SIEMENS

Datasheet 6ES7317-2AK14-0AB0

SIMATIC S7-300, CPU317-2 DP, CENTRAL PROCESSING UNIT WITH 1 MBYTE WORKING MEMORY, 1. INTERFACE MPI/DP 12MBIT/S, 2. INTERFACE DP-MASTER/SLAVE, MICRO MEMORY CARD NECESSARY

Product type designation	
General information	
Hardware product version	01
Firmware version	V3.3
Engineering with	
• Programming package	STEP7 as of V5.5 + SP1 or STEP 7 V5.2 + SP1 or higher with HSP 202
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 supply cables (recommendation)	2 A min.
Mains buffering	
• Mains/voltage failure buffering time	5 ms
• Repeat rate, min.	1 s
Load voltage L+	
Digital inputs	
Load voltage L+	
Digital outputs	
Load voltage L+	
Analog outputs	
Load voltage L+	

Input current	
Current consumption (rated value)	870 mA
Current consumption (in no-load operation), typ.	120 mA
Inrush current, typ.	4 A
I^2t	1 $A^2 \cdot s$
Digital inputs	
Digital outputs	

Power losses	
Power loss, typ.	4.5 W

Memory	
Type of memory	other
Work memory	
• Integrated	1 024 kbyte
• expandable	No
• Size of retentive memory for retentive data blocks	256 kbyte
Load memory	
• pluggable (MMC)	Yes
• pluggable (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 y
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data

Battery
Backup battery

CPU processing times	
for bit operations, typ.	0.025 µs
for word operations, typ.	0.03 µs
for fixed point arithmetic, typ.	0.04 µs
for floating point arithmetic, typ.	0.16 µs

CPU-blocks	
Number of blocks (total)	2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
• Number, max.	2 048; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	2 048; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	

• Number, max.	2 048; 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 time 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 isochronous mode OBs	1; OB 61
• 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	16
• additional within an error OB	4

Counters, timers and their retentivity	
S7 counter	
• Number	512
of which retentive with battery	
of which retentive without battery	
Retentivity	
— can be set	Yes
— lower limit	0
— upper limit	511
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	512
of which retentive with battery	
of which retentive without battery	
Retentivity	
— can be set	Yes

— lower limit	0
— upper limit	511
— 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, total	All, max. 256 KB
Flag	
• Number, max.	4 096 byte
• Retentivity available	Yes; From MB 0 to MB 4095
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Data blocks	
• Number, max.	2 048; Number range: 1 to 16000
• Size, max.	64 kbyte
• 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	
• Inputs	8 192 byte
• Outputs	8 192 byte
of which, distributed	
— Inputs	8 192 byte
— Outputs	8 192 byte
Process image	
• Inputs	8 192 byte
• Outputs	8 192 byte
• Inputs, adjustable	8 192 byte
• Outputs, adjustable	8 192 byte
• Inputs, default	256 byte
• Outputs, default	256 byte
Default addresses of the integrated channels	
Subprocess images	
• Number of subprocess images, max.	1

Digital channels	
• Inputs	65 536
• Outputs	65 536
• Inputs, of which central	1 024
• Outputs, of which central	1 024
Analog channels	
• Inputs	4 096
• Outputs	4 096
• Inputs, of which central	256
• Outputs, of which central	256
Addressing volume	
Address space per module	

Hardware configuration	
Expansion devices, max.	3
Number of DP masters	
• Integrated	2
• Via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, point-to-point	8
• CP, LAN	10
Rack	
• Racks, max.	4
• Modules per rack, max.	8

Time of day	
Clock	
• Hardware clock (real-time clock)	Yes
• battery-backed and synchronizable	Yes
• Deviation per day, max.	10 s; Typ.: 2 s
• Backup time	6 wk; At 40 °C ambient temperature
• Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
• Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
• Number	4
• Number/Number range	0 to 3
• Range of values	0 to 2^31 hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart
Clock synchronization	
• supported	Yes

• to MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes; With DP slave only slave clock
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	No

Digital inputs	
Number of digital inputs	0
Number of simultaneously controllable inputs	
all mounting positions	
horizontal installation	
vertical installation	
Input voltage	
Input current	
Input delay (for rated value of input voltage)	
for standard inputs	
for interrupt inputs	
for counter/technological functions	
Cable length	
Technological functions	
Standard DI	

Digital outputs	
Number of digital outputs	0
Switching capacity of the outputs	
Load resistance range	
Output voltage	
Output current	
Parallel switching of 2 outputs	
Switching frequency	
Aggregate current of outputs (per group)	
all mounting positions	
horizontal installation	
vertical installation	
all other mounting positions	
Integrated high-speed cams	
Cable length	

Analog inputs	
Number of analog inputs	0
Input ranges	
Input ranges (rated values), voltages	

Input ranges (rated values), currents	
Input ranges (rated values), resistance thermometer	
Input ranges (rated values), resistors	
Thermocouple (TC)	
Temperature compensation	
Characteristic linearization	
Cable length	

Analog outputs	
Number of analog outputs	0
Output ranges, voltage	
Output ranges, current	
Connection of actuators	
Load impedance (in rated range of output)	
Destruction limits against externally applied voltages and currents	
Cable length	

Analog value creation	
Integration and conversion time/resolution per channel	
Settling time	

Encoder	
Connection of signal encoders	
Connectable encoders	

Errors/accuracies	
Operational limit in overall temperature range	
Basic error limit (operational limit at 25 °C)	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	

Interfaces	
Number of USB interfaces	0
Number of parallel interfaces	0
Number of 20 mA interfaces (TTY)	0
Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of other interfaces	0
PROFIBUS DP	
MPI	
Point-to-point	
Integrated protocol driver	
Transmission speed, RS 422/485	

1. Interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes

Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
• MPI	Yes
• DP master	Yes
• DP slave	Yes; A DP slave at both interfaces simultaneously is not possible
• 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; Only server, configured on one side
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes
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; Only server, configured on one side
— S7 communication, as client	No
— S7 communication, as server	Yes
— Equidistance mode support	Yes
— Isochronous mode	No
— 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.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte

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	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes; Only server, configured on one side
— 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 RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Media redundancy	
Functionality	
• MPI	No
• DP master	Yes
• DP slave	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No
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; Only server, configured on one side
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes

— Equidistance mode support	Yes
— Isochronous mode	Yes; OB 61
— 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.	8 192 byte
— Outputs, max.	8 192 byte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
DP slave	
• GSD file	The latest GSD file is available on the Internet (http://www.siemens.com/profibus-gsd)
• 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	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes; Only server, configured on one side
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
PROFINET IO Controller	
Services	
Address area	
PROFINET IO Device	
Services	
Transfer memory	

Submodules	
PROFINET CBA	
Point-to-point connection	
Open IE communication	

3. Interface	
Media redundancy	
Functionality	
PROFINET IO Controller	
Services	
Address area	
PROFINET IO Device	
Services	
Transfer memory	
Submodules	
PROFINET CBA	
Open IE communication	
PROFINET CBA (at 50% communication load)	

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
• 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	
• 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
Standard communication (FMS)	

Open IE communication	
Web server	
PROFINET CBA (at set setpoint communication load)	
Remote interconnections with acyclic transmission	
Remote interconnections with cyclic transmission	
HMI variables via PROFINET (acyclic)	
PROFIBUS proxy functionality	
Number of connections	
• overall	32
• usable for PG communication	31
— reserved for PG communication	1
— Adjustable for PG communication, min.	1
— Adjustable for PG communication, max.	31
• usable for OP communication	31
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	31
• usable for S7 basic communication	30
— Reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	30
• usable for routing	X1 as a MPI, max. 10; X1 as DP Master max. 24; X1 as DP Slave (active) max. 14; X2 as DP Master max. 24; X2 as DP Slave (active) max. 14

S7 message functions	
Number of login stations for message functions, max.	32; 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
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
• Force, variables	Inputs, outputs
• Number of variables, max.	10
Diagnostic buffer	
• present	Yes
• Number of entries, max.	500
— can be set	No
— Of which powerfail-proof	100; Only the last 100 entries are retained
• Number of entries readable in RUN, max.	499
— can be set	Yes; From 10 to 499
— preset	10
Service data	
• Can be read out	Yes

Interrupts/diagnostics/status information
Alarms
Diagnostic messages
Diagnostics indication LED

Galvanic isolation
Galvanic isolation digital inputs
Galvanic isolation digital outputs
Galvanic isolation analog inputs
Galvanic isolation analog outputs

Standards, approvals, certificates
Marine approval
Use in hazardous areas

Ambient conditions	
Ambient temperature in operation	
• during operating phase, minimum	0 °C
• max.	60 °C
Extended ambient conditions	
Relative humidity	
Resistance	

Configuration	
Configuration software	
• STEP 7	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
• STEP 7 Lite	No
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
Software libraries	
Know-how protection	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Cycle time monitoring	

Dimensions	
Width	40 mm
Height	125 mm
Depth	130 mm

Weights	
Weight, approx.	360 g

last modified: 17.01.2015