

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7315-2EH13-0AB0

CPU 315-2 PN/DP CONTROLLER

Used with the applicable PLC System configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

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Overview CPU 317-2 DP



- The CPU with a large program memory and quantity framework for demanding requirements
- For multisector automation tasks in the construction of series machines, special machines and plants
- Used as a central controller on production lines with central and distributed I/O
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For extensive I/O configurations
- For setting up distributed I/O structures
- Supports as an option the use of SIMATIC Engineering Tools
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP

Micro memory card required for operation of CPU.

Overview CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding requirements
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET I/O controller for operating distributed I/O on PROFINET
- For multisector automation tasks in the construction of series machines, special machines and plants
- Used as a central controller on production lines with central and distributed I/O
- For extensive I/O configurations
- For setting up distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP-master/slave interface
- Supports as an option the use of SIMATIC Engineering Tools

Micro memory card required for operation of CPU.

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Overview CPU 319-3 PN/DP



- The CPU with high command processing performance, large program memory and quantity framework for demanding applications
- For cross-sector automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O on PROFIBUS and PROFINET
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CP

Technical specifications

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Product status				
Associated programming package	STEP7 V5.2 or higher + SP1 with HW update	STEP7 V5.2 or higher + SP1 with HW update	STEP 7 V 5.1 or higher + SP 4	STEP 7 V5.3 SP1 with hardware update
Supply voltages				
Rated value				
• DC 24 V	Yes	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V
Voltages and currents				
External protection for supply cables (recommendation)	min. 2 A	min. 2 A	min. 2 A	min. 2 A
Current consumption				
Inrush current, typ.	2.5 A	2.5 A	2.5 A	2.5 A
$I_{\Delta t}$	0.5 A²s	0.5 A²s	0.5 A²s	1 A²s
Current consumption (in no-load operation), typ.	60 mA	60 mA	60 mA	100 mA
Current consumption (rated value)	0.6 A	0.6 A		650 mA
from supply voltage L+, max.	600 mA	600 mA	800 mA	
Power loss, typ.	2.5 W	2.5 W	2.5 W	3.5 W
Memory				
Memory				
• RAM				
- integrated	32 KByte; for program and data, less the display data	96 KByte; for program and data, less the display data	128 KByte	256 KByte; for program and data, less the display data
- expandable	No	No	No	No
• Load memory				
- pluggable (MMC)	Yes	Yes	Yes	Yes
- pluggable (MMC), max.	4 MByte	8 MByte	8 MByte	8 MByte
Backup				
• present	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)	Yes; guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data	Yes; Program and data		Yes; Program and data

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Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
CPU/blocks				
DB				
• Number, max.	511; Number band: 1 to 511	511; Number band: 1 to 511	1,024; Number band: 1 to 1023	1,023; Number band: 1 to 1023
• Size, max.	16 KByte	16 KByte	16 KByte	16 KByte
FB				
• Number, max.	1,024; Number band: 0 to 2047	1,024; Number band: 0 to 2047	2,048; Number band: 0 to 2047	1,024; Number band: 0 to 2047
• Size, max.	16 KByte	16 KByte	16 KByte	16 KByte
FC				
• Number, max.	1,024; Number band: 0 to 2047	1,024; Number band: 0 to 2047	2,048; Number band: 0 to 2047	1,024; Number band: 0 to 2047
• Size, max.	16 KByte	16 KByte	16 KByte	16 KByte
OB				
• Number, max.	see Operation List	see Operation List		see Operation List
• Size, max.	16 KByte	16 KByte	16 KByte	16 KByte
Nesting depth				
• per priority class	8	8	8	8
• additional within an error OB	4	4	4	4
CPU/processing times				
for bit operations, min.	0.2 µs	0.1 µs	0.1 µs	0.1 µs
for word operations, min.	0.4 µs	0.2 µs	0.2 µs	0.2 µs
for fixed point arithmetic, min.	5 µs	2 µs	2 µs	2 µs
for floating point arithmetic, min.	6 µs	3 µs	3 µs	3 µs
Times/counters and their remanence				
S7 counter				
• Number	128	256	256	256
• of which remanent without battery				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	127	255		255
• Remanence				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0		0
- upper limit	127	255		255
• Counting range				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	999	999	999	999
IEC counter				
• present	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB
S7 times				
• Number	128	256	256	256
• Remanence				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0		0
- upper limit	127	255		255
- preset	No retentivity	No retentivity	No retentivity	No retentivity
• Time range				
- lower limit	10 ms	10 ms	10 ms	10 ms
- upper limit	9,990 s	9,990 s	9,990 s	9,990 s

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	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
IEC timer				
• present	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB
Data areas and their remanence				
Flag				
• Number, max.	128 Byte	256 Byte	2,048 Byte	2,048 Byte
• Remanence available	Yes; MB 0 to MB 127	Yes; MB 0 to MB 255	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 2047
• Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks				
• Number, max.	511; from DB1 to DB511	511; from DB1 to DB511	1,023; from DB 1 to DB 1023	1,023; from DB 1 to DB 1023
• Size, max.	16 KByte	16 KByte	16 KByte; Local data size: max. 1024 bytes per priority class/ 510 bytes per block	16 KByte
• Remanence adjustable	Yes; via non-retain property on DB	Yes; via non-retain property on DB		Yes; via non-retain property on DB
• Remanence preset	Yes	Yes		Yes
Local data				
• per priority class, max.	256 Byte	510 Byte	128 Byte	1,024 Byte; per block max. 510
Address area				
I/O address area				
• Inputs	1 KByte	1 KByte	2 KByte	2 KByte
• Outputs	1 KByte	1 KByte	2 KByte	2 KByte
• of which, distributed				
- Inputs			2 KByte	2 KByte
- Outputs			2 KByte	2 KByte
Process image				
• Inputs	128 Byte	128 Byte	128 Byte	128 Byte
• Outputs	128 Byte	128 Byte	128 Byte	128 Byte
Digital channels				
• Inputs	256	1,024	16,384	16,384
• Outputs	256	1,024	16,384	16,384
• Inputs, of which central	256	1,024	1,024	1,024; max.
• Outputs, of which central	256	1,024	1,024	1,024; max.
Analog channels				
• Inputs	64	256	1,024	1,024
• Outputs	64	256	1,024	1,024
• Inputs, of which central	64	256	256	256; max.
• Outputs, of which central	64	256	256	256; max.
Hardware config.				
Central devices, max.	1	1		1
Expansion devices, max.	0	3		3
Racks, max.	1	4	4	4
Modules per rack, max.	8	8	8	8
Number of DP masters				
• integrated	0	0	1	1
• via CP	4	4	4	4

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Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Number of operable FMs and CPs (recommended)				
• FM	8	8	8	8
• CP, point-to-point	8	8	8	8
• CP, LAN	4	10	10	10
Time				
Clock				
• Hardware clock (real-time clock)		Yes	Yes	Yes
• Software clock	Yes			
• Battery backed and synchronized	No	Yes	Yes	Yes
• Deviation per day, max.	15 s	10 s	10 s	10 s
Operating hours counter				
• Number	1	1	1	1
• Number/Number range	0	0	0	0
• Range of values	0 to 2 ³¹ hours (when using SFC101)	0 to 2 ³¹ hours (when using SFC101)	0 to 2 ³¹ hours (when using SFC101)	2 ³¹ hours (when using the SFC 101)
• Granularity	1 hour	1 hour	1 hour	1 hour
• remanent	Yes; must be restarted at each warm restart	Yes; must be restarted at each warm restart	Yes; must be restarted at each warm restart	Yes; must be restarted at each warm restart
Clock synchronization				
• supports	Yes	Yes	Yes	Yes
• to MPI, Master	Yes	Yes	Yes	Yes
• to MPI, Slave	Yes	Yes	Yes	Yes
• in AS, Master	Yes	Yes	Yes	Yes
• in AS, Slave				Yes
S7 message functions				
Number of login stations for message functions, max.	6; depending on the configured connections for PG/OP and S7 basic communication	12; depending on the configured connections for PG/OP and S7 basic communication	16; depending on the configured connections for PG-/ OP- and S7-basic communication	16; (depending on the configured connections for PG-/OP and S7 basic communication)
Process diagnostic messages	Yes	Yes	Yes	Yes
Simultaneously active Alarm-S blocks, max.	20	40	40	40
Test commissioning functions				
Status/control				
• Status/control variable	Yes	Yes	Yes	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters
Monitoring functions				
• Number of variables, max.	30	30	30	30
• of which status variable, max.	30	30	30	30
• of which control variable, max.	14	14	14	14
Forcing				
• Forcing	Yes	Yes	Yes	Yes
• Force, variables	Inputs, outputs	Inputs, outputs	Inputs, outputs	Inputs, outputs
• Forcing, number of variables, max.	10	10	10	10
Status block	Yes	Yes	Yes	Yes
Single step	Yes	Yes	Yes	Yes
Number of breakpoints	2	2	2	2

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	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Monitoring functions				
Diagnostic buffer				
• present	Yes	Yes	Yes	Yes
• Number of entries, max.	100	100	100	100
• adjustable	No	No	No	No
Communication functions				
PG/OP communication	Yes	Yes	Yes	Yes
Routing	No	No	Yes	Yes
Global data communication				
• supported	Yes	Yes	Yes	Yes
• Size of GD packets, max.	22 Byte	22 Byte	22 Byte	22 Byte
S7 basic communication				
• supported	Yes	Yes	Yes	Yes
S7 communication				
• supported	Yes	Yes	Yes	Yes
S5-compatible communication				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Open IE communication				
• TCP/IP				Yes; via integrated PROFINET interface and loadable FBs 8
- Number of connections, max.				8
- Data length, max.				1,460 Byte
Number of connections				
• overall	6	12	16	16
• usable for PG communication	5	11	15	15; max.
• usable for OP communication	5	11	15	15
• usable for S7 basic communication	2	8	12	14
• usable for routing			4	
PROFINET CBA (at set setpoint communication load)				
• Setpoint for the CPU communication load				50%
• Number of remote interconnection partners				32
• Number of functions, master/slave				17
• Total of all master/slave connections				1,000
• Data length of all incoming connections master/slave, max.				4,000 Byte
• Data length of all outgoing connections master/slave, max.				4,000 Byte
• Number of device-internal and PROFIBUS interconnections				500
• Data length of device-internal und PROFIBUS interconnections, max.				4,000 Byte
• Data length per connection, max.				1,400 Byte

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PROFINET CBA (at set setpoint communication load)				
- Remote interconnections with acyclic transmission - Sampling frequency: sampling interval, min. - Number of incoming interconnections - Number of outgoing interconnections - Data length of all incoming interconnections, max. - Data length of all outgoing interconnections, max. - Data length per connection, max.				500 ms 100 100 2,000 Byte 2,000 Byte 1,400 Byte
- Remote interconnections with cyclic transmission - Transmission frequency: transmission interval, min. - Number of incoming interconnections - Data length of all incoming interconnections, max. - Data length of all outgoing interconnections, max. - Data length per connection, max.				10 ms 200 2,000 Byte 2,000 Byte 450 Byte
- HMI variables via PROFINET (acyclic) - Number of log-in stations for HMI variables (PN OPC/iMap) - HMI variable updating - Number of HMI variables - Data length of all HMI variables, max.				3; 2 * PN OPC / 1 * iMap 500 ms 200 2,000 Byte
- PROFIBUS proxy functionality - supported - Number of linked PROFIBUS devices - Data length per connection, max.				Yes 16 240 Byte; Slave-dependent
MPI				
Cable length, max.		50 m; without repeater		
1st interface				
Type of interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
isolated	No	No	No	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA
Functionality				
• MPI	Yes	Yes	Yes	Yes
• DP master	No	No	No	Yes
• DP slave	No	No	No	Yes
• Point-to-point coupling	No	No	No	No

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Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
MPI				
• Number of connections	6	12	16	16
• Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- Routing	No	No	Yes	Yes
- Global data communication	Yes	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes	Yes
- S7 communication, as client	No	No	No	No
- S7 communication, as server	Yes	Yes	Yes	Yes
• Transmission speeds, max.	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	12 Mbit/s
DP master				
• Services				
- PG/OP communication				Yes
- Routing				Yes
- Global data communication				No
- S7 basic communication				Yes
- S7 communication				Yes
- S7 communication, as client				No
- S7 communication, as server				Yes
- equidistance support				Yes
- SYNC/FREEZE				Yes
- DPV1				Yes
• Transmission speeds, max.				12 Mbit/s
• Number of DP slaves, max.				124
DP slave				
• Services				
- Routing				Yes; only when interface active
- Global data communication				No
- S7 basic communication				Yes
- S7 communication				Yes
- S7 communication, as client				No
- S7 communication, as server				Yes
- direct data exchange (cross traffic)				Yes
- DPV1				No
• Transmission speeds, max.				12 Mbit/s
• Transfer memory				
- Inputs				244 Byte
- Outputs				244 Byte
• Address area, max.				32; with max. 32 bytes each
2nd interface				
Type of interface			Integral RS 485 interface	PROFINET
Physics			RS 485	Ethernet
isolated			Yes	Yes
Power supply to interface (15 to 30 V DC), max.			200 mA	0 mA
Automatic detection of transmission speed				Yes; (10/100 MBit/s)