SIMATIC S7-300

Brochures

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http://www.siemens.com/simatic/printmaterial

S7-300/S7-300F/SIPLUS S7-300

Overview

S7-300

- The modular mini PLC system for the low and mid-performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase
- Powerful thanks to a range of integrated functions

S7-300F

- Failsafe automation system for plants with increased safety requirements for production technology
- Based on S7-300
- Additional ET 200S and ET 200M distributed I/O stations complete with safety-related modules can be connected; safety-related communication over PROFIBUS DP with the PROFIsafe profile
- Standard modules can be used in addition for non-safety-relevant applications

SIPLUS S7-300

- The PLC for use under extremely harsh environmental conditions
- With enhanced temperature range from -25 °C to +60 °C
- Use in environments with pollutant gases (corrosive gas atmospheres)
- Occasional short-term condensation and enhanced mechanical stress permissible
- With the proven PLC technology of the S7-300
- Easy handling, programming, maintenance and service
- Ideal for use in automobile construction, environmental technology, mining, chemical plants, conveying technology, food & beverages industry etc.
- The substitute for expensive special solutions

For more information, go to:

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Technical specifications

General technical specifications S7-300, S7-300F	
Degree of protection	Degree of protection IP20 to IEC 60 529
Ambient temperature	
• With horizontal mounting	0 … 60 °C
• With vertical mounting	0 … 40 °C
Relative humidity	5 to 95 %, no condensation (RH severity level 2 in accordance with IEC 61131-2)
Atmospheric pressure	795 … 1080 hPa
Isolation	
• 24 V DC circuits	Test voltage 500 V DC
• 230 V AC circuits	Test voltage 1460 V AC
Electromagnetic compatibility	Requirements of EMC law; Noise immunity according to IEC 61000-6-2, tested according to: IEC 61000-4-2, 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6 Emitted interference according to EN 50081-2, tested according to EN 55011, class A, group 1
Mechanical rating	
• Vibrations, tested according to/tested with	IEC 60068, Part 2-6/10 up 58 Hz; constant amplitude 0.075 mm; 58 to 150 Hz; constant acceleration 1 g; oscillation period: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes
• Shock, tested according to/tested with	IEC 60068, Part 2-27/half-sine: strength of impact 15 g (peak value), duration 11 ms

General technical data of the SIPLUS S7-300	
Climatic environmental conditions	
Temperature	Horizontal installation: -25 °C to 60 °C vertical installation: -25 °C to 40 °C
Relative humidity	5 to 95%; short-term condensation permissible, corresponds to relative humidity (RH) load 2 according to IEC 1131-2 and IEC 721 3-3 Cl. 3K5
Short-term ice formation	-25 °C to 0 °C IEC 721 3-3 Cl. 3K5
Air pressure	1080 to 795 hPa corresponds to an altitude of -1000 to 2000 m
Contaminant concentration	SO_2: < 0.5 ppm; relative humidity < 60% test: 10 ppm, 4 days H_2S: < 0.1 ppm; relative humidity < 60% test: 1 ppm, 4 days (to IEC 721 3-3; Class 3C3)
Mechanical environmental conditions	
Vibrations	Type of vibration: Frequency sweeps with a rate of change of 1 octave/minute. 2 Hz ≤ f ≤9 Hz, constant Amplitude 3.0 mm, 9 Hz ≤ f ≤150 Hz, constant acceleration 1 g, duration of oscillation: 10 frequency cycles per axis in each of the three mutually perpendicular axes Vibration tests according to IEC 68 Part 2-6 (sine wave) and IEC 721 3-3, Class 3M4
Shock	Type of shock: Half-sine, intensity of shock: 15 g peak value, 11 ms duration, direction: 3 shocks each in +/- direction in each of the 3 perpendicular axes Shock testing in accordance with IEC 68 Part 2-27
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes [1]

[1] Does not apply to 6AG1314-6CF02-2AB0, 6AG1315-6EG10-2AB0, 6AG1317-6EJ10-2AB0, 6AG1336-1HE00-2AB0, 6AG1314-6CF02-2AB0, 6AG1331-7KF02-2AB0, 6AG1331-7PF02-2AB0, 6AG1332-5HF00-2AB0, 6AG1334-0KE00-2AB0, 6AG1331-7TB00-2AB0

Compact CPUs

Overview CPU 312C

- The compact CPU with integrated digital inputs and outputs
- For small applications with high requirements in terms of processing power
- With process-related functions

Micro memory card required to operate the CPU.

Overview CPU 313C-2 PtP

- The compact CPU with integrated digital I/Os and second serial interface
- For installations with high requirements in terms of processing power and response time.
- With process-related functions

Micro memory card required to operate the CPU.

Overview CPU 313C

- The compact CPU with integrated digital and analog inputs and outputs
- For installations with high requirements in terms of processing power and response time.
- With process-related functions

Micro memory card required to operate the CPU.

Overview 313C-2 DP

- The compact CPU with integrated digital I/Os and PROFIBUS DP master/slave interface
- With process-related functions
- For tasks with special functions
- For the connection of standalone I/O devices

Micro memory card required to operate the CPU.

Overview CPU 314C-2 PtP

- The compact CPU with integrated digital and analog I/Os, as well as a second serial interface
- For installations with high requirements in terms of processing power and response time
- With process-related functions

Micro memory card required to operate the CPU.

Overview CPU 314C-2 DP

- The compact CPU with integrated digital and analog I/Os and PROFIBUS DP master/slave interface
- With process-related functions
- For tasks with special functions
- For the connection of standalone I/O devices

Micro memory card required to operate the CPU.

Technical specifications

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Product status						
associated programming package	STEP 7 V5.3 SP2 or higher with HW update					
Supply voltages						
Rated value						
• DC 24 V	Yes	Yes	Yes	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	20.4 V	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	28.8 V	28.8 V
external protection for supply cables (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A					
Current consumption						
Current consumption (rated value)	500 mA	700 mA	700 mA	900 mA	800 mA	1 000 mA
Current consumption (in no-load operation), typ.	60 mA	150 mA	100 mA	100 mA	150 mA	150 mA
Inrush current, typ.	11 A	11 A	11 A	11 A	11 A	11 A
I^2t	0.7 $A^2 \cdot$ s	0.7 $A^2 \cdot$ s	0.7 $A^2 \cdot$ s	0.7 $A^2 \cdot$ s	0.7 $A^2 \cdot$ s	0.7 $A^2 \cdot$ s
from supply voltage L+, max.	500 mA	700 mA	700 mA	900 mA	800 mA	1 000 mA
Current consumption/power loss						
Power loss, typ.	6 W	14 W	10 W	10 W	14 W	14 W
Memory						
Type of storage						
RAM						
• integrated	32 Kibyte; For program and data	64 Kibyte; For program and data	64 Kibyte; For program and data	64 Kibyte; For program and data	96 Kibyte; For program and data	96 Kibyte; For program and data
• expandable	No	No	No	No	No	No
Load memory						
• pluggable (MMC)	Yes	Yes	Yes	Yes	Yes	Yes
• pluggable (MMC), max.	4 MByte	8 MByte	8 MByte	8 MByte	8 MByte	8 MByte

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Backup						
• present	Yes; Guaranteed by MMC (maintenance-free)					
• without battery	Yes; Program and data					
CPU/ blocks						
DB						
• Number, max.	511; Number range: 1 to 511					
• Size, max.	16 Kibyte					
FB						
• Number, max.	1 024; Sequence of numbers: 0 to 2047					
• Size, max.	16 Kibyte					
FC						
• Number, max.	1 024; Sequence of numbers: 0 to 2047					
• Size, max.	16 Kibyte					
OB						
• Size, max.	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte; See instruction	16 Kibyte
Nesting depth						
• per priority class	8	8	8	8	8	8
• additional within an error OB	4	4	4	4	4	4
CPU/processing times						
for bit operations, min.	0.2 µs	0.1 µs	0.1 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	0.2 µs	0.2 µs
for fixed point arithmetic, min.	5 µs	2 µs	2 µs	2 µs	2 µs	2 µs
for floating point arithmetic, min.	6 µs	3 µs	3 µs	3 µs	3 µs	3 µs
Times/counters and their remanence						
S7 counter						
• Number	128	256	256	256	256	256
• of which remanent without battery						
- adjustable	Yes	Yes	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0	0
- upper limit	127	255	255	255	255	255
• Remanence						
- adjustable	Yes	Yes	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0	0
- upper limit	127	255	255	255	255	255
• Counting range						
- lower limit	0	0	0	0	0	0
- upper limit	999	999	999	999	999	999
IEC counter						
• present	Yes	Yes	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB	SFB	SFB
S7 times						
• Number	128	256	256	256	256	256
• Remanence						
- adjustable	Yes	Yes	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0	0
- upper limit	127	255	255	255	255	255
- preset	No retentivity	No retentivity	No retentivity	No retentivity	No retentivity	No retentivity

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
S7 times (continued)						
• Time range						
- lower limit	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s	9 990 s	9 990 s	9 990 s
IEC timer						
• present	Yes	Yes	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB	SFB	SFB
Data areas and their remanence						
Flag						
• Number, max.	128 byte	256 byte	256 byte	256 byte	256 byte	256 byte
• Remanence available	Yes; MB 0 to MB 127	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255	Yes; MB 0 to MB 255
• Number of clock memories	8; 1 memory byte	8; 1 memory byte	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	511; Number range: 1 to 511	511; Number range: 1 to 511	511; Number range: 1 to 511	511; Number range: 1 to 511
• Size, max.	16 Kibyte					
• Remanence adjustable	Yes; via non-retain property on DB					
• Remanence preset	Yes					
Local data						
• per priority class, max.	256 byte	510 byte	510 byte	510 byte	510 byte	510 byte
Address area						
I/O address area						
• Inputs	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte
• Outputs	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte	1 Kibyte
• of which, distributed						
- Inputs			none	1 006 byte; max.	none	979 byte
- Outputs			none	1 006 byte; max.	none	986 byte
Process image						
• Inputs	128 byte	128 byte	128 byte	128 byte	128 byte	128 byte
• Outputs	128 byte	128 byte	128 byte	128 byte	128 byte	128 byte
Digital channels						
• Inputs	266	1 016	1 008	8 064	1 016	7 856
• Outputs	262	1 008	1 008	8 064	1 008	7 904
• Inputs, of which central	266	1 016	1 008	1 008	1 016	1 016
• Outputs, of which central	262	1 008	1 008	1 008	1 008	1 008
Analog channels						
• Inputs	64	253	248	503	253	494
• Outputs	64	250	248	503	250	495
• Inputs, of which central	64	253	248	248	253	253
• Outputs, of which central	64	250	248	248	250	250
Hardware config.						
Central devices, max.	1	1	1	1	1	1
Expansion devices, max.	0	3	3	3	3	3
Racks, max.	1	4	4	4	4	4
Modules per rack, max.	8	8; In rack 3 max. 7	8; In rack 3 max. 7	8; In rack 3 max. 7	8; In rack 3 max. 7	8; In rack 3 max. 7

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Number of DP masters						
• integrated	none	none	No	1	none	1
• via CP	4	4	4	4	4	4
Number of operable FMs and CPs (recommended)						
• FM	8	8	8	8	8	8
• CP, point-to-point	8	8	8	8	8	8
• CP, LAN	4	6	6	6	10	10
Time						
Clock						
• Hardware clock (real-time clock)		Yes	Yes	Yes	Yes	Yes
• Software clock	Yes					
• buffered and synchronizable	No	Yes	Yes	Yes	Yes	Yes
• Deviation per day, max.	15 s	10 s	10 s	10 s	10 s	10 s
Operating hours counter						
• Number	1	1	1	1	1	1
• Number/Number range	0	0	0	0	0	0
• Range of values	2^31 hours (when using the SFC 101)	2^31 hours (when using the SFC 101)	2^31 hours (when using the SFC 101)	2^31 hours (when using the SFC 101)	2^31 hours (when using the SFC 101)	2^31 hours (when using the SFC 101)
• Granularity	1 hour	1 hour	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	Yes; must be restarted at each warm restart.	Yes; must be restarted at each warm restart.
Clock synchronization						
• supports	Yes	Yes	Yes	Yes	Yes	Yes
• to MPI, Master	Yes	Yes	Yes	Yes	Yes	Yes
• to MPI, Slave	Yes	Yes	Yes	Yes	Yes	Yes
• to DP, Master				Yes; on DP slave only time-of-day slave		Yes; on DP slave only time-of-day slave
• to DP, Slave				Yes		Yes
• in AS, Master	Yes	Yes	Yes	Yes	Yes	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	8; Depending on the configured connections for PG/OP and S7 basic communication	8; Depending on the configured connections for PG/OP and S7 basic communication	8	12; 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
Process diagnostic messages	Yes	Yes	Yes	Yes	Yes	Yes
simultaneously active Alarm-S blocks, max.	20	20	20	20	40	40
Test commissioning functions						
Status/control						
• Status/control variable	Yes	Yes	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	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	30	30	30	30	30	30
• of which status variable, max.	30	30	30	30	30	30
• of which control variable, max.	14	14	14	14	14	14

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Forcing						
• Forcing	Yes					
• Force, variables	Inputs, outputs					
• Number of variables, max.	10					
Status block	Yes	Yes	Yes	Yes	Yes	Yes
Single step	Yes	Yes	Yes	Yes	Yes	Yes
Number of breakpoints	2	2	2	2	2	2
Diagnostic buffer						
• present	Yes	Yes	Yes	Yes	Yes	Yes
• Number of entries, max.	100	100	100	100	100	100
• adjustable				No		
Communication functions						
PG/OP communication	Yes	Yes	Yes	Yes	Yes	Yes
Routing	No	No	No	Yes	No	Yes
Global data communication						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
• Size of GD packets, max.	22 byte	22 byte	22 byte	22 byte	22 byte	22 byte
S7 basic communication						
• supported	Yes	Yes	Yes; Server	Yes	Yes	Yes
S7 communication						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
S5-compatible communication						
• supported	Yes; via CP and loadable FC					
Number of connections						
• overall	6	8	8	8	12	12
• usable for PG communication	5	7	7	7	11	11
• usable for OP communication	5	7	7	7	11	11
• usable for S7 basic communication	2	4	4	4	8	8
• usable for routing	No	No	No	4; max.	No	4; max.
Connection point						
required front connectors	1x 40-pin	2x 40-pin	1x 40-pin	1x 40-pin	2x 40-pin	2x 40-pin
MPI						
Cable length, max.	50 m; without repeater	50 m; without repeater	50 m; without repeater	50 m; without repeater	50 m; without repeater	50 m; without repeater
Point-to-point						
Cable length, max.			1 200 m		1 200 m	
Integrated protocol driver						
• 3964 (R)			Yes		Yes	
• ASCII			Yes		Yes	
• RK512			No		Yes	
Transmission speed, RS 422/485						
• with 3964 (R) protocol, max.			38.4 Kbit/s half duplex; 19.2 Kbit/s full duplex		19.2 kBit/s; 38.4 Kbit/s half duplex; 19.2 Kbit/s full duplex	
• with ASCII protocol, max.			38.4 Kbit/s half duplex; 1 9.2 Kbit/s full duplex		19.2 kBit/s; 38.4 Kbit/s half duplex; 19.2 Kbit/s full duplex	

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Transmission speed, RS 422/485 (continued)						
• with RK 512 protocol, max.					19.2 kBit/s; 38.4 Kbit/s half duplex; 19.2 Kbit/s full duplex	
1st interface						
Type of interface	integrated RS 485 interface	integrated RS 485 interface	integrated RS 485 interface	integrated RS 485 interface	integrated RS 485 interface	integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485	RS 485	RS 485
isolated	No	No	No	Yes	No	No
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Functionality						
• MPI	Yes	Yes	Yes	Yes	Yes	Yes
• DP master	No	No	No	No	No	No
• DP slave	No	No	No	No	No	No
• Point-to-point coupling	No	No	No	No	No	No
MPI						
• Number of connections	6	8	8	8	12	12
• Services						
- PG/OP communication	Yes	Yes	Yes	Yes	Yes	Yes
- Routing	No	No	No	Yes	No	Yes
- Global data communication	Yes	Yes	Yes	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes	Yes	Yes	Yes
- S7 communication, as client	No	No	No	No	No	No
- S7 communication, as server	Yes	Yes	Yes	Yes	Yes	Yes
• Transmission speeds, max.	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
2nd interface						
Type of interface			integrated RS 422/ 485 interface	integrated RS 422/ 485 interface	integrated RS 422/ 485 interface	integrated RS 422/ 485 interface
Physics			RS 422 / RS 485 (X.27)	RS 485	RS 422 / RS 485 (X.27)	RS 485
isolated			Yes	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.			No	200 mA	No	200 mA
Functionality						
• MPI			No	No	No	No
• DP master			No	Yes	No	Yes
• DP slave			No	Yes	No	Yes
• PROFINET IO controller			No	No	No	No
• PROFINET CBA			No	No	No	No
• Point-to-point coupling			Yes	No	Yes	No
DP master						
• Number of connections, max.				8; For PG/OP communication		12; For PG/OP communication
• Number of connections (of which reserved), max.				1 for PG, 1 for OP		1 for PG, 1 for OP

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
DP master (continued)						
• Services						
- PG/OP communication				Yes		Yes
- Routing				Yes		Yes
- Global data communication				No		No
- S7 basic communication				Yes; I blocks only		Yes; I blocks only
- S7 communication				Yes		Yes
- S7 communication, as client				No		No
- S7 communication, as server				Yes		Yes
- equidistance support				Yes		Yes
- Isochronous mode				No		No
- SYNC/FREEZE				Yes		Yes
- Activation/deactivation of DP slaves				Yes		Yes
- direct data exchange (cross traffic)				Yes		Yes
- DPV1				Yes		Yes
• Transmission speeds, max.				12 MBit/s		12 MBit/s
• Number of DP slaves, max.				32		32
• Address area						
- Inputs, max.				1 Kibyte		1 Kibyte
- Outputs, max.				1 Kibyte		1 Kibyte
• Useful data per DP slave						
- Inputs, max.				244 byte		244 byte
- Outputs, max.				244 byte		244 byte
DP slave						
• Number of connections				8		12
• Services						
- PG/OP communication				Yes		Yes
- Routing				Yes; only when interface active		Yes; only when interface active
- Global data communication				No		No
- S7 basic communication				No		No
- S7 communication, as client				No		No
- S7 communication, as server				Yes		Yes
- direct data exchange (cross traffic)				Yes		Yes
- DPV1				No		No
• GSD file				You can obtain the current GSD file from http://www.siemens.com/profibus-gsd		You can obtain the current GSD file from http://www.siemens.de/profibus-gsd
• Transmission speeds, max.				12 kBit/s		12 kBit/s
• automatic baud rate search				Yes; only with passive interface		Yes; only with passive interface
• Transfer memory						
- Inputs				244 byte		244 byte
- Outputs				244 byte		244 byte
• Address area, max.				32		32
• Useful data per address area, max.				32 byte		32 byte

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
CPU/programming						
Programming language						
• STEP 7	Yes; V5.3 SP2 with HW update	Yes; V5.3 SP2 with HW update	Yes; V5.2 SP2 with HW update	Yes; V5.3 SP2 with HW update	Yes; V5.3 SP2 with HW update	Yes; V5.3 SP2 with HW update
• LAD	Yes	Yes	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes	Yes	Yes
• SCL	Yes	Yes	Yes	Yes	Yes	Yes
• CFC					Yes	Yes
• GRAPH	Yes	Yes	Yes	Yes	Yes	Yes
• HiGraph	Yes	Yes	Yes	Yes	Yes	Yes
Operational stocks	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8	8	8	8
User program protection/ password protection	Yes	Yes	Yes	Yes	Yes	Yes
System functions (SFC)	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list^	See instruction list
System function blocks (SFB)	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list
Digital inputs						
Number of digital inputs	10	24	16	16	24	24
• of which, inputs usable for technological functions	8	12	12	12	16	16
Number of simultanneously controllable inputs						
• horizontal installation						
- up to 40 °C, max.	10	24	16	16	24	24
- up to 60 °C, max.	5	12	8	8	12	12
• vertical installation						
- up to 40 °C, max.	5	12	8	8	12	12
• Technological functions						
- shielded, max.	100 m	100 m	100 m	100 m	50 m	50 m
- unshielded, max.	not allowed	not allowed	not allowed	not allowed	not allowed	not allowed
• Standard DI						
- schielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
- unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Input characteristic curve to IEC 1131, Type 1	Yes	Yes	Yes	Yes	Yes	Yes
Input voltage						
• Rated value, DC	24 V	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V	-3 to +5 V	-3 to +5 V	-3 to +5 V	-3 to +5 V
• for signal "1"	15 to 30 V	15 to 30 V	15 to 30 V	15 to 30 V	15 to 30 V	15 to 30 V
Input current						
• for signal "1", typ.	9 mA	9 mA	9 mA	9 mA	9 mA	9 mA
Input delay (for rated value of input voltage)						
• for standard inputs						
- programmable	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms	Yes; 0.1 / 0.3 / 3 / 15 ms
- Rated value	3 ms	3 ms	3 ms	3 ms	3 ms	3 ms
• for counter/technological functions						
- at "0" to "1", max.	48 µs	16 µs	16 µs	16 µs	8 µs	8 µs

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Cable length						
• cable length, shielded, max.	1 000 m; 100 m for technological functions	1 000 m; 100 m for technological functions	1 000 m; 100 m for technological functions	1 000 m; 100 m for technological functions	1 000 m; 50 m for technological functions	1 000 m; 50 m for technological functions
• Cable length unshielded, max.	600 m; For technological functions: No	600 m; For technological functions: No	600 m; For technological functions: No	600 m; For technological functions: No	600 m; For technological functions: No	600 m; For technological functions: No
Digital outputs						
Number of digital outputs	6	16	16	16	16	16
• of which, high-speed outputs	2	4	4	4	4	4
Short-circuit protection of the output	Yes; clocked electronically	Yes; clocked electronically	Yes; clocked electronically	Yes; clocked electronically	Yes; clocked electronically	Yes; clocked electronically
• Response threshold, typ.	1 A	1 A	1 A	1 A	1 A	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)
Lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes
Output voltage						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current						
• for signal "1" rated value	500 mA	500 mA	500 mA	500 mA	500 mA	500 mA
• for signal "1" permissible range, min.	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA
• for signal "1" permissible range, max.	0.6 A	0.6 A	0.6 A	0.6 A	0.6 A	0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Parallel switching of 2 outputs						
• for increased power	No	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes	Yes
Switching frequency						
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0,5 Hz	0,5 Hz	0,5 Hz	0,5 Hz	0,5 Hz	0,5 Hz
• on lamp load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• of the pulse outputs, with resistive load, max.	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz
Aggregate current of the outputs (per group)						
• horizontal installation						
- up to 40 °C, max.	2 A	3 A	3 A	3 A	3 A	3 A
- up to 60 °C, max.	1.5 A	2 A	2 A	2 A	2 A	2 A
• vertical installation						
- up to 40 °C, max.	1.5 A	2 A	2 A	2 A	2 A	2 A
Load impedance range						
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	4 kΩ	4 kΩ	4 kΩ
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Analog inputs						
Number of analog inputs for voltage/current measurement		4			4	4
Number of analog inputs for resistance/temperature measurement		1			1	1
cable length, shielded, max.		100 m			100 m	100 m
Permissible input frequency for current input (destruction limit), max.		2.5 V; permanent			2.5 V; permanent	2.5 V; permanent
permissible input current for voltage input (destruction limit), max.		0.5 mA; permanent			0.5 mA; permanent	0.5 mA; permanent
technical unit for temperature measurement, adjustable		Yes; Degrees Celsius / degrees Fahrenheit / Kelvin			Yes; Degrees Celsius / degrees Fahrenheit / Kelvin	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages						
• 0 to +10 V		Yes			Yes	Yes
• -10 V to +10 V		Yes			Yes	Yes
Input ranges (rated values), currents						
• 0 to 20 mA		Yes			Yes	Yes
• -20 to +20 mA		Yes			Yes	Yes
• 4 to 20 mA		Yes			Yes	Yes
Input ranges (rated values), resistance thermometers						
• Pt 100		Yes			Yes	Yes
Input ranges (rated values), resistors						
• No-Load voltage, typ.		2,5 V			2,5 V	2,5 V
• Measured current, typ.		1.8 to 3.3 mA			1.8 to 3.3 mA	1.8 to 3.3 mA
• 0 to 600 Ohm		Yes			Yes	Yes
• permissible input frequency for voltage input (destruction limit), max.		30 V; permanent			30 V; permanent	30 V; permanent
• permissible input current for current input (destruction limit), max.		50 mA; permanent			50 mA; permanent	50 mA; permanent
Characteristic curve linearization						
• programmable		Yes; by software			Yes; by software	Yes; by software
- for thermoresistor		Pt 100			Pt 100	Pt 100
Temperature compensation						
• programmable		No			No	No
Analog outputs						
Number of analg outputs		2			2	2
cable length, shielded, max.		200 m			200 m	200 m
Voltage output, Short-circuit protection		Yes			Yes	Yes
Voltage output, short-circuit current, max..		55 mA			55 mA	55 mA
Current output, no-load voltage, max.		17 V			17 V	17 V
Output ranges, voltage						
• 0 to 10 V		Yes			Yes	Yes
• -10 to +10 V		Yes			Yes	Yes
Output ranges, current						
• 0 to 20 mA		Yes			Yes	Yes
• -20 to +20 mA		Yes			Yes	Yes
• 4 to 20 mA		Yes			Yes	Yes

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Connection of actuators						
• for voltage output 2-conductor connection		Yes; Without compensation of the line resistances			Yes; Without compensation of the line resistances	Yes; Without compensation of the line resistances
• for voltage output 4-conductor connection		No			No	No
• for current output 2-conductor connection		Yes			Yes	Yes
Load impedance (in rated range of output)						
• with voltage outputs, min.		1 kΩ			1 kΩ	1 kΩ
• with voltage outputs, capacitive load, max.		0.1 µF			0.1 µF	0.1 µF
• with current outputs, max.		300 Ω			300 Ω	300 Ω
• with current outputs, inductive load, max.		0.1 milliH			0.1 milliH	0.1 milliH
Destruction limits against externally applied voltages and currents						
• Voltages at the outputs towards MANA		16 V; permanent			16 V; permanent	16 V; permanent
• Current, max.		50 mA; permanent			50 mA; permanent	50 mA; permanent
Analog value creation						
Measurement principle		Actual value encryption (successive approximation)			Actual value encryption (successive approximation)	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel						
• Resolution with overload area (bit including sign), max.		12 Bit			12 Bit	12 Bit
• Integration time, parameterizable		Yes; 2.5 / 16.6 / 20 ms			Yes; 2.5 / 16.6 / 20 ms	Yes; 2.5 / 16.6 / 20 ms
• permissible input frequency, max.		400 Hz			400 Hz	400 Hz
• Interference voltage suppression for interference frequency f1 in Hz		400 / 60 / 50 Hz			400 / 60 / 50 Hz	400 / 60 / 50 Hz
• Conversion time (per channel)		1 ms			1 ms	1 ms
• Time constant of the input filter		0.38 ms			0.38 ms	0.38 ms
• Basic execution time of the module (all channels released)		1 ms			1 ms	1 ms
Settling time						
• for resistive load		0.6 ms			0.6 ms	0.6 ms
• for capacitive load		1 ms			1 ms	1 ms
• for inductive load		0.5 ms			0.5 ms	0.5 ms
Encoder						
Connection of signal encoders						
• for voltage measurement		Yes			Yes	Yes
• for current measurement as 2-wire transducer		Yes; with external supply			Yes; with external supply	Yes; with external supply
• for current measurement as 4-wire transducer		Yes			Yes	Yes
• for resistance measurement with 2-conductor connection		Yes; without compensation of the line resistances			Yes; without compensation of the line resistances	Yes; without compensation of the line resistances
• for resistance measurement with 3-conductor connection		No			No	No
• for resistance measurement with 4-conductor connection		No			No	No

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Connectable encoders						
• 2-wire BEROS	Yes	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Errors/accuracies						
Temperature error (relative to input areas)		+/- 0,006 %/K			+/- 0,006 %/K	+/- 0,006 %/K
Crosstalk between the inputs, min.		60 dB			60 dB	60 dB
Repeat accuracy in settled status at 25 °C (relative to input area)		+/- 0,06 %			+/- 0,06 %	+/- 0,06 %
Output ripple (based on output range, bandwidth 0 to 50 kHz)		+/- 0,1 %			+/- 0,1 %	+/- 0,1 %
Linearity error (relative to output area)		+/- 0,15 %			+/- 0,15 %	+/- 0,15 %
Temperature error (relative to output area)		+/- 0,01 %/K			+/- 0,01 %/K	+/- 0,01 %/K
Crosstalk between the outputs, min.		60 dB			60 dB	60 dB
Repeat accuracy in settled status at 25 °C (relative to output area)		+/- 0,06 %			+/- 0,06 %	+/- 0,06 %
Operational limit in overall temperature range						
• Voltage, relative to input area		+/- 1 %			+/- 1 %	+/- 1 %
• Current, relative to input area		+/- 1 %			+/- 1 %	+/- 1 %
• Impedance, relative to input area		+/- 5 %			+/- 5 %	+/- 5 %
• Voltage, relative to output area		+/- 1 %			+/- 1 %	+/- 1 %
• Current, relative to output area		+/- 1 %			+/- 1 %	+/- 1 %
Basic error limit (operational limit at 25 °C)						
• Voltage, relative to input area		+/- 0,7 %; Linearity error +/-0.06%			+/- 0,7 %; Linearity error +/-0.06%	+/- 0,7 %; Linearity error +/-0.06%
• Current, relative to input area		+/- 0,7 %; Linearity error +/-0.06%			+/- 0,7 %; Linearity error +/-0.06%	+/- 0,7 %; Linearity error +/-0.06%
• Impedance, relative to input area		+/- 3 %; Linearity error +/-0.2%			+/- 3 %; Linearity error +/-0.2%	+/- 3 %; Linearity error +/-0.2%
• Resistance-type thermometer, relative to input area		+/- 3 %			+/- 3 %	+/- 3 %
• Voltage, relative to output area		+/- 0,7 %			+/- 0,7 %	+/- 0,7 %
• Current, relative to output area		+/- 0,7 %			+/- 0,7 %	+/- 0,7 %
Interference voltage suppression for f = n x (fl +/- 1 %), fl = interference frequency						
• Series mode interference (peak value of interference < rated value of input range), min.		30 dB			30 dB	30 dB
• common mode voltage, min.		40 dB			40 dB	40 dB

Technical specifications (continued)

	6ES7 312-5BE03-0AB0	6ES7 313-5BF03-0AB0	6ES7 313-6BF03-0AB0	6ES7 313-6CF03-0AB0	6ES7 314-6BG03-0AB0	6ES7 314-6CG03-0AB0
Integrated Functions						
Number of counters	2; 2 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)	3; 3 channels (see "Technological Functions" manual)	4; see "Technological Functions" manual	4; see "Technological Functions" manual
Counter frequency (counter) max.	10 kHz	30 kHz	30 kHz	30 kHz	60 kHz	60 kHz
Frequency measurement	Yes	Yes	Yes	Yes	Yes	Yes
controlled positioning	No	No	No	No	Yes	Yes
PID controller	No	Yes	Yes	Yes	Yes	Yes
Number of pulse outputs	2; 2 channels pulse width modulation up to 2.5 kHz (see Manual "Technological Functions")	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological Functions" manual)	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological Functions" manual)	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological Functions" manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2,5 kHz	2,5 kHz	2,5 kHz	2,5 kHz	2,5 kHz	2,5 kHz
Isolation						
Galvanic isolation, digital inputs						
• galvanic isolation, digital inputs	Yes	Yes	Yes	Yes	Yes	Yes
• between the channels	No	No	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Isolation, digital outputs						
• Galvanic isolation, digital outputs	Yes	Yes	Yes	Yes	Yes	Yes
• between the channels	No	Yes	Yes	Yes	Yes	Yes
• between the channels, in groups of		8	8	8	8	8
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Isolation, analog inputs						
• Isolation, analog inputs		Yes; common for analog I/O			Yes; common for analog I/O	Yes; common for analog I/O
• between the channels		No			No	No
• between the channels and the backplane bus		Yes			Yes	Yes
Isolation, analog outputs						
• Galvanic isolation, analog outputs		Yes; common for analog I/O			Yes; common for analog I/O	Yes; common for analog I/O
• between the channels		No			No	No
• between the channels and the backplane bus		Yes			Yes	Yes
Dimensions						
Dimensions						
• Width	80 mm	120 mm	120 mm	120 mm	120 mm	120 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
• Depth	130 mm	130 mm	130 mm	130 mm	130 mm	130 mm
Weights						
• Weight, approx.	409 g	660 g	566 g	566 g	676 g	676 g

Compact CPUs

Ordering Data	Order No.
CPU 312C Compact CPU, main memory 32 KB, power supply 24 V DC, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC is required	**6ES7 312-5BE03-0AB0**
CPU 313C Compact CPU, main memory 64 KB, power supply 24 V DC, 24 DI/16 DO, 4 AI/2 AO integrated, integrated functions, MPI; MMC is required	**6ES7 313-5BF03-0AB0**
CPU 313C-2 PtP Compact CPU, main memory 64 KB, power supply 24 V DC, 16 DI/16 DO integrated, integrated functions, MPI; RS 422/485 interface; MMC is required	**6ES7 313-6BF03-0AB0**
CPU 313C-2 DP Compact CPU, main memory 64 KB, power supply 24 V DC, 16 DI/16 DO integrated, integrated functions, MPI PROFIBUS DP master/slave interface; MMC is required	**6ES7 313-6CF03-0AB0**
CPU 314C-2 PtP Compact CPU, main memory 96 KB, power supply 24 V DC, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI; RS 422/485 interface; MMC is required	**6ES7 314-6BG03-0AB0**
CPU 314C-2 DP Compact CPU, main memory 96 KB, power supply 24 V DC, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; MMC is required	**6ES7 314-6CG03-0AB0**
Micro Memory Card	
64 KB	**6ES7 953-8LF20-0AA0**
128 KB	**6ES7 953-8LG11-0AA0**
512 KB	**6ES7 953-8LJ20-0AA0**
2 MB	**6ES7 953-8LL20-0AA0**
4 MB	**6ES7 953-8LM20-0AA0**
8 MB	**6ES7 953-8LP20-0AA0**
MPI cable For connecting SIMATIC S7 and the PG through MPI; 5 m in length	**6ES7 901-0BF00-0AA0**
Point-to-point link cable for connection to CPU 31xC-2 PtP	
5 m	**6ES7 902-3AB00-0AA0**
10 m	**6ES7 902-3AC00-0AA0**
50 m	**6ES7 902-3AG00-0AA0**

		Order No.
Front connector (1 unit) for compact CPUs 40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
SIMATIC TOP connect		See page 4/218 For information about which components can be used for the respective module, see DT/IA Mall or Catalog KT 10.2
Slot number plates		**6ES7 912-0AA00-0AA0**
S7-300 manual Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming Devices), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**
Power supply connector 10 units, spare part		**6ES7 391-1AA00-0AA0**
Labeling strips 10 units, spare part		**6ES7 392-2XX00-0AA0**
Label cover 10 units, spare part		**6ES7 392-2XY00-0AA0**
S7 SmartLabel Software for automatic labeling of modules direct from the STEP 7 project	B8	**2XV9 450-1SL01-0YX0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Ordering Data	Order No.
Labeling sheets for machine inscription	
For 16-channel signal modules, DIN A4, for printing with laser printer;	
10 units	
petrol	**6ES7 392-2AX00-0AA0**
light-beige	**6ES7 392-2BX00-0AA0**
yellow	**6ES7 392-2CX00-0AA0**
red	**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer;	
10 units	
petrol	**6ES7 392-2AX10-0AA0**
light-beige	**6ES7 392-2BX10-0AA0**
yellow	**6ES7 392-2CX10-0AA0**
red	**6ES7 392-2DX10-0AA0**

	Order No.
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA12-0XA0**
- With programming device interface	**6ES7 972-0BB12-0XA0**
• With 90° cable outlet for FastConnect connection system, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA51-0XA0**
- With programming device interface	**6ES7 972-0BB51-0XA0**
• With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1 500-0EA02**
PROFIBUS Fast Connect bus cable	**6XV1 830-0EH10**
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
RS 485 repeater for PROFIBUS	**6ES7 972-0AA01-0XA0**
Data transfer rate up to 12 Mbit/s; 24 V DC; IP20 housing	
PROFIBUS bus components	see Catalogs IK PI, CA 01
For establishing MPI/PROFIBUS communication	

Standard CPUs

Overview CPU 312

- The starter CPU for Totally Integrated Automation (TIA).
- For small-scale applications with moderate requirements on the processing speed.

Micro memory card required to operate the CPU.

Overview CPU 315-2 DP

- The CPU with medium to large program memory and quantity framework for the use, if required, of SIMATIC Engineering Tools
- 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

Micro memory card required for operation of CPU.

Overview CPU 314

- For installations with medium requirements on program scope
- High processing performance in binary and floating-point arithmetic

Micro memory card is required to operate the CPU.

Overview CPU 315-2 PN/DP

- The CPU with mid-range program memory and quantity frameworks
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Integral PROFINET interface
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO Controller for operating distributed I/O on PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS

Micro Memory Card required for operation of CPU.

Overview CPU 317-2 DP

- The CPU with a 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
- High processing power in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports 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 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
- High processing power in binary and floating-point arithmetic
- 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
- Combined MPI/PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CPU.

Standard CPUs

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 CPU.

Technical specifications

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Product status				
associated programming package	STEP 7 V5.2 SP1 with hardware update or higher	STEP 7 V5.2 SP1 with hardware update or higher	STEP 7 V 5.2 or higher + SP 1 with HW update	STEP 7 V5.4 SP2
Supply voltages				
Rated value				
• DC 24 V	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				
Current consumption (rated value)	2.5 A	2.5 A	2.5 A	2.5 A
Current consumption (in no-load operation), typ.	0.5 A^2s	0.5 A^2s	0.5 A^2s	1 A^2s
Inrush current, typ.	60 mA	60 mA	60 mA	100 mA
I^2t	0.6 A	0.6 A	0.8 A	650 mA
from supply voltage L+, max.	600 mA	600 mA	800 mA	
Current consumption/power loss				
Power loss, typ.	2.5 W	2.5 W	2.5 W	3.5 W
Memory				
Type of storage				
RAM				
• integrated	32 Kibyte; For program and data	96 Kibyte; For program and data	128 Kibyte	256 Kibyte; For program and data
• expandable	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	Yes; Program and data

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 range: 1 to 511	511; Number range: 1 to 511	1 023; Number band: 1 to 1023	1 023; Number band: 1 to 1023
• Size, max.	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
FB				
• Number, max.	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047
• Size, max	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
FC				
• Number, max.	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047	1 024; Sequence of numbers: 0 to 2047
• Size, max	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
OB				
• Size, max	16 Kibyte	16 Kibyte	16 Kibyte	16 Kibyte
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
- upper limit	127	255		255
• Remanence				
- adjustable	Yes	Yes	Yes	Yes
- lower limit	0	0	0	0
- upper limit	127	255	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	0
- upper limit	127	255	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

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
IEC timer (continued)				
• 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; Number range: 1 to 511	1 023; Number range: 1 to 1023	1 023; Number range: 1 to 1023
• Size, max.	16 Kibyte	16 Kibyte	16 Kibyte; Local data size: max. 1024 bytes per execution level/ 510 bytes per block	16 Kibyte
• 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	1 024 byte; per block max. 510	1 024 byte; per block max. 510
Address area				
I/O address area				
• Inputs	1 Kibyte	1 Kibyte	2 Kibyte	2 Kibyte
• Outputs	1 Kibyte	1 Kibyte	2 Kibyte	2 Kibyte
• of which, distributed				
- Inputs			2 Kibyte	2 Kibyte
- Outputs			2 Kibyte	2 Kibyte
Process image				
• Inputs	128 byte	128 byte	128 byte	2 048 byte
• Outputs	128 byte	128 byte	128 byte	2 048 byte
• Inputs, adjustable				2 Kibyte
• Outputs, adjustable				2 Kibyte
• Inputs, preset				2 Kibyte
• Outputs, preset				2 Kibyte
Subprocess images				
• Number of subprocess images, max.				1
Digital channels				
• Inputs	256	1 024		
• Outputs	256	1 024		
• 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		
• Outputs	64	256		
• 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		
Expansion devices, max.	0	3		
Racks, max.	1	4		
Modules per rack, max.	8	8	8	8

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Number of DP masters				
• integrated	0	0	1	1
• via CP	4	4	4	4
Number of operable FMs and CPs (recommended)				
• FM	8	8		
• CP, point-to-point	8	8		
• CP, LAN	4	10		
Time				
Clock				
• Hardware clock (real-time clock)		Yes	Yes	Yes
• Software clock	Yes			
• buffered and synchronizable	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 SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	2^31 hours (when using 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
• to DP, Master			Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave
• to DP, Slave	Yes	Yes	Yes	Yes
• in AS, Master				Yes
• in AS, Slave				Yes; as client
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
• 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
• 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

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Diagnostic buffer				
• present	Yes	Yes	Yes	Yes
• Number of entries, max.	100	100	100	500
• 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
- Number of connections, max.				8
- Data length, max.				1 460 byte; with connection type 01H; 8192 bytes with connection type 11H
• ISO-on-TCP (RFC1006)				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
- Data length, max.				8 192 byte
• UDP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
- Data length, max.				1 472 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	X1 configured as 1) MPI: max. 10; 2) DP master: max. 24; 3) DP slave (active): max. 14; X2 configured as PROFINET: max. 24
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				30
• 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

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
PROFINET CBA (at set setpoint communication load) (continued)				
• Number of device-internal and PROFIBUS interconnections				500
• Data length of device-internal and PROFIBUS interconnections, max.				4 000 byte
• Data length per connection, max.				1 400 byte
• Remote interconnections with acyclic transmission				
- Sampling frequency: sampling interval, min.				500 ms
- Number of incoming interconnections				100
- Number of outgoing interconnections				100
- Data length of all incoming interconnections, max.				2 000 Byte
- Data length of all outgoing interconnections, max.				2 000 Byte
- Data length per connection, max.				1 400 Byte
• Remote interconnections with cyclic transmission				
- Transmission frequency: transmission interval, min.				10 ms
- Number of incoming interconnections				200
- Number of outgoing interconnections				200
- Data length of all incoming interconnections, max.				2 000 byte
- Data length of all outgoing interconnections, max.				2 000 byte
- Data length per connection, max.				450 byte
• HMI variables via PROFINET (acyclic)				
- Number of log-in stations for HMI variables (PN OPC/iMap)				3; 2x PN OPC/1x iMap
- HMI variable updating				500 ms
- Number of HMI variables				200
- Data length of all HMI variables, max.				2 000 byte
• PROFIBUS proxy functionality				
- supported				Yes
- Number of linked PROFIBUS devices				16
- Data length per connection, max.				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
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

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
MPI (continued)				
- 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; I blocks only
- S7 communication				Yes
- S7 communication, as client				No
- S7 communication, as server				Yes
- equidistance support				Yes
- Isochronous mode				Yes; OB61
- SYNC/FREEZE				Yes
- Activation/deactivation of DP slaves				Yes
- DPV1				Yes
• Transmission speeds, max.				12 MBit/s
• Number of DP slaves, max.				124
• Address area				
- Inputs, max.				2 Kibyte
- Outputs, max.				2 Kibyte
• Useful data per DP slave				
- Inputs, max.				244 byte
- Outputs, max.				244 byte
DP slave				
• 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
- 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 RJ 45
isolated			Yes	Yes
Power supply to interface (15 to 30 V DC), max.			200 mA	
automatic detection of transmission speed				Yes; (10/100 Mbit/s)

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
Functionality				
• MPI			No	No
• DP master			Yes	No
• DP slave			Yes	No
• PROFINET IO controller				Yes
• PROFINET CBA				Yes
• Point-to-point coupling			No	No
DP master				
• Number of connections, max.			16	
• 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 support			Yes	
- Isochronous mode			No	
- SYNC/FREEZE			Yes	
- DPV1			Yes	
• Transmission speeds, max.			12 MBit/s	
• Number of DP slaves, max.			124; Per station	
• Address area				
- Inputs, max.			2 048 byte	
- Outputs, max.			2 048 byte	
• Useful data per DP slave				
- Inputs, max.			244 byte	
- Outputs, max.			244 byte	
DP slave				
• Number of connections			16	
• Services				
- PG/OP communication			Yes	
- Routing			Yes; with interface active	
- Global data communication			No	
- S7 basic communication			No	
- S7 communication, as client			No	
- S7 communication, as server			Yes	
- direct data exchange (cross traffic)			Yes	
- DPV1			No	
• GSD file			You can obtain the current GSD file from http://www.siemens.com/profibus-gsd	
• Transmission speeds, max.			12 MBit/s	
• automatic baud rate search			Yes; only with passive interface	
• Transfer memory				
- Inputs			244 byte	
- Outputs			244 byte	
• Address area, max.			32	
• Useful data per address area, max.			32 byte	

Technical specifications (continued)

	6ES7 312-1AE13-0AB0	6ES7 314-1AG13-0AB0	6ES7 315-2AG10-0AB0	6ES7 315-2EH13-0AB0
PROFINET IO controller				
• Services				
- PG/OP communication				Yes
- Routing				Yes
- S7 communication				Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32
- open IE communication				Yes; via TCP/IP, ISO on TCP and UDP
• Transmission speed, max.				100 MBit/s
• Total number of connectable IO Devices, max.				128
• Updating time				1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices and on the number of configured net data items)
• Address area				
- Inputs, max.				2 Kibyte
- Outputs, max.				2 Kibyte
- Useful data consistency, max.				254 byte
PROFINET CBA				
• Acyclic transmission				Yes
• cyclic transmission				Yes
CPU/programming				
Programming language				
• STEP 7	Yes; V5.2 SP1 or higher with hardware update	Yes; V5.2 SP1 or higher with hardware update	Yes; V 5.2 SP1 or higher with HW update	Yes; V5.4 SP2 or higher
• LAD	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes
• SCL	Yes	Yes	Yes	Yes
• CFC		Yes	Yes	Yes
• GRAPH	Yes	Yes	Yes	Yes
• HiGraph	Yes	Yes	Yes	Yes
Operational stocks	See instruction list	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8	8
User program protection/ password protection	Yes	Yes	Yes	Yes
System functions (SFC)	See instruction list	See instruction list	See instruction list	See instruction list
System function blocks (SFB)	See instruction list	See instruction list	See instruction list	See instruction list
Dimensions				
Dimensions				
• Width	40 mm	40 mm	40 mm	80 mm
• Height	125 mm	125 mm	125 mm	125 mm
Weights				
Weight, approx.	270 g	280 g	290 g	460 g

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
Product status			
associated programming package	STEP 7 V5.2 + SP 1 or higher with hardware update	STEP 7 V5.4 + SP2 or higher	STEP 7 V5.4 + SP2 or higher
Supply voltages			
Rated value			
• DC 24 V	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
• permissible range, lower limit (DC)	28.8 V	28.8 V	28.8 V
external protection for supply cables (recommendation)	min. 2 A	min. 2 A	min. 2 A
Current consumption			
Current consumption (rated value))	850 mA	650 mA	1 050 mA
Current consumption (in no-load operation), typ.	100 mA	100 mA	400 mA
Inrush current, typ.	2,5 A	2,5 A	4 A
I^2t	1 A^2s	1 A^2s	1,2 A^2s
Current consumption/power loss			
Power loss, typ.	4 W	3,5 W	14 W
Memory			
Type of storage			
• RAM			
- integrated	512 Kibyte	1 MByte; For program and data	1 400 Kibyte
- expandable	No	No	No
• Load memory			
- pluggable (MMC)	Yes	Yes	Yes
- pluggable (MMC), max.	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)
• without battery	Yes; Program and data	Yes; Program and data	Yes; Program and data
CPU/blocks			
DB			
• Number, max.	2 047; Number band: 1 to 2047	2 047; Number band: 1 to 2047	4 095; Sequence of numbers: 1 to 4095
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FB			
• Number, max.	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
FC			
• Number, max.	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
OB			
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth			
• per priority class	16	16	16
• additional within an error OB	4	4	4
CPU/processing times			
for bit operations, min.	0.05 µs	0.05 µs	0.01 µs
for word operations, min.	0.2 µs	0.2 µs	0.02 µs
for fixed point arithmetic, min.	0.2 µs	0.2 µs	0.02 µs
for floating point arithmetic, min.	1 µs	1 µs	0.04 µs

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
Times/counters and their remanence			
S7 counter			
• Number	512	512	2 048
• of which remanent without battery			
- adjustable	Yes	Yes	
- lower limit		0	
- upper limit		511	
• Remanence			
- adjustable	Yes	Yes	Yes
- lower limit		0	0
- upper limit		511	2 047
• Counting range			
- adjustable	Yes	Yes	Yes
- lower limit	0	0	0
- upper limit	999	999	999
IEC counter			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
S7 times			
• Number	512	512	2 048
• Remanence			
- adjustable	Yes	Yes	Yes
- lower limit		0	0
- upper limit		511	2 047
- preset	No retentivity	No retentivity	No retentivity
• Time range			
- lower limit	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s
IEC timer			
• present	Yes	Yes	Yes
• Type	SFB	SFB	SFB
Data areas and their remanence			
Flag			
• Number, max.	4 096 Byte	4 096 Byte	8 Kibyte
• Remanence available	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 8191
• Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks			
• Number, max.	2 047; from DB 1 to DB 2047	2 047; from DB 1 to DB 2047	4 095; Number sequence: 1 to 4095
• Size, max.	64 Kibyte	64 Kibyte	64 Kibyte
• 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.	1 024 byte	1 024 byte	1 024 byte
Address area			
I/O address area			
• Inputs	8 Kibyte	8 Kibyte	8 Kibyte
• Outputs	8 Kibyte	8 Kibyte	8 Kibyte
• of which, distributed			
- Inputs	8 192 byte	8 Kibyte	8 Kibyte
- Outputs	8 192 byte	8 Kibyte	8 Kibyte
Process image			
• Inputs	2 048 byte	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte	2 048 byte
• Inputs, adjustable	2 Kibyte	2 048 byte	2 Kibyte

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
Process image (continued)			
• Outputs, adjustable	2 Kibyte	2 048 byte	2 Kibyte
• Inputs, preset	256 byte	256 byte	256 byte
• Outputs, preset	256 byte	256 byte	256 byte
Subprocess images			
• Number of subprocess images, max.	1	1	1
Digital channels			
• Inputs	65 536	65 536	65 536
• Outputs	65 536	65 536	65 536
• Inputs, of which central	1 024	1 024	1 024
• Outputs, of which central	1 024	1 024	1 024
Analog channels			
• Inputs	4 096	4 096	4 096
• Outputs	4 096	4 096	4 096
• Inputs, of which central	256	256	256
• Outputs, of which central	256	256	256
Hardware config.			
Central devices, max.		1	
Expansion devices, max.		3	
Racks, max.	4	4	4
Modules per rack, max.	8	8	8
Number of DP masters			
• integrated	2	1	2
• via CP	4	4	4
Number of operable FMs and CPs (recommended)			
• FM	8	8	8
• CP, point-to-point	8	8	8
• CP, LAN	10	10	10
Time			
Clock			
• Hardware clock (real-time clock)	Yes	Yes	Yes
• buffered and synchronizable	Yes	Yes	Yes
• Deviation per day, max.	10 s	10 s	10 s
Operating hours counter			
• Number	4	4	4
• Number/Number range	0 to 3	0 to 3	0 to 3
• Range of values	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)
• Granularity	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.
Clock synchronization			
• supports	Yes	Yes	Yes
• to MPI, Master	Yes	Yes	Yes
• to MPI, Slave	Yes	Yes	Yes
• to DP, Master	Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave
• to DP, Slave	Yes	Yes	Yes
• in AS, Master	Yes	Yes	Yes
• in AS, Slave	Yes	Yes	Yes
• on Ethernet via NTP		Yes; as client	Yes; as client

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
S7 message functions			
Number of login stations for message functions, max.	32; Depending on the configured connections for PG/OP and S7 basic communication	32; Depending on the configured connections for PG/OP and S7 basic communication	32; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes
simultaneously active Alarm-S blocks, max.	60	60	60
Test commissioning functions			
Status/control			
• Status/control variable	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
• Number of variables, max.	30	30	30
• of which status variable, max.	30	30	30
• of which control variable, max.	14	14	14
Forcing			
• Forcing	Yes	Yes	Yes
• Force, variables	Inputs, outputs	Inputs, outputs	Inputs, outputs
• Number of variables, max.	10	10	10
Status block	Yes	Yes	Yes
Single step	Yes	Yes	Yes
Number of breakpoints	2	2	2
Diagnostic buffer			
• present	Yes	Yes	Yes
• Number of entries, max.	100	500	500
• adjustable	No	No	No
Communication functions			
PG/OP communication	Yes	Yes	Yes
Routing	Yes	Yes	Yes
Global data communication			
• supported	Yes	Yes	Yes
• Size of GD packets, max.	22 byte	22 byte	22 byte
S7 basic communication			
• supported	Yes	Yes	Yes
S7 communication			
• supported	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
Open IE communication			
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8	8
- Data length, max.		1 460 byte; with connection type 01H; 8192 bytes with connection type 11H	1 460 byte; with connection type 01H; 8192 bytes with connection type 11H
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8	8
- Data length, max.		8 192 byte	8 192 byte
• UDP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8	8
- Data length, max.		1 472 byte	1 472 byte

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
Number of connections			
• overall	32	32	32
• usable for PG communication	31	31	31
• usable for OP communication	31	31	31
• usable for S7 basic communication	30	30	30
• usable for routing	8	X1 configured as 1) MPI: max. 10; 2) DP master: max. 24; 3) DP slave (active): max. 14; X2 configured as PROFINET: max. 24	
PROFINET CBA (at set setpoint communication load)			
• Setpoint for the CPU communication load		50%	20%
• Number of remote interconnection partners		32	32
• Number of functions, master/slave		30	50
• Total of all master/slave connections		1 000	3 000
• Data length of all incoming connections master/slave, max.		4 000 byte	24 000 byte
• Data length of all outgoing connections master/slave, max.		4 000 byte	24 000 byte
• Number of device-internal and PROFIBUS interconnections		500	1 000
• Data length of device-internal and PROFIBUS interconnections, max.		4 000 byte	8 000 byte
• Data length per connection, max.		1 400 byte	1 400 byte
• Remote interconnections with acyclic transmission			
- Sampling frequency: sampling interval, min.		500 ms	200 ms
- Number of incoming interconnections		100	100
- Number of outgoing interconnections		100	100
- Data length of all incoming interconnections, max.		2 000 byte	3 200 byte
- Data length of all outgoing interconnections, max.		2 000 byte	3 200 byte
- Data length per connection, max.		1 400 byte	1 400 byte
• Remote interconnections with cyclic transmission			
- Transmission frequency: transmission interval, min.		10 ms	1 ms
- Number of incoming interconnections		200	300
- Number of outgoing interconnections		200	300
- Data length of all incoming interconnections, max.		2 000 byte	4 800 byte
- Data length of all outgoing interconnections, max.		2 000 byte	4 800 byte
- Data length per connection, max.		450 byte	250 byte
• HMI variables via PROFINET (acyclic)			
- Number of log-in stations for HMI variables (PN OPC/iMap)		3; 2x PN OPC/1x iMap	3; 2x PN OPC/1x iMap
- HMI variable updating		500 ms	500 ms
- Number of HMI variables		200	600
- Data length of all HMI variables, max.		2 000 byte	9 600 byte
• PROFIBUS proxy functionality			
- supported		Yes	Yes
- Number of linked PROFIBUS devices		16	32
- Data length per connection, max.		240 byte; Slave-dependent	240 byte; Slave-dependent

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
1st interface			
Type of interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485	RS 485
isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	150 mA
Functionality			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
• Point-to-point coupling	No	No	No
MPI			
• Number of connections	32	32	16
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No	No	No
- S7 communication, as server	Yes	Yes	Yes
• Transmission speeds, max.	12 MBit/s	12 MBit/s	12 MBit/s
DP master			
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes	Yes	Yes
- Global data communication	No	No	No
- S7 basic communication	Yes; I blocks only	Yes; I blocks only	Yes; I blocks only
- S7 communication	Yes	Yes	Yes
- S7 communication, as client	No	No	No
- S7 communication, as server	Yes	Yes	Yes
- equidistance support	Yes	Yes	Yes
- Isochronous mode	No	Yes; OB 61	No
- SYNC/FREEZE	Yes	Yes	Yes
- Activation/deactivation of DP slaves	Yes	Yes	Yes
- DPV1	Yes	Yes	Yes
• Transmission speeds, max.	12 MBit/s	12 MBit/s	12 MBit/s
• Number of DP slaves, max.	124	124	124
• Address area			
- Inputs, max.	8 096 byte	8 Kibyte	8 Kibyte
- Outputs, max.	8 096 byte	8 Kibyte	8 Kibyte
• Useful data per DP slave			
- Inputs, max.	244 byte	244 byte	244 byte
- Outputs, max.	244 byte	244 byte	244 byte
DP slave			
• Services			
- PG/OP communication	Yes	Yes	Yes
- Routing	Yes; only with active interface	Yes; with interface active	Yes; with interface active
- Global data communication	No	No	No
- S7 basic communication	No	No	No
- S7 communication	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
• Services (continued)			
- S7 communication, as client	No	No	No
- S7 communication, as server	Yes	Yes	Yes
- direct data exchange (cross traffic)	Yes	Yes	Yes
- DPV1	No	No	No
• Transmission speeds, max.	12 MBit/s	12 MBit/s	12 MBit/s
• Transfer memory			
- Inputs	244 byte	244 byte	244 byte
- Outputs	244 byte	244 byte	244 byte
• Address area, max.	32	32	32
• Useful data per address area, max.	32 byte	32 byte	32 byte
2nd interface			
Type of interface	Integral RS 485 interface	PROFINET	Integral RS 485 interface
Physics	RS 485	Ethernet RJ 45	RS 485
isolated	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	0 mA	200 mA
automatic detection of transmission speed		Yes; (10/100 Mbit/s)	
Functionality			
• MPI	No	No	No
• DP master	Yes	No	Yes
• DP slave	Yes	No	Yes
• PROFINET IO controller		Yes	No
• PROFINET CBA		Yes	No
• Point-to-point coupling	No	No	No
DP master			
• Number of connections, max.	32		
• Services			
- PG/OP communication	Yes		Yes
- Routing	Yes		Yes
- Global data communication	No		No
- S7 basic communication	Yes; I blocks only		Yes; I blocks only
- S7 communication	Yes		Yes
- S7 communication, as client	No		No
- S7 communication, as server	Yes		Yes
- equidistance support	Yes		Yes
- Isochronous mode	Yes; OB 61		Yes; OB 61
- SYNC/FREEZE	Yes		Yes
- Activation/deactivation of DP slaves	Yes		Yes
- DPV1	Yes		Yes
• Transmission speeds, max.	12 MBit/s		12 MBit/s
• Number of DP slaves, max.	124		124
• Address area			
- Inputs, max.	8 096 byte		8 Kibyte
- Outputs, max.	8 096 byte		8 Kibyte
• Useful data per DP slave			
- Inputs, max.	244 byte		244 byte
- Outputs, max.	244 byte		244 byte

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
DP slave			
• Number of connections	32		
• Services			
- PG/OP communication	Yes		Yes
- Routing	Yes; with interface active		Yes; with interface active
- Global data communication	No		No
- S7 basic communication	No		No
- S7 communication, as client	No		No
- S7 communication, as server	Yes		Yes
- direct data exchange (cross traffic)	Yes		Yes
- DPV1	No		No
• GSD file	You can obtain the current GSD file from http://www.siemens.com/profibus-gsd		You can obtain the current GSD file from http://www.siemens.com/profibus-gsd
• Transmission speeds, max.	12 MBit/s		12 MBit/s
• automatic baud rate search	Yes; only with passive interface		Yes; only with passive interface
• Transfer memory			
- Inputs	244 byte		244 byte
- Outputs	244 byte		244 byte
• Address area, max.	32		32
• Useful data per address area, max.	32 byte		32 byte
PROFINET IO controller			
• Services			
- PG/OP communication		Yes	
- Routing		Yes	
- S7 communication		Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32	
- open IE communication		Yes; via TCP/IP, ISO on TCP and UDP	
• Transmission speed, max.		100 MBit/s	
• Total number of connectable IO Devices, max.		128	
• Updating time		1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices and on the number of configured net data items)	
• Address area			
- Inputs, max.		8 Kibyte	
- Outputs, max.		8 Kibyte	
- Useful data consistency, max.		254 byte	
PROFINET CBA			
• Acyclic transmission		Yes	
• cyclic transmission		Yes	
3rd interface			
Type of interfaces			PROFINET
Physics			Ethernet RJ45
isolated			Yes
power supply to interface (15 to 30 V DC), max.			0 mA
automatic detection of transmission speed			Yes; (10/100 Mbit/s)

Technical specifications (continued)

	6ES7 317-2AJ10-0AB0	6ES7 317-2EK13-0AB0	6ES7 318-3EL00-0AB0
Functionality			
• MPI			No
• DP master			No
• DP slave			No
• PROFINET IO controller			Yes
• PROFINET IO device			No
• PROFINET CBA			Yes
• Point-to-point coupling			No
• Updating times			250 µs...128 ms (with send cycle of 250 µs); 500 µs...256 ms (with send cycle of 500 µs); 1 ms...512 ms (with send cycle 1 ms); minimum value of the send cycle is also dependent on the set communication share for PROFINET IO, on the number of I/O devices and on the volume of configured user data.
Open IE communication			
• Number of connections, max.			8
CPU/programming			
Programming language			
• STEP 7	Yes; V 5.2 SP1 or higher with HW update	Yes; V5.4 + SP2 or higher	Yes; V5.4 or higher + SP2
• LAD	Yes	Yes	Yes
• FUP	Yes	Yes	Yes
• AWL	Yes	Yes	Yes
• SCL	Yes	Yes	Yes
• CFC	Yes	Yes	Yes
• GRAPH	Yes	Yes	Yes
• HiGraph	Yes	Yes	Yes
Operational stocks	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8
User program protection/password protection	Yes	Yes	Yes
System functions (SFC)	See instruction list	See instruction list	See instruction list
System function blocks (SFB)	See instruction list	See instruction list	See instruction list
Dimensions			
Dimensions			
• Width	80 mm	80 mm	120 mm
• Height	125 mm	125 mm	125 mm
• Depth	130 mm	130 mm	130 mm
Weights			
• Weight, approx.	460 g	460 g	1 250 g

Standard CPUs

Ordering Data	Order No.
CPU 312 Main memory 32 KB, power supply 24 V DC, MPI; MMC required	**6ES7 312-1AE13-0AB0**
CPU 314 Main memory 96 KB, power supply 24 V DC, MPI; MMC required	**6ES7 314-1AG13-0AB0**
CPU 315-2 DP Main memory 128 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	**6ES7 315-2AG10-0AB0**
CPU 315-2 PN/DP Main memory 256 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	**6ES7 315-2EH13-0AB0**
CPU 317-2 DP Main memory 512 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, MMC required	**6ES7 317-2AJ10-0AB0**
CPU 317-2 PN/DP Main memory 1 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	**6ES7 317-2EK13-0AB0**
CPU 319-3 PN/DP Main memory 1.4 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	**6ES7 318-3EL00-0AB0**
Micro Memory Card	
64 KB	**6ES7 953-8LF20-0AA0**
128 KB	**6ES7 953-8LG11-0AA0**
512 KB	**6ES7 953-8LJ20-0AA0**
2 MB	**6ES7 953-8LL20-0AA0**
4 MB	**6ES7 953-8LM20-0AA0**
8 MB	**6ES7 953-8LP20-0AA0**
MPI cable For connecting SIMATIC S7 and the PG through MPI; 5 m in length	**6ES7 901-0BF00-0AA0**
Slot number plates	**6ES7 912-0AA00-0AA0**
S7-300 manual Design, CPU data, module data, instruction list	
German	**6ES7 398-8FA10-8AA0**
English	**6ES7 398-8FA10-8BA0**
French	**6ES7 398-8FA10-8CA0**
Spanish	**6ES7 398-8FA10-8DA0**
Italian	**6ES7 398-8FA10-8EA0**

		Order No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming Devices), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**
Power supply connector 10 units, spare part		**6ES7 391-1AA00-0AA0**
Manual "Communication for SIMATIC S7-300/-400"		
German		**6ES7 398-8EA00-8AA0**
English		**6ES7 398-8EA00-8BA0**
French		**6ES7 398-8EA00-8CA0**
Spanish		**6ES7 398-8EA00-8DA0**
Italian		**6ES7 398-8EA00-8EA0**
SIMATIC S7 training case With mounting components for mounting S7-200 and S7-300		**6ES7 910-3AA00-0XA0**
PROFIBUS bus components		
PROFIBUS DP bus connector RS 485		
• With 90° cable outlet, max. transmission rate 12 Mbit/s		
- Without programming device interface		**6ES7 972-0BA12-0XA0**
- With programming device interface		**6ES7 972-0BB12-0XA0**
• With 90° cable outlet for FastConnect connection system, max. transmission rate 12 Mbit/s		
- Without programming device interface		**6ES7 972-0BA51-0XA0**
- With programming device interface		**6ES7 972-0BB51-0XA0**
• With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS		**6GK1 500-0EA02**
PROFIBUS Fast Connect bus cable Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m		**6XV1 830-0EH10**
RS 485 repeater for PROFIBUS Data transfer rate up to 12 Mbit/s; 24 V DC; IP20 housing		**6ES7 972-0AA01-0XA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

Ordering Data	Order No.
PROFINET bus components	
IE FC TP Standard Cable GP 2x2 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter	**6XV1 840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1 873-2A**
SCALANCE X204-2 Industrial Ethernet Switch Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	**6GK5 204-2BB10-2AA3**

	Order No.
IE FC RJ45 Plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 Plug 145 145° cable outlet	
1 unit	**6GK1 901-1BB30-0AA0**
10 units	**6GK1 901-1BB30-0AB0**
50 units	**6GK1 901-1BB30-0AE0**
IE FC RJ45 Plug 180 180° cable outlet	
1 unit	**6GK1 901-1BB10-2AA0**
10 units	**6GK1 901-1BB10-2AB0**
50 units	**6GK1 901-1BB10-2AE0**
PROFIBUS/PROFINET bus components For establishing MPI/PROFIBUS/PROFINET communication	see Catalogs IK PI, CA 01

Technology CPUs

Overview CPU 315T-2 DP

- SIMATIC CPU with integrated technology/motion control functionality
- With the full functionality of the standard CPU 315-2 DP
- For multi-sector automation tasks in the construction of series machines, special machines and plants
- Ideal for synchronized motional sequences such a coupling to a virtual/real master, electronic gearbox, cam disc or print-mark correction.
- Used as a central controller on production lines with central and distributed I/O
- With integrated I/O for fast technological functions (e.g. cam switching, reference point detection)
- PROFIBUS DP (DRIVE) interface for the isochronous connection of drive components.
- A common S7 application program for control and motion control tasks (no additional programming language for motion control required)
- Optional "S7 Technology" package required

Micro Memory Card required for operation of CPU.

Overview CPU 317T-2 DP

- SIMATIC CPU with integrated technology/motion control functionality
- With the full functionality of the standard CPU 317-2 DP
- For multi-sector automation tasks in the construction of series machines, special machines and plants
- Ideal for synchronized motional sequences such a coupling to a virtual/real master, electronic gearbox, cam disc or print-mark correction.
- Used as a central controller on production lines with central and distributed I/O
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP
- With integrated I/O for fast technological functions (e.g. cam switching, reference point detection)
- PROFIBUS DP (DRIVE) interface for the isochronous connection of drive components.
- A common S7 application program for control and motion control tasks (no additional programming language for motion control required)
- Optional "S7 Technology" package required

Micro Memory Card required for operation of CPU.

Technical specifications

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Supply voltages		
Rated value		
• DC 24 V	Yes	Yes
• permissible range, lower limit (DC)	20,4 V	20,4 V
• permissible range, upper limit (DC)	28,8 V	28,8 V
external protection for supply cables (recommendation)	min. 2 A	min. 2 A
Current consumption		
Current consumption (in no-load operation), typ.	200 mA	200 mA
Inrush current, typ.	2,5 A	2,5 A
I^2t	1 $A^2 \cdot$ s	1 $A^2 \cdot$ s

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Current consumption/power loss		
Power loss, typ.	6 W	6 W
Memory		
Type of storage		
RAM		
• integrated	256 Kibyte	1 024 Kibyte
• expandable	No	No
Load memory		
• pluggable (MMC)	Yes	Yes
• pluggable (MMC), max.	8 MByte	8 MByte

Technical specifications (continued)

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Backup		
• present	Yes; Guaranteed by MMC (maintenance-free)	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data	Yes; Program and data
CPU/blocks		
DB		
• Number, max.	1 023; Number band: 1 to 1023	2 047; Number band: 1 to 2047
• Size, max.	64 Kibyte	64 Kibyte
FB		
• Number, max.	1 024; Sequence of numbers: 0 to 2047	2 047; Number band: 1 to 2047
• Size, max.	64 Kibyte	64 Kibyte
FC		
• Number, max.	1 024; Sequence of numbers: 0 to 2047	2 047; Number band: 1 to 2047
• Size, max.	64 Kibyte	64 Kibyte
OB		
• Size, max.	64 Kibyte	64 Kibyte
Nesting depth		
• per priority class	8	16
• additional within an error OB	4	4
CPU/processing times		
for bit operations, min.	0.1 µs	0.05 µs
for word operations, min.	0.2 µs	0.2 µs
for fixed point arithmetic, min.	2 µs	0.2 µs
for floating point arithmetic, min.	3 µs	1 µs
Times/counters and their remanence		
S7 counter		
• Number	256; Number range: 0...255	512; Number range: 0...511
• Remanence		
- adjustable	Yes	Yes
• Counting range		
- adjustable	Yes	Yes
- lower limit	0	0
- upper limit	999	999
IEC counter		
• present	Yes	Yes
• Type	SFB	SFB
S7 times		
• Number	256; Number range: 0...255	512; Number range: 0...511
• Remanence		
- adjustable	Yes	Yes
- preset	No retentivity	No retentivity
• Time range		
- lower limit	10 ms	10 ms
- upper limit	9 990 s	9 990 s

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
S7 times (continued)		
IEC timer		
• present	Yes	Yes
• Type	SFB	SFB
Data areas and their remanence		
Flag		
• Number, max.	2 048 byte	4 096 byte
• Remanence available	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 4095
• Number of clock memories	8; 1 memory byte	8; 1 memory byte
Data blocks		
• Number, max.	1 023; From DB 1 to DB 1023	2 047; from DB 1 to DB 2047
• Size, max.	64 Kibyte	64 Kibyte
• Remanence adjustable	Yes; via non-retain property on DB	Yes; via non-retain property on DB
• Remanence preset	Yes	Yes
Local data		
• per priority class, max.	1 024 byte	1 024 byte
Address area		
I/O address area		
• Inputs	2 048 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte
• of which, distributed		
- Inputs	2 048 byte	8 192 byte
- Outputs	2 048 byte	8 192 byte
Process image		
• Inputs, adjustable	2 048 byte	2 048 byte
• Outputs, adjustable	2 048 byte	2 048 byte
• Inputs, preset	128 byte	256 byte
• Outputs, preset	128 byte	256 byte
Subprocess images		
• Number of subprocess images, max.	1	1
Digital channels		
• Inputs	16 384	65 536
• Outputs	16 384	65 536
• Inputs, of which central	512	512
• Outputs, of which central	512	512
Analog channels		
• Inputs	1 024	4 096
• Outputs	1 024	4 096
• Inputs, of which central	64	64
• Outputs, of which central	64	64
Hardware config.		
Central devices, max.	1	1
Expansion devices, max.	0	0
Racks, max.	1	1
Modules per rack, max.	8	8

Technical specifications (continued)

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Number of DP masters		
• integrated	2; 1 DP and 1 DP (drive)	2; 1 DP and 1 DP (drive)
• via CP	2; for DP	2; for DP
Number of operable FMs and CPs (recommended)		
• FM	8	8
• CP, point-to-point	8	8
• CP, LAN	10	10
Time		
Clock		
• Hardware clock (real-time clock)	Yes	Yes
• buffered and synchronizable	Yes	Yes
• Deviation per day, max.	10 s	10 s
Operating hours counter		
• Number	1	4
• Number/Number range	0	0 to 3
• Range of values	0 to 2^31 hours (when using SFC 101)	0 to 2^31 hours (when using SFC 101)
• Granularity	1 hour	1 hour
• remanent	Yes; Must be restarted at each restart	Yes; Must be restarted at each restart
Clock synchronization		
• supports	Yes	Yes
• to MPI, Master	Yes	Yes
• to MPI, Slave	Yes	Yes
• to DP, Master	Yes	Yes
• to DP, Slave	Yes	Yes
• in AS, Master	Yes	Yes
• in AS, Slave	Yes	Yes
S7 message functions		
Number of login stations for message functions, max.	16; depending on the configured connections for PG/OP and S7 basic communication	32; depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes
simultaneously active Alarm-S blocks, max.	40	60
Test commissioning functions		
Status/control		
• Status/control variable	Yes	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	30	30
• of which status variable, max.	30	30
• of which control variable, max.	14	14

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Forcing		
• Forcing	Yes	Yes
• Force, variables	Inputs, outputs	Inputs, outputs
• Number of variables, max.	10	10
Status block	Yes	Yes
Single step	Yes	Yes
Number of breakpoints	2	2
Diagnostic buffer		
• present	Yes	Yes
• Number of entries, max.	100	100
• adjustable	No	No
Communication functions		
PG/OP communication	Yes	Yes
Routing	Yes	Yes
Global data communication		
• supported	Yes	Yes
• Size of GD packets, max.	22 byte	22 byte
S7 basic communication		
• supported	Yes	Yes
S7 communication		
• supported	Yes	Yes
S5-compatible communication		
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections		
• overall	16	32
• usable for PG communication	15	31
• usable for OP communication	15	31
• usable for S7 basic communication	12	30
• usable for routing	8; additional	8; additional
1st interface		
Type of interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485
isolated	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA
Functionality		
• MPI	Yes	Yes
• DP master	Yes	Yes
• DP slave	Yes	Yes
• Point-to-point coupling	No	No

Technical specifications (continued)

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
MPI		
• Number of connections	32	32
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	Yes	Yes
- S7 basic communication	Yes	Yes
- S7 communication	Yes	Yes
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB
- S7 communication, as server	Yes; Connection configured on one side only.	Yes; Connection configured on one side only.
• Transmission speeds, max.	12 MBit/s	12 MBit/s
DP master		
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	No	No
- S7 basic communication	Yes; I blocks only.	Yes; I blocks only.
- S7 communication	Yes	Yes
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB
- S7 communication, as server	Yes; Connections configured on one side only.	Yes; Connections configured on one side only.
- equidistance support	Yes	Yes
- Isochronous mode	Yes; OB 61	Yes; OB 61
- SYNC/FREEZE	Yes	Yes
- Activation/deactivation of DP slaves	Yes	Yes
- DPV1	Yes	Yes
• Transmission speeds, max.	12 MBit/s	12 MBit/s
• Number of DP slaves, max.	124	124
• Address area		
- Inputs, max.	2 048 byte	8 192 byte
- Outputs, max.	2 048 byte	8 192 byte
• Useful data per DP slave		
- Inputs, max.	244 byte	244 byte
- Outputs, max.	244 byte	244 byte
DP slave		
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes; only with active interface	Yes; only with active interface
- Global data communication	No	No
- S7 basic communication	No	No
- S7 communication	Yes	Yes
- S7 communication, as client	No; but via CP and loadable FB	No; but via CP and loadable FB
- S7 communication, as server	Yes; Connection configured on one side only.	Yes; Connection configured on one side only.
- direct data exchange (cross traffic)	Yes	Yes
- DPV1	No	No
• Transmission speeds, max.	12 MBit/s	12 MBit/s

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
DP slave (continued)		
• Transfer memory		
- Inputs	244 byte	244 byte
- Outputs	244 byte	244 byte
• Address area, max.	32	32
• Useful data per address area, max.	32 byte	32 byte
2nd interface		
Type of interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485
isolated	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA
Functionality		
• MPI	No	No
• DP master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master
• DP slave	No	No
• Point-to-point coupling	No	No
DP master		
• Services		
- PG/OP communication	No	No
- Routing	No	No
- Global data communication	No	No
- S7 basic communication	No	No
- S7 communication	No	No
- equidistance support	Yes	Yes
- Isochronous mode	Yes	Yes
- SYNC/FREEZE	No	No
- Activation/deactivation of DP slaves	Yes	Yes
- DPV1	No	No
• Transmission speeds, max.	12 MBit/s	12 MBit/s
• Number of DP slaves, max.	64	64
• Address area		
- Inputs, max.	1 024 byte	1 024 byte
- Outputs, max.	1 024 byte	1 024 byte
• Useful data per DP slave		
- Inputs, max.	244 byte	244 byte
- Outputs, max.	244 byte	244 byte
• GSD file	http://www.siemens.com/support in Product Support area	http://www.siemens.com/support in Product Support area
• Transmission speeds, max.	12 MBit/s	12 MBit/s

Technical specifications (continued)

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
CPU/programming		
Programming language		
• STEP 7	Yes; V 5.2 SP 1 or higher and S7-Technology option package	Yes
• LAD	Yes	Yes
• FUP	Yes	Yes
• AWL	Yes	Yes
• SCL	Yes	Yes
• CFC	Yes	Yes
• GRAPH	Yes	Yes
• HiGraph	Yes	Yes
Operational stocks	See instruction list	See instruction list
Nesting levels	8	8
User program protection/password protection	Yes	Yes
System functions (SFC)	See instruction list	See instruction list
System function blocks (SFB)	See instruction list	See instruction list
Digital inputs		
Number of digital inputs	4	4
• of which, inputs usable for technological functions	4	4
Number of simultaneously controllable inputs		
• horizontal installation		
- up to 40 °C, max.	4	4
- up to 60 °C, max.	4	4
• vertical installation		
- up to 40 °C, max.	4	4
Input characteristic curve to IEC 1131, Typ 1	Yes	Yes
Input voltage		
• Rated value, DC	24 V	24 V
• for signal "0"	-3 V...5 V	-3 V...5 V
• for signal "1"	15 V...30 V	15 V...30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Input delay (for rated value of input voltage)		
• for counter/technological functions		
- at "0" to "1", max.	10 µs; typically	10 µs; typically
- at "1" to "0", max.	10 µs; typically	10 µs; typically
Cable length		
• cable length, shielded, max.	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Digital outputs		
Number of digital outputs	8	8
• of which, high-speed outputs	8	8
Functions	For technology functions, e.g. high-speed cam switch signals	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection of the output	Yes	Yes
• Response threshold, typ.	1,0 A	1,0 A
Limitation of inductive shutdown voltage to	48 V	48 V
Lamp load, max.	5 W	5 W
Controlling a digital input	No	No
Output voltage		
• for signal "0" (DC), max.	3 V; (2L+)	3 V; (2L+)
• for signal "1", min.	rated voltage - 2,5 V	rated voltage - 2,5 V
Output current		
• for signal "1" rated value	0,5 A	0,5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A	0.6 A
• for signal "0" residual current, max.	0.3 mA	0.3 mA
Parallel switching of 2 outputs		
• for increased power	No	No
• for redundant control of a load	No	No
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.2 Hz; to IEC 947-5-1, DC13	0.2 Hz; to IEC 947-5-1, DC13
• on lamp load, max.	100 Hz	100 Hz
Aggregate current of the outputs (per group)		
• horizontal installation		
- up to 40 °C, max.	4 A	4 A
- up to 60 °C, max.	3 A	3 A
• all other mounting positions		
- up to 40 °C, max.	3 A	3 A
Load impedance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
• cable length, shielded, max.	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m

Technical specifications (continued)

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Encoder		
Connectable encoders		
• 2-wire BEROS	No	No
Isolation		
Galvanic isolation, digital inputs		
• between the channels and the backplane bus	Yes	Yes
Isolation, digital outputs		
• between the channels and the backplane bus	Yes	Yes

	6ES7 315-6TH13-0AB0	6ES7 317-6TK13-0AB0
Dimensions		
Dimensions		
• Width	160 mm	160 mm
• Height	125 mm	125 mm
• Depth	130 mm	130 mm
Weights		
• Weight, approx.	750 g	750 g

Ordering Data

		Order No.
CPU 315T-2 DP Main memory 256 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface; with Technology/ Motion Control functions; MMC required	B7	**6ES7 315-6TH13-0AB0**
CPU 317T-2 DP Main memory 1024 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface; with Technology/ Motion Control functions; MMC required	B7	**6ES7 317-6TK13-0AB0**
S7 Technology V4.1 *Task:* Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT-2 DP *Requirement:* STEP 7 V5.4 SP2 or higher *Delivery package:* on DVD; incl. documentation for CPU 31xT-2 DP (included on DVD)		**6ES7 864-1CC41-0YX0**
Micro Memory Card		
4 MB		**6ES7 953-8LM20-0AA0**
8 MB		**6ES7 953-8LP20-0AA0**
MPI cable For connecting SIMATIC S7 and the PG through MPI; 5 m in length		**6ES7 901-0BF00-0AA0**
Front connector (1 unit)		
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**

		Order No.
Slot number plates		**6ES7 912-0AA00-0AA0**
S7-300 manual Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming Devices), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**
Power supply connector 10 units, spare part		**6ES7 391-1AA00-0AA0**
Labeling strips 10 units, spare part		**6ES7 392-2XX00-0AA0**
Label cover 10 units, spare part		**6ES7 392-2XY00-0AA0**
S7 SmartLabel V3.0 Software for automatic labeling of modules based on data of the STEP 7 project		
Single License	B8	**2XV9 450-1SL03-0YX0**
Upgrade Single License	B8	**2XV9 450-1SL03-0YX4**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Technology CPUs

Ordering Data	Order No.
Labeling sheets for machine inscription	
For 16-channel signal modules, DIN A4, for printing with laser printer;	
10 units	
petrol	**6ES7 392-2AX00-0AA0**
light-beige	**6ES7 392-2BX00-0AA0**
yellow	**6ES7 392-2CX00-0AA0**
red	**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer;	
10 units	
petrol	**6ES7 392-2AX10-0AA0**
light-beige	**6ES7 392-2BX10-0AA0**
yellow	**6ES7 392-2CX10-0AA0**
red	**6ES7 392-2DX10-0AA0**
Manual "Communication for SIMATIC S7-300/-400"	
German	**6ES7 398-8EA00-8AA0**
English	**6ES7 398-8EA00-8BA0**
French	**6ES7 398-8EA00-8CA0**
Spanish	**6ES7 398-8EA00-8DA0**
Italian	**6ES7 398-8EA00-8EA0**

	Order No.
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA12-0XA0**
- With programming device interface	**6ES7 972-0BB12-0XA0**
• With 90° cable outlet for FastConnect connection system, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA51-0XA0**
- With programming device interface	**6ES7 972-0BB51-0XA0**
• With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1 500-0EA02**
PROFIBUS Fast Connect bus cable	**6XV1 830-0EH10**
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
RS 485 repeater for PROFIBUS	**6ES7 972-0AA01-0XA0**
Data transfer rate up to 12 Mbit/s; 24 V DC; IP20 housing	
PROFIBUS bus components	see Catalogs IK PI, CA 01
For establishing MPI/PROFIBUS communication	

Overview CPU 315F-2 DP

- For design of a fail-safe automation system for plants with increased safety requirements
- Based on the SIMATIC CPU 315-2 DP
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non-safety-relevant applications

Micro Memory Card required for operation of CPU.

Overview CPU 315F-2 PN/DP

- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

Micro Memory Card required for operation of CPU.

Fail-safe CPUs

Overview CPU 317F-2 DP

- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the two integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications

Micro Memory Card required for operation of CPU.

Overview CPU 317F-2 PN/DP

- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

Micro Memory Card required for operation of CPU.

Overview CPU 319F-3 PN/DP

- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Fail-safe I/O modules can be connected decentralized over the integrated PROFINET interface (PROFIsafe) and/or over the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of ET200M can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and decentralized
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

For operation of the CPU, a micro memory card is required.

Technical specifications

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
Product status					
associated programming package	STEP 7 V5.2 SP1 or higher with HSP 0126	STEP 7 V5.4 SP2 or higher S7 Distributed Safety V5.4 or higher	STEP 7 V5.2 SP1 with hardware update or higher; S7 Distributed Safety 5.2 SP1 or higher	STEP 7 V5.4 SP2 or higher, S7 Distributed Safety V5.4 or higher	STEP 7 V5.4 or higher, Service Pack 2 with HSP 143
Supply voltages					
Rated value					
• DC 24 V	Yes	Yes	Yes	Yes	Yes
• permissible range, lower limit (DC)	20.4 V	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	28.8 V
external protection for supply cables (recommendation)	min. 2 A	min. 2 A	min. 2 A	min. 2 A	min. 2 A
Current consumption					
Current consumption (rated value)		650 mA		650 mA	1 050 mA
Current consumption (in no-load operation), typ.	60 mA	100 mA	100 mA	100 mA	400 mA
Inrush current, typ.	2.5 A	2.5 A	2.5 A	2.5 A	4 A
I^2t	0.5 $A^2 \cdot$ s	1 $A^2 \cdot$ s	1 $A^2 \cdot$ s	1 $A^2 \cdot$ s	1.2 $A^2 \cdot$ s
Current consumption/ power loss					
Power loss, typ.	2.5 W	3.5 W	4 W	3,5 W	14 W
Memory					
Type of storage					
RAM					
• integrated	192 Kibyte; The number of F-instructions compared to a standard program is limited due to the F-specific overheads; depending on the type of programming, about 36 K F-instructions are possible.	256 Kibyte; For program and data	1 024 Kibyte	1 MByte; For program and data	1 400 Kibyte

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
RAM (continued)					
• expandable	No	No	No	No	No
Load memory					
• pluggable (MMC)	Yes	Yes	Yes	Yes	Yes
• pluggable (MMC), max.	8 MByte	8 MByte	8 MByte	8 MByte	8 MByte
• expandable FEPROM		can be plugged in as MMC			
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)	Yes; up to 700 KB, maintenance-free
• without battery		Yes; Program and data	Yes; Program and data	Yes; Program and data	Yes; Program and data
CPU/blocks					
DB					
• Number, max.	1 023; DB 0 reserved	1 023; Number band: 1 to 1023	2 047; Number band: 1 to 2047	2 047; Number band: 1 to 2047	4 095; DB 0 reserved
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
FB					
• Number, max.	2 048; See instruction list	1 024; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; from FB 0 to FB 2047
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
FC					
• Number, max.	2 048; See instruction list	1 024; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; Sequence of numbers: 0 to 2047	2 048; from FC 0 to FC 2047
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
OB					
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
Nesting depth					
• per priority class	8	8	16	16	16
• additional within an error OB	4	4	4	4	4
CPU/processing times					
for bit operations, min.	0.1 µs	0.1 µs	0.05 µs	0.05 µs	0.01 µs
for word operations, min.	0.2 µs	0.2 µs	0.2 µs	0.2 µs	0.02 µs
for fixed point arithmetic, min.	2 µs	2 µs	0.2 µs	0.2 µs	0.02 µs
for floating point arithmetic, min.	6 µs	3 µs	1 µs	1 µs	0.1 µs
Times/counters and their remanence					
S7 counter					
• Number	256	256	512	512	2 048
• of which remanent without battery					
- adjustable	Yes	Yes	Yes	Yes	
- lower limit		0		0	
- upper limit		255		511	
• Remanence					
- adjustable		Yes	Yes	Yes	Yes
- lower limit		0	0	0	
- upper limit		255	511	511	
• Counting range					
- adjustable		Yes	Yes	Yes	Yes
- lower limit	0	0	0	0	0
- upper limit	999	999	999	999	999
IEC counter					
• present	Yes	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB	SFB

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
S7 times					
• Number	256	256	512	512	2 048
• Remanence					
- adjustable	Yes	Yes	Yes	Yes	Yes
- lower limit		0	0	0	
- upper limit		255	511	511	
- preset	No retentivity	No retentivity	No retentivity	No retentivity	No retentivity
• Time range					
- lower limit	10 ms	10 ms	10 ms	10 ms	10 ms
- upper limit	9 990 s	9 990 s	9 990 s	9 990 s	9 990 s
IEC timer					
• present	Yes	Yes	Yes	Yes	Yes
• Type	SFB	SFB	SFB	SFB	SFB
Data areas and their remanence					
Flag					
• Number, max.	2 048 byte	2 048 byte	4 096 byte	4 096 byte	8 Kibyte
• Remanence available	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 2047	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 4095	Yes; MB 0 to MB 8191
• Number of clock memories	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte	8; 1 memory byte
Data blocks					
• Number, max.	1 023; DB 0 reserved	1 023; From DB 1 to DB 1023	2 047; from DB 1 to DB 2047	2 047; from DB 1 to DB 2047	4 095; from DB 1 to DB 4095
• Size, max.	16 Kibyte	16 Kibyte	64 Kibyte	64 Kibyte	64 Kibyte
• Remanence adjustable		Yes; via non-retain property on DB	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	yes
Local data					
• per priority class, max.	1 024 byte	1 024 byte; per Block max. 510	1 024 byte	1 024 byte	1 024 byte
Address area					
I/O address area					
• Inputs	2 Kibyte	2 Kibyte	8 Kibyte	8 Kibyte	8 Kibyte
• Outputs	2 Kibyte	2 Kibyte	8 Kibyte	8 Kibyte	8 Kibyte
• of which, distributed					
- Inputs	2 Kibyte	2 Kibyte	8 Kibyte	8 Kibyte	8 Kibyte
- Outputs	2 Kibyte	2 Kibyte	8 Kibyte	8 Kibyte	8 Kibyte
Process image					
• Inputs	384 byte	384 byte	1 024 byte	2 048 byte	
• Outputs	384 byte	384 byte	1 024 byte	2 048 byte	
• Inputs, adjustable				2 048 byte	2 Kibyte
• Outputs, adjustable				2 048 byte	2 Kibyte
• Inputs, preset				1 024 byte	1 024 byte
• Outputs, preset				1 024 byte	1 024 byte
Subprocess images					
• Number of subprocess images, max.					1
Digital channels					
• Inputs	16 384	16 384	65 536	65 536	65 536
• Outputs	16 384	16 384	65 536	65 536	65 536
• Inputs, of which central	1 024	1 024; max.	1 024	1 024	1 024
• Outputs, of which central	1 024	1 024; max.	1 024	1 024	1 024

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
Analog channels					
• Inputs	1 024	1 024	4 096	4 096	4 096
• Outputs	1 024	1 024	4 096	4 096	4 096
• Inputs, of which central	256	256; max.	256	256	256
• Outputs, of which central	256	256; max.	256	256	256
Hardware config.					
Central devices, max.		1	1	1	
Expansion devices, max.		3	3	3	
Racks, max.	4	4	4	4	4
Modules per rack, max.	8	8	8	8	8
Number of DP masters					
• integrated	1	1	2	1	2
• via CP	1	4	4	4	4
Number of operable FMs and CPs (recommended)					
• FM	8	8	8	8	8
• CP, point-to-point	8	8	8	8	8
• CP, LAN	10	10	10	10	10
Time					
Clock					
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes	Yes
• buffered and synchronizable	Yes	Yes	Yes	Yes	Yes
• Deviation per day, max.	10 s	10 s	10 s	10 s	10 s
Operating hours counter					
• Number	1	1	4	4	4
• Number/Number range	0	0	0 to 3	0 to 3	0 to 3
• Range of values	0 to 2^31 hours (when using SFC 101)				
• Granularity	1 hour				
• remanent	Yes; must be restarted at each warm restart.				
Clock synchronization					
• supports	Yes	Yes	Yes	Yes	Yes
• to MPI, Master	Yes	Yes	Yes	Yes	Yes
• to MPI, Slave	Yes	Yes	Yes	Yes	Yes
• to DP, Master	Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave	Yes; on DP slave only time-of-day slave	Yes
• to DP, Slave	Yes	Yes	Yes	Yes	Yes; on DP slave only time-of-day slave
• in AS, Master	Yes	Yes	Yes	Yes	Yes
• in AS, Slave		Yes	Yes	Yes	Yes
• on Ethernet via NTP					Yes; as client
S7 message functions					
Number of login stations for message functions, max.	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)	32; Depending on the configured connections for PG/OP and S7 basic communication	32; Depending on the configured connections for PG/OP and S7 basic communication	32; depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes	Yes	Yes	Yes	Yes
simultaneously active Alarm-S blocks, max.	40	40	60	60	60
Test commissioning functions					
Status/control					
• Status/control variable	Yes	Yes	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
Status/control (continued)					
• 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	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	30	30	30	30	30
• of which status variable, max.	30	30	30	30	30
• of which control variable, max.	14	14	14	14	14
Forcing					
• Forcing	Yes	Yes	Yes	Yes	Yes
• Force, variables	Inputs, outputs	Inputs, outputs	Inputs, outputs	Inputs, outputs	Inputs, outputs
• Number of variables, max.	10	10	10	10	10
Status block	Yes	Yes	Yes	Yes	Yes
Single step	Yes	Yes	Yes	Yes	Yes
Number of breakpoints	2	2	2	2	2
Diagnostic buffer					
• present	Yes	Yes	Yes	Yes	Yes
• Number of entries, max.	100	100	100	100	500
• adjustable	No	No	No	No	
Communication functions					
PG/OP communication	Yes	Yes	Yes	Yes	Yes
Routing	Yes	Yes	Yes	Yes	Yes
Global data communication					
• supported	Yes	Yes	Yes	Yes	Yes
• Size of GD packets, max.	22 byte	22 byte	22 byte	22 byte	22 byte
S7 basic communication					
• supported	Yes	Yes	Yes	Yes	Yes
S7 communication					
• supported	Yes	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	Yes; via CP and loadable FC
Open IE communication					
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		8	8
- Data length, max.		1 460 byte		1 460 byte	1 460 byte
• ISO-on-TCP (RFC1006)					Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.					8
- Data length, max.					8 192 byte
• UDP					Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.					8
- Data length, max.					1 472 byte
Number of connections					
• overall	16	16	32	32	32
• usable for PG communication	15	15; max.	31	31	31
• usable for OP communication	15	15	31	31	31

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
Number of connections (continued)					
• usable for S7 basic communication	12	14	30	30	30
• usable for routing		X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: max. 24	8		
PROFINET CBA (at set setpoint communication load)					
• Setpoint for the CPU communication load		50%		50%	20%
• Number of remote interconnection partners		32		32	32
• Number of functions, master/slave		17		17	50
• Total of all master/slave connections		1 000		1 000	3 000
• Data length of all incoming connections master/slave, max.		4 000 byte		4 000 byte	24 000 byte
• Data length of all outgoing connections master/slave, max.		4 000 byte		4 000 byte	24 000 byte
• Number of device-internal and PROFIBUS interconnections		500		500	1 000
• Data length of device-internal and PROFIBUS interconnections, max.		4 000 byte		4 000 byte	8 000 byte
• Data length per connection, max.		1 400 byte		1 400 byte	1 400 byte
• Remote interconnections with acyclic transmission					
- Sampling frequency: sampling interval, min.		500 ms		500 ms	200 ms
- Number of incoming interconnections		100		100	100
- Number of outgoing interconnections		100		100	100
- Data length of all incoming interconnections, max.		2 000 byte		2 000 byte	3 200 byte
- Data length of all outgoing interconnections, max.		2 000 byte		2 000 byte	3 200 byte
- Data length per connection, max.		1 400 byte		1 400 byte	1 400 byte
• Remote interconnections with cyclic transmission					
- Transmission frequency: transmission interval, min.		10 ms		10 ms	1 ms
- Number of incoming interconnections		200		200	300
- Number of outgoing interconnections		200		200	300
- Data length of all incoming interconnections, max.		2 000 byte		2 000 byte	4 800 byte
- Data length of all outgoing interconnections, max.		2 000 byte		2 000 byte	4 800 byte
- Data length per connection, max.		450 byte		450 byte	250 byte

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
• HMI variables via PROFINET (acyclic)					
- Number of log-in stations for HMI variables (PN OPC/iMap)		3; 2x PN OPC/1x iMap		3; 2x PN OPC/1x iMap	3; 2x PN OPC/1x iMap
- HMI variable updating		500 ms		500 ms	500 ms
- Number of HMI variables		200		200	600
- Data length of all HMI variables, max.		2 000 byte		2 000 byte	9 600 byte
• PROFIBUS proxy functionality					
- supported		Yes		Yes	Yes
- Number of linked PROFIBUS devices		16		16	32
- Data length per connection, max.		240 byte; Slave-dependent		240 byte; Slave-dependent	240 byte; Slave-dependent
PROFINET CBA (at 50 % communication load)					
• Data length for arrays and structures (local interconnection), max.		Slave-dependent		Slave-dependent	
• HMI variables via PROFINET (acyclic)					
- Number of log-in stations for HMI variables (PN OPC/iMap)		2 * PN OPC / 1 * iMap		2 * PN OPC / 1 * iMap	
1st interface					
Type of interface	Integral RS 485 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	RS 485
isolated	No	Yes	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	200 mA	200 mA	200 mA	150 mA
Functionality					
• MPI	Yes	Yes	Yes	Yes	Yes
• DP master	No	Yes	Yes	Yes	Yes
• DP slave	No	Yes	Yes	Yes	Yes
• Point-to-point coupling	No	No	No	No	No
MPI					
• Number of connections	16	16	32	16	32
• Services					
- PG/OP communication	Yes	Yes	Yes	Yes	Yes
- Routing	Yes	Yes	Yes	Yes	Yes
- Global data communication	Yes	Yes	Yes	Yes	Yes
- S7 basic communication	Yes	Yes	Yes	Yes	Yes
- S7 communication	Yes	Yes	Yes	Yes	Yes
- S7 communication, as client	Yes; via CP and loadable FB	No	No	No	No
- S7 communication, as server	Yes	Yes	Yes	Yes	Yes; via CP and loadable FB
• Transmission speeds, max.	187.5 kBit/s	12 MBit/s	12 MBit/s	12 MBit/s	12 MBit/s
DP master					
• Services					
- PG/OP communication		Yes	Yes	Yes	Yes
- Routing		Yes	Yes	Yes	Yes
- Global data communication		No	No	No	No
- S7 basic communication		Yes	Yes	Yes	Yes; with I blocks
- S7 communication		Yes	Yes	Yes	Yes
- S7 communication, as client		No	No	No	No
- S7 communication, as server		Yes	Yes	Yes	Yes
- equidistance support		Yes	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
DP master					
• Services (continued)					
- Isochronous mode		Yes; OB 61	No	Yes; OB 61	No
- SYNC/FREEZE		Yes	Yes	Yes	Yes
- Activation/deactivation of DP slaves		Yes	Yes	Yes	Yes
- DPV1		Yes	Yes	Yes	Yes
• Transmission speeds, max.		12 MBit/s	12 MBit/s	12 MBit/s	12 MBit/s
• Number of DP slaves, max.		124	124	124	124
• Address area					
- Inputs, max.			244 byte		8 Kibyte
- Outputs, max.			244 byte		8 Kibyte
• Useful data per DP slave					
- Inputs, max.					244 byte
- Outputs, max.					244 byte
DP slave					
• Services					
- Routing		Yes; only with active interface	Yes; only with active interface	Yes; with interface active	Yes; with interface active
- Global data communication		No	No	No	No
- S7 basic communication		Yes	Yes	Yes	No
- S7 communication		Yes	Yes	Yes	Yes
- S7 communication, as client		No	No	No	No
- S7 communication, as server		Yes	Yes	Yes	Yes
- direct data exchange (cross traffic)		Yes	Yes	Yes	Yes
- DPV1		No	No	No	No
• Transmission speeds, max.		12 MBit/s	12 MBit/s	12 MBit/s	12 MBit/s
• Transfer memory					
- Inputs		244 byte	244 byte	244 byte	244 byte
- Outputs		244 byte	244 byte	244 byte	244 byte
• Address area, max.		32; with max. 32 bytes each	32	32	32
• Useful data per address area, max.			32 byte	32 byte	32 byte
2nd interface					
Type of interface	Integral RS 485 interface	PROFINET	Integral RS 485 interface	PROFINET	Integral RS 485 interface
Physics	RS 485	Ethernet	RS 485	Ethernet	RS 485
isolated	Yes	Yes	Yes	Yes	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA	0 mA	200 mA	0 mA	200 mA
automatic detection of transmission speed		Yes; (10/100 Mbit/s)		Yes; (10/100 Mbit/s)	
Functionality					
• MPI	No	No	No	No	No
• DP master	Yes	No	Yes	No	Yes
• DP slave	Yes	No	Yes	No	Yes
• PROFINET IO controller		Yes		Yes; Firmware Status V2.3 or higher	No
• PROFINET CBA		Yes		Yes	No
• Point-to-point coupling	No	No	No	No	No
DP master					
• Number of connections, max.	16		32		

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
DP master (continued)					
• Services					
- PG/OP communication	Yes		Yes		Yes
- Routing	Yes		Yes		Yes
- Global data communication	No		No		No
- S7 basic communication	No		Yes		Yes; with I blocks
- S7 communication	No		Yes		Yes
- S7 communication, as client			No		No
- S7 communication, as server			Yes		Yes
- equidistance support	Yes		Yes		Yes
- Isochronous mode			Yes; OB 61		Yes; OB 61
- SYNC/FREEZE	Yes		Yes		Yes
- Activation/deactivation of DP slaves			Yes		Yes
- DPV1	Yes		Yes		Yes
• Transmission speeds, max.	12 MBit/s		12 MBit/s		12 MBit/s
• Number of DP slaves, max.	125		124		124
• Address area					
- Inputs, max.	244 Kibyte		244 byte		8 Kibyte
- Outputs, max.	244 Kibyte		244 byte		8 Kibyte
• Useful data per DP slave					
- Inputs, max.					244 byte
- Outputs, max.					244 byte
DP slave					
• Number of connections	16		32		
• Services					
- PG/OP communication	Yes		Yes		Yes
- Routing	Yes; with interface active		Yes; with interface active		Yes; with interface active
- Global data communication	No		No		No
- S7 basic communication	No		Yes		Yes
- S7 communication, as client	No		No		No
- S7 communication, as server	No		Yes		Yes
- direct data exchange (cross traffic)	Yes		Yes		Yes
- DPV1	No		No		No
• GSD file	You can obtain the current GSD file from http://www.siemens.com/profibus-gsd		You can obtain the current GSD file from http://www.siemens.com/profibus-gsd		The current GSD file can be obtained from: http://www.siemens.com/profibus-gsd
• Transmission speeds, max.	12 MBit/s		12 MBit/s		12 MBit/s
• automatic baud rate search			Yes; only with passive interface		Yes; only with passive interface
• Transfer memory					
- Inputs	244 byte		244 byte		244 byte
- Outputs	244 byte		244 byte		244 byte
• Address area, max.	32		32		32
• Useful data per address area, max.	32 byte		32 byte		32 byte
PROFINET IO controller					
• Services					
- PG/OP communication		Yes		Yes	
- Routing		Yes		Yes	
- S7 communication		Yes; with loadable FBs, max. configurable connections: 14, max. number of instances: 32		Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32	
- open IE communication		Yes; via TCP/IP		Yes; via TCP/IP	

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
PROFINET IO controller (contin.)					
• Transmission speed, max.		100 MBit/s		100 MBit/s	
• Total number of connectable IO Devices, max.		128		128	
• Updating time		1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices and on the number of configured net data items)		1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices and on the number of configured net data items)	
• Address area					
- Inputs, max.		2 Kibyte		8 Kibyte	
- Outputs, max.		2 Kibyte		8 Kibyte	
- Useful data consistency, max.		256 byte		256 byte	
PROFINET CBA					
• Acyclic transmission		Yes		Yes	
• cyclic transmission		Yes		Yes	
3rd interface					
Type of interfaces					PROFINET
Physics					RJ45
isolated					Yes
automatic detection of transmission speed					Yes; (10/100 MBit/s)
Functionality					
• MPI					No
• PROFINET IO controller					Yes
• PROFINET IO device					No
• PROFINET CBA					Yes
• Point-to-point coupling					No
• Updating times					0.25...512 depending on the send cycle
Open IE communication					
• Number of connections, max.					8
CPU/programming					
Programming language					
• STEP 7	Yes; V5.1 SP6 or higher	Yes; V5.3 SP3 or higher with hardware update	Yes; V5.2 SP1 or higher	Yes; V5.3 SP3 or higher with hardware update	Yes; 5.4 or higher, Service Pack 1 with HSP
• LAD	Yes	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes	Yes
• SCL	Yes	Yes	Yes	Yes	Yes
• CFC		Yes	Yes	Yes	Yes
• GRAPH		Yes	Yes	Yes	Yes
• HiGraph		Yes	Yes	Yes	Yes
Operational stocks	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list
Nesting levels	8	8	8	8	8
User program protection/password protection	Yes	Yes	Yes	Yes	Yes
System functions (SFC)	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list
System function blocks (SFB)	See instruction list	See instruction list	See instruction list	See instruction list	See instruction list

Technical specifications (continued)

	6ES7 315-6FF01-0AB0	6ES7 315-2FH13-0AB0	6ES7 317-6FF03-0AB0	6ES7 317-2FK13-0AB0	6ES7 318-3FL00-0AB0
Dimensions					
Dimensions					
• Width	40 mm	80 mm	80 mm	80 mm	120 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm
• Depth	130 mm	130 mm	130 mm	130 mm	130 mm
Weights					
• Weight, approx.	290 g	460 g	460 g	460 g	1 250 g

4

Ordering Data

		Order No.
CPU 315F-2 DP CPU for SIMATIC S7-300F; main memory 192 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, incl. single location number labels and 2 keys		**6ES7 315-6FF01-0AB0**
CPU 315F-2 PN/DP CPU for SIMATIC S7-300F; main memory 256 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; incl. slot number labels		**6ES7 315-2FH13-0AB0**
CPU 317F-2 DP Main memory 1 MB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required		**6ES7 317-6FF03-0AB0**
CPU 317F-2 PN/DP Main memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; MMC required		**6ES7 317-2FK13-0AB0**
CPU 319F-3 PN/DP Main memory 1.4 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	B7	**6ES7 318-3FL00-0AB0**
Distributed Safety V5.4 programming tool Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher		
Floating license		**6ES7 833-1FC02-0YA5**
Software Update Service		**6ES7 833-1FC00-0YX2**
Distributed Safety Upgrade From V5.x to V5.4; Floating license for 1 user		**6ES7 833-1FC02-0YE5**

		Order No.
Micro Memory Card		
64 KB		**6ES7 953-8LF20-0AA0**
128 KB		**6ES7 953-8LG11-0AA0**
512 KB		**6ES7 953-8LJ20-0AA0**
2 MB		**6ES7 953-8LL20-0AA0**
4 MB		**6ES7 953-8LM20-0AA0**
8 MB		**6ES7 953-8LP20-0AA0**
MPI cable For connecting SIMATIC S7 and the PG through MPI; 5 m in length		**6ES7 901-0BF00-0AA0**
Slot number plates		**6ES7 912-0AA00-0AA0**
S7-300 manual Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming Devices), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**
Power supply connector 10 units, spare part		**6ES7 391-1AA00-0AA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H

Fail-safe CPUs

Ordering Data	Order No.
Manual "Communication for SIMATIC S7-300/-400"	
German	**6ES7 398-8EA00-8AA0**
English	**6ES7 398-8EA00-8BA0**
French	**6ES7 398-8EA00-8CA0**
Spanish	**6ES7 398-8EA00-8DA0**
Italian	**6ES7 398-8EA00-8EA0**
PROFIBUS bus components	
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA12-0XA0**
- With programming device interface	**6ES7 972-0BB12-0XA0**
• With 90° cable outlet for FastConnect connection system, max. transmission rate 12 Mbit/s	
- Without programming device interface	**6ES7 972-0BA51-0XA0**
- With programming device interface	**6ES7 972-0BB51-0XA0**
• With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1 500-0EA02**
PROFIBUS Fast Connect bus cable	**6XV1 830-0EH10**
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
RS 485 repeater for PROFIBUS	**6ES7 972-0AA01-0XA0**
Data transfer rate up to 12 Mbit/s; 24 V DC; IP20 housing	

	Order No.
PROFINET bus components	
IE FC TP Standard Cable GP 2x2	**6XV1 840-2AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter	
FO Standard Cable GP (50/125)	**6XV1 873-2A**
Standard cable, splittable, UL approval, sold by the meter	
SCALANCE X204-2 Industrial Ethernet Switch	**6GK5 204-2BB10-2AA3**
Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	
IE FC RJ45 Plugs	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 Plug 145	
145° cable outlet	
1 unit	**6GK1 901-1BB30-0AA0**
10 units	**6GK1 901-1BB30-0AB0**
50 units	**6GK1 901-1BB30-0AE0**
IE FC RJ45 Plug 180	
180° cable outlet	
1 unit	**6GK1 901-1BB10-2AA0**
10 units	**6GK1 901-1BB10-2AB0**
50 units	**6GK1 901-1BB10-2AE0**
PROFIBUS/PROFINET bus components	see Catalogs IK PI, CA 01
For establishing MPI/PROFIBUS/PROFINET communication	

Overview SIPLUS CPU 312C

- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

Micro Memory Card required for operation of CPU..

	SIPLUS CPU 312C	
Order No.	**6AG1 312-5BE03-2AB0**	**6AG1 312-5BE03-2AY0**
Order No. based on	**6ES7 312-5BE03-0AB0**	**6ES7 312-5BE03-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Ambient conditions	Suitable for extraordinary medial exposure (for example by chloric and sulphuric atmospheres).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 313C

- The compact CPU with integrated digital and analog inputs and outputs
- For installations with high requirements in terms of processing power and response time.
- With process-related functions

Micro Memory Card required to operate the CPU.

	SIPLUS CPU 313C	
Order No.	**6AG1 313-5BF03-2AB0**	**6AG1 313-5BF03-2AY0**
Order No. based on	**6ES7 313-5BF03-0AB0**	**6ES7 313-5BF03-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Ambient conditions	Suitable for extraordinary medial exposure (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1).	No	Yes
Technical specifications	The technical data are identical with the technical data of the based on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

SIPLUS compact CPUs

Overview SIPLUS CPU 314C-2DP

- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 314C-2DP	
Order No.	**6AG1 314-6CG03-2AB0**	**6AG1 314-6CG03-2AY0**
Order No. based on	**6ES7 314-6CG03-0AB0**	**6ES7 314-6CG03-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Ordering Data

		Order No.
SIPLUS CPU 312C		
(extended temperature and medial exposure)		
Compact CPU, main memory 32 KB, power supply 24 V DC, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC required	B7	**6AG1 312-5BE03-2AB0**
Conforms to EN 50155	B7	**6AG1 312-5BE03-2AY0**
SIPLUS CPU 313C		
(extended temperature and medial exposure)		
Compact CPU, main memory 64 KB, power supply 24 V DC, 24 DI/16 DO, 4 AI/2 AO integrated, integrated functions, MPI; MMC required	B7	**6AG1 313-5BF03-2AB0**
Conforms to EN 50155	B7	**6AG1 313-5BF03-2AY0**
SIPLUS CPU 314C-2 DP		
(extended temperature and medial exposure)		
Compact CPU, main memory 96 KB, power supply 24 V DC, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	B7	**6AG1 314-6CG03-2AB0**
Conforms to EN 50155	B7	**6AG1 314-6CG03-2AY0**
Accessories		see S7-300 compact-CPUs, page 4/18

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview SIPLUS CPU 314

- For plants with medium program scope requirements
- High processing performance in binary and floating-point arithmetic

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 314	
Order No.	**6AG1 314-1AG13-2AB0**	**6AG1 314-1AG13-2AY0**
Order No. based on	**6ES7 314-1AG13-0AB0**	**6ES7 314-1AG13-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 315-2 DP

- The CPU with medium to large program memory and quantity frameworks for optional use of SIMATIC engineering tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For large I/O configuration
- For designing distributed I/O structures

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 315-2 DP
Order No.	**6AG1 315-2AG10-2AB0**
Order No. based on	**6ES7 315-2AG10-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes
Technical specifications	The technical data are identical with those of the based-on modules.

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

SIPLUS standard CPUs

Overview SIPLUS CPU 315-2 PN/DP

- The CPU with medium-sized program memory and quantity structures
- High processing performance in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Integrated PROFINET interface
- Combined MPI/PROFIBUS DP master/slave interface
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO Controller to operate distributed I/Os on PROFINET

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 315-2 PN/DP	
Order No.	**6AG1 315-2EH13-2AB0**	**6AG1 315-2EH13-2AY0**
Order No. based on	**6ES7 315-2EH13-0AB0**	**6ES7 315-2EH13-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155)	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 317-2 PN/DP

- The CPU with a large program memory and quantity framework for demanding applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO-Controller to operate distributed I/Os on PROFINET
- 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
- For large I/O configuration
- For designing distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP master/slave interface
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 317-2 PN/DP	
Order No.	**6AG1 317-2EK13-2AB0**	**6AG1 317-2EK13-2AY0**
Order No. based on	**6ES7 317-2EK13-0AB0**	**6ES7 317-2EK13-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155)	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Ordering Data

		Order No.
SIPLUS CPU 314		
(extended temperature and medial exposure)		
Main memory 96 KB, power supply 24 V DC, MPI; MMC required	B7	**6AG1 314-1AG13-2AB0**
Conforms to EN 50155	B7	**6AG1 314-1AG13-2AY0**
SIPLUS CPU 315-2 DP	B7	**6AG1 315-2AG10-2AB0**
(extended temperature and medial exposure)		
Main memory 128 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required; Conforms to EN 50155		
SIPLUS CPU 315-2 PN/DP		
(extended temperature and medial exposure)		
Main memory 256 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	B7	**6AG1 315-2EH13-2AB0**
Conforms to EN 50155		**6AG1 315-2EH13-2AY0**
SIPLUS CPU 317-2 PN/DP		
(extended temperature and medial exposure)		
Main memory 1 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required		**6AG1 317-2EK13-2AB0**
Conforms to EN 50155	B7	**6AG1 317-2EK13-2AY0**
Accessories		see S7-300 standard CPUs, page 4/40

B7: Subject to export regulations: AL: N and ECCN: EAR99H

SIPLUS fail-safe CPUs

Overview SIPLUS CPU 315F-2 DP

- For design of a fail-safe automation system for plants with increased safety requirements
- Based on the SIMATIC CPU 315-2 DP
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe).
- Fail-safe I/O modules of ET 200M can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and decentralized

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 315F-2 DP
Order No.	**6AG1 315-6FF01-2AB0**
Order No. based on	**6ES7 315-6FF01-0AB0**
Ambient temperature range	- 25 ... + 60 °C; condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes
Technical specifications	The technical data are identical with those of the based-on modules..

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 315F-2 PN/DP

- For design of a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Standard modules for non-safety-related applications can be operated centrally and decentralized
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 315F-2 PN/DP
Order No.	**6AG1 315-2FH13-2AB0**
Order No. based on	**6ES7 315-2FH13-0AB0**
Ambient temperature range	- 25 ... + 60 °C; condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Technical specifications	The technical data are identical with those of the based-on modules.

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 317F-2 DP

- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Distributed fail-safe I/O modules can be connected through the two integral PROFIBUS DP interfaces (PROFIsafe).
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Standard modules for non-safety-related applications can be operated centrally and decentralized

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 317F-2 DP	
Order No.	**6AG1 317-6FF03-2AB0**	**6AG1 317-6FF03-2AY0**
Order No. based on	**6ES7 317-6FF03-0AB0**	**6ES7 317-6FF03-0AB0**
Ambient temperature range	-25 ... +60 °C; condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules..	

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

Overview SIPLUS CPU 317F-2 PN/DP

- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Fail-safe I/O modules can be connected decentralized over the integrated PROFINET interface (PROFIsafe) and/or over the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe I/O modules of ET 200M can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and decentralized
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

Micro Memory Card required for operation of CPU.

	SIPLUS CPU 317F-2 PN/DP
Order No.	**6AG1 317-2FK13-2AB0**
Order No. based on	**6ES7 317-2FK13-0AB0**
Ambient temperature range	- 25 ... + 60 °C; condensation permitted
Ambient conditions	Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere).
Technical specifications	The technical data is identical to that of the based-on modules.

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

SIPLUS fail-safe CPUs

Ordering Data		Order No.
SIPLUS CPU 315F-2 DP (extended temperature and medial exposure) CPU for SIMATIC S7-300F; main memory 192 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, incl. single slot number labels; MMC required; Conforms to EN 50155		**6AG1 315-6FF01-2AB0**
SIPLUS CPU 315F-2 PN/DP (extended temperature and medial exposure) CPU for SIMATIC S7-300F; main memory 256 KB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; incl. single slot number labels; MMC required	B7	**6AG1 315-2FH13-2AB0**
SIPLUS CPU 317F-2 DP (extended temperature and medial exposure) CPU for SIMATIC S7-300F; main memory 1 MB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	B7	**6AG1 317-6FF03-2AB0**
Conforms to EN 50155		**6AG1 317-6FF03-2AY0**
SIPLUS CPU 317F-2 PN/DP (extended temperature and medial exposure) CPU for SIMATIC S7-300F; main memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	B7	**6AG1 317-2FK13-2AB0**
Accessories		see S7-300 fail-safe CPUs, page 4/61

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

- Digital inputs
- For connecting standard switches and two-wire proximity switches (BERO)

Technical specifications

	6ES7 321-1BH02-0AA0	6ES7 321-1BH50-0AA0	6ES7 321-1BL00-0AA0	6ES7 321-1BP00-0AA0	6ES7 321-1BH10-0AA0
Supply voltages					
Load voltage L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Current consumption					
from load voltage L+ (without load), max.	25 mA				
from backplane bus DC 5 V, max.	10 mA	10 mA	15 mA	100 mA	110 mA
Current consumption/ power loss					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
Connection point					
required front connectors	20-pin	20-pin	40-pin	Cable: 6ES7 392-4Bxx0-0AA0 terminal blocks: 6ES7 392-1xN00-0AA0	20-pin
Isochronous mode					
Isochronouos mode	No	No	No	No	Yes
Digital inputs					
Number of digital inputs	16	16	32	64	16
Number of simultanneously controllable inputs					
• horizontal installation					
- up to 40 °C, max.			32	64	
- up to 60 °C, max.	16	16	16	32	16
• vertical installation					
- up to 40 °C, max.	16	16	32	32	16
Input characteristic curve to IEC 1131, Type 1	Yes	Yes	Yes	Yes	Yes
Input voltage					
• Rated value, DC	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-5 to +30 V	-30 to +5 V	-30...5	-30 to +5 V
• for signal "1"	13 to 30 V	-13 to -30 V	13 to 30 V	13...30	13 to 30 V

Technical specifications (continued)

	6ES7 321-1BH02-0AA0	6ES7 321-1BH50-0AA0	6ES7 321-1BL00-0AA0	6ES7 321-1BP00-0AA0	6ES7 321-1BH10-0AA0
Input current					
• for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA; typical	7 mA
Input delay (for rated value of input voltage)					
• for standard inputs					
- programmable				No	
- at " to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
Cable length					
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m
Encoder					
Connectable encoders					
• 2-wire BEROS	Yes	Yes	Yes	No	Yes
- permissible quiescent current (2-wire BEROS), max.	1.5 mA	1.5 mA	1.5 mA		1.5 mA
Status information/alarms/ diagnostics					
Alarms					
• Alarms	No	No	No	No	No
• Diagnostic alarm				No	
• Process alarm				No	
Diagnoses					
• Diagnostic functions	No	No	No	No	No
Diagnostics indication LED					
• Status indicator digital input (green)	Yes	Yes	Yes	Yes	Yes
Isolation					
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
Isolation					
Galvanic isolation, digital inputs					
• between the channels	No	No	No	No	No
• between the channels, in groups of	16	16	16	16	16
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes	Yes; Optocoupler
Dimensions					
Dimensions					
• Width	40 mm	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm

	6ES7 321-7BH01-0AB0	6ES7 321-1CH00-0AA0	6ES7 321-1CH20-0AA0	6ES7 321-1FH00-0AA0
Supply voltages				
Load voltage L+				
• Rated value (DC)	24 V	24 V	48 V	
Load voltage L1				
• Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.

Technical specifications (continued)

	6ES7 321-7BH01-0AB0	6ES7 321-1CH00-0AA0	6ES7 321-1CH20-0AA0	6ES7 321-1FH00-0AA0
Current consumption				
from load voltage L+ (without load), max.	90 mA			
from backplane bus DC 5 V, max.	130 mA	100 mA	40 mA	29 mA
Current consumption/ power loss				
Power loss, typ.	4 W	1.5 W; at 24 V; 2,8 W at 48 V	4.3 W	4.9 W
Connection point				
required front connectors	20-pin	40-pin	20-pin	20-pin
Isochronous mode				
Isochronouos mode	Yes	No	No	No
Digital inputs				
Number of digital inputs	16	16	16	16
Number of simultanneously controllable inputs				
• horizontal installation				
- up to 50 °C, max.			8	
- up to 60 °C, max.	16	16	8; 6 to Ue 146 V	16
• vertical installation				
- up to 40 °C, max.	16	16	8	16
Input characteristic curve to IEC 1131, Type 1		Yes	Yes	Yes
Input characteristic curve to IEC 1131, Type 2	Yes			
Input voltage				
• Rated value, AC		24 V; AC 24 or 48 V		230 V; 120/230 V AC
• Rated value, DC	24 V	24 V; DC 24 or 48 V	48 V; DC 48 to 125 V	
• for signal "0"	-30 to +5 V	-5 to +5 V AC	-146 to +15 V DC	0 to 40 V
• for signal "1"	13 to 30 V	14 to 60 V AC	30 to 146 V DC	79 to 264 V
• Frequency range		0 to 63 Hz		47 to 63 Hz
Input current				
• for signal "1", typ.	7 mA	2.7 mA	3.5 mA	6.5 mA; (120 V, 60 Hz), 16 mA (230 V, 50 Hz)
Input delay (for rated value of input voltage)				
• for standard inputs				
- programmable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms	No		No
- at " to "1", min.			0.1 ms	
- at "0" to "1", max.		16 ms	3.5 ms	25 ms
Cable length				
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m
Encoder				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	2 mA	1 mA	1 mA	2 mA

Technical specifications (continued)

	6ES7 321-7BH01-0AB0	6ES7 321-1CH00-0AA0	6ES7 321-1CH20-0AA0	6ES7 321-1FH00-0AA0
Status information/alarms/ diagnostics				
Alarms				
• Alarms	Yes	No	No	No
• Diagnostic alarm	Yes; Parameterizable	No	No	No
• Process alarm	Yes; Parameterizable	No	No	No
Diagnoses				
• Diagnostic functions	Yes; parameterizable	No	No	No
Diagnostics indication LED				
• Status indicator digital input (green)	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	500 V DC	1500 V AC	1500 V DC	4000 VDC
Isolation				
Galvanic isolation, digital inputs				
• between the channels	No	Yes	No	No
• between the channels, in groups of	16	1	8	4
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm
Weights				
• Weight, approx.	200 g	260 g	200 g	240 g

	6ES7 321-1EL00-0AA0	6ES7 321-1FF01-0AA0	6ES7 321-1FF10-0AA0
Supply voltages			
Load voltage L1			
• Rated value (AC)	120 V	230 V; 120/230 V AC	230 V; 120/230 V AC; all load voltages must have the same phase.
Current consumption			
from backplane bus DC 5 V, max.	16 mA	29 mA	100 mA
Current consumption/ power loss			
Power loss, typ.	4 W	4.9 W	4.9 W
Connection point			
required front connectors	40-pin	20-pin	40-pin
Isochronous mode			
Isochronouos mode	No	No	No
Digital inputs			
Number of digital inputs	32	8	8
Number of simultanneously controllable inputs			
• horizontal installation			
- up to 40 °C, max.	32		
- up to 60 °C, max.	24	8	8
• vertical installation			
- up to 40 °C, max.	32	8	8

Technical specifications (continued)

	6ES7 321-1EL00-0AA0	6ES7 321-1FF01-0AA0	6ES7 321-1FF10-0AA0
Input characteristic curve to IEC 1131, Type 1		Yes	Yes
Input characteristic curve to IEC 1131, Type 2	Yes		
Input voltage			
• Rated value, AC	120 V	230 V; 120/230 V AC	120 V; 120/230 V AC
• for signal "0"	0 to 20 V	0 to 40 V	0 to 40 V
• for signal "1"	74 to 132 V	79 to 264 V	79 to 264 V
• Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Input current			
• for signal "1", typ.	21 mA	6.5 mA; (120 V); 11 mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)
Input delay (for rated value of input voltage)			
• for standard inputs			
- programmable	No	No	No
- at "0" to "1", max.	15 ms	25 ms	25 ms
Cable length			
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	4 mA	2 mA	2 mA
Status information/alarms/ diagnostics			
Alarms			
• Alarms	No	No	No
• Diagnostic alarm	No	No	No
• Process alarm	No	No	No
Diagnoses			
• Diagnostic functions	No	No	No
Diagnostics indication LED			
• Status indicator digital input (green)	Yes; Per channel	Yes	Yes
Isolation			
Isolation checked with	2500 V DC	4000 V DC	1500 V AC
Isolation			
Galvanic isolation, digital inputs			
• between the channels	No	No	Yes
• between the channels, in groups of	8	2	1
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions			
Dimensions			
• Width	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weights			
• Weight, approx.	300 g	240 g	240 g

SM 321 digital input modules

Ordering Data		Order No.
SM 321 Digital Input Modules		
incl. labeling strips, bus connector		
16 inputs, 24 V DC		**6ES7 321-1BH02-0AA0**
16 inputs, 24 V DC, active low		**6ES7 321-1BH50-0AA0**
32 inputs, 24 V DC		**6ES7 321-1BL00-0AA0**
64 inputs, 24 V DC, active high/low		**6ES7 321-1BP00-0AA0**
Note: 6ES7 392-4...0-0AA0 connection cable and 6ES7 392-1.N00-0AA0 terminal blocks necessary.		
16 inputs, 24 … 48 V DC	B7	**6ES7 321-1CH00-0AA0**
16 inputs, 48 … 125 V DC	B7	**6ES7 321-1CH20-0AA0**
16 inputs, 24 V DC, for isochronous mode		**6ES7 321-1BH10-0AA0**
32 inputs, 120 V AC	B7	**6ES7 321-1EL00-0AA0**
8 inputs, 120/230 V AC	B7	**6ES7 321-1FF01-0AA0**
8 inputs, 120/230 V AC, single root	B7	**6ES7 321-1FF10-0AA0**
16 inputs, 120/230 V AC	B7	**6ES7 321-1FH00-0AA0**
16 inputs, 24 V DC, for isochronous mode, diagnostics-capable		**6ES7 321-7BH01-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
S7-300 connecting cable		
For 64-channel modules; 2 units		
1 m		**6ES7 392-4BB00-0AA0**
2.5 m		**6ES7 392-4BC50-0AA0**
5 m		**6ES7 392-4BF00-0AA0**
Terminal block		
For 64-channel modules; 2 units		
With screw contacts		**6ES7 392-1AN00-0AA0**
With spring-loaded contacts		**6ES7 392-1BN00-0AA0**

		Order No.
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3mm²/16 AWG cables		
SIMATIC TOP connect		see page 4/218
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XX00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XX10-0AA0**
Label cover		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XY00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XY10-0AA0**
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX10-0AA0**
light-beige		**6ES7 392-2BX10-0AA0**
yellow		**6ES7 392-2CX10-0AA0**
red		**6ES7 392-2DX10-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

	6ES7 322-1BH01-0AA0	6ES7 322-1BH10-0AA0	6ES7 322-1BL00-0AA0	6ES7 322-1BP00-0AA0	6ES7 322-1BP50-0AA0	6ES7 322-8BF00-0AB0
Supply voltages						
Load voltage L+						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Current consumption						
from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
Current consumption/ power loss						
Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
Connection point						
required front connectors	20-pin	20-pin	40-pin	Cable: 6ES7 392-4Bxx0-0AA0 terminal blocks: 6ES7 392-1xN00-0AA0	Cable: 6ES7 392-4Bxx0-0AA0; terminal blocks: 6ES7 392-1xN00-0AA0	20-pin
Digital outputs						
Number of digital outputs	16	16	32	64	64	8
Short-circuit protection of the output	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53V)	M+ (45 V)	L+ (-45 V)
Lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Output voltage						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.3 A	0.3 A	0.5 A
• for signal "1" permissible range, min.				2.4 mA	2.4 mA	
• for signal "1" permissible range, max.				0.36 A	0.36 A	
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA	5 mA	5 mA			10 mA

Technical specifications (continued)

	6ES7 322-1BH01-0AA0	6ES7 322-1BH10-0AA0	6ES7 322-1BL00-0AA0	6ES7 322-1BP00-0AA0	6ES7 322-1BP50-0AA0	6ES7 322-8BF00-0AB0
Output current (continued)						
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA			10 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA
Switching frequency						
• with resistive load, max.	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz		0.5 Hz	0.5 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of the outputs (per group)						
• horizontal installation						
- up to 40 °C, max.	4 A	4 A	4 A	1.6 A	1.6 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A	1.2 A	1.2 A	3 A
• vertical installation						
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Status information/alarms/ diagnostics						
Alarms						
• Diagnostic alarm	No	No	No	No	No	Yes; Parameterizable
Diagnoses						
• Diagnostics	No	No	No	No	No	Yes
Isolation						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 VDC
Isolation						
Isolation, digital outputs						
• between the channels, in groups of	8	8	8	16	16	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions						
Dimensions						
• Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm

	6ES7 322-5GH00-0AB0	6ES7 322-1CF00-0AA0	6ES7 322-1BF01-0AA0	6ES7 322-1FF01-0AA0	6ES7 322-5FF00-0AB0	6ES7 322-1FH00-0AA0
Supply voltages						
Load voltage L+						
• Rated value (DC)	24 V; 24 / 48	48 V; 48 to 125 V DC	24 V			
Load voltage L1						
• Rated value (AC)				230 V; AC 120/230 V	230 V; AC 120/230 V	230 V; AC 120/230 V

Technical specifications (continued)

	6ES7 322-5GH00-0AB0	6ES7 322-1CF00-0AA0	6ES7 322-1BF01-0AA0	6ES7 322-1FF01-0AA0	6ES7 322-5FF00-0AB0	6ES7 322-1FH00-0AA0
Current consumption						
from load voltage L+ (without load), max.	200 mA	2 mA	60 mA			2 mA
from load voltage L1 (without load), max.				2 mA	2 mA	3 mA
from backplane bus DC 5 V, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
Current consumption/ power loss						
Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
Connection point						
required front connectors	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
Digital outputs						
Number of digital outputs	16	8	8	8	8	16
Short-circuit protection of the output	No; to be provided externally	Yes; Electronic	Yes; Electronic	Yes; Fuse 8 A, 250 V; per group	Yes; to be provided externally; fuse 3,15 A / 250 V, quick response	Yes; Fuse 8 A, 250 V; per group
Limitation of inductive shutdown voltage to		M (-1 V)	L+ (-48 V)			
Lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
Output voltage						
• for signal "1", min.	L+ (-0.25 V)		L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
Output current						
• for signal "1" rated value	0.5 A	1.5 A	2 A	2 A	2 A	1 A
• for signal "1" permissible range for 0 to 40 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 0 to 40 °C, max.		1.5 A	2.4 A	2 A	2 A	1 A
• for signal "1" permissible range for 40 to 60 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 40 to 60 °C, max.		1.5 A	2.4 A	1 A	1 A	0.5 A
• for signal "1" minimum load current		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible peak current, max.	1.5 A; for 50 ms, 1 A 2 s one-time	3 A; for 10 ms		20 A; max. 1 AC cycle	20 A; with 2 half waves	20 A; with 2 half waves
• for signal "0" residual current, max.	10 µA	0.5 mA	0.5 mA	2 mA	2 mA	2 mA
Switching frequency						
• with resistive load, max.	10 Hz	25 Hz	100 Hz	10 Hz	10 Hz	10 Hz
• with inductive load, max.		0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	0.5 Hz	10 Hz	10 Hz	1 Hz	1 Hz	1 Hz
Aggregate current of the outputs (per group)						
• horizontal installation						
- up to 40 °C, max.		6 A		4 A	8 A	4 A
- up to 50 °C, max.		4 A				
- up to 60 °C, max.	0.5 A; (8 A per module)	3 A	4 A	2 A	4 A	2 A
• vertical installation						
- up to 40 °C, max.		4 A	4 A	2 A	4 A	2 A
• all other mounting positions						
- up to 40 °C, max.	0.5 A; (8 A per module)					
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m

Technical specifications (continued)

	6ES7 322-5GH00-0AB0	6ES7 322-1CF00-0AA0	6ES7 322-1BF01-0AA0	6ES7 322-1FF01-0AA0	6ES7 322-5FF00-0AB0	6ES7 322-1FH00-0AA0
Status information/alarms/ diagnostics						
Alarms						
• Diagnostic alarm	Yes; Parameter-izable	No	No	No	Yes; Parameter-izable	No
Diagnoses						
• Diagnostics	Yes; Parameters can be assigned	No	No	Yes	Yes	Yes
Isolation						
Isolation checked with	1500 V AC	1500 V AC	500 V DC	1500 V AC	1500 V AC	4000 V DC
Isolation						
Isolation, digital outputs						
• between the channels, in groups of	1	4	4	4	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions						
Dimensions						
• Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm
Weights						
• Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g

	6ES7 322-1FL00-0AA0	6ES7 322-1HF01-0AA0	6ES7 322-1HF10-0AA0	6ES7 322-5HF00-0AB0	6ES7 322-1HH01-0AA0
Supply voltages					
Load voltage L+					
• Rated value (DC)		24 V	120 V	24 V	120 V
Load voltage L1					
• Rated value (AC)	120 V; AC 120/230 V		230 V	230 V	230 V
Current consumption					
from load voltage L+ (without load), max.		110 mA; Current consumption of relay			
from load voltage L1 (without load), max.	10 mA	110 mA			
from backplane bus DC 5 V, max.	190 mA	40 mA	40 mA	100 mA	100 mA
Current consumption/ power loss					
Power loss, typ.	25 W	3.2 W	4.2 W	3.5 W	4.5 W
Connection point					
required front connectors	20-pin	20-pin	40-pin	40-pin	20-pin
Digital outputs					
Number of digital outputs	32	8; Relay	8; Relay	8; Relay	16; Relay
Short-circuit protection of the output	No		No; to be provided externally	No; to be provided externally	
Lamp load, max.	50 W	50 W	1 500 W; AC 230 V	1 500 W; AC 230 V	50 W; AC 230 V
Output voltage					
• for signal "1", min.	L1 (-0.8 V)				

Technical specifications (continued)

	6ES7 322-1FL00-0AA0	6ES7 322-1HF01-0AA0	6ES7 322-1HF10-0AA0	6ES7 322-5HF00-0AB0	6ES7 322-1HH01-0AA0
Output current					
• for signal "1" rated value	1 A				
• for signal "1" permissible range for 0 to 40 °C, min.	10 mA				
• for signal "1" permissible range for 0 to 40 °C, max.	1 A				
• for signal "1" permissible range for 40 to 60 °C, min.	10 mA				
• for signal "1" permissible range for 40 to 60 °C, max.	1 A				
• for signal "1" minimum load current	10 mA	5 mA	5 mA	10 mA	10 mA
• for signal "1" permissible peak current, max.	10 A; per group (for 2 AC cycles)				
• for signal "0" residual current, max.	2 mA				
Switching frequency					
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of the outputs (per group)					
• horizontal installation					
- up to 40 °C, max.	4 A				
- up to 60 °C, max.	3 A		5 A	5 A	8 A
• vertical installation					
- up to 40 °C, max.	4 A		5 A	5 A	8 A
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m	600 m	600 m
Relay outputs					
Rated input voltage of relay L+ (DC)		24 V; 110 mA	24 V		24 V
Number of operating cycles		300 000; 230 V AC: 100000; 120 V AC: 200000; 24 V DC: 300000 (at 2 A)	300 000; 300000 (24 V DC, at 2 A); 200000 (120 V AC, at 3 A); 100000 (230 V AC, at 3 A)	100 000; 100,000 (DC 24 V, at 5 A), 100,000 (AC 230 V, at 5 A)	100 000; 50000 (24 V DC, at 2 A); 700000 (120 V AC, at 2 A); 100000 (230 V AC, at 2 A)
Switching capacity of the contacts					
• with inductive load, max.		2 A; 2 A (230 V AC), 2 A (24 V DC)	3 A; 3 A (230 V DC); 2 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
• with resistive load, max.		2 A	8 A; 8 A (230 V DC); 5 A (24 V AC)	5 A; 5 A (230 V AC), 5 A (24 V DC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
Status information/alarms/ diagnostics					
Alarms					
• Diagnostic alarm	No	No	No	Yes; Parameterizable	No
Diagnoses					
• Diagnostics	Yes	No	No	Yes	No
Isolation					
Isolation checked with	4000 V DC	1500 V AC	2000 V AC	1500 V AC	1500 V AC

SM 322 digital output modules

Technical specifications (continued)

	6ES7 322-1FL00-0AA0	6ES7 322-1HF01-0AA0	6ES7 322-1HF10-0AA0	6ES7 322-5HF00-0AB0	6ES7 322-1HH01-0AA0
Isolation					
Isolation, digital outputs					
• between the channels, in groups of	8	2	1	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Dimensions					
Dimensions					
• Width	80 mm	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm	125 mm
• Depth	117 mm	120 mm	120 mm	120 mm	120 mm
Weights					
• Weight, approx.	500 g	190 g	320 g	320 g	250 g

4

Ordering Data

		Order No.
SM 322 digital output modules		
incl. labeling strips, bus connector		
8 outputs, 24 V DC, 2 A		**6ES7 322-1BF01-0AA0**
16 outputs, 24 V DC, 0.5 A		**6ES7 322-1BH01-0AA0**
16 outputs, 24 V DC, 0.5 A, high speed		**6ES7 322-1BH10-0AA0**
32 outputs, 24 V DC, 0.5 A		**6ES7 322-1BL00-0AA0**
64 outputs, 24 V DC, 0.3 A		**6ES7 322-1BP00-0AA0**
Note: 6ES7392-4...0-0AA0 connection cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.		
64 outputs, 24 V DC, 0.3 A, sink output		**6ES7 322-1BP50-0AA0**
Note: 6ES7 392-4...0-0AA0 connection cable and 6ES7 392-1.N00-0AA0 terminal blocks necessary.		
8 outputs, 24 V DC, 0.5 A, diagnostics-capable		**6ES7 322-8BF00-0AB0**
16 outputs, 24/48 V DC, 0.5 A	B7	**6ES7 322-5GH00-0AB0**
8 outputs, 48 … 125 V DC, 1.5 A	B7	**6ES7 322-1CF00-0AA0**
8 outputs, 120/230 V AC, 1 A	B7	**6ES7 322-1FF01-0AA0**
8 outputs, 120/230 V AC, 2 A	B7	**6ES7 322-5FF00-0AB0**
16 outputs, 120/230 V AC, 1 A	B7	**6ES7 322-1FH00-0AA0**
32 outputs, 120 V AC, 1 A	B7	**6ES7 322-1FL00-0AA0**
8 outputs, relay contacts, 2 A		**6ES7 322-1HF01-0AA0**
8 outputs, relay contacts, 5 A		**6ES7 322-1HF10-0AA0**
8 outputs, relay contacts, 5 A, with RC filter, overvoltage protection	B7	**6ES7 322-5HF00-0AB0**
16 outputs, relay contacts, 8 A		**6ES7 322-1HH01-0AA0**

		Order No.
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
S7-300 connecting cable		
For 64-channel modules; 2 units		
1 m		**6ES7 392-4BB00-0AA0**
2.5 m		**6ES7 392-4BC50-0AA0**
5 m		**6ES7 392-4BF00-0AA0**
Terminal block		
For 64-channel modules; 2 units		
With screw contacts		**6ES7 392-1AN00-0AA0**
With spring-loaded contacts		**6ES7 392-1BN00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors		
SIMATIC TOP connect		see page 4/218

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Ordering Data		Order No.
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Set of fuses for SM 322		
10 fuses 8 A quick-response, 2 fuse holders; for 6ES7 322-1FF01-0AA0, 6ES7 322-1FH00-0AA0		**6ES7 973-1HD00-0AA0**
10 fuses 6.3 A; for 6ES7 322-1CF00-0AA0		**6ES7 973-1GC00-0AA0**
Labeling strips		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XX00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XX10-0AA0**
Label cover		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XY00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XY10-0AA0**
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**

		Order No.
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX10-0AA0**
light-beige		**6ES7 392-2BX10-0AA0**
yellow		**6ES7 392-2CX10-0AA0**
red		**6ES7 392-2DX10-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B8: Subject to export regulations: AL: N and ECCN: EAR99S

SM 323/SM 327 digital input/output modules

Overview

- Digital inputs and outputs
- For connecting standard switches, two-wire proximity switches (BERO), solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Supply voltages			
Load voltage L+			
• Rated value (DC)	24 V	24 V	24 V
Current consumption			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus DC 5 V, max.	40 mA	80 mA	60 mA
Current consumption/ power loss			
Power loss, typ.	3.5 W	6.5 W	3 W
Connection point			
required front connectors	20-pin	40-pin	20-pin
Isochronous mode			
Isochronouos mode	No	No	No
Digital inputs			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Number of simultanneously controllable inputs			
- Number of simultaneously controllable inputs, up to 40 °C	8	16	16
- Number of simultaneously controllable inputs, up to 60 °C	8	8	16
Input characteristic curve to IEC 1131, Type 1	Yes	Yes	Yes
Input voltage			
• Rated value, DC	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V	15 to 30 V
Input current			
• for signal "1", typ.	7 mA	7 mA	6 mA

Technical specifications (continued)

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Input delay (for rated value of input voltage)			
• for standard inputs			
- at " to "1", min.	1.2 ms	1.2 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	1.2 ms	1.2 ms
- at "1" to "0", max.	4.8 ms	4.8 ms	4.8 ms
Cable length			
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m
Digital outputs			
Number of digital outputs	8	16	8; can also be parameterized individually as DI
Short-circuit protection of the output	Yes; Electronic	Yes; Electronic	Yes; Electronic
• Response threshold, typ.	1 A	1 A	1 A
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-48 V)	L+ (-54 V)
Lamp load, max.	5 W	5 W	5 W
Controlling a digital input	Yes	Yes	Yes
Output voltage			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.5 V)
Output current			
• for signal "1" rated value	0.5 A	0.5 A	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 "1" minimum load current	5 mA	5 mA	
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Output delay with resistive load			
• "0" to "1", max.	100 µs	100 µs	350 µs
• "1" to "0", max.	500 µs	500 µs	500 µs
Parallel switching of 2 outputs			
• for increased power	No	No	No
• for redundant control of a load	Yes; Outputs of the same group only	Yes; Outputs of the same group only	Yes; Outputs of the same group only
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	100 Hz	10 Hz
Aggregate current of the outputs (per group)			
• horizontal installation			
- up to 40 °C, max.		4 A	4 A
- up to 60 °C, max.	4 A	3 A	3 A
• vertical installation			
- up to 40 °C, max.	4 A	2 A	2 A

Technical specifications (continued)

	6ES7 323-1BH01-0AA0	6ES7 323-1BL00-0AA0	6ES7 327-1BH00-0AB0
Load impedance range			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
• cable length, shielded, max.	1 000 m	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m	600 m
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	2 mA	1.5 mA	1.5 mA
Status information/alarms/ diagnostics			
Alarms			
• Alarms	No	No	No
Diagnoses			
• Diagnostic functions	No	No	No
Diagnostics indication LED			
• Status indicator digital output (green)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes	Yes	Yes
Isolation			
Isolation checked with	500 V DC	500 V DC	500 V DC
Isolation			
Galvanic isolation, digital inputs			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	16	
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Isolation, digital outputs			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	8	
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference			
between different circuits	75 V DC / 60 V AC	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions			
Dimensions			
• Width	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weights			
• Weight, approx.	220 g	260 g	200 g

Ordering Data		Order No.
SM 323 digital input/output modules		
incl. labeling strips, bus connector		
8 inputs, 8 outputs		**6ES7 323-1BH01-0AA0**
16 inputs, 16 outputs		**6ES7 323-1BL00-0AA0**
SM 327 digital input/output modules		
incl. labeling strips, bus connector		
8 inputs, 8 inputs or outputs (can be configured)		**6ES7 327-1BH00-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires		
SIMATIC TOP connect		see page 4/218
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XX00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XX10-0AA0**

		Order No.
Label cover		
10 units (spare part)		
for modules with 20-pin front connector		**6ES7 392-2XY00-0AA0**
for modules with 40-pin front connector		**6ES7 392-2XY10-0AA0**
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX10-0AA0**
light-beige		**6ES7 392-2BX10-0AA0**
yellow		**6ES7 392-2CX10-0AA0**
red		**6ES7 392-2DX10-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

SIPLUS SM 321 digital input modules

Overview

- Digital inputs
- For connection of switches and 2-wire proximity switches (BEROs)

SIPLUS SM 321	16 DI	32 DI	16 DI
Order No.	**6AG1 321-1BH02-2AA0**	**6AG1 321-1BL00-2AA0**	**6AG1 321-7BH01-2AB0**
Order No. based on	**6ES7 321-1BH02-0AA0**	**6ES7 321-1BL00-0AA0**	**6ES7 321-7BH01-0AB0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	- 25 ... + 70 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)		
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes
Technical specifications	The technical data are identical with those of the based-on modules.		

SIPLUS SM 321	16 DI – 48 ... 125 V DC	8 DI – 120/230 V AC
Order No.	**6AG1 321-1CH20-2AA0**	**6AG1 321-1FF01-2AA0**
Order No. based on	**6ES7 321-1CH20-0AA0**	**6ES7 321-1FF01-0AA0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Technical specifications	The technical data are identical with those of the based-on modules.	

Ordering Data

		Order No.
SIPLUS SM 321 digital input modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connectors		
16 inputs, 24 V DC	B7	**6AG1 321-1BH02-2AA0**
32 inputs, 24 V DC	B7	**6AG1 321-1BL00-2AA0**
16 inputs, 48 to 120 V DC	B7	**6AG1 321-1CH20-2AA0**
16 inputs, 24 V DC, for isochronous mode, diagnostics-capable	B7	**6AG1 321-7BH01-2AB0**
8 inputs, 120/230 V AC	B7	**6AG1 321-1FF01-2AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 digital input modules, page 4/76

Overview

- Digital outputs
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

SIPLUS SM 322	16 DO	8 DO	8 DO	8 DO – 48 ... 125 V DC
Order No.	**6AG1 322-1BH01-2AA0**	**6AG1 322-1BF01-2XB0**	**6AG1 322-8BF00-2AB0**	**6AG1 322-1CF00-2AA0**
Order No. based on	**6ES7 322-1BH01-0AA0**	**6ES7 322-1BF01-0AA0**	**6ES7 322-8BF00-0AB0**	**6ES7 322-1CF00-0AA0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted			
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)			
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes	Yes
Technical specifications	The technical data are identical with those of the based-on modules.			

SIPLUS SM 322	8 DO – 120/230 V AC	8 RO	32 DO	16 RO
Order No.	**6AG1 322-1FF01-2AA0**	**6AG1 322-1HF10-2AA0**	**6AG1 322-1BL00-2AA0**	**6AG1 322-1HH01-2AA0**
Order No. based on	**6ES7 322-1FF01-0AA0**	**6ES7 322-1HF10-0AA0**	**6ES7 322-1BL00-0AA0**	**6ES7 322-1HH01-0AA0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted	- 25 ... + 70 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)			
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes	Yes
Technical specifications	The technical data are identical with those of the based-on modules.			

Ordering Data

		Order No.
SIPLUS SM 322 digital output modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connectors		
8 outputs, 24 V DC, 2 A		**6AG1 322-1BF01-2AA0**
16 outputs, 24 V DC, 0.5 A	B7	**6AG1 322-1BH01-2AA0**
32 outputs, 24 V DC, 0.5 A		**6AG1 322-1BL00-2AA0**
8 outputs, 24 V DC, 0.5 A, diagnostics-capable	B7	**6AG1 322-8BF00-2AB0**
8 outputs, 4 ... 125 V DC, 1.5 A	B7	**6AG1 322-1CF00-2AA0**
8 outputs, 120/230 V AC, 1 A	B7	**6AG1 322-1FF01-2AA0**
8 outputs, relay contacts, 5 A	B7	**6AG1 322-1HF10-2AA0**
16 outputs, relay contacts, 8 A		**6AG1 322-1HH01-2AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 digital output modules, page 4/82

SIPLUS SM 323 digital input/output module

Overview

- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BERO), solenoid valves, contactors, small-power motors, lamps and motor starters

SIPLUS SM 323	8 DI/8 DO
Order No.	**6AG1 323-1BH01-2AA0**
Order No. based on	**6ES7 323-1BH01-0AA0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes
Technical specifications	The technical data are identical with those of the based-on modules.

Ordering Data

		Order No.
SIPLUS SM 323 digital input/output modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connectors		
8 inputs, 8 outputs	B7	**6AG1 323-1BH01-2AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 digital input/output modules, page 4/87

Overview

- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

Technical specifications

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Supply voltages				
Load voltage L+				
• Rated value (DC)	24 V	24 V		24 V
• reverse polarity protection	Yes	Yes		Yes
Current consumption				
from load voltage L+ (without load), max.	200 mA	50 mA		80 mA
from backplane bus DC 5 V, max.	50 mA	60 mA	90 mA	50 mA
Current consumption/ power loss				
Power loss, typ.	1 W	1.5 W	0.4 W	1.3 W
Connection point				
required front connectors	20-pin	20-pin	40-pin	20-polig
Isochronous mode				
Isochronouos mode	No	Yes	No	No
Analog inputs				
Number of analog inputs	8	8	8	2
Number of analog inputs for resistance measurement	4		8	1
cable length, shielded, max.	200 m; 50 m at 80 mV and with thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and with thermocouples
Input ranges (rated values), voltages				
• 0 to +10 V	No	No	Yes	No
• 1 to 5 V	Yes	Yes	Yes	Yes
• 1 to 10 V	No	Yes	No	No
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Input ranges (rated values), voltages (continued)				
• -2.5 V to +2.5 V	Yes	No	No	Yes
• -250 mV to +250 mV	Yes	No	No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	No	No	Yes	No
• -500 mV to +500 mV	Yes	Yes	Yes	Yes
• -80 mV to +80 mV	Yes	Yes	No	Yes
Input ranges (rated values), currents				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 to +10 mA	Yes		No	Yes
• -20 to +20 mA	Yes	Yes	Yes	Yes
• -3.2 to +3.2 mA	Yes	No	No	Yes
• 4 to 20 mA	Yes	Yes	Yes	Yes
Input ranges (rated values), thermoelements				
• Type B	No	No	No	
• Type E	Yes	No	No	Yes
• Type J	Yes	No	No	Yes
• Type K	Yes	No	No	Yes
• Type L	No	No	No	No
• Type N	Yes	No	No	Yes
• Type R	No	No	No	No
• Type S	No	No	No	No
• Type T	No	No	No	No
• Type U	No	No	No	No
• Type TXK/TXK(L) to GOST	No	No	No	No
Input ranges (rated values), resistors				
• 0 to 150 Ohm	Yes	No	No	Yes
• 0 to 300 Ohm	Yes	No	No	Yes
• 0 to 600 Ohm	Yes	No	Yes	Yes
• 0 to 6000 Ohm	No	No	Yes	No
Input ranges (rated values), resistance thermometers				
• Cu 10	No	No	No	No
• Ni 100	Yes; Standard	No	Yes; Standard/climate	Yes
• Ni 1000	No	No	Yes	
• LG-Ni 1000	No		Yes; Standard/climate	
• Ni 120	No		No	
• Ni 200	No		No	
• Ni 500	No		No	
• Pt 100	Yes; Standard		Yes; Standard/climate	Yes
• Pt 1000	No		No	
• Pt 200	No		No	
• Pt 500	No		No	
• permissible input frequency for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)	20 V; 20 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	30 V; 12 V continuous, 30 V for max. 1 s	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
• permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA

Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Characteristic curve linearization				
• programmable	Yes		Yes	Yes
- for thermoelements	Type E, J, K, L, N			Type E, J, K, L, N
- for thermoresistor	Pt100 (standard, climatic range), Ni100 (standard, climatic range)		yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.	Pt100 (standard, climatic range), Ni100 (standard, climatic range)
Temperature compensation				
• programmable	Yes			Yes
• internal temperature compensation	Yes			Yes
• external temperature compensation with compensations socket	Yes			Yes
Analog value creation				
Measurement principle	integrating	Actual value encryption	integrating	integrating
Integration and conversion time/resolution per channel				
• Resolution with overload area (bit including sign), max.	15 Bit; unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/ 12 bits + sign/ 14 bits + sign	14 Bit; unipolar: 14 bits; bipolar: 13 bits + sign	13 Bit	15 Bit; unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/ 12 bits + sign/ 14 bits + sign
• Integration time, parameterizable	Yes; 2.5/ 16.67/ 20/ 100 ms	Yes	Yes; 60 / 50 ms	Yes; 2.5/ 16.67/ 20/ 100 ms
• Basic conversion time, ms		52 µs per channel	66 / 55 ms	
• Basic conversion time, including integration time, ms	3/ 17/ 22/ 102 ms		66 / 55 ms	6 / 34 / 44 / 204 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	50 / 60 Hz	400 / 60 / 50 / 10 Hz
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer	Yes	Yes	Yes; with external supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with 2-conductor connection	Yes		Yes	Yes
• for resistance measurement with 3-conductor connection	Yes		Yes	Yes
• for resistance measurement with 4-conductor connection	Yes		Yes	Yes
Errors/accuracies				
Operational limit in overall temperature range				
• Voltage, relative to input area	+/- 1 %; +/-1% (80 mV); +/-0.6% (250 to 1000 mV); +/-0.8% (2.5 to 10 V)	+/- 0,4 %	+/- 0,6 %; +/-0.6% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); +/-0.5% (+/-50 mV, 500 mV, 1 V)	+/- 1 %; +/-1% (80 mV); +/-0.6% (250 to 1000 mV); +/-0.8% (2.5 to 10 V)
• Current, relative to input area	+/- 0,7 %; from 3.2 to 20 mA	+/- 0,3 %	+/- 0,5 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA	+/- 0,7 %; from 3.2 to 20 mA
• Impedance, relative to input area	+/- 0,7 %; 150, 300, 600 Ohm		+/- 0,5 %; 0 to 6 kohms, 0 to 600 kohms	+/- 0,7 %; 150, 300, 600 Ohm

Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Operational limit in overall temperature range (continued)				
• Resistance-type thermometer, relative to input area	+/- 0,7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)		1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)	+/- 0,7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input area	+/- 0,6 %; +/-0.4% (250 to 1000 mV); +/-0.6% (2.5 to 10 mV); +/-0.7% (80 mV)	+/- 0,25 %	+/- 0,4 %; 0.4% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (+/-50 mV, 500 mV, 1 V)	+/- 0.6 %; +/-0.6% (80 mV, 2.5 to 10 V); +/-0.4% (250 to 1000 mV)
• Current, relative to input area	+/- 0,5 %; 3.2 to 20 mA	+/- 0,2 %	+/- 0,3 %; +/-20mA,0-20mA,4-20mA	+/- 0,5 %; 3.2 to 20 mA
• Impedance, relative to input area	+/- 0,5 %; 150, 300, 600 Ohm		+/- 0,3 %; 0 to 6 kohms, 0 to 600 kohms	+/- 0,5 %; 150, 300, 600 Ohm
• Resistance-type thermometer, relative to input area	+/- 0,6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climate)		1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)	+/- 0.6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climate)
Status information/alarms/ diagnostics				
Alarms				
• Diagnostic alarm	Yes; parameterizable, channels 0 and 2	Yes; Parameterizable	No	Yes
• Limit value alarm	Yes; parameterizable	Yes; parameterizable, channels 0 and 2	No	Yes; parameterizable, channel 0 0
Diagnoses				
• Diagnostic information readable	Yes	Yes	No	Yes
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
Isolation				
Isolation, analog inputs				
• between the channels	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Dimensions				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	117 mm	120 mm
Weights				
• Weight, approx.	250 g	200 g	250 g	250 g

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Supply voltages				
Load voltage L+				
• Rated value (DC)	24 V	24 V		24 V
• reverse polarity protection	Yes	Yes		Yes

Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Current consumption				
from load voltage L+ (without load), max.	240 mA	200 mA		200 mA
from backplane bus DC 5 V, max.	100 mA	100 mA	130 mA	100 mA
Current consumption/ power loss				
Power loss, typ.	4.6 W	3 W	0.6 W	3 W
Connection point				
required front connectors	40-pin	40-pin	40-pin	40-pin
Isochronous mode				
Isochronouos mode	No	No	No	No
Analog inputs				
Number of analog inputs	8	8	8	8
Number of analog inputs for resistance measurement	8			
cable length, shielded, max.	200 m	100 m	200 m	200 m
Input ranges (rated values), voltages				
• 0 to +10 V	No	No	No	No
• 1 to 5 V	No	No	Yes	Yes
• 1 to 10 V	No	No	No	No
• -1 V to +1 V	No	No	No	No
• -10 V to +10 V	No	No	Yes	Yes
• -2.5 V to +2.5 V	No	No	No	No
• -250 mV to +250 mV	No	No	No	No
• -5 V to +5 V	No	No	Yes	Yes
• -50 mV to +50 mV	No	No	No	No
• -500 mV to +500 mV	No	No	No	No
• -80 mV to +80 mV	No	No	No	No
Input ranges (rated values), currents				
• 0 to 20 mA	No	No	Yes	Yes
• -10 to +10 mA	No	No		
• -20 to +20 mA	No	No	Yes	Yes
• -3.2 to +3.2 mA	No	No	No	No
• 4 to 20 mA	No	No	Yes	Yes
Input ranges (rated values), thermoelements				
• Type B	No	Yes	No	No
• Type E	No	Yes	No	No
• Type J	No	Yes	No	No
• Type K	No	Yes	No	No
• Type L	No	Yes	No	No
• Type N	No	Yes	No	No
• Type R	No	Yes	No	No
• Type S	No	Yes	No	No
• Type T	No	Yes	No	No
• Type U	No	Yes	No	No
• Type TXK/TXK(L) to GOST	No	Yes	No	No

Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Input ranges (rated values), resistance thermometers				
• Cu 10	Yes	No	No	No
• Ni 100	Yes	No	No	No
• Ni 1000	Yes	No	No	No
• LG-Ni 1000	Yes	No	No	No
• Ni 120	Yes	No	No	No
• Ni 200	Yes	No	No	No
• Ni 500	Yes	No	No	No
• Pt 100	Yes	No	No	No
• Pt 1000	Yes	No	No	No
• Pt 200	Yes	No	No	No
• Pt 500	Yes	No	No	No
Input ranges (rated values), resistors				
• 0 to 150 Ohm	Yes	No	No	No
• 0 to 300 Ohm	Yes	No	No	No
• 0 to 600 Ohm	Yes	No	No	No
• 0 to 6000 Ohm		No	No	No
• permissible input frequency for voltage input (destruction limit), max.	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	50 V; permanent	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)
• permissible input current for current input (destruction limit), max.			32 mA	40 mA
Characteristic curve linearization				
• programmable	Yes	Yes		
- for thermoelements		Type B, E, J, K, L, N, R, S. T, U, C		
- for thermoresistor	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/climate)			
Temperature compensation				
• programmable		Yes		
• internal temperature compensation		Yes		
• external temperature compensation with compensations socket		Yes		
• external temperature compensation with Pt100		Yes		
Analog value creation				
Measurement principle	integrating	integrating	integrating	integrating
Integration and conversion time/resolution per channel				
• Resolution with overload area (bit including sign), max.	16 Bit; Two's complement	16 Bit; Two's complement	16 Bit; unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/ 15 bits + sign/15 bits + sign/15 bits + sign	16 Bit; unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/1 5 bits + sign/15 bits + sign/15 bits + sign
• Integration time, parameterizable	Yes	Yes	Yes; 10 / 16.67 / 20 / 100 ms	Yes; 23 / 72 / 83 / 95 ms
• Basic conversion time, ms	up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms	up to 4 channels: 10 ms per module, as of 5 channels: 190 ms per module		10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)

Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Integration and conversion time/resolution per channel (continued)				
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz	400 / 60 / 50 Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer			Yes; with external transmitter; possible with separate supply for transmitter	Yes; with external transmitter, current supply; possible with separate supply for transmitter
• for current measurement as 4-wire transducer			Yes	Yes
• for resistance measurement with 2-conductor connection	Yes; without resistance correction			
• for resistance measurement with 3-conductor connection	Yes			
• for resistance measurement with 4-conductor connection	Yes			
Errors/accuracies				
Operational limit in overall temperature range				
• Voltage, relative to input area		+/-1 K	+/- 0.1 %; +/-0.7%	+/- 0.1 %
• Current, relative to input area			+/- 0.3 %; +/-0.9%	+/- 0.1 %
• Impedance, relative to input area	+/- 0,1 %			
• Resistance-type thermometer, relative to input area	+/-1 K			
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input area			+/- 0.05 %	+/- 0.05 %
• Current, relative to input area			+/- 0.05 %	+/- 0.05 %
• Impedance, relative to input area	+/- 0.05 %			
• Resistance-type thermometer, relative to input area	+/-0.5 K			
Status information/alarms/ diagnostics				
Alarms				
• Diagnostic alarm	Yes; parameters can be set per group	Yes; parameters can be set per group	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable, channels 0 and 2	Yes; parameterizable all channels (end of cycle interrupt is also supported across modules)
Diagnoses				
• Diagnostic information readable	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V AC
Isolation				
Isolation, analog inputs				
• between the channels	No	No	No	No
• between the channels, in groups of	2	2	2	2
• between the channels and the backplane bus	Yes	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Dimensions				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm
Weights				
• Weight, approx.	272 g	272 g	272 g	272 g

4

Ordering Data

		Order No.
SM 331 analog input modules		
Including labeling strips, bus connector, measuring range modules		
8 inputs, 13-bit resolution		**6ES7 331-1KF01-0AB0**
8 inputs, resolution 9/12/14 bits		**6ES7 331-7KF02-0AB0**
2 inputs, resolution 9/12/14 bits		**6ES7 331-7KB02-0AB0**
8 inputs, enhanced resolution 16 bits	B7	**6ES7 331-7NF00-0AB0**
8 inputs, enhanced resolution 16 bits, 4-channel mode	B7	**6ES7 331-7NF10-0AB0**
8 inputs, resolution 14 bits, for isochronous mode		**6ES7 331-7HF01-0AB0**
8 inputs, for thermal resistors	B7	**6ES7 331-7PF01-0AB0**
8 inputs, for thermoelements		**6ES7 331-7PF11-0AB0**
Measuring range module for analog inputs		**6ES7 974-0AA00-0AA0**
1 module for 2 analog inputs; 2 units (spare part)		
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**

		Order No.
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires		
SIMATIC TOP connect		see page 4/218
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Shield connecting element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminal elements each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**

B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Ordering Data	Order No.
Labeling sheets for machine labeling	
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	**6ES7 392-2AX00-0AA0**
light-beige	**6ES7 392-2BX00-0AA0**
yellow	**6ES7 392-2CX00-0AA0**
red	**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	**6ES7 392-2AX10-0AA0**
light-beige	**6ES7 392-2BX10-0AA0**
yellow	**6ES7 392-2CX10-0AA0**
red	**6ES7 392-2DX10-0AA0**

		Order No.
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

SM 332 analog output modules

Overview

- Analog outputs
- For the connection of analog actuators

Technical specifications

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Supply voltages				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
Current consumption				
from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus DC 5 V, max.	60 mA	60 mA	100 mA	120 mA
Current consumption/ power loss				
Power loss, typ.	3 W	3 W	6 W	3 W
Connection point				
required front connectors	20-pin	20-pin	40-pin	20-pin
Analog outputs				
Number of analog outputs	2	4	8	4; isochronous mode
cable length, shielded, max.	200 m	200 m	200 m	200 m
Voltage output, Short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
Output ranges, voltage				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 to 5 V	Yes	Yes	Yes	Yes
• -10 to +10 V	Yes	Yes	Yes	Yes
Output ranges, current				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 to +20 mA	Yes	Yes	Yes	Yes
• 4 to 20 mA	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)				
• with voltage outputs, min.	1 kΩ	1 kΩ	1 kΩ	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	1 µF	1 µF
• with current outputs, max.	500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	10 milliH	10 milliH	10 milliH	1 milliH

Technical specifications (continued)

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Analog value creation				
Integration and conversion time/resolution per channel				
• Resolution with overload area (bit including sign), max.	12 Bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	12 Bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	12 Bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	16 Bit
• Conversion time (per channel)	0.8 ms	0.8 ms	0.8 ms	200 µs; in isochronous mode 640 µs
Settling time				
• for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
• for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
• for inductive load	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms
Errors/accuracies				
Operational limit in overall temperature range				
• Voltage, relative to output area	+/- 0.5 %	+/- 0.5 %	+/- 0.5 %	+/- 0.12 %
• Current, relative to output area	+/- 0.6 %	+/- 0.6 %	+/- 0.6 %	+/- 0.18 %
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to output area	+/- 0,4 %	+/- 0.4 %	+/- 0.4 %	+/- 0.02 %
• Current, relative to output area	+/- 0,5 %	+/- 0.5 %	+/- 0.5 %	+/- 0.02 %
Status information/alarms/ diagnostics				
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes
Diagnoses				
• Diagnostic information readable	Yes	Yes	Yes	
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	1500 V DC
Isolation				
Isolation, analog outputs				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Dimensions				
Dimensions				
• Width	40 mm	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm	120 mm
Weights				
• Weight, approx.	220 g	220 g	272 g	220 g

SM 332 analog output modules

Ordering Data		Order No.
SM 332 analog output modules		
incl. labeling strips, bus connector		
4 outputs, 11/12 bit		**6ES7 332-5HD01-0AB0**
4 outputs, 16 bit	B7	**6ES7 332-7ND02-0AB0**
2 outputs, 11/12 bit		**6ES7 332-5HB01-0AB0**
8 outputs, 11/12 bit		**6ES7 332-5HF00-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires		
SIMATIC TOP connect		see page 4/218
Bus connectors		
1 unit (spare part)		**6ES7 390-0AA00-0AA0**
Shield connecting element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminal elements each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		

		Order No.
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine labeling		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX10-0AA0**
light-beige		**6ES7 392-2BX10-0AA0**
yellow		**6ES7 392-2CX10-0AA0**
red		**6ES7 392-2DX10-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- Analog inputs and outputs
- For the connection of analog sensors and actuators

Technical specifications

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Current consumption		
from load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus DC 5 V, max.	55 mA	60 mA
Current consumption/ power loss		
Power loss, typ.	3 W	2 W
Connection point		
required front connectors	20-pin	20-pin
Analog inputs		
Number of analog inputs	4	4
Number of analog inputs for voltage measurement	4	2
Number of analog inputs for resistance measurement		4
Cycle time (all channels), max.	5 ms	85 ms
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
Input ranges (rated values), resistance thermometers		
• Pt 100		Yes; only climatic range

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Input ranges (rated values), resistors		
• 0 to 10000 Ohm		Yes
• permissible input frequency for voltage input (destruction limit), max.	20 V	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
• permissible input current for current input (destruction limit), max.	40 mA	
Analog outputs		
Number of analg outputs	2	2
cable length, shielded, max.	200 m	100 m
Voltage output, Short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max..	11 mA	10 mA
Current output, no-load voltage, max.	15 V	
Output ranges, voltage		
• 0 to 10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	5 kΩ	2.5 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF
• with current outputs, max.	300 Ω	
• with current outputs, inductive load, max.	1 milliH	

Technical specifications (continued)

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Analog value creation		
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	8 Bit	12 Bit
• Integration time, ms		16,67 / 20
Settling time		
• for resistive load	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	
Encoder		
Connection of signal encoders		
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with 2-conductor connection		Yes
• for resistance measurement with 3-conductor connection		Yes
• for resistance measurement with 4-conductor connection		Yes
Errors/accuracies		
Operational limit in overall temperature range		
• Voltage, relative to input area	+/- 0.9 %	+/- 0.7 %; 0 to 10 V
• Current, relative to input area	+/- 0.8 %	
• Impedance, relative to input area		+/- 3.5 %; 10 kOhm
• Resistance-type thermometer, relative to input area		+/- 1 %
• Voltage, relative to output area	+/- 0.6 %	+/- 1 %
• Current, relative to output area	+/- 1 %	

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input area	+/- 0.7 %	+/- 0.5 %; 0 to 10 V
• Current, relative to input area	+/- 0.6 %	
• Impedance, relative to input area		+/- 2.8 %; 10 kOhm
• Resistance-type thermometer, relative to input area		+/- 0.8 %
• Voltage, relative to output area	+/- 0.5 %	+/- 0.85 %
• Current, relative to output area	+/- 0.5 %	
Status information/alarms/diagnostics		
Alarms		
• Alarms	No	No
Diagnoses		
• Diagnostic functions	No	No
Isolation		
Isolation checked with	500 V DC	500 V DC
Isolation		
Isolation, analog inputs		
• between the channels and the backplane bus	No	Yes
Isolation, analog outputs		
• between the channels and the backplane bus	No	Yes
Dimensions		
Dimensions		
• Width	40 mm	40 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	285 g	200 g

Ordering Data		Order No.
SM 334 analog input/output modules		
incl. labeling strips, bus connector		
4 inputs, 2 outputs		**6ES7 334-0CE01-0AA0**
4 inputs, 2 outputs, resistance measurement, Pt 100		**6ES7 334-0KE00-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded terminals		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires		
SIMATIC TOP connect		see page 4/218
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Shield connecting element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminal elements each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		

		Order No.
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine labeling		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

SM 335 fast analog hybrid module

Application

The SM 335 fast analog input/output module converts

- Analog signals from the process into digital values for the SIMATIC S7-300 and
- Digital signals from the SIMATIC S7-300 into analog signals for the process.

In addition, the module can also supply encoders (e.g. linear potentiometers) with 10 V / 25 mA and has one counter input. Via the counter input it is possible, for example, to determine a speed, when the path length covered during the interval is known or the signals of simple rotating sensors can be recorded and the speed calculated by means of the interval duration.

Technical specifications

	SM 335
Module-specific data	
Number of inputs	4
Number of outputs	4
Cable length, shielded	200 m
With wire-break monitoring in range 0 V ... 10 V	30 m
Voltages, currents, potentials	
Rated load voltage	24 V DC
Polarity reversal protection	Yes
Galvanic isolation	Yes
Permissible potential difference	
• between inputs (U_{CM})	3 V
• between input (M terminal) and central grounding point	75 V DC
• Insulation	tested at 500 V DC
Current consumption	
• from S7-300 backplane bus, max.	75 mA
• from L+, max.	150 mA
Power losses, max.	3.6 W
Status, interrupts, diagnostics	
Interrupts	
• Limit value interrupt	No
• Cycle end interrupt	Yes, parameterizable
• Diagnostics interrupt	Yes, parameterizable
Diagnostic functions	
• Fault display for grouped fault	Yes, red LED
• Diagnostic information can be read out	Yes
Analog value generation for inputs	
Measuring principle	successive approximation

	SM 335
Conversion time per channel	200 µs
• Basic conversion time for 4 channels, max.	1 ms
Resolution	
• Bipolar	13 bits + sign
• Unipolar	14 bits
Analog inputs	
Interference between inputs	
• at 50 Hz	65 dB
• at 60 Hz	65 dB
Operational limits (over entire temperature range, referred to input range)	
• with voltage measurement	±0.15 % (with 14-bit resolution)
• with current measurement	0.25 %
Basic error limit (operational limits at 25 °C, referred to input range)	0.13 % (with 14-bit resolution)
Temperature error (referred to input range)	±0.1 % (with 14-bit resolution)
Linearity error (referred to input range)	±0.015 %
Repeatability (under steady-state conditions, at 25 °C, referred to input range)	±0.05 %
Encoder selection data	
Input range (rated values)/ input resistance	
• Voltage	±1 V; ±10 V; ±2.5 V; 0 V ... 2 V; 0 V ... 10 V: 10 MΩ
• Current (max. 2 channels programmable as current inputs)	±10 mA; 0 mA ... 20 mA; 4 mA ... 20 mA: 100 Ω
Permissible input voltage for voltage input (destruction limit)	±30 V

Technical specifications (continued)

	SM 335
Permissible input current for current input (destruction limit)	25 mA
Connection of signal encoder	
• for voltage measurement	possible
• for current measurement	
- as 2-wire transducer	not possible
- as 4-wire transducer	possible
• for resistance measurement	not possible
Output for supplying the transducer (short-circuit proof)	10 V/25 mA
Data for encoder supply output	
Rated voltage	10 V
Output current, max.	25 mA
Short-circuit proof	Yes
Operating limits (over entire temperature range)	0.2 %
Temperature error	0.002 %/K
Basic error for rated voltage	0,1 %
Outputs	
Resolution(including overcontrol range)	
• ±10 V	11 bits + sign
• from 0 V ... 10 V	12 bits
Conversion time per channel, max.	800 µs
Settling time	
• for resistive load	< 0.1 ms
• for capacitive load	< 3.3 ms
• for inductive load	< 0.5 ms
Interference between outputs	40 dB
Substitute values can be switched in	Yes

	SM 335
Operational limits (over entire temperature range, referred to output range)	0.5 %
Basic error limit (operational limits at 25 °C, referred to output range)	0.2 %
Linearity error (referred to output range)	±0.05 %
Repeatability (under steady-state conditions, at 25 °C, referred to output range)	±0.05 %
Output ripple (referred to output range)	±0.05 %
Actuator selection data	
Input ranges (rated values)	±10 V and 0 V ... 10 V (switchover)
Load impedance	
• for voltage outputs, min.	3 kΩ
• for capacitive load, max.	1 µF
• for inductive load, max.	1 mH
Voltage output	
• Short-circuit proof	Yes
• Short-circuit current, max.	8 mA
Connection of the actuators for voltage output	
• as 2-wire connection	possible
• as 4-wire connection	not possible
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	300 g

Ordering Data

	Order No.
SM 335 fast analog hybrid module 4 inputs, 4 outputs, 1 pulse input and encoder supply	**6ES7 335-7HG01-0AB0**
Interference suppressor filter for SM 335 to achieve the noise immunity common to SIMATIC S7; the filter is connected into the 24-V power supply circuit for the SM 335, and can protect up to four SM 335 modules	**6ES7 335-7HG00-6AA0**
SM 335 manual	
German	**6ES7 335-7HG00-8AA1**
English	**6ES7 335-7HG00-8BA1**

	Order No.
Front connectors	
20-pin, with screw contacts	
• 1 unit	**6ES7 392-1AJ00-0AA0**
• 100 units	**6ES7 392-1AJ00-1AB0**
Shield connecting element 80 mm wide, with 2 rows for 4 terminal elements each	**6ES7 390-5AA00-0AA0**
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7 390-5CA00-0AA0**

SIPLUS SM 331 analog input modules

Overview

- Analog inputs
- Connecting voltage sensors and current sensors, thermo elements, resistors and resistance thermometers

SIPLUS SM 331	2 AI	8 AI	8 AI, 16 bit	8 AI, 16 bit	8 AI, 40pole
Order No.	**6AG1 331-7KB02-2AB0**	**6AG1 331-7KF02-2AB0**	**6AG1 331-7NF00-2AB0**	**6AG1 331-7NF10-2AB0**	**6AG1 331-7PF01-2AB0**
Order No. based on	**6ES7 331-7KB02-0AB0**	**6ES7 331-7KF02-0AB0**	**6ES7 331-7NF00-0AB0**	**6ES7 331-7NF10-0AB0**	**6ES7 331-7PF01-0AB0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	- 25 ... + 70 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)				
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	No	Yes	No	No
Technical specifications	The technical data are identical with those of the based-on modules.				

Ordering Data

		Order No.
SIPLUS SM 331 analog input modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connector, measuring range modules		
8 inputs, resolution 9/12/14 bits		**6AG1 331-7KF02-2AB0**
2 inputs, resolution 9/12/14 bits	B7	**6AG1 331-7KB02-2AB0**
8 inputs, enhanced resolution 16 bits	B7	**6AG1 331-7NF00-2AB0**
8 inputs, enhanced resolution 16 bits, 4-channel mode	B7	**6AG1 331-7NF10-2AB0**
8 inputs, for thermal resistors	B7	**6AG1 331-7PF01-2AB0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 analog input modules, page 4/98

Overview

- Analog outputs
- For connection of analog actuators

SIPLUS SM 321	2 AO	8 AO
Order No.	**6AG1 332-5HB01-2AB0**	**6AG1 332-5HF00-2AB0**
Order No. based on	**6ES7 332-5HB01-0AB0**	**6ES7 332-5HF00-0AB0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	No
Technical specifications	The technical data are identical with those of the based-on modules.	

Ordering Data

		Order No.
SIPLUS SM 332 analog output modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connector		
2 outputs, 11/12 bit	B7	**6AG1 332-5HB01-2AB0**
8 outputs, 11/12 bit		**6AG1 332-5HF00-2AB0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 analog output modules, page 4/102

SIPLUS SM 334 analog input/output modules

Overview

- Analog inputs and outputs
- For connection of analog sensors and actuators

SIPLUS SM 334	4 AI / 2 AO
Order No.	**6AG1 334-0KE00-2AB0**
Order No. based on	**6ES7 334-0KE00-0AB0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)
Technical specifications	The technical data are identical with those of the based-on modules.

Ordering Data

		Order No.
SIPLUS SM 334 analog input/output modules		
(extended temperature range and medial exposure)		
incl. labeling strips, bus connector		
4 inputs, 2 outputs, resistance measurement, Pt 100	B7	**6AG1 334-0KE00-2AB0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Accessories	Order No.
	see S7-300 analog input/output modules, page 4/105

SM 326 F digital input modules - Safety Integrated

Overview

- Digital inputs for the fail-safe SIMATIC S7 systems
- They are suitable for connecting:
  - Switches and 2-wire proximity switches (BEROs)
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- Can be used in standard mode as an S7-300 module

Technical specifications

	6ES7 326-1RF00-0AB0	6ES7 326-1BK01-0AB0
Supply voltages		
Supply voltage of electronics and encoders 1L+/2L+		
• Rated value (DC)	24 V	24 V
Current consumption		
from load voltage L+ (without load), max.	160 mA	450 mA
from backplane bus DC 5 V, max.	90 mA	100 mA
Current consumption/power loss		
Power loss, typ.	4.5 W	10 W
Connection point		
required front connectors	40-pin	40-pin
Digital inputs		
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)	24
Number of simultanneously controllable inputs		
- Number of simultaneously controllable inputs, up to 40 °C	8; vertical setup	24
- Number of simultaneously controllable inputs, up to 60 °C	8; horizontal set up	24; (at 24 V) or 18 (at 28.8 V)
Input voltage		
• Rated value, DC	in accordance with DIN 19234 or NAMUR	24 V
• for signal "0"		-30 to +5 V
• for signal "1"		11 to 30 V
Input current		
• for signal "0", max. (permissible quiescent current)	0.35 to 1.2 mA	2 mA
• for signal "1", typ.	2.1 to 7 mA	10 mA

	6ES7 326-1RF00-0AB0	6ES7 326-1BK01-0AB0
Input delay (for rated value of input voltage)		
• for standard inputs		
- at "0" to "1", max.		3.4 ms
- at "1" to "0", max.		3.4 ms
• for NAMUR inputs		
- at "0" to "1", max.	1.2 to 3 ms	
- at "1" to "0", max.	1.2 to 3 ms	
Cable length		
• cable length, shielded, max.	200 m	200 m
• Cable length unshielded, max.	100 m	100 m
Encoder supply		
Number of outputs	8	4; isolated
Output voltage	8.2 V DC	
Output current, rated value		400 mA
Encoder		
Connectable encoders		
• 2-wire BEROS		Yes; if short-circuit test is deactivated
- permissible quiescent current (2-wire BEROS), max.		2 mA
Ex(i) characteristics		
Module for Ex(i) protection	Yes	
Max. values of input circuits (per channel)		
• Co (permissible external capacity), max.	3 µF	
• Io (chort-circuit current), max.	13.9 mA	
• Lo (permissible external inductivity), max.	80 milliH	

Technical specifications (continued)

	6ES7 326-1RF00-0AB0	6ES7 326-1BK01-0AB0
Max. values of input circuits (per channel) (continued)		
• Po (power of load), max.	33.1 mW	
• Uo (output no-load voltage), max.	10 V	
• Um (fault voltage), max.	60 V DC/ 30 V AC	
• Ta (permissible ambient temperature), max.	60 °C	60 °C
Status information/alarms/ diagnostics		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Diagnostic information readable	Yes	Yes
Isolation		
Isolation checked with	500 V DC	500 V DC / 350 V AC
Isolation		
Galvanic isolation, digital inputs		
• between the channels	Yes	Yes
• between the channels, in groups of		12
• between the channels and the backplane bus	Yes	Yes

	6ES7 326-1RF00-0AB0	6ES7 326-1BK01-0AB0
Standards, approvals, certificates		
Type of protection to EN 50020 (CENELEC)	II(2)G [EEx ib] IIC to EN 50020	
Test number KEMA	99 ATEX 2671 X	
Highest safety class achievable in safety mode		
• to DIN VDE 0801	AK 4 (one channel), AK 5 and 6 (two channel)	AK 6
• to EN 954	Cat. 3 (single-channel), Cat. 4 (two-channel)	Cat. 4
• to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)	SIL 3
Dimensions		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	482 g	442 g

Ordering Data	Order No.
SM 326 F digital input module	
24 inputs, 24 V DC	**6ES7 326-1BK01-0AB0**
8 inputs, 24 V DC, NAMUR	**6ES7 326-1RF00-0AB0**
Distributed Safety V5.4 programming tool Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher	
Floating license	**6ES7 833-1FC02-0YA5**
Software Update Service	**6ES7 833-1FC00-0YX2**
Distributed Safety Upgrade From V5.x to V5.4; Floating license for 1 user	**6ES7 833-1FC02-0YE5**
Labeling sheet with strips for 10 electronic blocks	
• For 16-channel electronic blocks incl. add-on terminals	**6ES7 193-1BH00-0XA0**
• For 32-channel electronic blocks incl. add-on terminals	**6ES7 193-1BL00-0XA0**
Connecting cable for PROFIBUS 12 Mbit/s, for connecting PG to PROFIBUS DP, pre-assembled with 2 x 9-pin Sub-D connector, 3 m	**6ES7 901-4BD00-0XA0**
PROFIBUS bus connector	
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s	**6ES7 972-0BA12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s	**6ES7 972-0BB12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, without PG socket, up to 12 Mbit/s	**6ES7 972-0BA51-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, with PG socket, up to 12 Mbit/s	**6ES7 972-0BB51-0XA0**
DIN rail for active bus modules for max. 5 active bus modules for hot swapping function	
• 483 mm (19") long	**6ES7 195-1GA00-0XA0**
• 530 mm long	**6ES7 195-1GF30-0XA0**
• 620 mm long	**6ES7 195-1GG30-0XA0**
• 2000 mm long	**6ES7 195-1GC00-0XA0**

		Order No.
Active bus module BM 1 x 80 for 1 module with 80 mm width		**6ES7 195-7HC00-0XA0**
SITOP power supply module for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E		**6ES7 307-1EA00-0AA0**
Front connectors		
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Labeling strips For fail-safe modules (spare part); 10 units		**6ES7 392-2XX20-0AA0**
Label cover For fail-safe modules (spare part); 10 units		**6ES7 392-2XY20-0AA0**
LK 393 cable guide For F modules; L+ and M connections; 5 units		**6ES7 393-4AA10-0AA0**
S7-300 manual Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current S7 Manual Collection DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

SM 326 F digital output modules - Safety Integrated

Overview

- Digital outputs for the fail-safe SIMATIC S7 systems
- Two variants (1 x source/source output, 1 x source/sink output)
- For connection of solenoid valves, DC contactors and signaling lamps
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- Can be used in standard mode as an S7-300 module (only applies to 6ES7 326-2BF01-0AB0)

Technical specifications

	6ES7 326-2BF01-0AB0	6ES7 326-2BF40-0AB0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V; 1L+, 2L+, 3L+	24 V; 1L+, 2L+, 3L+
Current consumption		
from load voltage1L+, max.	70 mA; from supply voltage	75 mA; from supply voltage
from load voltage 2L+ (without load), max.	100 mA	100 mA
from load voltage 3L+ (without load), max.	100 mA	100 mA
from backplane bus DC 5 V, max.	100 mA	100 mA
Current consumption/power loss		
Power loss, typ.	12 W	12 W
Connection point		
required front connectors	40-pin	40-pin
Digital outputs		
Number of digital outputs	10	8
Short-circuit protection of the output	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	L+ (-53 V) without series diode, L+ (-33 V) with series diode	L+ (-33 V)
Lamp load, max.	5 W	5 W
Output voltage		
• for signal "1" with series diode, min.	L+ (-1.8 V)	
• for signal "1" without series diode, min.	L+ (-1 V)	L+ (-1 V)

	6ES7 326-2BF01-0AB0	6ES7 326-2BF40-0AB0
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 0 to 40 °C, max.	2 A; 2 A for horizontal installation, 1 A for vertical installation	2 A; 2 A for horizontal installation, 1 A for vertical installation
• for signal "1" permissible range for 40 to 60 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 40 to 60 °C, max.	1 A; for horizontal installation	1 A; for horizontal installation
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency		
• with resistive load, max.	10 Hz	30 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Aggregate current of the outputs (per group)		
• horizontal installation		
- up to 40 °C, max.	7.5 A; without series diode, 5 A with series diode	7.5 A
- up to 60 °C, max.	5 A; without series diode, 4 A with series diode	5 A
• vertical installation		
- up to 40 °C, max.	5 A; without series diode, 4 A with series diode	5 A
• cable length, shielded, max.	1 000 m; 200 m for SIL3, AK 6, Cat 4	30 m
• Cable length unshielded, max.	600 m	50 m

Technical specifications (continued)

	6ES7 326-2BF01-0AB0	6ES7 326-2BF40-0AB0
Status information/alarms/ diagnostics		
Alarms		
• Diagnostic alarm	Yes	Yes; Parameterizable
Diagnoses		
• Diagnostic information readable	Yes	Yes
Isolation		
Isolation checked with	500 V DC / 350 V AC	500 V DC / 350 V AC
Isolation		
Isolation, digital outputs		
• between the channels	Yes	Yes
• between the channels, in groups of	5	4
• between the channels and the backplane bus	Yes	Yes
• between the channels and the voltage supply to the electronics	Yes	Yes

	6ES7 326-2BF01-0AB0	6ES7 326-2BF40-0AB0
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• to DIN VDE 0801	AK 5 and 6	
• to EN 954	Cat. 4	Cat. 4
• to IEC 61508	SIL 3	SIL 3
Dimensions		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	465 g	465 g

SM 326 F digital output modules - Safety Integrated

Ordering Data	Order No.
SM 326 F digital output module	
10 outputs, 24 V DC, 2 A	**6ES7 326-2BF01-0AB0**
8 outputs, 24 V DC, 2 A	**6ES7 326-2BF40-0AB0**
Distributed Safety V5.4 programming tool Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher	
Floating license	**6ES7 833-1FC02-0YA5**
Software Update Service	**6ES7 833-1FC00-0YX2**
Distributed Safety Upgrade From V5.x to V5.4; Floating license for 1 user	**6ES7 833-1FC02-0YE5**
Labeling sheet with strips for 10 electronic blocks	
• For 16-channel electronic blocks incl. add-on terminals	**6ES7 193-1BH00-0XA0**
• For 32-channel electronic blocks incl. add-on terminals	**6ES7 193-1BL00-0XA0**
Connecting cable for PROFIBUS 12 Mbit/s, for connecting PG to PROFIBUS DP, pre-assembled with 2 x 9-pin Sub-D connector, 3 m	**6ES7 901-4BD00-0XA0**
PROFIBUS bus connector	
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s	**6ES7 972-0BA12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s	**6ES7 972-0BB12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, without PG socket, up to 12 Mbit/s	**6ES7 972-0BA51-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, with PG socket, up to 12 Mbit/s	**6ES7 972-0BB51-0XA0**
DIN rail for active bus modules for max. 5 active bus modules, for function "Insertion and removal"	
• 483 mm (19") long	**6ES7 195-1GA00-0XA0**
• 530 mm long	**6ES7 195-1GF30-0XA0**
• 620 mm long	**6ES7 195-1GG30-0XA0**
• 2000 mm long	**6ES7 195-1GC00-0XA0**

		Order No.
Active bus module BM 1 x 80 for 1 module with 80 mm width		**6ES7 195-7HC00-0XA0**
SITOP power supply module for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E		**6ES7 307-1EA00-0AA0**
Front connectors		
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Labeling strips For fail-safe modules (spare part), 10 units		**6ES7 392-2XX20-0AA0**
Label cover For fail-safe modules (spare part), 10 units		**6ES7 392-2XY20-0AA0**
LK 393 cable guide For F modules; L+ and M connections, 5 units		**6ES7 393-4AA10-0AA0**
S7-300 manual Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current S7 Manual Collection DVD and the three subsequent updates	B3	**6ES7 998-8XC01-8YE2**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

SM 336 F analog input module - Safety Integrated

Overview

- Analog inputs for the fail-safe SIMATIC S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIMATIC S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 - 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 to 20 mA, 4 to 20 mA
  - Short-circuit proof power supply from 2 or 4-wire transducer via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data

Technical specifications

	6ES7 336-4GE00-0AB0
Supply voltages	
Load voltage L+	
• Rated value (DC)	24 V
• reverse polarity protection	Yes
Current consumption	
from backplane bus DC 5 V, max.	90 mA
from supply voltage L+, max.	150 mA; Typical
Current consumption/ power loss	
Power loss, typ.	4.5 W
Connection point	
required front connectors	20-pin
Analog inputs	
Number of analog inputs	6
cable length, shielded, max.	1 000 m
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 to 20 mA	Yes
• permissible input current for current input (destruction limit), max.	40 mA
Analog value creation	
Integration and conversion time/resolution per channel	
• Resolution with overload area (bit including sign), max.	16 Bit; 15bits + sign
• Integration time, ms	20 at 50 Hz 16.7 at 60 Hz
• Interference voltage suppression for interference frequency f1 in Hz	f=n x (f1+-0.5%)
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

	6ES7 336-4GE00-0AB0
Errors/accuracies	
Operational limit in overall temperature range	
• Current, relative to input area	+/- 0.2 %; 40µA
Basic error limit (operational limit at 25 °C)	
• Current, relative to input area	+/- 0.1 %
Status information/alarms/ diagnostics	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
Isolation	
Isolation checked with	370 V for 1min
Isolation	
Isolation, analog inputs	
• between the channels	Yes
• between the channels and the backplane bus	Yes
• between the channels and the voltage supply to the electronics	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• to DIN V 19250	old
• to EN 954	CAT. 4
• to IEC 61508	SIL 3
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	350 g

SM 336 F analog input module - Safety Integrated

Ordering Data		Order No.
SM 336 F analog input module		
6 inputs, 15 bit, 0/4 - 20 mA HART	B7	**6ES7 336-4GE00-0AB0**
Distributed Safety V5.4 programming tool		
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher		
Floating License		**6ES7 833-1FC02-0YA5**
Software Update Service		**6ES7 833-1FC00-0YX2**
Distributed Safety Upgrade From V5.x to V5.4; Floating License for 1 user		**6ES7 833-1FC02-0YE5**
Labeling sheet with strips for 10 electronic blocks		
• For 16-channel electronic blocks incl. add-on terminals		**6ES7 193-1BH00-0XA0**
• For 32-channel electronic blocks incl. add-on terminals		**6ES7 193-1BL00-0XA0**
Connecting cable for PROFIBUS 12 Mbit/s, for connecting PG to PROFIBUS DP, pre-assembled with 2 x 9-pin Sub-D connector, 3 m		**6ES7 901-4BD00-0XA0**
PROFIBUS bus connector		
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s		**6ES7 972-0BA12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, without PG socket, up to 12 Mbit/s		**6ES7 972-0BB12-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, without PG socket, up to 12 Mbit/s		**6ES7 972-0BA51-0XA0**
• 90° cable outlet, terminating resistor with isolating function, insulation displacement technology, Fast Connect, with PG socket, up to 12 Mbit/s		**6ES7 972-0BB51-0XA0**

		Order No.
DIN rail for active bus modules for max. 5 active bus modules for hot swapping function		
• Length: 483 mm		**6ES7 195-1GA00-0XA0**
• Length: 530 mm		**6ES7 195-1GF30-0XA0**
• Length: 620 mm		**6ES7 195-1GG30-0XA0**
• Length: 2000 mm		**6ES7 195-1GC00-0XA0**
Active bus module BM 1 x 80 for 1 module with 80 mm width		**6ES7 195-7HC00-0XA0**
SITOP power supply module for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E		**6ES7 307-1EA00-0AA0**
Front connectors		
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Labeling strips For fail-safe modules (spare part), 10 units		**6ES7 392-2XX20-0AA0**
Label cover For fail-safe modules (spare part), 10 units		**6ES7 392-2XY20-0AA0**
S7 SmartLabel V3.0 Software for automatic labeling of modules based on data of the STEP 7 project		
Single License	B8	**2XV9 450-1SL03-0YX0**
Upgrade Single License	B8	**2XV9 450-1SL03-0YX4**

B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Ordering Data	Order No.
Labeling sheets for machine inscription	
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units	
petrol	**6ES7 392-2AX10-0AA0**
light-beige	**6ES7 392-2BX10-0AA0**
yellow	**6ES7 392-2CX10-0AA0**
red	**6ES7 392-2DX10-0AA0**
LK 393 cable guide	**6ES7 393-4AA10-0AA0**
For F modules; L+ and M connections, 5 units	
S7-300 manual	
Design, CPU data, module data, instruction list	
German	**6ES7 398-8FA10-8AA0**
English	**6ES7 398-8FA10-8BA0**
French	**6ES7 398-8FA10-8CA0**
Spanish	**6ES7 398-8FA10-8DA0**
Italian	**6ES7 398-8FA10-8EA0**

		Order No.
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (distributed I/O), SIMATIC PC, SIMATIC PG (programming devices), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

Isolation module

Overview

- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M when Cat. 4 or SIL 3 has to be achieved
- The isolation module is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respectively

When Cat. 4/SIL 3 is required, the isolation module must be implemented in the following situations:

Application	Isolation module must be used
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP	
• Only fail-safe modules in the tier	Yes, behind the CPU
• Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack	
• Only fail-safe modules in the tier	Yes, after the IM 36x
• Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with copper connection	
• Only fail-safe modules in the station	Yes, after the IM 153-2
• Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with fiber-optic connection	
• Only fail-safe modules in the station	No
• Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module

Technical specifications

	6ES7 195-7KF00-0XA0
Dimensions	
Weights	
• Weight, approx.	10 g

Ordering Data

	Order No.
Isolation module for simultaneous operation of fail-safe and standard modules in an ET 200M	**6ES7 195-7KF00-0XA0**
Isolation bus module for accommodating the isolating module in an ET 200M	**6ES7 195-7HG00-0XA0**

Overview

- Digital inputs for the fail-safe SIMATIC S7 systems
- They are suitable for connecting:
  - switches and 2-wire proximity switches (BEROs)
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- Can be used in standard mode as an S7-300 module

Fail-safe digital input module SIPLUS SM 326	
Order No.	**6AG1 326-1BK01-2AB0**
Order No. based on	**6ES7 326-1BK01-0AB0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)
Technical specifications	The technical data are identical with those of the based-on modules.

Ordering Data

	Order No.
SIPLUS SM 326 F digital input module	
(extended temperature range and medial exposure)	
24 inputs, 24 V DC	**6AG1 326-1BK01-2AB0**
Accessories	see S7-300 F digital input modules, page 4/113

SIPLUS SM 326 F digital output module - Safety Integrated

Overview

- Digital outputs for the fail-safe SIMATIC S7 systems
- Two variants (1 x source/current sourcing, 1 x source/current sinking)
- For connection of solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- Can be used in standard mode as an S7-300 module (only applies to 6ES7 326-2BF01-0AB0)

Fail-safe digital output module SIPLUS SM 326			
Order No.	**6AG1 326-2BF01-2AB0**	**6AG1 326-2BF40-2AB0**	**6AG1 326-2BF40-2AY0**
Order No. based on	**6ES7 326-2BF01-0AB0**	**6ES7 326-2BF40-0AB0**	**6ES7 326-2BF40-0AB0**
Ambient temperature range	-25 ... +60 °C, condensation permitted		
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)		
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	No	Yes
Technical specifications	The technical data are identical with those of the based-on modules.		

Ordering Data

	Order No.
SIPLUS SM 326 F digital output modules	
(extended temperature range and medial exposure)	
10 outputs, 24 V DC, 2 A	**6AG1 326-2BF01-2AB0**
8 outputs, 24 V DC, 2 A	**6AG1 326-2BF40-2AB0**
8 outputs, 24 V DC, 2 A; conforms to EN 50155	**6AG1 326-2BF40-2AY0**

	Order No.
Accessories	see S7-300 F digital output modules, page 4/116

Overview

- Permits combined operation of fail-safe signal modules in safety mode and standard S7-300 modules in the same ET 200M system.
- Design of PROFIBUS DP lines using copper bus cables. It is not necessary to use fiber-optic cables.
- Every IM 153-x can be used

The isolation module is not required if safety class SIL 2 is to be achieved.

SIPLUS S7-300 isolation module	
Order No.	**6AG1 195-7KF00-2XA0**
Order No. based on	**6ES7 195-7KF00-0XA0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes
Technical specifications	The technical data are identical with those of the based-on modules.

Information about safety class and safety category see isolating module, page 4/120.

Ordering Data

Ordering Data	Order No.
SIPLUS isolating module for simultaneous operation of fail-safe and standard modules in an ET 200M	**6AG1 195-7KF00-2XA0**
Accessories	see Isolation module, page 4/120

4

Ex digital input/output modules

Overview

- I/O modules for applications within potentially explosive chemical plants
- For connecting sensors and actuators from zones 1 and 2 in hazardous area installations
- Associated electrical equipment [EEx ib] IIC in accordance with DIN 50020
- For isolating non-intrinsically safe circuits of the programmable logic controller and the intrinsically safe circuits from the process

Technical specifications

	6ES7 321-7RD00-0AB0
Supply voltages	
Load voltage L+	
• Rated value (DC)	24 V
Current consumption	
from load voltage L+ (without load), max.	50 mA
from backplane bus DC 5 V, max.	80 mA
Current consumption/ power loss	
Power loss, typ.	1.1 W
Connection point	
required front connectors	20-pin
Digital inputs	
Number of NAMUR inputs	4
Input voltage	
• Rated value, DC	8.2 V; from internal power circuit supply
Input current	
• on wire break, max.	0.1 mA
• on short -circuit, max.	8.5 mA
• for NAMUR encoders	
- for signal "0"	0.35 to 1.2 mA
- for signal "1"	2.1 to 7 mA
Input delay (for rated value of input voltage)	
• Input frequency (with 0.1 ms delay), max.	2 kHz
• for NAMUR inputs	
- programmable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms (plus 0.25 ms preparation time)
Cable length	
• Cable length unshielded, max.	200 m

	6ES7 321-7RD00-0AB0
Encoder supply	
Output voltage	via the inputs
Encoder	
Connectable encoders	
• NAMUR encoder	Yes; Two-wire connection
Ex(i) characteristics	
Max. values of input circuits (per channel)	
• Co (permissible external capacity), max.	3 µF
• Io (chort-circuit current), max.	14.1 mA
• Lo (permissible external inductivity), max.	100 milliH
• Po (power of load), max.	33.7 mW
• Uo (output no-load voltage), max.	10 V
Status information/alarms/ diagnostics	
Diagnoses	
• Diagnostic information readable	Yes
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	Yes
• between the channels, in groups of	1
Standards, approvals, certificates	
Type of protection to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection to FM	Class II, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2094X
Dimensions	
Weights	
• Weight, approx.	230 g

Technical specifications (continued)

	6ES7 322-5SD00-0AB0	6ES7 322-5RD00-0AB0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Current consumption		
from load voltage L+ (without load), max.	160 mA	160 mA
from backplane bus DC 5 V, max.	70 mA	70 mA
Current consumption/ power loss		
Power loss, typ.	3 W	3 W
Connection point		
required front connectors	20-pin	20-pin
Digital outputs		
Number of digital outputs	4	4
Short-circuit protection of the output	Yes; Electronic	Yes; Electronic
• Response threshold, typ.	Output current with short-circuit protection, min. 10 mA + 10 %	Output current with short-circuit protection, min. 20.5 mA + 10 %
Output voltage		
• Rated value (DC)	24 V	15 V
Output current		
• for signal "1" permissible range for 0 to 60 °C, max.	10 mA; +/-10%	20 mA; +/-10%
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
Load impedance range		
• upper limit	390 Ω Two-wire connection	200 Ω Two-wire connection
• Cable length unshielded, max.	200 m	200 m

	6ES7 322-5SD00-0AB0	6ES7 322-5RD00-0AB0
Ex(i) characteristics		
Max. values of output circuits (per channel)		
• Co (permissible external capacity), max.	90 nF	500 nF
• Io (chort-circuit current), max.	70 mA	85 mA
• Lo (permissible external inductivity), max.	6.7 milliH	5 milliH
• Po (power of load), max.	440 mW	335 mW
• Uo (output no-load voltage), max.	25.2 V	15.75 V
Status information/alarms/ diagnostics		
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Short circuit	Yes	Yes
• Group error	Yes	Yes
Isolation		
Isolation, digital outputs		
• Galvanic isolation, digital outputs	Yes	Yes
• between the channels, in groups of	1	1
Standards, approvals, certificates		
Type of protection to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
Type of protection to FM	Class I, Division 2, Group A, B, C, D T4	AIS CL.1, DIV 1, GP A, B, C, D; CL.I, DIV 2, GP A, B, C, D T4
Test number PTB	Ex-96.D.2093X	Ex-96.D.2102X
Dimensions		
Weights		
• Weight, approx.	230 g	230 g

Ex digital input/output modules

Ordering Data		Order No.
Ex digital input module		
4 inputs, isolated, NAMUR		**6ES7 321-7RD00-0AB0**
Ex digital output modules		
4 outputs, isolated, 24 V DC, 10 mA		**6ES7 322-5SD00-0AB0**
4 outputs, isolated, 15 V DC, 20 mA		**6ES7 322-5RD00-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
Front door, elevated design		
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	B7	**6ES7 328-0AA00-7AA0**
LK 393 cable guide		**6ES7 393-4AA00-0AA0**
Mandatory for operation in Ex-hazard areas		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		

		Order No.
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- I/O modules for applications within potentially explosive chemical plants
- For connecting sensors and actuators from zones 1 and 2 in hazardous area installations
- Associated electrical equipment [EEx ib] IIC in accordance with DIN 50020
- For isolation of non-IS circuits of the automation system and the IS circuits from the process

Technical specifications

	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Voltage supply to the transducers		
• present	Yes	
• Rated value (DC)	13 V; at 22 mA	
• No-load voltage (DC)	25.2 V	
Current consumption		
from backplane bus DC 5 V, max.	60 mA	120 mA
from supply voltage L+, max.	150 mA	
Current consumption/ power loss		
Power loss, typ.	3 W	0.6 W
Connection point		
required front connectors	20-pin	20-pin
Analog inputs		
Number of analog inputs	4	8; 8x thermocouples; 4x RTD thermal sensors
cable length, shielded, max.	200 m	200 m; TC: 50m
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 to 20 mA	Yes	
Input ranges (rated values), thermoelements		
• Type B		Yes
• Type E		Yes
• Type J		Yes

	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Input ranges (rated values), thermoelements (continued)		
• Type K		Yes
• Type L		Yes
• Type N		Yes
• Type R		Yes
• Type S		Yes
• Type T		Yes
• Type U		Yes
Input ranges (rated values), resistance thermometers		
• Ni 100		Yes
• Pt 100		Yes
• Pt 200		Yes
• permissible input current for current input (destruction limit), max.	40 mA	
Analog value creation		
Measurement principle	Sigma Delta	Sigma Delta
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	16 Bit; 10 to 15 bits + sign	16 Bit; 10 to 15 bits + sign
• Integration time, parameterizable	Yes; 2.5 to 100 ms	Yes; 2.5 to 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 to 400 Hz	10 to 400 Hz
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes

Ex analog input/output modules

Technical specifications (continued)

	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Ex(i) characteristics		
Max. values of input circuits (per channel)		
• Co (permissible external capacity), max.	90 nF	43 µF
• Io (chort-circuit current), max.	68.5 mA	28.8 mA
• Lo (permissible external inductivity), max.	7.5 milliH	40 milliH
• Po (power of load), max.	431 mW	41.4 mW
• Ri, max.	50 Ω	
• Uo (output no-load voltage), max.	25.2 V	5.9 V
Errors/accuracies		
Temperature error (relative to input areas)		Temperature error: 0.001 to 0.002%/K
Operational limit in overall temperature range		
• Current, relative to input area	+/- 0.45 %	
• Resistance-type thermometer, relative to input area		0.09 to 0.04%
Basic error limit (operational limit at 25 °C)		
• Current, relative to input area	+/- 0.1 %	
• Resistance-type thermometer, relative to input area		+/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1 %), fl = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	60 db	60 db
• common mode voltage, min.	130 db	130 db

	6ES7 331-7RD00-0AB0	6ES7 331-7SF00-0AB0
Status information/alarms/ diagnostics		
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Overrange	Yes	Yes
• Wire break in signal encoder cable	Yes	Yes
• Short circuit of the signal encoder cable	Yes	Yes
Isolation		
Isolation, analog inputs		
• Isolation, analog inputs	Yes	Yes
Standards, approvals, certificates		
Type of protection to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
Type of protection to FM	Class I, Division 2, Group A, B, C, D T4	Class I, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2092X	Ex-96.D.2108X
Dimensions		
Weights		
• Weight, approx.	290 g	210 g

	6ES7 332-5RD00-0AB0
Supply voltages	
Load voltage L+	
• Rated value (DC)	24 V
Current consumption	
from load voltage L+ (without load), max.	180 mA
from backplane bus DC 5 V, max.	80 mA
Current consumption/ power loss	
Power loss, typ.	4 W
Connection point	
required front connectors	20-pin

	6ES7 332-5RD00-0AB0
Analog outputs	
Number of analg outputs	4
cable length, shielded, max.	200 m
Voltage output, Short-circuit protection	Yes
Voltage output, short-circuit current, max..	70 mA
Current output, no-load voltage, max.	14 V
Output ranges, current	
• 0 to 20 mA	Yes
• 4 to 20 mA	Yes

Technical specifications (continued)

	6ES7 332-5RD00-0AB0
Connection of actuators	
• for current output 2-conductor connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	500 Ω
Analog value creation	
Integration and conversion time/resolution per channel	
• Resolution with overload area (bit including sign), max.	15 Bit
• Basic conversion time, ms	2.5 ms
Ex(i) characteristics	
Max. values of output circuits (per channel)	
• Co (permissible external capacity), max.	850 nF
• Io (chort-circuit current), max.	70 mA
• Lo (permissible external inductivity), max.	6.6 milliH
• Po (power of load), max.	440 mW
• Uo (output no-load voltage), max.	14 V
Errors/accuracies	
Operational limit in overall temperature range	
• Current, relative to output area	+/- 0.55 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output area	+/- 0.2 %

	6ES7 332-5RD00-0AB0
Status information/alarms/ diagnostics	
Diagnoses	
• Diagnostic information readable	Yes
• Overrange	Yes
• Wire break in acutator cable	Yes
• Group error	Yes
Isolation	
Isolation, analog outputs	
• Galvanic isolation, analog outputs	Yes
Standards, approvals, certificates	
Type of protection to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection to FM	Class I, Division 2, Group A, B, C, D T4
Test number PTB	Ex-96.D.2026X
Dimensions	
Weights	
• Weight, approx.	280 g

Ex analog input/output modules

Ordering Data		Order No.
Ex analog input modules		
4 inputs, isolated, 0/4 to 20 mA, 15 bit		**6ES7 331-7RD00-0AB0**
8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100		**6ES7 331-7SF00-0AB0**
Ex analog output module		
4 outputs, isolated, 0/4 to 20 mA		**6ES7 332-5RD00-0AB0**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
Front door, elevated design		
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	B7	**6ES7 328-0AA00-7AA0**
LK 393 cable guide		**6ES7 393-4AA00-0AA0**
Mandatory for operation in Ex-hazard areas		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		

		Order No.
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- One-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs to output the response upon reaching the comparison value.
- Operating modes:
  - Continuous counting
  - One-shot counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter with gate function

Note:

Incremental encoders and pre-assembled connecting cables for counting and positioning functions are offered under SIMODRIVE Sensor or Motion Connect 500.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 350-1AH03-0AE0
Supply voltages	
Aux. voltage 1L+, load voltage 2 L+	
• Rated value (DC)	24 V
• Permissible range (ripple included)	
- dynamic, lower limit (DC)	18.5 V
- dynamic, upper limit (DC)	30.2 V
- static, lower limit (DC)	20.4 V
- static, upper limit (DC)	28.8 V
• non-periodic skip	
- Duration	500 ms
- Recovery time	50 s
- Value	35 V
Current consumption	
from load voltage 1L+ (without load), max.	40 mA
from backplane bus DC 5 V, max.	160 mA
Current consumption/ power loss	
Power loss, typ.	4.5 W
Connection point	
required front connectors	1x 20-pin
Digital inputs	
Number of digital inputs	3
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
Input voltage	
• for signal "0"	-28.8 to +5 V
• for signal "1"	+11 to +28.8 V

	6ES7 350-1AH03-0AE0
Input current	
• for signal "1", typ.	9 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection of the output	Yes; clocked electronically
Limitation of inductive shutdown voltage to	2L+ (-39 V)
Output voltage	
• for signal "0" (DC), max.	3 V
• for signal "1", min.	2L+ (-1.5 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
Output delay with resistive load	
• "0" to "1", max.	300 µs
Encoder supply	
5 V encoder supply	
• 5 V	Yes; 5.2 V +/-2%
• Output current, max.	300 mA
24 V encoder supply	
• 24 V	Yes; 1L+ (-3 V)
• Output current, max.	400 mA

Technical specifications (continued)

	6ES7 350-1AH03-0AE0
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; with 2 pulse strings offset by 90°
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes; 1 pulse train, 1 direction level
Counters	
Number of counter inputs	1
Counting range, Description	32 bit or +/-31 bit
Minimum pulse width, adjustable	Yes; 2.5 or 25 µs
Counter input 5 V	
• Type	RS 422
• Terminating resistor	220 Ω
• Differential input voltage	1.3 V
• Counter frequency, max.	500 kHz
Counter input 24 V	
• Input voltage, for signal "0"	-28.8 to +5 V
• Input voltage, for signal "1"	+11 to +28.8 V
• Input current, for signal "1", typ.	9 mA
• Counter frequency, max.	200 kHz
• Minimum pulse width	2.5 µs

	6ES7 350-1AH03-0AE0
Isolation	
Isolation checked with	500 V
Isolation	
Galvanic isolation, digital inputs	
• between the channels and the backplane bus	Yes; Optocoupler
Isolation, digital outputs	
• between the channels and the backplane bus	Yes; Optocoupler
Isolation counter	
• between the channels and the backplane bus	Yes; Optocoupler
Permissible potential difference	
between different circuits	75 V DC / 60 V AC
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	250 g

Ordering Data		Order No.
FM 350-1 counter module		**6ES7 350-1AH03-0AE0**
with 1 channel, max. 500 kHz; for incremental encoder		
Coding plug - Range card for analog inputs		**6ES7 974-0AA00-0AA0**
Spare part		
Front connector		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label		**6ES7 912-0AA00-0AA0**
Spare part		
Shield connection element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

	Order No.
Connectable incremental encoders 6FX2 001-2...	See the A&D Mall under SIMODRIVE Sensors or Motion Connect 500 (see also www.siemens.com/ simatic-technology)
Signal cable	
Preassembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA	**6FX5 002-2CA12-■■■ 0**
Length code:	
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

SIPLUS FM 350-1 counter module

Overview

- Single-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 definable comparison values
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous counting
  - Single count
  - Periodic count
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter by gate function

Note: Incremental sensors and preassembled connecting cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

SIPLUS FM 350-1		
Order No.	**6AG1 350-1AH03-2AY0**	**6AG1 350-1AH03-2AE0**
Order No. based on	**6ES7 350-1AH03-0AE0**	**6ES7 350-1AH03-0AE0**
Ambient temperature range	-25 ... +60 °C, condensation permitted	-25 ... +60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)	
Conforms with standard for electronic equipment used on rolling stock (EN 50155).	Yes	No
Technical specifications	The technical data are identical with those of the based-on modules.	

For further technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-techdoku

Ordering Data

	Order No.
SIPLUS FM 350-1 counter module	
(extended temperature range and medial exposure)	
With 1 channel, max. 500 kHz; for incremental encoder	
Without conformity to EN 50155	**6AG1 350-1AH03-2AE0**
With conformity to EN 50155	**6AG1 350-1AH03-2AY0**

	Order No.
Accessories	see FM 350-1 counter module, page 4/133

Overview

- 8-channel intelligent counter module for universal counting and measuring
- To directly connect 24 V incremental encoders, direction sensors, initiators or NAMUR encoders.
- Check function with preselectable set points (number depends on mode)
- Integrated digital outputs to output the response when the setpoint is reached
- Modes:
  - Continuous/one-off/periodic counting
  - Frequency/speed measurement
  - Cycle duration measurement
  - Dosing

Note:

Incremental encoder and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 350-2AH01-0AE0
Supply voltages	
Aux. voltage 1L+, load voltage 2 L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
from load voltage L+ (without load), max.	150 mA
from backplane bus DC 5 V, max.	100 mA
Current consumption/ power loss	
Power loss, typ.	10 W
Connection point	
required front connectors	1x 40-pin
Digital inputs	
Number of digital inputs	8
Functions	1 each for gate start/ gate stop
Input voltage	
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30.2 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
• for standard inputs	
- at "0" to "1", max.	50 µs
Cable length	
• cable length, shielded, max.	100 m

	6ES7 350-2AH01-0AE0
Digital outputs	
Number of digital outputs	8
Short-circuit protection of the output	Yes
Limitation of inductive shutdown voltage to	L+ (-40 V)
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	300 µs
Switching frequency	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
Aggregate current of the outputs (per group)	
• horizontal installation	
- up to 40 °C, max.	4 A
- up to 60 °C, max.	2 A
• all other mounting positions	
- up to 40 °C, max.	2 A
• cable length, shielded, max.	600 m
• Cable length unshielded, max.	100 m
Encoder supply	
Output voltage	NAMUR-encoder supply: 8.2 V +/-2%
Output current, rated value	200 mA
Short-circuit protection	Yes

Technical specifications (continued)

	6ES7 350-2AH01-0AE0
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes
• NAMUR encoder	Yes
• 2-wire BEROS	Yes
NAMUR encoder	
• Number of NAMUR inputs	8
• Input signal	to DIN 19 234
• Input current, for signal "0", max.	1.2 mA
• Input current, for signal "1", min.	2.1 mA
• Input delay, max.	50 µs
• Input frequency, max.	20 kHz
• cable length, shielded, max.	100 m
Counters	
Counter input 24 V	
• Number	8; 32 bit or +/-31 bit
• Input voltage, for signal "0"	-3 to 5 V
• Input voltage, for signal "1"	11 to 30.2 V
• Input current, for signal "0", max. (permissible quiescent current)	2 mA
• Input current, for signal "1", typ.	9 mA
• Input delay, max.,	50 µs
• Counter frequency, max.	20 kHz; 24 V incremental encoder: 10 kHz; 24-V direction encoder: 20 kHz; 24-V initiator: 20 kHz; NAMUR encoder: 20 kHz
• Cable length, max.	100 m

	6ES7 350-2AH01-0AE0
Status information/alarms/ diagnostics	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Process alarm	Yes; Parameterizable
Diagnoses	
• Diagnostic functions	Yes; Diagnostic information readable
Isolation	
Galvanic isolation, digital inputs	
• between the channels and the backplane bus	Yes; and shielding
• between the channels and the backplane bus (NAMUR)	Yes, against backplane bus and shielding
Isolation, digital outputs	
• between the channels and the backplane bus	Yes; and shielding
Isolation counter	
• between the channels and the backplane bus	Yes; and shielding
Dimensions	
Dimensions	
• Width	80 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	460 g

Ordering Data		Order No.
FM 350-2 counter module	B7	**6ES7 350-2AH01-0AE0**
With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configuration package and electronic documentation on CD		
Front connector		
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX10-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label		**6ES7 912-0AA00-0AA0**
Spare part		
Shield connection element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

	Order No.				
Signal cable					
Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA	**6FX5 002-2CA12-**	■	■	■	**0**
Length code:					
0 m		**1**			
100 m		**2**			
200 m		**3**			
0 m			**A**		
10 m			**B**		
20 m			**C**		
30 m			**D**		
40 m			**E**		
50 m			**F**		
60 m			**G**		
70 m			**H**		
80 m			**J**		
90 m			**K**		
0 m				**A**	
1 m				**B**	
2 m				**C**	
3 m				**D**	
4 m				**E**	
5 m				**F**	
6 m				**G**	
7 m				**H**	
8 m				**J**	
9 m				**K**	

B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

SIPLUS FM 350-2 counter module

Overview

- 8-channel intelligent counter module for universal counting and measuring tasks
- For direct connection of 24 V incremental encoders, direction encoders, initiators or NAMUR sensors
- Compare function with programmable comparison values (number dependent on operating mode)
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous/once-only/periodic counting
  - Frequency/speed control
  - Period measurement
  - Proportioning

Note:

Incremental sensors and pre-assembled connecting cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

More information is available on the Internet at

http://www.siemens.com/simatic-technology

SIPLUS FM 350-2	
Order No.	**6AG1 350-2AH00-4AE0**
Order No. based on	**6ES7 350-2AH00-0AE0**
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)
Technical specifications	The technical data are identical with those of the based-on modules.

Ordering Data

	Order No.
SIPLUS FM 350-2 counter module (extended temperature range and medial exposure) with 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR sensors; incl. configuring package and electronical documentation on CD	**6AG1 350-2AH00-4AE0**

	Order No.
Accessories	see FM 350-2 counter module, page 4/137

Overview

- Two-channel positioning module for rapid-traverse/creep-speed drives
- 4 digital outputs per channel for motor control
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 351-1AH01-0AE0
Supply voltages	
Rated value	
• DC 24 V	Yes
Current consumption	
Current consumption, max.	350 mA
Connection point	
required front connectors	1x 20-pin
Digital inputs	
Number of digital inputs	8
Functions	Reference cams, reversing cams, flying actual value setting, start/stop positioning
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for 2-wire BERO	
- for signal "0", typ.	2 mA
- for signal "1", typ.	6 mA
Digital outputs	
Number of digital outputs	8
Functions	Rapid traverse, creep, run right, run left
Short-circuit protection of the output	Yes
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V
Output current	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	350 mA
• Cable length, max.	32 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	400 mA; per channel
• Cable length, max.	100 m
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire BEROS	Yes
- permissible quiescent current (2-wire BEROS), max.	2 mA; on signal "0", max. 2 mA; on signal "1", max. 6 mA
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	0.5 MHz
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length	13 or 25 bit
• Clock frequency, max.	1 MHz
• Gray code	1
• cable length, shielded, max.	300 m; at max. 125 kHz

FM 351 positioning module

Technical specifications (continued)

	6ES7 351-1AH01-0AE0
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	Yes
Isolation, digital outputs	
• Galvanic isolation, digital outputs	Yes

	6ES7 351-1AH01-0AE0
Dimensions	
Dimensions	
• Width	80 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	550 g

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Ordering Data

		Order No.
FM 351 positioning module		**6ES7 351-1AH01-0AE0**
for rapid traverse and creep speed drives		
Front connector		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
Slot number label		**6ES7 912-0AA00-0AA0**
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under "Accessories", page 4/233
Spare part		
Shield connection element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

	Order No.
Signal cables	
Pre-assembled for HTL encoder, UL/DESINA	**6FX5 0 ■ 2-2AL00- ■ ■ ■ ■**
Pre-assembled for SSI absolute encoder, UL/DESINA	**6FX5 0 ■ 2-2CC11- ■ ■ ■ ■**
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	**6FX5 0 ■ 2-2CD01- ■ ■ ■ ■**
Pre-assembled for TTL encoder 24 V, UL/DESINA	**6FX5 0 ■ 2-2CD24- ■ ■ ■ ■**
Not crimped	**0**
Module end crimped, connector case supplied	**1**
Motor end crimped, connector case supplied	**4**
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
0 m	**K**
0,0 m	**0**
0,1 m	**1**
0,2 m	**2**
0,3 m	**3**
0,4 m	**4**
0,5 m	**5**
0,6 m	**6**
0,7 m	**7**
0,8 m	**8**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 352-1AH02-0AE0
Supply voltages	
Rated value	
• DC 24 V	Yes
Current consumption	
from load voltage L+ (without load), max.	200 mA
from backplane bus DC 5 V, max.	100 mA
Connection point	
required front connectors	1 x 20-pin
Digital inputs	
Number of digital inputs	4
Functions	Reference point switch, flying actual value setting/length measurement, brake release, enable track output no. 3
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-30 to 5 V
• for signal "1"	11 to 30 V
Input current	
• for 2-wire BERO	
- for signal "0", typ.	2 mA
- for signal "1", typ.	7 mA
Digital outputs	
Number of digital outputs	13
Functions	Cam track
Short-circuit protection of the output	Yes
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V

	6ES7 352-1AH02-0AE0
Output current	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	32 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire BEROS	Yes
- permissible quiescent current (2-wire BEROS), max.	2 mA
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz

FM 352 cam controller

Technical specifications (continued)

	6ES7 352-1AH02-0AE0
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length, 25 kHz for 100 m cable length
Encoder signals, absolute encoder (SSI)	
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length	13 or 25 bit
• Clock frequency, max.	1 MHz
• Gray code	1
• cable length, shielded, max.	320 m; at max. 125 kHz

	6ES7 352-1AH02-0AE0
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	No
Isolation, digital outputs	
• Galvanic isolation, digital outputs	No
Dimensions	
Dimensions	
• Width	80 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	550 g

Ordering Data

		Order No.
FM 352 electronic cam controller		**6ES7 352-1AH02-0AE0**
Front connector		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**

	Order No.
Labeling sheets for machine inscription	see under “Accessories“, page 4/233
Slot number label	**6ES7 912-0AA00-0AA0**
Spare part	
Shield connection element	**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each	
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7 390-5CA00-0AA0**
Signal cable	
Pre-assembled for HTL encoder, UL/DESINA	**6FX5 0■2-2AL00-■■■■**
Pre-assembled for SSI absolute encoder, UL/DESINA	**6FX5 0■2-2CC11-■■■■**
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	**6FX5 0■2-2CD01-■■■■**
Pre-assembled for TTL encoder 24 V, UL/DESINA	**6FX5 0■2-2CD24-■■■■**
Length code	see FM 351, page 4/140

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- The FM 352-5 High-speed Boolean processor offers an extremely fast binary control and some of the quickest switching procedures ever possible (cycle duration: 1 µs)
- Programming with LAD or FBD is possible
- The instruction set available includes bit instructions (instruction subset of STEP 7), timers, counters, frequency dividers, frequency generators, and shift registers
- 12 integrated DI/8 integrated DO
- 2 versions: Current sinking or current sourcing digital outputs
- 1 channel for connecting a 24 V incremental encoder, a 5 V incremental encoder (RS422) or a serial interface absolute encoder

A micro memory card is required for operation of the FM 352-5

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Supply voltages		
Rated value		
• DC 24 V	Yes	Yes
Load voltage L+		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
• reverse polarity protection	Yes	Yes
Current consumption		
from load voltage1L+, max.	150 mA; typ. 60 mA	150 mA; typ. 60 mA
from load voltage 2L+ (without load), max.	200 mA; typ. 60 mA, DI/DO supply	200 mA; typ. 60 mA, DI/DO supply
from load voltage 3L+ (with encoder), max.	600 mA; typ. 80 mA plus encoder supply	600 mA; typ. 80 mA plus encoder supply
from load voltage 3L+ (without encoder), max.	200 mA; typ. 80 mA	200 mA; typ. 80 mA
from backplane bus DC 5 V, max.	100 mA; typically	100 mA; typically
Current consumption/ power loss		
Power loss, typ.	6.5 W	6.5 W
Memory		
Type of storage		
Memory Card, RAM	128 Kibyte; required for operation, MMC	128 Kibyte; required for operation, MMC

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
interfaces		
Updating time	PLC interface: 5 ms (2.6 ms type)	PLC interface: 5 ms (2.6 ms type)
Connection point		
required front connectors	1x 40-pin	1x 40-pin
CPU/programming		
Program cycle time (scan)	1 µs	1 µs
Digital inputs		
Number of digital inputs	8; standard and up to 12 at 24 V DC encoder inputs as digital inputs	8; standard and up to 12 at 24 V DC encoder inputs as digital inputs
Input voltage		
• Rated value, DC	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	11 to 30 V	11 to 30 V
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• for signal "1", typ.	3.8 mA	3.8 mA
Input delay (for rated value of input voltage)		
• Input frequency (with 0.1 ms delay), max.	200 kHz	200 kHz
• Programmable digital filter delay	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.5 ms	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.5 ms

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Technical specifications (continued)

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Input delay (for rated value of input voltage) (continued)		
• Minimum pulse width for program reactions	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms
• for standard inputs		
- at "0" to "1", max.	3 µs; typ. 1.5 µs	3 µs; typ. 1.5 µs
Cable length		
• cable length, shielded, max.	600 m; shielded cable recommended if filtering set in 1.6 ms frame.	600 m; shielded cable recommended if filtering set in 1.6 ms frame.
• Cable length unshielded, max.	100 m	100 m
Digital outputs		
Number of digital outputs	8	8
M-switching	Yes	
P-switching		Yes
Short-circuit protection of the output	Yes; Overvoltage protection, thermal protection	Yes; Overvoltage protection, thermal protection
• Response threshold, typ.	1.7 to 3.5 A	1.7 to 3.5 A
Limitation of inductive shutdown voltage to	2M +45 V typ, (40 to 55 V); comment: no protection against inductive kickback >55 mJ	2M +45 V typ, (40 to 55 V); comment: no protection against inductive kickback >55 mJ
Lamp load, max.	5 W	5 W
Controlling a digital input	No	No
Output voltage		
• Rated value (DC)	24 V	24 V
• for signal "0" (DC), max.	28.8 V	28.8 V
• for signal "1" (DC), max.	0.5 V	0.5 V
Output current		
• for signal "1" rated value	0.5 A; at 60 °C	0.5 A; at 60 °C
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA
• for signal "0" residual current, max.	1 mA	1 mA
Output delay with resistive load		
• "0" to "1", max.	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A
• "1" to "0", max.	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Parallel switching of 2 outputs		
• for increased power	Yes; 2	Yes; 2
Switching frequency		
• with resistive load, max.	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A
• with inductive load, max.	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes
• on lamp load, max.	10 Hz	10 Hz
• cable length, shielded, max.	600 m	600 m
• Cable length unshielded, max.	100 m	100 m
Encoder supply		
5 V encoder supply		
• 5 V	Yes	Yes
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	250 mA	250 mA
24 V encoder supply		
• 24 V	Yes	Yes
• Short-circuit protection	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage
• Output current, max.	400 mA	400 mA
Encoder		
Connectable encoders		
• Incremental encoder (symmetrical)	Yes	Yes
• Incremental encoder (asymmetrical)	Yes	Yes
• Absolute encoder (SSI)	Yes	Yes
• 2-wire BEROS	Yes; typ. 1 A	Yes; typ. 1 A
- permissible quiescent current (2-wire BEROS), max.	1.5 mA	1.5 mA

Technical specifications (continued)

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Encoder signals, incremental encoder (symmetrical)		
• Trace mark signals	A, notA, B, notB	A, notA, B, notB
• Zero mark signal	N, notN	N, notN
• Input signal	5 V difference signal (phys. RS 422)	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz	1 MHz
• cable length, shielded, max.	100 m; Cable length, RS 422 (5V) incremental encoders, Siemens type 6FX201-2, 5 V supply: 500 kHz, 32 meters, shielded, max.; cable length, RS 422 (5V) incremental encoders, Siemens type 6FX201-2, 24 V supply: 500 kHz, 100 meters, shielded, max.	100 m; Cable length, RS 422 (5V) incremental encoders, Siemens type 6FX201-2, 5 V supply: 500 kHz, 32 meters, shielded, max.; cable length, RS 422 (5V) incremental encoders, Siemens type 6FX201-2, 24 V supply: 500 kHz, 100 meters, shielded, max.
Encoder signals, incremental encoder (asymmetrical)		
• Trace mark signals	A, B	A, B
• Zero mark signal	N	N
• Input voltage	24 V	24 V
• Input frequency, max.	200 kHz	200 kHz
• cable length, shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.
Encoder signals, absolute encoder (SSI)		
• Data signal	DATA, notDATA	DATA, notDATA
• Clock signal	CK, notCK	CK, notCK
• Telegram length	13 or 25 bit	13 or 25 bit
• Clock frequency, max.	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz
• cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX201-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX201-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max.

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Encoder signals, absolute encoder (SSI) (continued)		
• Monoflop time	settable: 16/32/48/64 µs	settable: 16/32/48/64 µs
• Listening mode	Yes; one or two stations	Yes; one or two stations
• Multiturn	Yes; 25 bit message frame	Yes; 25 bit message frame
Encoder signal evaluation		
• Counting direction, forward	Yes	Yes
• Counting direction, backward	Yes	Yes
Reaction times		
Input and output reaction time	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)
Counters		
Counting range, Description	Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)	Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)
Counting range, lower limit	-2.14748E9	-2.14748E9
Counting range, upper limit	2.14748E9	2.14748E9
Counting mode		
• Counting mode, individual	Yes	Yes
• Counting mode, continuous	Yes	Yes
• Counting mode, periodic	Yes	Yes
Status information/alarms/ diagnostics		
Alarms		
• Diagnostic alarm	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization errror; SSI message frame overflow	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization errror; SSI message frame overflow
• Process alarm	Yes; 8 available; for generation by user program	Yes; 8 available; for generation by user program
Diagnoses		
• Wire break in signal encoder cable	Yes	Yes
• Overflow/underflow	Yes	Yes
• missing load voltage	Yes	Yes

FM 352-5 high-speed Boolean processor

Technical specifications (continued)

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Isolation		
between 1L and 2L and 3L	Yes; 75 V DC / 60 V AC	Yes; 75 V DC / 60 V AC
between digital I/O & 2L and encoder I/O & 3L	Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
between backplane bus and digital & encoder I/O & 1L & 2L & 3L	Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
Galvanic isolation, digital inputs		
• galvanic isolation, digital inputs	Yes; Yes CPU, E/A and sensor units are separated	Yes; Yes CPU, E/A and sensor units are separated

	6ES7 352-5AH00-0AE0	6ES7 352-5AH10-0AE0
Dimensions		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)

Ordering Data

		Order No.
FM 352-5 high-speed Boolean processor		
with current sinking digital outputs	B7	**6ES7 352-5AH00-0AE0**
with current sourcing digital outputs	B7	**6ES7 352-5AH10-0AE0**
Micro Memory Card		
128 KB		**6ES7 953-8LG11-0AA0**
512 KB		**6ES7 953-8LJ20-0AA0**
2 MB		**6ES7 953-8LL20-0AA0**

	Order No.
Front connectors	
40-pin, with screw contacts	
• 1 unit	**6ES7 392-1AM00-0AA0**
• 100 units	**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts	
• 1 unit	**6ES7 392-1BM01-0AA0**
• 100 units	**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect	
• 1 unit	**6ES7 392-1CM00-0AA0**
Signal cables	
To HTL and TTL encoders, preassembled, without Sub-D connector	**6FX5 002-2CA12-■■■0**
To SSI absolute encoders 6FX2 001-5, preassembled, without Sub-D connector	**6FX5 002-2CC12-■■■■**
Length code	see FM 351, page 4/140

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

- Positioning module for stepper motors in machines with high clock pulse rates
- Can be used for point-to-point positioning tasks and for complex traversing patterns

Technical specifications

	6ES7 353-1AH01-0AE0
Supply voltages	
Rated value	
• DC 24 V	Yes
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
Current consumption, max.	300 mA
Connection point	
required front connectors	1x 20-pin
Digital inputs	
Number of digital inputs	4; (+ 1 input for message signal)
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA
Digital outputs	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
Short-circuit protection of the output	Yes

	6ES7 353-1AH01-0AE0
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 3 V
Output current	
• for signal "1" permissible range for 0 to 55 °C, max.	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA
Drive interface	
Signal input I	
• Function	"Power section ready"
Signal output I	
• Output ready signal	
• Type	5 V difference signal (phys. RS 422)
• Function	Direction , enable, clock pulse, current control
• Differential output voltage, min.	2 V; RL = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; Io = 20 mA
• Differential output voltage, for signal "1", min.	3.7 V; Io = -20 mA
• Cable length, max.	35 m
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	No
Isolation, digital outputs	
• Galvanic isolation, digital outputs	No
Dimensions	
Dimensions	
• Width	80 mm
• Height	125 mm
• Depth	118 mm
Weights	
• Weight, approx.	500 g

FM 353 positioning module

Ordering Data		Order No.
FM 353 positioning module		**6ES7 353-1AH01-0AE0**
For stepper motors; incl. configuration package on CD-ROM (Ge, En, Fr, It) comprising • FM 353 manual, electronic • Standard function blocks (STEP 7 interface software) • Screen form-based configuration software for FM 353 • Standard interactive screen forms for OP7/OP17		
FM 353 manual		
German		**6ES7 353-1AH01-8AG0**
English		**6ES7 353-1AH01-8BG0**
French		**6ES7 353-1AH01-8CG0**
Italian		**6ES7 353-1AH01-8EG0**
Edit FM		**6FC5 263-0AA03-0AB0**
Program editor for editing, loading and saving NC programs with the standard programming device/PC; German/English, on CD-ROM		
Connecting cables		
To stepper motor power section		**6FX8 0■2-3AC02-■■■■**
Length code		see FM 351, page 4/140
Connecting cables and encoders		see Catalog NC 60, CA 01 or in the DT/IA Mall
Front connector		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**

		Order No.
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label		**6ES7 912-0AA00-0AA0**
Spare part		
Shield connection element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- Positioning module for servo motors in machines with high clock pulse rates
- Can be used for point-to-point positioning tasks and for complex traversing patterns

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 354-1AH01-0AE0
Supply voltages	
Rated value	
• DC 24 V	Yes
Current consumption	
Current consumption, max.	350 mA
Connection point	
required front connectors	1x 20-pin
Digital inputs	
Number of digital inputs	4
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA
Digital outputs	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
Short-circuit protection of the output	Yes
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 3 V

	6ES7 354-1AH01-0AE0
Output current	
• for signal "1" permissible range for 0 to 55 °C, max.	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	220 mA
• Cable length, max.	35 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length	13, 21 or 25 bit
• Clock frequency, max.	1.25 Mbit/s
• cable length, shielded, max.	100 m; 10 m at 1.25 Mbit/s, 100 m at max. 125 kbit/s

Technical specifications (continued)

	6ES7 354-1AH01-0AE0
Drive interface	
Signal input I	
• Type	Input loop controller message, isolated (optocoupler)
• Function	"Drive ready"
• Input voltage, rated value (DC)	24 V
• Input voltage, for signal "0"	-3 to 5 V
• Input voltage, for signal "1"	15 to 30 V
• Input current, for signal "1"	2 to 6 mA
Signal output II	
• Type	Output closed-loop controller enable (contact)
• Function	Drive disconnection for operation via contact relay
• Load	1 A/50 V/30 VA DC
Signal output III	
• Type	Analog output
• Function	Setpoint output for drive
• Output voltage	-10 to +10 V
• Output current	-3 to +3 mA
• Cable length, max.	35 m

	6ES7 354-1AH01-0AE0
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	No
Isolation, digital outputs	
• Galvanic isolation, digital outputs	No
Dimensions	
Dimensions	
• Width	80 mm
• Height	125 mm
• Depth	118 mm
Weights	
• Weight, approx.	550 g

Ordering Data

		Order No.
FM 354 positioning module	A4	**6ES7 354-1AH01-0AE0**
for servo motors, incl. configuration package on CD-ROM (Ge, En, Fr, It) comprising • FM 354 manual, electronic • Standard function blocks (STEP 7 interface software) • Screen form-based configuration software for FM 354 • Standard interactive screen forms for OP7/OP17		
FM 354 manual		
German		**6ES7 354-1AH01-8AG0**
English		**6ES7 354-1AH01-8BG0**
French		**6ES7 354-1AH01-8CG0**
Italian		**6ES7 354-1AH01-8EG0**
Edit FM		**6FC5 263-0AA03-0AB0**
Program editor for editing, loading and saving NC programs with the standard programming device/PC; German/English, on CD-ROM		
Connecting cables		
To SSI absolute encoders 6FX2 001-5, preassembled		**6FX5 0■2-2CC11-■■■■**
To incremental encoders 6FX2 001-1, preassembled		**6FX5 0■2-2CD01-■■■■**
For 24 V incremental encoders, preassembled		**6FX5 0■2-2CD24-■■■■**
To ROD 320 built-in encoders, preassembled		**6FX5 0■2-2CE02-■■■■**
To SIMODRIVE 611A, preassembled		**6FX5 0■2-2CJ00-■■■■**
To SIMODRIVE 611U, preassembled		**6FX5 0■2-2CJ10-■■■■**
To SSI absolute encoders 6FX2 001-5, preassembled, without Sub-D connector		**6FX5 002-2CC12-■■■■**
To SSI absolute encoders 6FX2 001-5, preassembled, suitable for trailing		**6FX8 0■2-2CC11-■■■■**
To incremental encoders 6FX2 001-2, preassembled, suitable for trailing		**6FX8 0■2-2CD01-■■■■**
To ROD 320 built-in encoders, preassembled, suitable for trailing		**6FX8 0■2-2CE02-■■■■**
To SIMODRIVE 611A, preassembled, suitable for trailing		**6FX8 0■2-2CJ00-■■■■**
To SIMODRIVE 611U, preassembled, suitable for trailing, 1 free end		**6FX8 0■2-2CJ10-■■■■**
To SIMODRIVE 611A, preassembled, suitable for trailing, free ends		**6FX8 0■2-3AB01-■■■■**
Length code		see FM 351, page 4/140

		Order No.
Encoders		see Catalog NC 60, CA 01 or in the DT/IA Mall
Front connector		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label		**6ES7 912-0AA00-0AA0**
Spare part		
Shield connection element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each		
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

A4: Subject to export regulations: AL: N and ECCN: 4A994B1
B8: Subject to export regulations: AL: N and ECCN: EAR99S

FM 357-2 positioning module

Overview

- Path and positioning control for intelligent motion control of up to 4 axes
- Covers a wide spectrum from independent individual positioning axes through to interpolatory multi-axis continuous-path control
- For the control of stepper motors and controlled servo-drive axes
- User-friendly startup through easy-to-use parameterization tool
- Interface for SIMODRIVE 611U and MASTERDRIVES MC via the isochronous PROFIBUS (not for FM 357-2H in combination with HT6)

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 357-4AH01-0AE0
Supply voltages	
Rated value	
• DC 24 V	Yes
Current consumption	
from backplane bus DC 5 V, max.	100 mA
Current consumption/ power loss	
Power consumption	
• Power consumption, typ.	24 W
Memory	
Type of storage	
NC program memory	750 Kibyte
Connection point	
required front connectors	1x 40-pin
Digital inputs	
Number of digital inputs	18
Functions	4 Bero, 2 probes, 12 for any use
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 30 mA
Digital outputs	
Number of digital outputs	8
Functions	8 for any use

	6ES7 357-4AH01-0AE0
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 3 V
Output current	
• for signal "1" permissible range for 0 to 55 °C, max.	0.5 A; with UPmax
• for signal "0" residual current, max.	2 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	210 mA
• Cable length, max.	35 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz

Technical specifications (continued)

	6ES7 357-4AH01-0AE0
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length	13, 21 or 25 bit
• Clock frequency, max.	1.5 Mbit/s
• cable length, shielded, max.	250 m; at max. 187.5 kBit/s
Positioning	
Programmable traverse speed, max.	1 000 m/min
Signal output I	
• Output ready signal	
• Type	5 V difference signal (phys. RS 422)
• Function	Direction , enable, clock pulse
• Differential output voltage, min.	2 V; RL = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; Io = 20 mA
• Differential output voltage, for signal "1", min.	3.7 V; Io = -20 mA
• Pulse frequency	750 kHz
• Cable length, max.	50 m; 35 m in hybrid mode with servo axes
Signal output II	
• Type	Controller release (contact), FM-READY output (contact)
• Function	Drive disconnection for operation via contact relay, Data set ready for link with Emergency STOP
• Load	1 A/50 V/30 VA DC

	6ES7 357-4AH01-0AE0
Signal output III	
• Type	Analog output
• Function	Drive interface for analog drives: setpoint output for drive
• Output voltage	-10 to +10 V
• Output current	-3 to +3 mA
• Cable length, max.	35 m
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	Yes
Isolation, digital outputs	
• Galvanic isolation, digital outputs	Yes
Dimensions	
Dimensions	
• Width	200 mm
• Height	125 mm
• Depth	118 mm
Weights	
• Weight, approx.	1 200 g

FM 357-2 positioning module

Ordering Data		Order No.
FM 357-2 positioning module	A4	**6ES7 357-4AH01-0AE0**
Basic unit		
System firmware		
incl. configuration package on CD-ROM, German, English, French, Italian, consisting of equipment manual (electronic), configuring software (parameterization screenforms, standard blocks, operator control and monitoring screenforms for OP17/OP27)		
FM 357-2L system firmware		**6ES7 357-4AH03-3AE0**
On memory card		
FM 357-2LX system firmware		**6ES7 357-4BH03-3AE0**
With additional functions; on memory card		
FM 357-H system firmware		**6ES7 357-4CH03-3AE0**
With additional functions for the handling sector; on memory card		
FM 357-2 manual		
German		**6ES7 357-4AH00-8AG0**
English		**6ES7 357-4AH00-8BG0**
French		**6ES7 357-4AH00-8CG0**
Italian		**6ES7 357-4AH00-8EG0**
Edit FM		**6FC5 263-0AA03-0AB0**
Program editor for editing, loading and saving NC programs with the standard programming device/PC; German/English, on CD-ROM		

	Order No.
Connecting cables and encoders	see Catalog NC 60, CA 01 or in the DT/IA Mall
Front connector	
40-pin, with screw contacts	
• 1 unit	**6ES7 392-1AM00-0AA0**
• 100 units	**6ES7 392-1AM00-1AB0**
40-pin with spring-loaded contacts	
• 1 unit	**6ES7 392-1BM01-0AA0**
• 100 units	**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect	
• 1 unit	**6ES7 392-1CM00-0AA0**
Back-up battery	**6ES7 971-1AA00-0AA0**
Li-Ion, 3.6 V/0.95 Ah	
Signal cable	
Pre-assembled for SSI absolute encoder, UL/DESINA	**6FX5 0■2-2CC11-■■■■**
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	**6FX5 0■2-2CD01-■■■■**
Pre-assembled for TTL encoder 24 V, UL/DESINA	**6FX5 0■2-2CD24-■■■■**
Length code	see FM 351, page 4/140

A4: Subject to export regulations: AL: N and ECCN: 4A994B1

Overview

- 4-channel closed-loop control module for universal closed-loop control tasks
- Used for temperature, pressure, flowrate and fill-level control loops
- User-friendly online self-optimization for temperature controls
- Preprogrammed controller structures
- 2 control algorithms
- 2 versions:
  - FM 355 C as continuous-action controller
  - FM 355 S as step or pulse controller
- With 4 analog outputs (FM 355 C) or 8 digital outputs (FM 355 S) for direct control of the most common types of actuator
- Continued operation of the control loop is possible even after a CPU stop or failure

Technical specifications

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from load voltage L+ (without load), max.	310 mA; typ. 260 mA	270 mA; typ. 220 mA
from backplane bus DC 5 V, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Current consumption/ power loss		
Power loss, max.	7.8 W	6.9 W
Power loss, typ.	6.5 W	5.5 W
Connection point		
required front connectors	2x 20-pin	2x 20-pin
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve to IEC 1131, Type 2	Yes	Yes
Input voltage		
• Rated value, DC	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• cable length, shielded, max.	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Digital outputs		
Number of digital outputs		8
Short-circuit protection of the output		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output voltage		
• for signal "1", min.		L+ (-2.5 V)
Output current		
• for signal "1" rated value		100 mA
• for signal "1" permissible range for 0 to 60 °C, min.		5 mA
• for signal "1" permissible range for 0 to 60 °C, max.		150 mA
• for signal "0" residual current, max.		0.5 mA
Parallel switching of 2 outputs		
• for logic links		Yes
Switching frequency		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
Aggregate current of the outputs (per group)		
• up to 60 °C, max.		400 mA
Load impedance range		
• lower limit		240 Ω
• upper limit		4 kΩ
• cable length, shielded, max.		1 000 m
• Cable length unshielded, max.		600 m

Technical specifications (continued)

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Analog inputs		
Number of analog inputs	4	4
cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 to +23.5 mA	Yes	Yes
• 4 to 20 mA	Yes	Yes
Input ranges (rated values), thermoelements		
• Type B	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
Input ranges (rated values), resistance thermometers		
• Pt 100	Yes	Yes
• permissible input frequency for voltage input (destruction limit), max.	30 V	30 V
• permissible input current for current input (destruction limit), max.	40 mA	40 mA
Characteristic curve linearization		
• programmable	Yes	Yes
- for thermoelements	Type B, J, K, R, S	Type B, J, K, R, S
- for thermoresistor	Pt100 (standard)	Pt100 (standard)
Temperature compensation		
• internal temperature compensation	Yes	Yes
• external temperature compensation with Pt100	Yes	Yes
Analog outputs		
Number of analg outputs	4	
cable length, shielded, max.	200 m; 50m at 80 mV and thermocouples	
Voltage output, Short-circuit protection	Yes	
Voltage output, short-circuit current, max..	25 mA	
Current output, no-load voltage, max.	18 V	

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Output ranges, voltage		
• 0 to 10 V	Yes	
• -10 to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA	Yes	
• 4 to 20 mA	Yes	
Connection of actuators		
• for voltage output 2-conductor connection	Yes	
• for current output 2-conductor connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 milliH	
Analog value creation		
Measurement principle	integrating	integrating
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	14 Bit; 12 or 14 bit, parameterizable	14 Bit; 12 or 14 bit, parameterizable
• Conversion time (per channel)	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz
Settling time		
• for resistive load	0.2 ms	0.1 ms
• for capacitive load	3.3 ms	3.3 ms
• for inductive load	0.5 ms	0.5 ms
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Connectable encoders		
• 2-wire BEROS	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1.5 mA	1.5 mA

Technical specifications (continued)

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Errors/accuracies		
Linearity error (relative to input area)	+/- 0.05 %	+/- 0.05 %
Temperature error (relative to input areas)	+/- 0.005 %/K	+/- 0.005 %/K
Linearity error (relative to output area)	+/- 0.05 %	
Temperature error (relative to output area)	+/- 0.02 %/K	
Operational limit in overall temperature range		
• Voltage, relative to input area	+/- 0.6 %; +/-0.6 to +/-1%	+/- 0.6 %; +/-0.6 to +/-1%
• Current, relative to input area	+/- 0.6 %; +/-0.6 to +/-1%	+/- 0.6 %; +/-0.6 to +/-1%
• Resistance-type thermometer, relative to input area	+/- 0.6 %; +/-0.6 to +/-1%	+/- 0.6 %; +/-0.6 to +/-1%
• Voltage, relative to output area	+/- 0.5 %	
• Current, relative to output area	+/- 0.6 %	
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input area	+/- 0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%	+/- 0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%
• Current, relative to input area	+/- 0.4 %; +/-0.4 to +/-0.6%	+/- 0.4 %; +/-0.4 to +/-0.6%
• Resistance-type thermometer, relative to input area	+/- 0.4 %; +/-0.4 to +/-0.6%	+/- 0.4 %; +/-0.4 to +/-0.6%
• Voltage, relative to output area	+/- 0.3 %	
• Current, relative to output area	+/- 0.5 %	

	6ES7 355-0VH10-0AE0	6ES7 355-1VH10-0AE0
Interference voltage suppression for f = n x (fl +/- 1 %), fl = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 db	40 db
• common mode voltage (USS < 2.5 V) , min.	70 db	70 db
Control technology		
Number of closed loop controllers	4	4
Status information/alarms/ diagnostics		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Isolation		
Isolation checked with	500 V DC	500 V DC
Isolation		
Isolation, controller		
• between the channels	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	470 g	470 g

FM 355 controller module

Ordering Data	Order No.
FM 355 C controller module with 4 analog outputs for 4 continuous-action controllers	**6ES7 355-0VH10-0AE0**
FM 355 S controller module with 8 digital outputs for 4 step or pulse controllers	**6ES7 355-1VH10-0AE0**
Front connector 20-pin, with screw contacts	
• 1 unit	**6ES7 392-1AJ00-0AA0**
• 100 units	**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7 392-1BJ00-0AA0**
• 100 units	**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect	
• 1 unit	**6ES7 392-1CJ00-0AA0**
Bus connectors 1 unit (spare part)	**6ES7 390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7 392-2XX00-0AA0**

		Order No.
S7 SmartLabel V3.0 Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label Spare part		**6ES7 912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each		**6ES7 390-5AA00-0AA0**
Terminal elements 2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- 4-channel closed-loop controller module specifically for temperature controls
- Including integrated and easy-to-use online self-optimization
- Heating and cooling controllers as well as combined controllers with heating and active cooling function feasible
- Ready-to-use controller structures
- 2 versions:
  - FM 355-2 C as a continuous controller
  - FM 355-2 S as step or pulse controllers
- With 4 analog outputs (FM 355-2 C) or 8 digital inputs (FM 355-2 S) to directly control the most common final control elements
- It is possible to continue closed-loop control operation even if the CPU stops or fails

Technical specifications

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from load voltage L+ (without load), max.	310 mA; typ. 260 mA	270 mA; typ. 220 mA
from backplane bus DC 5 V, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Current consumption/ power loss		
Power loss, max.	7.8 W	6.9 W
Power loss, typ.	6.5 W	5.5 W
Connection point		
required front connectors	2x 20-pin	2x 20-pin
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve to IEC 1131, Type 2	Yes	Yes
Input voltage		
• Rated value, DC	24 V	24 V
• for signal "0"	-3 to +5 V	-3 to +5 V
• for signal "1"	13 to 30 V	13 to 30 V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• cable length, shielded, max.	1 000 m	1 000 m
• Cable length unshielded, max.	600 m	600 m

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Digital outputs		
Number of digital outputs		8
Short-circuit protection of the output		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Lamp load, max.		5 W
Controlling a digital input		Yes
Output voltage		
• for signal "1", min.		L+ (-2.5 V)
Output current		
• for signal "1" rated value		0.1 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.		150 mA
• for signal "0" residual current, max.		0.5 mA
Parallel switching of 2 outputs		
• for logic links		Yes
Switching frequency		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
Aggregate current of the outputs (per group)		
• up to 60 °C, max.		400 mA
Load impedance range		
• lower limit		240 Ω
• upper limit		4 kΩ
• cable length, shielded, max.		1 000 m
• Cable length unshielded, max.		600 m

FM 355-2 temperature controller module

Technical specifications (continued)

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Analog inputs		
Number of analog inputs	4	4
cable length, shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 to +11.75 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 to +23.5 mA	Yes	Yes
• 4 to 20 mA	Yes	Yes
Input ranges (rated values), thermoelements		
• Type B	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
Input ranges (rated values), resistance thermometers		
• Pt 100	Yes	Yes
• permissible input frequency for voltage input (destruction limit), max.	20 V	20 V
• permissible input current for current input (destruction limit), max.	40 mA	40 mA
Characteristic curve linearization		
• programmable	Yes	Yes
- for thermoelements	Type B, E, J, K, R, S	Type B, E, J, K, R, S
- for thermoresistor	Pt100 (standard)	Pt100 (standard)
Temperature compensation		
• internal temperature compensation	Yes	Yes
• external temperature compensation with Pt100	Yes	Yes
Analog outputs		
Number of analg outputs	4	
cable length, shielded, max.	200 m; 50m at 80 mV and thermocouples	
Voltage output, Short-circuit protection	Yes	
Voltage output, short-circuit current, max..	25 mA	
Current output, no-load voltage, max.	18 V	

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Output ranges, voltage		
• 0 to 10 V	Yes	
• -10 to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA	Yes	
• 4 to 20 mA	Yes	
Connection of actuators		
• for voltage output 2-conductor connection	Yes	
• for current output 2-conductor connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 milliH	
Analog value creation		
Measurement principle	integrating	integrating
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	14 Bit	14 Bit
• Conversion time (per channel)	100 ms; at 50/60 Hz	100 ms; at 50/60 Hz
Settling time		
• for resistive load	0.2 ms	0.1 ms
• for capacitive load	3.3 ms	3.3 ms
• for inductive load	0.5 ms	0.5 ms
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Connectable encoders		
• 2-wire BEROS	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1.5 mA	1.5 mA

Technical specifications (continued)

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Errors/accuracies		
Linearity error (relative to input area)	+/- 0.05 %	+/- 0.05 %
Temperature error (relative to input areas)	+/- 0.005 %/K	+/- 0.005 %/K
Linearity error (relative to output area)	+/- 0.05 %	
Temperature error (relative to output area)	+/- 0.02 %/K	
Operational limit in overall temperature range		
• Voltage, relative to input area	+/- 0.6 %; +/-0.6 to +/-0.7%	+/- 0.06 %; +/-0.06 to +/-0.7%
• Current, relative to input area	+/- 0.6 %; +/-0.6 to +/-0.7%	+/- 0.06 %; +/-0.06 to +/-0.7%
• Resistance-type thermometer, relative to input area	+/- 0.6 %; +/-0.6 to +/-0.7%	+/- 0.06 %; +/-0.06 to +/-0.7%
• Voltage, relative to output area	+/- 0.5 %	
• Current, relative to output area	+/- 0.6 %	
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input area	+/- 0.04 %; +/-0.04 to +/-0.5%	+/- 0.04 %; +/-0.04 to +/-0.5%
• Current, relative to input area	+/- 0.04 %; +/-0.04 to +/-0.5%	+/- 0.04 %; +/-0.04 to +/-0.5%
• Resistance-type thermometer, relative to input area	+/- 0.04 %; +/-0.04 to +/-0.5%	+/- 0.04 %; +/-0.04 to +/-0.5%
• Voltage, relative to output area	+/- 0.4 %	
• Current, relative to output area	+/- 0.5 %	
Interference voltage suppression for f = n x (fl +/- 1 %), fl = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 db	40 db
• common mode voltage (USS < 2.5 V) , min.	70 db	70 db

	6ES7 355-2CH00-0AE0	6ES7 355-2SH00-0AE0
Control technology		
Number of closed loop controllers	4	4
Status information/alarms/ diagnostics		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Isolation		
Isolation checked with	500 V DC	500 V DC
Isolation		
Isolation, controller		
• between the channels	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
Permissible potential difference		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75 V DC / 60 V AC	75 V DC / 60 V AC
Dimensions		
Dimensions		
• Width	80 mm	80 mm
• Height	125 mm	125 mm
• Depth	120 mm	120 mm
Weights		
• Weight, approx.	470 g	470 g

FM 355-2 temperature controller module

Ordering Data

	Order No.
FM 355-2 C temperature controller module with 4 analog outputs for 4 continuous-action controllers	**6ES7 355-2CH00-0AE0**
FM 355-2 S temperature controller module with 8 digital outputs for 4 step or pulse controllers	**6ES7 355-2SH00-0AE0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7 392-1AJ00-0AA0**
• 100 units	**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7 392-1BJ00-0AA0**
• 100 units	**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect	
1 unit	**6ES7 392-1CJ00-0AA0**
Bus connectors 1 unit (spare part)	**6ES7 390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7 392-2XX00-0AA0**

		Order No.
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		see under “Accessories“, page 4/233
Slot number label Spare part		**6ES7 912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each		**6ES7 390-5AA00-0AA0**
Terminal elements		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- Interface between a maximum of 3 absolute position encoders (SSI) and the CPU.
- To provide the position-encoder values for subsequent processing in the STEP 7 program.
- Enables the programmable controller's direct response to encoder values in moving systems.

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Further information can be found on the Internet at

http://www.siemens.com/simatic-technology

Technical specifications

	6ES7 338-4BC01-0AB0
Supply voltages	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
from load voltage L+ (without load), max.	10 mA
from backplane bus DC 5 V, max.	160 mA
Power loss, typ.	3 W
Connection point	
required front connectors	20-pin
Digital inputs	
Input voltage	
• for signal "0"	-3 to +5 V
• for signal "1"	11 to 30.2 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
• for standard inputs - at " to "1", min.	300 µs
Cable length	
• cable length, shielded, max.	600 m

	6ES7 338-4BC01-0AB0
Encoder supply	
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Output current, max.	900 mA
Encoder	
Number of connectable encoders, max.	3
Connectable encoders	
• Absolute encoder (SSI)	Yes
• 2-wire BEROS	Yes
Encoder signals, absolute encoder (SSI)	
• cable length, shielded, max.	320 m; 320 m at 125 kHz; 160 m at 250 kHz; 60 m at 500 kHz; 20 m at 1 MHz
Status information/alarms/ diagnostics	
Alarms	
• Diagnostic alarm	Yes
Isolation	
Galvanic isolation	No
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	235 g

SM 338 POS input module

Ordering Data		Order No.
SM 338 POS input module		**6ES7 338-4BC01-0AB0**
For position sensing with 3 SSI encoders		
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors		
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**
Signal cable		
Pre-assembled for SSI absolute encoder 6FX2 001-5, without Sub-D connector, UL/DESINA		**6FX5 002-2CC12-■■■■**
Length code		see FM 351, page 4/140

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

- For connecting up to 4 drives with analog setpoint interface or pulse-direction interface to a motion control
- Operation with isochronous PROFIBUS DP
- Connectable drives:
  - Electrical drives
  - Hydraulic drives
  - Stepper drives
- Can be used with SIMATIC CPU 31xT-2 DP, SIMOTION C230-2, SIMOTION P350, SIMOTION D4x5
- Can also be used with external encoders

Technical specifications

	6ES7 174-0AA00-0AA0
Supply voltages	
Rated value	
• DC 24 V	Yes
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
Current consumption, max.	500 mA
Power loss, typ.	12 W
Connection point	
required front connectors	40-pin
Isochronous mode	
Isochronouos mode	Yes
shortest clock pulse	1.5 ms
Digital inputs	
Number of digital inputs	10
Input voltage	
• for signal "0"	-3 to +5 V
• for signal "1"	15 to 30 V
Input current	
• for signal "0", max. (permissible quiescent current)	3 mA
• for signal "1", typ.	6 mA
Input delay (for rated value of input voltage)	
• for standard inputs	
- at " to "1", min.	15 µs
Cable length	
• cable length, shielded, max.	100 m

	6ES7 174-0AA00-0AA0
Digital outputs	
Number of digital outputs	8
Short-circuit protection of the output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Output voltage	
• Rated value (DC)	24 V; L+
• for signal "1", min.	L+ (-3 V)
• for signal "1" (DC), max.	24 V; max. value is equal to feed L+
Output current	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	500 mA
• for signal "0" residual current, max.	0.4 mA
Output delay with resistive load	
• "0" to "1", max.	500 µs
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	1 Hz
• cable length, shielded, max.	600 m
Relay outputs	
Number of relay outputs	5
Number of operating cycles	500 000
Switching capacity of the contacts	
• with resistive load, max.	1 A
Analog outputs	
Number of analg outputs	4
Output ranges, voltage	
• -10 to +10 V	Yes

IM 174 PROFIBUS module

Technical specifications (continued)

	6ES7 174-0AA00-0AA0
Analog value creation	
Integration and conversion time/resolution per channel	
• Resolution with overload area (bit including sign), max.	15 Bit
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	1.2 A
24 V encoder supply	
• 24 V	Yes
• Output current, max.	1.4 A
Absolute encoder (SSI) encoder supply	
• Absolute encoder (SSI)	Yes
• Short-circuit protection	Yes
Encoder	
Number of connectable encoders, max.	4
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
• cable length, shielded, max.	35 m; 35 m at max. 500 kHz; 10 m at max. 1 MHz
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CLS, notCLS
• Telegram length	13, 21, 25 bit
• Clock frequency, max.	3 MHz; 187.5 KHz to 3.0 MHz (parameterizable)
• Gray code	1
• cable length, shielded, max.	250 m; 250 m at 187.5 kHz; 10 m at 1.5 MHz

	6ES7 174-0AA00-0AA0
Number of drive interfaces	4
Analog drive	
• Setpoint signal	
- Short circuit proof	Yes; max. 45 mA, min. 3.3 kOhm load impedance
- Range of rated voltage	-10 to +10 V
- Output current	-3 to +3 mA
• Output controller release	
- Number of relay contacts	4
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V· A
- Number of switching cycles, min.	500 000; at 30 V DC, 1 A
- Cable length (shielded), max.	35 m
Signal output I	
• Output ready signal	
- Number of relay contacts	1
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V· A
- Number of switching cycles, min.	500 000; at 30 V DC, 1 A
- Cable length (shielded), max.	35 m
Signal output II	
• Differential output voltage, min.	2 V; R = 100 Ohm
• Differential output voltage for signal "1", min.	3.7 V; 3.7 V at I = -20 mA; 4.5 V at I = -100 µA,
• Differential output voltage for signal "0", max.	1 V; if I = -20 mA
• Load resistance, min.	55 Ω
• Output current, max.	60 mA
Signal output III	
• Pulse frequency	750 kHz
• Cable length (shielded), max.	50 m; in hybrid operation with analog axes 35 m, in asymmetrical transmission 10 m

Technical specifications (continued)

	6ES7 174-0AA00-0AA0
Isolation	
Galvanic isolation, digital inputs	
• galvanic isolation, digital inputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
Isolation, digital outputs	
• Galvanic isolation, digital outputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
Dimensions	
Dimensions	
• Width	160 mm
• Height	125 mm
• Depth	118 mm
Weights	
• Weight, approx.	1 kg

Ordering Data

		Order No.
IM 174 PROFIBUS module	B7	**6ES7 174-0AA00-0AA0**
PROFIBUS module for connecting analog drives and stepper drives to motion controllers		
Setpoint cable		
for the connection between IM 174 and SIMODRIVE 611-A		**6FX2 002-3AD01-■■■■**
for the connection between IM 174 with 3 stepper drives and one SIMODRIVE (end of cable cut off)		**6FX2 002-3AD02-■■■■**
Length code		see FM 351, page 4/140

B7: Subject to export regulations: AL: N and ECCN: EAR99H

SIWAREX U

Overview

SIWAREX U weighing electronics

SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Complete data access is then possible via the SIMATIC.

Technical specifications

	SIWAREX U
Integration in automation systems:	
• S7-300	Direct integration
• S7-400 (H)	Via ET 200M
• PCS 7 (H)	Via ET 200M
• C7	Via IM or ET 200M
• Automation systems from other vendors	Via ET 200M
Stand-alone (without SIMATIC CPU)	Possible with IM 153-1
Communication interfaces	• SIMATIC S7 (P bus) • RS 232 • TTY
Connection of remote displays (through TTY serial interface)	Gross, channel 1, 2 or default value 1, 2
Adjustment of scales settings	over SIMATIC (P bus) or PC using SIWATOOL U (RS 232)
Measuring properties	
• Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
• Internal resolution ADC Data format of weight values	65535 2 byte (fixed-point)
Number of measurements/second	50
Digital filter	0.05 - 5 Hz (in 7 steps), mean-value filter
Weighing functions	
• Weight values	Gross
• Limit values	2 (min./max.)
• Zero setting function	Per command
Load cells	Strain gages in 4-wire or 6-wire system

	SIWAREX U
Load cell powering	
• Supply voltage U_s (rated value)	6 V DC[1]
• Max. supply current	≤150 mA per channel
• Permissible load impedance	
- R_{Lmin}	> 40 Ω per channel
- R_{Lmax}	< 4010 Ω
	With Ex(i) interface:
- R_{Lmin}	> 87 Ω per channel
- R_{Lmax}	< 4010 Ω
Permissible load cell characteristic	Up to 4 mV/V
Max. distance of load cells	500 m[2] 150/500 m for gas group IIC 500 m[2] for gas group IIB (see SIWAREX IS Manual)
Intrinsically-safe load cell powering	Optional (Ex interface) with SIWAREX IS
Supply voltage 24 V DC	
• Rated voltage	24 V DC
• Max. current consumption	150 mA (single-channel) / 240 mA (two-channel)
Voltage supply from backplane bus	≤100 mA
Certification	ATEX 95, FM, cUL_{US} Haz. Loc.
IP degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ to $T_{max\ (IND)}$) (operating temperature)	
• Vertical installation	0 ... +60 °C
• Horizontal installation	0 ... +40 °C
EMC requirements according to	NAMUR NE21, Part 1 EN 61326

1) Supply of load cells compared to 7MH4601-1AA01 or. ... 1BA01 changed to 6 V DC.

2) Up to 1000 m possible under certain conditions, provided the recommended cable is used (see Accessories).

Ordering Data

		Order No.
SIWAREX U for SIMATIC S7 and ET 200M, incl. bus connector, weight 0.3 kg		
• Single-channel version[1] for connecting one scale	B7	**7MH4 950-1AA01**
• Two-channel version[2] for connecting two scales	B7	**7MH4 950-2AA01**
SIWAREX U Manual • available in a range of languages Free download on the Internet at: www.siemens.com/weighing-technology		
SIWAREX U configuration package[3] for SIMATIC S7 version 5.4 or higher on CD-ROM • PC SIWATOOL U software (available in a range of languages), new design • Sample program "Getting started" – ready to use application for SIMATIC S7 • SIWAREX U Manual on CD (in a range of languages), new design • HSP Hardware Support Package for integrating SIWAREX U in STEP 7		**7MH4 950-1AK01**
SIWAREX U configuration package for PCS 7, version 6.x in German and English on CD-ROM, module for the CFC and faceplate		**7MH4 683-3BA64**
SIWATOOL cable from SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), 3 m long	B7	**7MH4 607-8CA**
Installation material (mandatory)		
20-pin front plug with screw contacts (required for each SIWAREX module)		**6ES7 392-1AJ00-0AA0**
Shield contact element Sufficient for two SIWAREX U modules		**6ES7 390-5AA00-0AA0**
Shield connection terminal Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface		**6ES7 390-5CA00-0AA0**

1) compatible with 7MH4601-1AA01; supply of load cells changed to 6 V DC.

2) compatible with 7MH4601-1BA01; supply of load cells changed to 6 V DC.

	Order No.
S7 DIN rail	
• 160 mm	**6ES7 390-1AB60-0AA0**
• 480 mm	**6ES7 390-1AE80-0AA0**
• 530 mm	**6ES7 390-1AF30-0AA0**
• 830 mm	**6ES7 390-1AJ30-0AA0**
• 2000 mm	**6ES7 390-1BC00-0AA0**
Accessories (optional)	
PS 307 load power supplies (only required if 24 V DC not available) 120/230 V AC; 24 V DC, incl. power connector	
PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**
Labeling strips (10 units, spare part)	**6ES7 392-2XX00-0AA0**
Remote displays (option) The digital remote displays can be connected directly to SIWAREX U through a TTY interface. The following remote displays can be used: S102, S302 Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: http://www.siebert.de Detailed information available from manufacturer.	
SIWAREX JB junction box, aluminium housing for connecting up to 4 load cells in parallel, and for connecting several junction boxes	**7MH4 710-1BA**
SIWAREX JB junction box, stainless steel housing for connecting up to 4 load cells in parallel	**7MH4 710-1EA**
Ex interface, type SIWAREX Pi With UL and FM approvals, but **without ATEX approval** for intrinsically-safe connection of load cells, suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules. Not approved for use in the EU.	**7MH4 710-5AA**
Manual for Ex interface type SIWAREX Pi	**C71000-T5974-C29**

3) replaces 7MH4683-3AA63

B7: Subject to export regulations: AL: N and ECCN: EAR99H

SIWAREX U

Ordering Data	Order No.
SIWAREX IS Ex interface With ATEX approval, but **without UL and FM approvals**, for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.	
• With short-circuit current < 199 mA DC	**7MH4 710-5BA**
• With short-circuit current < 137 mA DC	**7MH4 710-5CA**

		Order No.
Cable (optional)		
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	B7	**7MH4 407-8BD0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

SIWAREX FTA weighing module

The SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used for automatic and non-automatic weighing, e.g. for the production of mixtures, filling, loading, monitoring and bagging.

It has been assigned appropriate scale approvals and is also suitable for calibration plants.

The SIWAREX FTA function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

Technical specifications

	SIWAREX FTA
Use in automation systems	
• S7-300	Directly or via ET 200M
• S7-400 (H)	Via ET 200M
• PCS 7 (H)	Via ET 200M
Communication interfaces	
• S7	Through backplane bus
• RS 232	For SIWATOOL or printer connection
• RS 485	For remote display or digital load cell
Module parameterization	Using SIMATIC S7 Using SIWATOOL FTA software (RS 232)
Measuring properties	
• EU type approval as non-automatic weighing machine, trade class III	3 x 6000 d ≥ 0.5 µV/e
• Internal resolution	16 million parts
• Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
Weighing functions	
• Non-automatic weighing machine	OIML R76
• Automatic weighing machine	OIML R51, R61, R107
Load cells	Strain gages in 4-wire or 6-wire system
• 3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
• Supply voltage U_S (rated value)	10.3 V DC
• Max. supply current	184 mA
• Permissible load cell resistance	
- R_{Lmin}	> 56 Ω > 87 Ω with Ex interface
- R_{Lmax}	≤4010 Ω

	SIWAREX FTA
Max. distance of load cells	
When using the recommended cable:	
• Standard	1000 m (500 m legal-for-trade)
• In hazardous area[1)]	
- For gases of group IIC	300 m
- For gases of group IIB	1000 m
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL_{US} Haz. Loc.
Power supply	
• Rated voltage	24 V DC
• Max. current consumption	500 mA
• Current consumption from backplane bus	Typ. 55 mA
Inputs/outputs	
• Digital inputs	7 DI electrically isolated
• Digital outputs	8 DO electrically isolated
• Counter input	Up to 10 kHz
• Analog output	
- Current range	0/4 ... 20 mA
- Updating rate	100 Hz
Approvals	EU type approval (CE, OIML R76) EU prototype test to MID (OIML R51, R61, R107)
Degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)} \cdots T_{max\ (IND)}$ (operating temperature)	
• Vertical installation	-10 ... 60 °C
• Horizontal installation	-10 ... 40 °C
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions in mm	80 x 125 x 130
Weight	600 g

1) For further details, see Ex interface, type SIWAREX IS

SIWAREX FTA

Ordering Data	Order No.
SIWAREX FTA Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: proportioning, filling, bagging, loading. Note: Observe approval conditions for applications with obligation of verification. We recommend using our calibration set and contacting our SIWAREX hotline.	**7MH4 900-2AA01**
SIWAREX FTA Manual • available in a range of languages Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTA "Getting started" Sample software shows beginners how to program the scales in STEP 7. Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTA configuration package for SIMATIC S7 on CD-ROM • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • SIWAREX FTA "Getting started" • SIWATOOL FTA commissioning software • Flexible software for legal-for-trade display in WinCC • Manual	**7MH4 900-2AK01**
SIWAREX FTA configuration package for PCS 7 V6.x on CD-ROM • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • SIWATOOL FTA commissioning software • Manual	**7MH4 900-2AK61**
SIWAREX FTA configuration package for PCS 7 V7.0 on CD-ROM • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • SIWATOOL FTA commissioning software • Manual	**7MH4 900-2AK62**

	Order No.
Calibration set for SIWAREX FTA For verification of up to 5 scales comprising: • 3 x inscription foil for labeling • 1 x protection foil • 10 x EU verification marks (black M on green background) • Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on CD-ROM	**7MH4 900-2AY10**
SIWAREX Multiscale STEP 7 software for SIWAREX FTA. Control of one or more scales for a scalable number of components and any number of recipes. Applications: batching plants, mixers in production process, CD-ROM	**7MH4 900-2AL01**
SIWAREX Multifill STEP 7 software for SIWAREX FTA. Control of filling and bagging processes for one or more filling stations and any number of materials, CD-ROM	**7MH4 900-2AM01**
SIWATOOL cable from SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232)	
• 2 m long	**7MH4 702-8CA**
• 5 m long	**7MH4 702-8CB**
40-pin front plug with screw contacts (required for each SIWAREX module), alternatively with spring-loaded contacts	**6ES7 392-1AM00-0AA0**
40-pin front plug with spring-loaded contacts (required for each SIWAREX module), alternatively with screw contacts	**6ES7 392-1BM01-0AA0**
Shield contact element Sufficient for one SIWAREX FTA module	**6ES7 390-5AA00-0AA0**
Shield connection terminal Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7 390-5CA00-0AA0**

Ordering Data	Order No.
S7 DIN rail	
• 160 mm	**6ES7 390-1AB60-0AA0**
• 480 mm	**6ES7 390-1AE80-0AA0**
• 530 mm	**6ES7 390-1AF30-0AA0**
• 830 mm	**6ES7 390-1AJ30-0AA0**
• 2000 mm	**6ES7 390-1BC00-0AA0**
PS 307 load power supply (only required if DC 24 V is not available) 120/230 V AC; 24 V DC	
• PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
• PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
• PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**
MMC memory for data recording up to 16 MB	**6ES7 953-8LG11-0AA0**
Remote display (optional) The Siebert S102 and S302 remote digital display can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: http://www.siebert.de Detailed information available from manufacturer.	
SIWAREX JB junction box, aluminium housing for connecting up to 4 load cells in parallel, and for connecting several junction boxes	**7MH4 710-1BA**
SIWAREX JB junction box, stainless steel housing for connecting up to 4 load cells in parallel	**7MH4 710-1EA**
Ex interface, type SIWAREX Pi With UL and FM approvals, but **without ATEX approval** for intrinsically-safe connection of load cells, suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules. Not approved for use in the EU.	**7MH4 710-5AA**
Manual for Ex interface type SIWAREX Pi	**C71000-T5974-C29**
Ex interface, type SIWAREX IS With ATEX approval, but **without UL and FM approvals** for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.	
• With short-circuit current < 199 mA DC	**7MH4 710-5BA**
• With short-circuit current < 137 mA DC	**7MH4 710-5CA**

		Order No.
Cable (optional)		
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 ... +80 °C		**7MH4 702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	B7	**7MH4 407-8BD0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

SIWAREX FTC

Overview

SIWAREX FTC weighing module

The SIWAREX FTC (Flexible Technology for Continuous Weighing) is a versatile and flexible weighing module for conveyor scales, loss-in-weigh scales and bulk flow meters. It can also be used to record weights and measure force. The SIWAREX FTC function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

Technical specifications

	SIWAREX FTC
Use in automation systems	
• S7-300	Directly or via ET 200M
• S7-400 (H)	Via ET 200M
• PCS 7 (H)	Via ET 200M
Communication interfaces	
• S7	Through backplane bus
• RS 232	For SIWATOOL or printer connection
• RS 485	For remote display or digital load cell
Module parameterization	Using SIMATIC S7 Using SIWATOOL FTC software (RS 232)
Measuring properties	
• Accuracy to EN 45501	3 x 6000 d ≥ 0.5 µV/e
• Internal resolution	+/- 8 million parts
• Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
Weighing functions	
• Non-automatic weighing machine, force measurement	
• Conveyor scale	
• Differential proportioning weigher	
• Bulk flow meter	
Load cells	Strain gages in 4-wire or 6-wire system
• 3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
• Supply voltage U_S (rated value)	10.3 V DC
• Max. supply current	184 mA
• Permissible load cell resistance	
- R_{Lmin}	> 56 Ω > 87 Ω with Ex interface
- R_{Lmax}	≤4010 Ω

	SIWAREX FTC
Max. distance of load cells	
When using the recommended cable:	
• Standard	1000 m
• In hazardous area[1)]	
- For gases of group IIC	300 m
- For gases of group IIB	1000 m
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL_{US} Haz. Loc.
Power supply	
• Rated voltage	24 V DC
• Max. current consumption	500 mA
• Current consumption from backplane bus	Typ. 55 mA
Inputs/outputs	
• Digital inputs	7 DI electrically isolated
• Digital outputs	8 DO electrically isolated
• Counter input	Up to 10 kHz
• Analog output	
- Current range	0/4 ... 20 mA
- Updating rate	100 Hz
Degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ ... $T_{max\ (IND)}$ (operating temperature)	
• Vertical installation	-10 ... 60 °C
• Horizontal installation	-10 ... 40 °C
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions in mm	80 x 125 x 130
Weight	600 g

1) For further details, see Ex interface, type SIWAREX IS

Ordering Data	Order No.
SIWAREX FTC Weighing electronics for S7-300 and ET 200M. Applications: Conveyor scales, force measurement, differential proportioning weighters and bulk flow meters	**7MH4 900-3AA01**
SIWAREX FTC_B Manual for conveyor scales • Available in a range of languages Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTC_L Manual for bulk flow meters and differential proportioning weighers • Available in a range of languages Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for conveyor scales Sample software shows beginners how to program the scales in STEP 7 for conveyor scale mode Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for bulk flow meters Sample software shows beginners how to program the scales in STEP 7 for bulk flow meter mode Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for differential proportioning weighers Sample software shows beginners how to program the scales in STEP 7 for differential proportioning weigher mode Free download from the Internet at: www.siemens.com/weighing-technology	
SIWAREX FTC_B configuration package for SIMATIC S7 on CD-ROM (conveyor scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • "Getting started" for conveyor scales • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	**7MH4 900-3AK01**

	Order No.
SIWAREX FTC_B configuration package for SIMATIC S7 on CD-ROM (conveyor scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • "Getting started" for conveyor scales • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	**7MH4 900-3AK02**
SIWAREX FTC_B configuration package for PCS 7 V6.x on CD-ROM (conveyor scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	**7MH4 900-3AK61**
SIWAREX FTC_B configuration package for PCS 7 V7.0 on CD-ROM (conveyor scale) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	**7MH4 900-3AK63**
SIWAREX FTC_L configuration package for PCS 7 V6.x on CD-ROM (loss-in-weight feeder) • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Commissioning software SIWATOOL FTC_L for bulk flow meters and loss-in-weight feeders • Manual	**7MH4 900-3AK62**
SIWATOOL cable from SIWAREX FTC with serial PC interface, for 9-pin PC interfaces (RS 232)	
• 2 m long	**7MH4 702-8CA**
• 5 m long	**7MH4 702-8CB**
40-pin front plug with screw contacts (required for each SIWAREX module), alternatively with spring-loaded contacts	**6ES7 392-1AM00-0AA0**
40-pin front plug with spring-loaded contacts (required for each SIWAREX module), alternatively with screw contacts	**6ES7 392-1BM01-0AA0**

SIWAREX FTC

Ordering Data	Order No.
Shield contact element Sufficient for one SIWAREX FTC module	**6ES7 390-5AA00-0AA0**
Shield connection terminal Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7 390-5CA00-0AA0**
S7 DIN rail	
• 160 mm	**6ES7 390-1AB60-0AA0**
• 480 mm	**6ES7 390-1AE80-0AA0**
• 530 mm	**6ES7 390-1AF30-0AA0**
• 830 mm	**6ES7 390-1AJ30-0AA0**
• 2000 mm	**6ES7 390-1BC00-0AA0**
PS 307 load power supply (only required if DC 24 V is not available) 120/230 V AC; 24 V DC	
• PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
• PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
• PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**
MMC memory for data recording up to 16 MB	**6ES7 953-8LG11-0AA0**
Remote display (optional) The Siebert S102 and S302 remote digital display can be directly connected to the SIWAREX FTC via an RS 485 interface. (not suitable for mode "Conveyor scale") Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: http://www.siebert.de Detailed information available from manufacturer.	
SIWAREX JB junction box, aluminium housing for connecting up to 4 load cells in parallel, and for connecting several junction boxes	**7MH4 710-1BA**
SIWAREX JB junction box, stainless steel housing for connecting up to 4 load cells in parallel	**7MH4 710-1EA**
Ex interface, type SIWAREX Pi With UL and FM approvals, but **without ATEX approval** for intrinsically-safe connection of load cells, suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules. Not approved for use in the EU.	**7MH4 710-5AA**
Manual for Ex interface type SIWAREX Pi	**C71000-T5974-C29**

Ordering Data		Order No.
Ex interface, type SIWAREX IS With ATEX approval, but **without UL and FM approvals** for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.		
• With short-circuit current < 199 mA DC		**7MH4 710-5BA**
• With short-circuit current < 137 mA DC		**7MH4 710-5CA**
Cable (optional)		
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 ... +80 °C		**7MH4 702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	B7	**7MH4 407-8BD0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

SIWAREX M is a legal-for-trade weighing module for exact weighing and proportioning, and can be used in SIMATIC automation systems without problem. The module controls the proportioning of individual setpoints independent of the cycle time of the automation system, and therefore achieves a high proportioning accuracy.

Technical specifications

	SIWAREX M
Main applications	• Platform scales • Fill level (containers/bins) • Proportioning and batching scales • Legal-for-trade scales
Intrinsically-safe load cell powering	Optional (Ex-I)
Stand-alone (without SIMATIC)	Yes
Integration in:	
• S7-300	Direct integration
• S7-400	Via ET 200M
• PCS 7	Via ET 200M
• C7	Via IM or ET 200M
• TELEPERM M (AS 388/488/TM)	Via ET 200M
Communication interfaces	SIMATIC S7 (P bus) RS 232, TTY
Process interfaces	
• Digital inputs	3 (assignable)
• Digital outputs	4 (assignable)
• Analog output/analog input	Yes / No
Remote display connection (via serial interface)	Yes (legal-for-trade) Gross/net/setpoint Remote display with operator control
Printer connection	Yes (legal-for-trade)
Measuring properties	
• EU type approval for medium accuracy weighing machines Class III (certified as legal-for-trade)	6000 d
• Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.01 %
• n_{ind} in acc. with EN 45501	6000
• Min. measuring signal Δu_{min} per d	0.5 µV
• Internal resolution	±524288
• Data format for weight values	4 byte (fixed-point)

	SIWAREX M
Number of measurements/second	50
Filter	Exponent filter: 0.05 ... 5 Hz Mean-value filter
Weighing functions	
• Weight values	Gross/net/tare
• Limit values	4 (min./max./empty/overfill)
• Scale standstill	Yes
• Zero setting function	Via command or automatically
Proportioning functions	• Control of coarse/fine flow valves • Tolerance monitoring • Material flow monitoring • Autom. proportioning optimization • Autom. reproportioning • Inching mode
Module parameterization	Via SIMATIC S7/C7 or SIWATOOL M PC parameterization software
UL/CSA/FM certification	Yes
IP degree of protection to DIN EN 60529; IEC 60529	In S7 frame: IP20 Stand-alone: IP10
Load cell powering	
• Supply voltage U_s (rated value)	10.2 V DC
• Max. supply current	≤180 mA
• Permissible load resistance:	
- R_{Lmin}	> 60 Ω
- R_{Lmax}	< 4010 Ω
	With Ex(i) interface:
- R_{Lmin}	> 87 Ω
- R_{Lmax}	< 4010 Ω
Permissible load cell characteristic	Up to 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-41.5 ... 41.5 mV

SIWAREX M

Technical specifications

	SIWAREX M
Max. distance of load cells	1000 m (300 m in Ex area[1])
Supply voltage 24 V DC	
• Rated voltage	24 V DC
• Max. current consumption	300 mA
Voltage supply from backplane bus	typ. 50 mA
Serial port 1	RS 232:
• Baud rate	2400/9600 baud
• Parity	Even/odd
• No. of data bits/stop bits	8/1
• Signal level	In acc. with EIA-RS 232
• Protocols	SIWAREX protocol 3964R XON/XOFF (printer)[2]
Serial port 2	TTY:
• Baud rate	9600 baud
• Parity	straight
• No. of data bits/stop bits	8/1
• Signal level	Active/passive (floating)
• Protocols	Remote display protocol SIWAREX protocol 3964R

	SIWAREX M
Binary inputs	Number: 3 Rated voltage: 24 V Switching frequency: 10 Hz
Binary outputs	Number: 4 (digital) Rated voltage: 24 V Rated current: 0.5 A Total max.: 1 A Electrical isolation: 500 V
Analog output	
• Output range	0/4 ... 20 mA
• Total error at 25 °C	0.15 %
• Updating rate	Approx. 350 ms
• Resolution	16 bits (0 ... 20 mA)
• Burden including line resistance	≤600 Ω
Climatic requirements	
$T_{min(IND)} \cdots T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +60 °C
• Horizontal installation/certified legal-for-trade	-10 ... +40 °C
MTBF (SN 29500)	172000 h at +40 °C

1) Up to 1000 m, depending on the gas group.

2) Serial printer, ANSI-, EPSON-, IBM-compatible

Ordering Data

	Order No.
SIWAREX M Medium accuracy weighing machine Class III, 6000 d, for the SIMATIC S7 and ET 200M, incl. bus connector, weight 0.6 kg Note: Observe approval conditions for applications with obligation of verification. We recommend that you contact the SIWAREX hotline.	**7MH4 553-1AA41**
SIWAREX M Manual • available in a range of languages Free download on the Internet at: www.siemens.com/weighing-technology	
SIWAREX M configuration package for SIMATIC S7 version 5.1 or higher available in German and English on CD-ROM • SIWATOOL PC parameterization software • SIMATIC S7 function blocks • SIWAREX M Manual on CD • Setup for incorporation of SIWAREX M into STEP 7	**7MH4 583-3FA63**
SIWAREX M configuration package for PCS 7, version 5.2 available in German and English on CD-ROM Block for the CFC and faceplate	**7MH4 583-3EA63**
SIWAREX M configuration package for PCS 7, version 6.x available in German and English on CD-ROM Block for the CFC and faceplate	**7MH4 583-3EA64**
SIWAREX Batch Recipe control for proportioning processes with SIWAREX M modules • STEP 7 program for SIMATIC S7 (CPU 314 or better) • Example programs for GUI for OP7 and OP27 (configuration with ProTool) • Documentation in German and English	**7MH4 553-4GS01**

Ordering Data	Order No.
SIWAREX Batch secondary license	**7MH4 583-4KL01**
Connection of SIWAREX M to serial PC interface	
for 9-pin PC interface	
• 2 m long	**7MH4 702-8CA**
• 5 m long	**7MH4 702-8CB**
Installation material (mandatory)	
Front connector for SIWAREX M	
20-pin, with screw contacts (required for each SIWAREX module)	**6ES7 392-1AJ00-0AA0**
Shield contact element	**6ES7 390-5AA00-0AA0**
One shield contact element is sufficient for one SIWAREX M module	
Shield connection terminal	**6ES7 390-5CA00-0AA0**
Contents: 2 units (suitable for 1 cable with diameter 4 ... 13 mm)	
Note:	
one shield connection terminal is required each for the	
• Scale connection	
• TTY interface	
• RS 232 interface	
• Analog output	
• Digital inputs/outputs	
S7 DIN rail	
• 160 mm	**6ES7 390-1AB60-0AA0**
• 480 mm	**6ES7 390-1AE80-0AA0**
• 530 mm	**6ES7 390-1AF30-0AA0**
• 830 mm	**6ES7 390-1AJ30-0AA0**
• 2000 mm	**6ES7 390-1BC00-0AA0**
Accessories (optional)	
PS 307 load power supplies	
120/230 V AC; 24 V DC, incl. power connector	
PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**
Labeling strips	**6ES7 392-2XX00-0AA0**
(10 units, spare part)	
Cable LiYCY 4 x 2 x 0.25 mm² B7	**7MH4 407-8BD0**
for TTY or RS 232 interface	

	Order No.
Remote displays (option)	
Remote displays	
The digital remote displays can be connected directly to SIWAREX M through a TTY interface.	
The following remote displays can be used:	
S102 and S302	
Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: http://www.siebert.de	
Detailed information available from manufacturer.	
Accessories for remote displays	
Legal-for-trade memory	
The OmniScale legal-for-trade memory can be connected to the SIWAREX M instead of the printer.	
There are 2 device versions:	
• for mounting rails - Horizontal, part number 522 201 - Vertical, part number 522 202	
CSM GmbH Raiffeisenstr. 34 D-70794 Filderstadt Tel.: 0711/77964-20 Fax: 0711/77964-40 Internet: http://www.csm.de	
Detailed information available from manufacturer.	
Printers (optional)	
T 2240/24 printer	**6GF6 520-1LM**
Needle matrix printer, 24 needles, DIN A4 and continuous form	
Note:	
An RS 232 interface must also be ordered separately.	
RS 232 interface for T 2240/24	**6GF6 520-2HA**
See Catalog KT61 for further printers	
Printer accessories	
Connection of SIWAREX M to serial printer interface (RS 232, 25-pin)	
• 5 m long	**7MH4 702-8CH**
• 10 m long	**7MH4 702-8CK**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

4

SIWAREX M

Ordering Data	Order No.
Accessories for SIWAREX M	
SIWAREX JB junction box, aluminium housing for connecting up to 4 load cells in parallel, and for connecting several junction boxes	**7MH4 710-1BA**
SIWAREX JB junction box, stainless steel housing for connecting up to 4 load cells in parallel	**7MH4 710-1EA**
Ex interface, type SIWAREX Pi With UL and FM approvals, but **without ATEX approval**, for intrinsically-safe connection of load cells, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Not approved for use in the EU.	**7MH4 710-5AA**
Manual for Ex interface type SIWAREX Pi	**C71000-T5974-C29**
SIWAREX IS Ex interface With ATEX approval, but **without UL and FM approvals**, for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU.	
• With short-circuit current < 199 mA DC	**7MH4 710-5BA**
• With short-circuit current < 137 mA DC	**7MH4 710-5CA**

		Order No.
Cable (optional)		
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C		**7MH4 702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	B7	**7MH4 407-8BD0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Overview

SIFLOW FC070 is based on the latest developments within the digital processing technology – engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain

SIFLOW FC070 is available in two versions:

- SIFLOW FC070 Standard
- SIFLOW FC070 Ex

The SIFLOW FC070 transmitter delivers true multi-parameter measurements i.e. mass flow, volume flow, density, temperature and fraction.

SIFLOW FC070 is designed for integration in a variety of automation systems, i.e.

- Central mounted in S7-300, C7
- Decentralized in ET 200M for use with S7-300 and S7-400 as PROFIBUS DP masters
- Decentralized in ET 200M for use with any automation system using standardized PROFIBUS DP masters
- Stand-alone via a MODBUS RTU master, i.e. SIMATIC PDM

The SIFLOW FC070 transmitter can be connected to all sensors of types MASS 2100, MC2 and FC300.

Technical specifications

SIFLOW FC070	
Measurement of	Mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in %
Measurement functions	
• Totalizer 1	Totalization of mass flow, volume flow, fraction A, fraction B
• Totalizer 2	Totalization of Mass flow, VolumeFlow, Fraction A, Fraction B
• Single and 2-stage Batch function	Batching function with the use of one or two outputs for dosing in high and low speed
• 4 programmable limits	4 programmable high/low limits for mass flow, volume flow density, sensor temperature, fraction A flow, fraction B flow, fraction A in %. Limits will generate an alarm if reached.

SIFLOW FC070	
Digital input	
Functions	Start batch, stop batch, start/stop batch, hold/continue batch, reset totalizer 1, reset totalizer 2, reset totalizer 1 and 2, zero adjust, force frequency output, freeze frequency output
High signal	• Nominal voltage: 24 V DC • Lower limit: 15 V DC • Upper limit: 30 V DC • Current: 2 ... 15 mA
Low signal	• Nominal voltage: 0 V DC • Lower limit: -3 V DC • Upper limit: 5 V DC • Current: -15 ... 15 mA
Input	Approx. 10 KΩ
Switching	Max. 100 Hz
Digital output 1 and 2	
Functions	• Output 1: Pulse, frequency, quadrature pulse, quadrature frequency 2-stage batch, batch • Output 2: Quadrature pulse, quadrature frequency, 2-stage batch
Voltage supply	3 ... 30 V DC (passive output)
Switching current	Max. 30 mA at 30 V DC
Voltage drop	≤3 V DC at max. current
Leakage current	≤0.4 mA at max. voltage 30 V DC
Load resistance	1 KΩ to 10 KΩ
Switching frequency	0 ... 12 KHz 50 % duty cycle
Functions	Pulse, frequency, quadrature pulse, quadrature frequency 2-stage batch, batch
Communication	
MODBUS RS 232C	• Max. baudrate: 115.200 baud • Max. line length: 15 m at 115.200 baud • Signal level: according to EIA-RS 232C
MODBUS RS 485	• Max. baudrate: 115.200 baud • Max. line length: 1200 m at 115.200 baud • Signal level: according to EIA-RS 485 • Bus termination: Integrated. Can be enabled by inserting wire jumpers.
Galvanic isolation	All inputs, outputs and communication interfaces are galvanically isolated. Isolation voltage: 500 V
Power	
Supply	24 V DC nominal
Tolerance	20.4 V DC ... 28.8 V DC
Consumption	Max. 6 W
Fuse	T1A / 125 V, not to be changed by user

SIFLOW FC070

Technical specifications (continued)

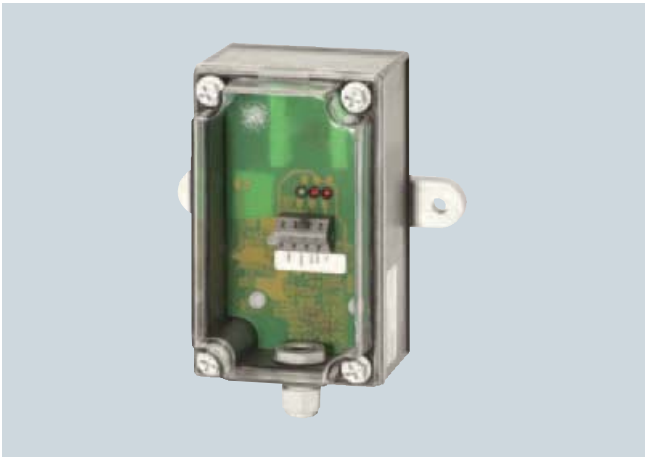
SIFLOW FC070	
Environment	
Ambient temperature	• Storage -40 °C ... +70 °C (-40 ... +158 °F) • Operation 0 °C ... +60 °C (32 ... 140 °F)
Operation conditions	Horizontally mounted rail. For vertically mounted rail, the maximum operating temperature is +45°C (+113 °F).
Altitude	• Operation: -1000 m ... 2000 m (pressure 795 hPa ... 1080 hPa)
Enclosure	
Material	Noryl, color: athracite
Rating	IP20/NEMA 2 according to IEC 60529
Mechanical load	According to SIMATIC standards (S7-300 devices)
Approvals	
• SIFLOW FC070 Standard	CE, cULus, ATEX II 3G EEx nA IIC
• SIFLOW FC070 Ex	CE, cULus, UL Haz.Loc., FM, ATEX II 3 G EEx nA II T4 and II (1) G [EEx ia] IIC
Electromagnetic compatibility	Requirements of EMC law; Noise immunity according to IEC 61000-6-2, tested according to: IEC 61000-4-2, 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6 Emitted interference according to EN 50081-2, tested according to EN 55011, class A, group 1
NAMUR	Within the limits according to "Allgemeine Anforderung" with error criteria A in accordance with NE21
Programming tools	
SIMATIC S7	Configuration trough backplane P-BUS and PLC program
SIMATIC PCS 7	Configuration trough backplane P-BUS and PLC/WinCC faceplates
SIMATIC PDM	Through MODBUS port RS 232C and RS 485

Ordering Data

	Order No.
SIFLOW FC070 flow transmitter Remember to order 40 pin front plug connector.	**7ME4 120-2DH20-0EA0**
40 pin front plug with screw contacts	**6ES7 392-1AM00-0AA0**
SIFLOW FC070 Ex flow transmitter Remember to order 20 pin front plug connector.	**7ME4 120-2DH21-0EA0**
20 pin front plug with screw contacts	**6ES7 392-1AJ00-0AA0**
Accessories	
Cable with multiplug for connecting MASS2100 and FC300 sensors	
• 5 m (16.4 ft)	**FDK-083H3015**
• 10 m (32.8 ft)	**FDK-083H3016**
• 25 m (82 ft)	**FDK-083H3017**
• 50 m (164 ft)	**FDK-083H3018**
• 75 m (246 ft)	**FDK-083H3054**
• 150 m (492 ft)	**FDK-083H3055**
Cable without multiplug for connecting MC2 sensors	
• 5 m (16.4 ft)	**FDK-083H3001**
• 25 m (82 ft)	**FDK-083H3002**
• 75 m (246 ft)	**FDK-083H3003**
• 150 m (492 ft)	**FDK-083H3004**
SIMATIC S7-300 rail The mechanical mounting rack of the SIMATIC S7-300	
• 160 mm (6.3")	**6ES7 390-1AB60-0AA0**
• 482 mm (18.9")	**6ES7 390-1AE80-0AA0**
• 530 mm (20.8")	**6ES7 390-1AF30-0AA0**
• 830 mm (32.7")	**6ES7 390-1AJ30-0AA0**
• 2000 mm (78.7")	**6ES7 390-1BC00-0AA0**
Shield connecting element For mounting on S7-300 rail. 80 mm wide with 2 rows for 4 shield terminal elements each (no shield terminal elements included)	**6ES7 390-5AA00-0AA0**
Shield terminal element for 1 cable with 3 to 8 mm in dia. 2 pieces	**6ES7 390-5BA00-0AA0**
Shield terminal element for 1 cable with 4 to 13 mm in dia. 2 pieces	**6ES7 390-5CA00-0AA0**
SIFLOW FC070 Demo suitcase	**A5E01075465**
Power supply	**6ES7 307-1BA00-0AA0**

SIPLUS DCF 77 radio clock module

Overview



This module can be used to synchronize the real-time clock of the SIMATIC S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC and SIPLUS together with a software driver included in the scope of delivery (function block FB). The function blocks are available on the Internet for downloading.

http://www.siemens.com/siplus – Support – Tools and Downloads!

Technical specifications

	Radio clock module SIPLUS DCF 77
Radio frequency	77.5 Hz
Power supply	24 V DC (20.4 to 28.8 DC)
Power consumption, typ.	50 mA
Dimensions (W x H x D)	75 mm x 125 mm[1] x 75 mm

1) Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

Ordering Data

		Order No.
SIPLUS DCF 77 radio clock module	B7	**6AG1 057-1AA03-0AA0**
For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig		

B7: Subject to export regulations: AL: N and ECCN: EAR99H

4

IQ-Sense sensor module

Overview

- Intelligent 8-channel electronics module for S7-300/ET 200M
- For the connection of up to 8 IQ-Sense sensors:
  - Optoelectronic sensors
  - Ultrasound sensors
- With standard function blocks for the various sensor technologies for simplified handling on a SIMATIC S7
- Conventional sensors cannot be operated.

Technical specifications

	6ES7 338-7XF00-0AB0
Supply voltages	
Load voltage L+	
• Rated value (DC)	24 V
Current consumption	
from load voltage L+ (without load), max.	1 A
from backplane bus DC 5 V, max.	150 mA; typically
Connection point	
required front connectors	20-pin
Digital inputs	
Number of digital inputs	8
Cable length	
• Cable length unshielded, max.	50 m
Encoder	
Connectable encoders	
• Description	photoelectronic proximity switches and ultrasonic sensors with IQ-Sense, cycle time 2.88 to 6 ms
Status information/alarms/ diagnostics	
Diagnostics indication LED	
• Status indicator digital input (green)	Yes
Isolation	
Isolation checked with	500 V DC
Isolation	
Galvanic isolation, digital inputs	
• between the channels	No
• between the channels and the backplane bus	Yes
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
Weight, approx.	250 g

Ordering Data

		Order No.
Sensor module 8x IQ-Sense		**6ES7 338-7XF00-0AB0**
Sensors for connection to the sensor module		
Diffuse sensor		
C40 IQ-Sense design	B6	**3SF7 240-3JQ00**
K80 IQ-Sense design	B6	**3SF7 210-3JQ00**
with background blanking, K80 IQ-Sense design	B6	**3SF7 214-3JQ00**
Retroflective sensor		
C40 IQ-Sense design	B6	**3SF7 241-3JQ00**
K80 IQ-Sense design	B6	**3SF7 211-3JQ00**
Ultrasonic sensor		
M18 IQ-Sense design; range 6 … 30 cm		**3SF6 232-3JA00**
M18 IQ-Sense design; range 15 … 100 cm		**3SF6 233-3JA00**
Front connectors		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		

B3: Subject to export regulations: AL: N and ECCN: 5D992B1
B6: Subject to export regulations: AL: N and ECCN: EAR99
B8: Subject to export regulations: AL: N and ECCN: EAR99S

SIMATIC PXO opto proximity switches with IQ-Sense

Overview

Opto BERO with IQ-Sense, C40 design IQ-Sense

Opto BERO with IQ-Sense, K80 design IQ-Sense

The photoelectric proximity switches react to changes in the received quantity of light. The light beam emitted from the emitter diode is interrupted or reflected by the object to be detected.

These sensors detect all objects regardless of their composition, whether metal, wood or plastic.

Depending on the type of BERO, the interruption or reflection of the light beam is evaluated. The following operating modes are possible with IQ-Sense:

- Diffuse sensors (energetic)
- Diffuse sensor (with background suppression)
- Reflex sensors

Features:

- Designs K80 IQ-Sense and C40 IQ-Sense
- IntelliTeach functionality
- Integrated anti-interference function
- Pre-failure warning (fouling/misalignment)

Technical specifications

Design		C40 design IQ-Sense	K80 design IQ-Sense
Diffuse sensor (energetic)			
Sensing range	m	0.7	2
Standard test object	mm	200 × 200 (white)	
Transmitter (type of light)	nm	Red LED, 660	IR LED, 880
Supply current	mA	50	
Response time	ms	1	
LEDs		Switching status (yellow), surplus light (green)	
Enclosure material		ABS + PBTP	PBTP
Protection		IP67	
Dimensions	mm	40 × 40 × 53	83 × 65 × 25
Diffuse sensor with background suppression			
Sensing range	m	–	0.2 ... 1
Standard test object	mm	–	200 × 200 (white)
Transmitter (type of light)	nm	–	IR-LED, 880
Supply current	mA	–	50
Response time	ms	–	2
LEDs		–	Switching status (yellow), surplus light (green)
Enclosure material		–	PBTP
Protection		–	IP67
Dimensions	mm	–	83 × 65 × 25

Technical specifications (continued)

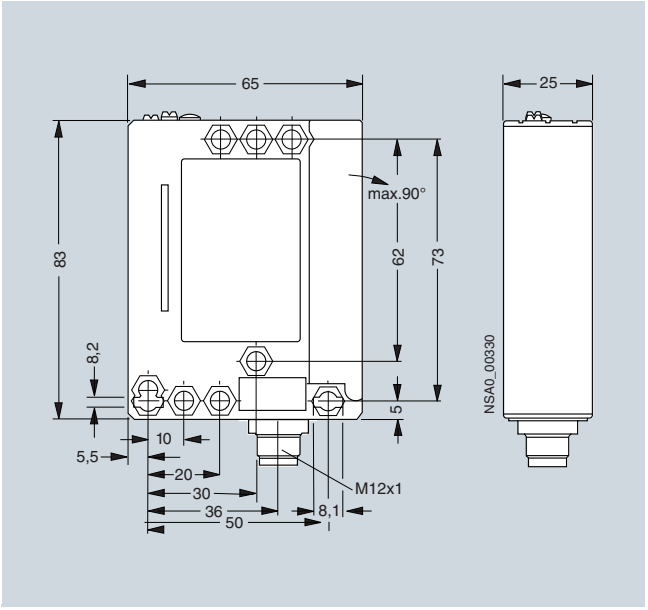
Design		C40 IQ-Sense	K80 IQ-Sense
Reflex sensor			
Sensing range	m	6	8
Standard test object		Reflector D84, 3RX7916	
Transmitter (type of light)	nm	Red LED 660 nm, polarized	
Supply current	mA	50	
Response time	ms	1	
LEDs		Switching status (yellow), surplus light (green)	
Enclosure material		ABS + PBTP	PBTP
Protection		IP67	
Dimensions	mm	40 × 40 × 53	83 × 65 × 25

Selection and Ordering Data

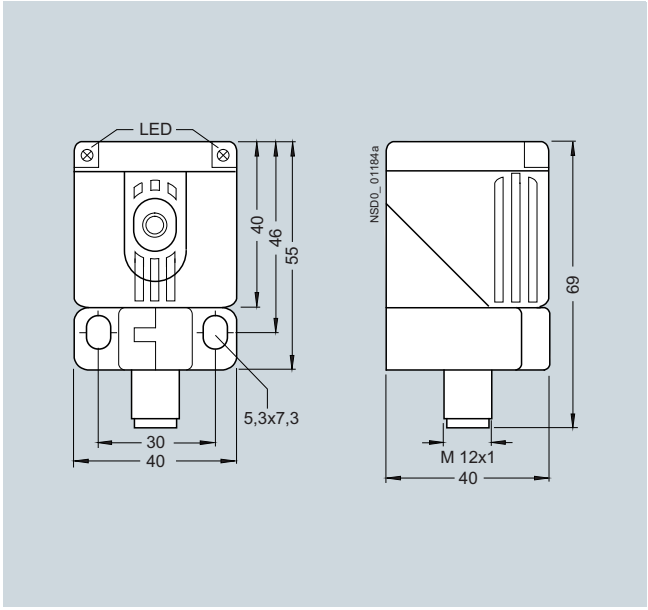
Version	Design	Type		Order No.
Photoelectric sensors for connection to the 4 IQ-Sense sensor module	C40 IQ-Sense	Diffuse sensor	B6	**3SF7 240-3JQ00**
		Reflex sensor	B6	**3SF7 241-3JQ00**
	K80 IQ-Sense	Diffuse sensor	B6	**3SF7 210-3JQ00**
		Diffuse sensor (with background suppression)	B6	**3SF7 214-3JQ00**
		Reflex sensor	B6	**3SF7 211-3JQ00**

B6: Subject to export regulations: AL: N and ECCN: EAR99

Dimensions



Opto BERO with IQ-Sense, K80 IQ-Sense design



Opto BERO with IQ-Sense, C40 IQ-Sense design

SIMATIC PXS sonar proximity switches with IQ-Sense

Overview

The sonar BEROs of the M18 IQ compact series are ready-to-use complete units with a cylindrical M18 housing for connection to the S7-300/ET 200M IQ-Sense module SM338, 8×IQ-Sense.

- Five operating modes:
  – Operation as measuring sensor (“analog signal“)
  – Diffuse sensor with background blanking
  – Diffuse sensor with differential travel
  – Diffuse sensor with foreground and background blanking
  – Retroreflective sensor.
- Statically configurable using STEP 7,
- Dynamically configurable using an S7 function block
- Measured distance to object is always transmitted
- Synchronizable, multiplex operation
- Temperature compensation,
- Connection with M12 connector
- Non-polarized 2-conductor connection (protected against polarity reversal),
- Channel-specific system diagnosis (e.g. wire-break, short-circuit, parameterization error).

Technical specifications

Order No.		3SF62 32-3JA00	3SF62 33-3JA00
Sensing range			
• Rated value	cm	5 ... 30	15 ... 100
• Maximum value	cm	5 ... 50	15 ... 150
Standard test object	mm	10 × 10	20 × 20
Differential travel *H* (adjustable)	mm	3 ... 30	10 ... 100
Repeat accuracy *R*	mm	1	2
Operating voltage (DC)		of IQ-Sense	
Rated operational current I_e		of IQ-Sense	
No-load current I_0		of IQ-Sense	
Adjustment / configuration		Beginning and end of switching range via IQ-Sense (IntelliTeach) or local teach-in via potentiometer	
Ultra-sound frequency	kHz	400	200
Switching frequency *f*	Hz	8	4
Response time	ms	54	110
Measuring rate	ms	13.44	26.88
Status display		yellow LED	
Casing material		nickel-plated brass, Transformer cover CRASTIN, Transformer surface epoxy resin	
Degree of protection		IP67	
Ambient temperature			
• Operation	°C	–25 ... +70	
• Storage	°C	–40 ... +85	

Selection and Ordering Data

Version	Type	Sensing range (cm)	Order No.
Ultrasonic sensors For connection to IQ-Sense	M18 IQ-Sense	5 ... 30	**3SF62 32–3JA00**
		15 ... 100	**3SF62 33–3JA00**

Overview

- Simulator module for program testing during commissioning and ongoing operation
- For the simulation of sensor signals using switches
- For display of signal conditions on the outputs using LED
- Simulation of
  - 16 inputs or
  - 16 outputs or
  - 8 inputs and 8 outputs
- Function can be directly adjusted on the module using a screwdriver

Technical specifications

	6ES7 374-2XH01-0AA0
Current consumption	
from backplane bus DC 5 V, max.	80 mA
Current consumption/ power loss	
Power loss, typ.	0.35 W
Digital inputs	
Number of digital inputs	16; Switch
Digital outputs	
Number of digital outputs	16; LEDs
Isolation	
Galvanic isolation, digital inputs	
• between the channels and the backplane bus	No
Isolation, digital outputs	
• between the channels and the backplane bus	No
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	190 g

Ordering Data

		Order No.
SM 374 simulator module	B7	**6ES7 374-2XH01-0AA0**
incl. bus connectors, labeling strips		
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit, spare part		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H
B8: Subject to export regulations: AL: N and ECCN: EAR99S

DM 370 dummy module

Overview

- Dummy module for reserving slots for non-parameterized signal modules
- Structure and address allocation is retained when replaced with a signal module

Technical specifications

	6ES7 370-0AA01-0AA0
Current consumption	
from backplane bus DC 5 V, max.	5 mA
Current consumption/ power loss	
Power loss, max.	0.03 W
Dimensions	
Dimensions	
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Weights	
• Weight, approx.	180 g

Ordering Data

		Order No.
DM 370 dummy module		**6ES7 370-0AA01-0AA0**
incl. bus connectors, labeling strips		
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit, spare part		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part)		
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part)		
S7 SmartLabel V3.0		
Software for automatic labeling of modules based on data of the STEP 7 project		
Single license	B8	**2XV9 450-1SL03-0YX0**
Upgrade single license	B8	**2XV9 450-1SL03-0YX4**
Labeling sheets for machine inscription		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**

B8: Subject to export regulations: AL: N and ECCN: EAR99S

Overview

- The economical complete solution for serial communication via point-to-point links.
- 3 versions with different transmission interfaces:
  - RS 232C (V.24)
  - 20 mA (TTY)
  - RS 422/RS 485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization via a parameterization tool integrated into STEP 7

Technical specifications

	6ES7 340-1AH02-0AE0	6ES7 340-1BH02-0AE0	6ES7 340-1CH02-0AE0
Supply voltages			
Rated value			
• DC 24 V	No; Power supply via backplane bus 5 V	No; Power supply via backplane bus 5 V	No; Power supply via backplane bus 5 V
Current consumption			
from backplane bus DC 5 V, max.	165 mA	190 mA	165 mA
Current consumption/ power loss			
Power loss, max.	0.85 W	0.95 W	0.85 W
Power loss, typ.	0.6 W	0.85 W	0.6 W
interfaces			
Number of interfaces	1; isolated	1; isolated	1; isolated
Physical interface, 20mA (TTY)		Yes	
interface physics, RS 232C (V.24)	Yes		
interface physics, RS 422/RS 485 (X.27)			Yes
Transmission speed, max.	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s
Transmission speed, min.	2.4 kBit/s	2.4 kBit/s	2.4 kBit/s
Connection point			
PtP	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
Voltage supply	over backplane bus	over backplane bus	over backplane bus
Point-to-point			
Cable length, max.	15 m	1 000 m; (100 m active, 1000 m passive)	1 200 m
supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined

4

Technical specifications (continued)

	6ES7 340-1AH02-0AE0	6ES7 340-1BH02-0AE0	6ES7 340-1CH02-0AE0
Integrated protocol driver			
• 3964 (R)	Yes	Yes	Yes
• ASCII	Yes	Yes	Yes
• customer-specific drivers reloadable	No	No	No
• RK512	No	No	No
Telegram length, max.			
• 3964 (R)	1 024 byte	1 024 byte	1 024 byte
• ASCII	1 024 byte	1 024 byte	1 024 byte
Transmission speed, 20 mA (TTY)			
• with 3964 (R) protocol, max.		19.2 kBit/s	
• with ASCII protocol, max.		9.6 kBit/s	
• with printer driver, max.,		9.6 kBit/s	
Transmission speed, RS 422/485			
• with 3964 (R) protocol, max.			19.2 kBit/s
• with ASCII protocol, max.			9.6 kBit/s
• with printer driver, max.			9.6 kBit/s
Transmission speed, RS232			
• with 3964 (R) protocol, max.	19.2 kBit/s		
• with ASCII protocol, max.	9.6 kBit/s		
• with printer driver, max.,	9.6 kBit/s		
Software			
Block			
• FB length in RAM, max.	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving
Dimensions			
Dimensions			
• Width	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weights			
• Weight, approx.	300 g	300 g	300 g

Ordering Data

	Order No.
CP 340 communications processor	**6ES7 340-1AH02-0AE0**
With one RS 232 C (V.24) interface	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-1AB00-0AA0**
10 m	**6ES7 902-1AC00-0AA0**
15 m	**6ES7 902-1AD00-0AA0**
CP 340 communications processor	**6ES7 340-1BH02-0AE0**
With one 20 mA (TTY) interface	
20 mA (TTY) connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-2AB00-0AA0**
10 m	**6ES7 902-2AC00-0AA0**
50 m	**6ES7 902-2AG00-0AA0**
CP 340 communications processor	**6ES7 340-1CH02-0AE0**
With one RS 422/485 (X.27) interface	
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-3AB00-0AA0**
10 m	**6ES7 902-3AC00-0AA0**
50 m	**6ES7 902-3AG00-0AA0**

Overview

- The economical, complete solution for serial communication over a point-to-point connection
- RS 232C (V.24) and RS 422/485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization using a parameterization tool integrated in STEP 7

SIPLUS CP 340 version	RS 422/485 (X.27)	RS 232 (V.24)
Order No.	**6AG1 340-1CH02-2AE0**	**6AG1 340-1AH02-2AE0**
Order No. based on	**6ES7 340-1CH02-0AE0**	**6ES7 340-1AH02-0AE0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere). In conformance with the standard for electronic equipment on rolling stock (EN 50155).	
Technical specifications	The technical data are identical with those of the based-on modules.	

Ordering Data

	Order No.
SIPLUS CP 340 communication module	
(extended temperature range and medial exposure)	
With one RS 232 C (V.24) interface	**6AG1 340-1AH02-2AE0**
With one RS 422/485 (X.27) interface	**6AG1 340-1CH02-2AE0**
Accessories	see CP 340, page 4/192

CP 341

Overview

- For powerful, high-speed serial communication via point-to-point links
- 3 versions with different physical properties:
  - RS 232C (V.24)
  - 20 mA (TTY),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customer-specific protocols (reloadable)
- Simple parameterization via a parameterization tool integrated into STEP 7

Technical specifications

	6ES7 341-1AH01-0AE0	6ES7 341-1BH01-0AE0	6ES7 341-1CH01-0AE0
Supply voltages			
Rated value			
• DC 24 V	Yes	Yes	Yes
Current consumption			
from backplane bus DC 5 V, max.	70 mA	70 mA	70 mA
from supply voltage L+, max.	200 mA	200 mA	240 mA
Current consumption/ power loss			
Power loss, max.	4.8 W	4.8 W	5.8 W
interfaces			
Number of interfaces	1; isolated	1; isolated	1; isolated
Physical interface, 20mA (TTY)		Yes	
interface physics, RS 232C (V.24)	Yes		
interface physics, RS 422/RS 485 (X.27)			Yes
Transmission speed, max.	76.8 kBit/s	19.2 kBit/s	76.8 kBit/s
Transmission speed, min.	0.3 kBit/s	0.3 kBit/s	0.3 kBit/s
Connection point			
PtP	9-pin sub D connector	9-pin sub D connector	15-pin sub D connector
Voltage supply	3 screw terminals: L+, M, GND	3 screw terminals: L+, M, GND	3 screw terminals: L+, M, GND
Point-to-point			
Cable length, max.	15 m	1 000 m	1 200 m
Integrated protocol driver			
• 3964 (R)	Yes	Yes	Yes; not with RS 485
• ASCII	Yes	Yes	Yes
• customer-specific drivers reloadable	Yes	Yes	Yes
• RK512	Yes	Yes	Yes; not with RS 485

Technical specifications (continued)

	6ES7 341-1AH01-0AE0	6ES7 341-1BH01-0AE0	6ES7 341-1CH01-0AE0
Telegram length, max.			
• 3964 (R)	1 024 byte	1 024 byte	1 024 byte
• ASCII	1 024 byte	1 024 byte	1 024 byte
• RK 512	1 024 byte	1 024 byte	1 024 byte
Transmission speed, 20 mA (TTY)			
• with 3964 (R) protocol, max.		76.8 kBit/s	
• with ASCII protocol, max.		76.8 kBit/s; 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6 and 76.8 kbps (76.8 kbps only achievable with half duplex)	
• with RK 512 protocol, max.		76.8 kBit/s	
Transmission speed, RS 422/485			
• with 3964 (R) protocol, max.			76.8 kBit/s
• with ASCII protocol, max.			76.8 kBit/s; 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6 and 76.8 kbps (76.8 kbps only achievable with half duplex)
• with RK 512 protocol, max.			76.8 kBit/s
Transmission speed, RS232			
• with 3964 (R) protocol, max.	76.8 kBit/s		
• with ASCII protocol, max.	76.8 kBit/s; 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6 and 76.8 kbps (76.8 kbps only achievable with half duplex)		
• with RK 512 protocol, max.	76.8 kBit/s		
Software			
Block			
• FB length in RAM, max.	5 500 byte; Data communication, sending and receiving	5 500 byte; Data communication, sending and receiving	5 500 byte; Data communication, sending and receiving
Dimensions			
Dimensions			
• Width	40 mm	40 mm	40 mm
• Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weights			
• Weight, approx.	300 g	300 g	300 g

CP 341

Ordering Data	Order No.
CP 341 communications processor	**6ES7 341-1AH01-0AE0**
With one RS 232 C (V.24) interface	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-1AB00-0AA0**
10 m	**6ES7 902-1AC00-0AA0**
15 m	**6ES7 902-1AD00-0AA0**
CP 341 communications processor	**6ES7 341-1BH01-0AE0**
With one 20 mA (TTY) interface	
20 mA (TTY) connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-2AB00-0AA0**
10 m	**6ES7 902-2AC00-0AA0**
50 m	**6ES7 902-2AG00-0AA0**
CP 341 communications processor	**6ES7 341-1CH01-0AE0**
With one RS 422/485 (X.27) interface	
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7 902-3AB00-0AA0**
10 m	**6ES7 902-3AC00-0AA0**
50 m	**6ES7 902-3AG00-0AA0**
Loadable drivers for CP 341	
MODBUS master (RTU format)	
• Single license	**6ES7 870-1AA01-0YA0**
• Single license, without software or documentation	**6ES7 870-1AA01-0YA1**
MODBUS slave (RTU format)	
• Single license	**6ES7 870-1AB01-0YA0**
• Single license, without software or documentation	**6ES7 870-1AB01-0YA1**
Data highway (DF1 protocol)	
• Single license	**6ES7 870-1AE00-0YA0**
• Single license, without software or documentation	**6ES7 870-1AE00-0YA1**

Overview

- For fast and powerful serial data exchange over a point-to-point connection
- 3 versions with different physical transmission characteristics:
  - RS 232C (V.24),
  - 20 mA (TTY),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customer-specific protocols (can be reloaded)
- Simple parameterization using a parameterization tool integrated in STEP 7

SIPLUS CP 341, version	RS 422/485 (X.27)
Order No.	**6AG1 341-1CH01-2AE0**
Order No. based on	**6ES7 341-1CH01-0AE0**
Ambient temperature range	- 25 ... + 60 °C, condensation permitted
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere)
Technical specifications	The technical data are identical with those of the based-on modules.

Ordering Data

	Order No.
CP 341 communication module (extended temperature range and medial exposure) With one RS 422/485 (X.27) interface	**6AG1 341-1CH01-2AE0**
Accessories	see CP 341, page 4/196

CP 343-2

Overview

The CP 343-2 is the AS-Interface master for the SIMATIC S7-300 PLC and the ET 200M distributed I/O device. The communications processor has the following functions:

- Up to 62 AS-Interface slaves can be connected and integrated analog value transfer (according to the AS-Interface specification V3.0)
- Supports all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Status displays of the operating statuses and display of the operational readiness of connected slaves with LEDs on the front panel
- Error displays (such as AS-Interface voltage errors, configuration errors) with LEDs on the front plate
- Compact enclosure in SIMATIC S7-300 design

Order No.	6GK7 343-2AH01-0XA0
Product type description	**CP 343-2**
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	S7-300 design
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	190 g
Number of slots required	1
Standards and specifications	
Version of the AS-Interface specification	V 3.0
Bus cycle time of the AS-Interface	
• with 31 slaves	5 ms
• with 62 slaves	10 ms
Performance data	
Data volume	
• of the address area of the inputs as allocation in the PLC	16 byte
• of the address area of the outputs as allocation in the PLC	16 byte

Technical specifications

Order No.	6GK7 343-2AH01-0XA0
Product type description	**CP 343-2**
Interfaces	
Version of electrical connection of the AS-Interface	S7-300 front connector with terminal connection
Supply voltage	
Supply voltage from backplane bus	5 V
Current consumption	
• from 5 V DC backplane bus, max.	200 mA
• from AS-Interface cable, max.	100 mA
Effective power loss	
Effective power loss	2 W

Ordering Data

	Order No.
CP 343-2 communications processor for the connection of SIMATIC S7-300 and ET 200M to AS-Interface; configuration of the AS-i network by means of SET-key; including manual on CD-ROM (German, English, French, Spanish, Italian); without front panel connector	**6GK7 343-2AH01-0XA0**
Front connector 20-pin, with screw contacts	**6ES7 392-1AJ00-0AA0**
Electronic manuals Communication systems, protocols, products on CD-ROM, German/English Free download in the Internet http://support.automation.siemens.com/WW/view/com/10805930/133300	**6GK1 975-1AA00-3AA0**

Overview

The CP 343-2 P is the AS-Interface master for the SIMATIC S7-300 PLC and the ET 200M distributed I/O device. The communications processor has the following functions:

- **Supports the configuration of the AS-Interface network with STEP 7, V5.2 and later**
- Up to 62 AS-Interface slaves can be connected and integrated analog value transfer (according to the AS-Interface specification V3.0)
- Supports all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Error displays (such as AS-Interface voltage errors, configuration errors) with LEDs on the front plate
- Compact enclosure in SIMATIC S7-300 design

Technical specifications

Order No.	6GK7 343-2AH11-0XA0
Product type description	**CP 343-2 P**
Interfaces	
Version of electrical connection of the AS-Interface	S7-300 front connector with terminal connection
Supply voltage	
Supply voltage from backplane bus	5 V
Current consumption	
• from 5 V DC backplane bus, max.	200 mA
• from AS-Interface cable, max.	100 mA
Effective power loss	
Effective power loss	2 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … 60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	S7-300 design
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	190 g
Number of slots required	1
Standards and specifications	
Version of the AS-Interface specification	V 3.0
Bus cycle time of the AS-Interface	
• with 31 slaves	5 ms
• with 62 slaves	10 ms
Performance data	
Data volume	
• of the address area of the inputs as allocation in the PLC	16 byte
• of the address area of the outputs as allocation in the PLC	16 byte
Configuration	
Configuration software included in scope of delivery of STEP 7 V5.2 or higher	Yes

Ordering Data

	Order No.
CP 343-2 P communications processor for the connection of SIMATIC S7-300 and ET 200M to AS-Interface; configuration of the AS-i network by means of SET-key or via STEP 7 (V5.2 or higher); including manual on CD-ROM (German, English, French, Spanish, Italian); without front panel connector	**6GK7 343-2AH11-0XA0**
Front connector 20-pin, with screw contacts	**6ES7 392-1AJ00-0AA0**
Electronic manuals Communication systems, protocols, products on CD-ROM, German/English Free download in Internet at http://support.automation.siemens.com/WW/view/com/10805930/133300	**6GK1 975-1AA00-3AA0**

CP 342-5

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 and the SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)
- Communication services:
  - PROFIBUS DP-V0
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Technical specifications

Order No.	6GK7 342-5DA02-0XE0
Product type description	**CP 342-5**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	9.6 kbit/s
• Maximum	12 Mbit/s
Interfaces	
Electrical connection version	
• of the PROFIBUS interface	9-pin Sub-D socket (RS 485)
• for voltage supply	4-pin terminal strip
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
Current consumption	
Current consumed	
• from backplane bus at 24 V DC typical	150 mA
• from external supply voltage at 24 V DC typical	250 mA
Effective power loss	
Effective power loss	6.75 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%

Order No.	6GK7 342-5DA02-0XE0
Product type description	**CP 342-5**
Design, dimensions and weight	
Module format	S7-300 compact module, single width
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Net weight	300 g
Max. number of modules per CPU	4
Performance data	
PROFIBUS DP	
Service as DP-Master DPV0	Yes
Number of DP-Slaves operable on DP-Master	124
Data volume	
• of the address area of the inputs as DP-Master overall	2 160 bytes
• of the address area of the outputs as DP-Master overall	2 160 bytes
• of the address area of the inputs per DP-Slave	244 bytes
• of the address area of the outputs per DP-Slave	244 bytes
Service as DP-Slave DPV0	Yes
Data volume	
• of the address area of the inputs as DP-Slave overall	240 bytes
• of the address area of the outputs as DP-Slave overall	240 bytes

Technical specifications (continued)

Order No.	6GK7 342-5DA02-0XE0
Product type description	**CP 342-5**
S7 communication	
Number of possible connections for S7 communication, max.	16
PG/OP communication	
Number of operable OP connections (acyclic services)	16
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. 1)	16
Data volume as useful data for open communication (SEND/RECEIVE) per connection, max.	240 bytes
Multi-protocol	
Number of active connections in multi-protocol operation	
• without DP, max.	32
• with DP, max.	28
Data volume of the address area of the diagnostic data per DP-Slave	240 bytes

1) also S5-compatible communication

Ordering data

	Order No.
CP 342-5 communications processor	**6GK7 342-5DA02-0XE0**
Communications processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s, with electronic manual on CD-ROM	
STEP 7 Version 5.4	
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement*: Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation	
• Floating license on CD	**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours	**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)	**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD	**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days	**6ES7 810-4CC08-0YA7**
PROFIBUS FastConnect bus connector RS485	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• Without PG interface	**6ES7 972-0BA51-0XA0**
• With PG interface	**6ES7 972-0BB51-0XA0**
PROFIBUS bus connector IP20	
With connection to PPI, MPI, PROFIBUS	
• Without PG interface	**6ES7 972-0BA12-0XA0**
• With PG interface	**6ES7 972-0BB12-0XA0**
PROFIBUS bus terminal 12M	**6GK1 500-0AA10**
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	
SIMATIC S7-300 DM 370	**6ES7 370-0AA01-0AA0**
Dummy module; used for module replacement	

CP 342-5 FO

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with optical interface for connecting the SIMATIC S7-300 and the SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)
- Direct connection to the optical PROFIBUS network over the integrated fiber-optic interface for plastic and PCF fiber-optic cables
- Communication services:
  - PROFIBUS DP-V0
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Technical specifications

Order No.	6GK7 342-5DF00-0XE0
Product type description	**CP 342-5 FO**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	9.6 kbit/s
• Maximum	12 Mbit/s
Interfaces	
Version of optical connection of the PROFIBUS interface	2 x duplex socket
Electrical connection version for voltage supply	4-pin terminal strip
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
Current consumption	
Current consumed	
• from backplane bus at 24 V DC typical	150 mA
• from external supply voltage at 24 V DC typical	250 mA
Effective power loss	
Effective power loss	6.75 W
Transmission link	
• for PCF plastic optical fiber, max.	300 m
• for POF FOC, max.	50 m

Order No.	6GK7 342-5DF00-0XE0
Product type description	**CP 342-5 FO**
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	Compact module
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Net weight	300 g
Max. number of modules per CPU	4
Performance data	
PROFIBUS DP	
Service as DP-Master DPV0	Yes
Max. number of DP-Slaves operable on DP-Master	124
Data volume	
• of the address area of the inputs as DP-Master overall	2 160 bytes
• of the address area of the outputs as DP-Master overall	2 160 bytes
• of the address area of the inputs per DP-Slave	244 bytes
• of the address area of the outputs per DP-Slave	244 bytes
• of the address area of the diagnostic data per DP-Slave	240 bytes

Technical specifications (continued)

Order No.	6GK7 342-5DF00-0XE0
Product type description	**CP 342-5 FO**
Service as DP-Slave DPV0	Yes
Data volume	
• of the address area of the inputs as DP-Slave overall	240 bytes
• of the address area of the outputs as DP-Slave overall	240 bytes
S7 communication	
Number of possible connections for S7 communication, max.	16
PG/OP communication	
Number of operable OP connections (acyclic services)	16

Order No.	6GK7 342-5DF00-0XE0
Product type description	**CP 342-5 FO**
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. 1)	16
Data volume as useful data for open communication (SEND/RECEIVE) per connection, max.	240 bytes
Multi-protocol	
Number of active connections in multi-protocol operation	
• without DP, max.	32
• with DP, max.	28

1) also S5-compatible communication

Ordering Data

	Order No.
CP 342-5 FO communications processor	**6GK7 342-5DF00-0XE0**
Communication processor for optical connection of SIMATIC S7-300 to PROFIBUS to 12 Mbit/s with electronic manual on CD-ROM	
STEP 7 Version 5.4	
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement*: Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation	
• Floating license on CD	**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours	**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)	**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD	**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days	**6ES7 810-4CC08-0YA7**

	Order No.
Manual for PROFIBUS networks	
Paper version	
Network architecture, components (OLM (V3), OBT, ILM), configuring and installation	
• German	**6GK1 970-5CA20-0AA0**
• English	**6GK1 970-5CA20-0AA1**
PROFIBUS Plastic Fiber Optic, Simplex Connector/ Polishing Set B7	**6GK1 901-0FB00-0AA0**
100 simplex connectors and 5 polishing sets for assembling PROFIBUS plastic fiber optic cables for the optical PROFIBUS DP	
PROFIBUS Plastic Fiber Optic, Stripping Tool Set B7	**6GK1 905-6PA10**
Tools for removing the outer sheath or core sheath of Plastic Fiber Optic cables	
Plug-in adapter	**6ES7 195-1BE00-0XA0**
For assembling the plastic Simplex connector in combination with CP 342-5 FO, IM 467 FO, IM 153-2 FO and IM 151 FO	
50 units	

B7: Subject to export regulations: AL: N and ECCN: EAR99H

CP 343-5

Overview

DP-M	DP-S	FMS	PG/OP	S7/S5	
		●	●	●	

Connection of SIMATIC S7-300 and SIMATIC C7 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit/s)

- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
  - PROFIBUS FMS
- Easy configuration and programming over PROFIBUS
- Can be easily integrated into the S7-300 system
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Technical specifications

Order No.	6GK7 343-5FA01-0XE0
Product type description	**CP 343-5**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	9.6 kbit/s
• Maximum	12 Mbit/s
Interfaces	
Electrical connection version	
• of the PROFIBUS interface	9-pin Sub-D socket (RS 485)
• for voltage supply	4-pin terminal strip
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
Current consumption	
Current consumed	
• from backplane bus at 24 V DC typical	150 mA
• from external supply voltage at 24 V DC typical	250 mA
Effective power loss	
Effective power loss	6.75 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	S7-300 compact module, single width
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Net weight	300 g
Max. number of modules per CPU	4
Performance data	
FMS function	
Number of possible connections in the case of FMS connection, max.	16
Data volume of the variables	
• for READ job, max.	237 bytes
• for WRITE and REPORT job, max.	233 bytes
Number of variables	
• Configurable from server to FMS partner	256
• Loadable from server to FMS partner	256
S7 communication	
Number of possible connections for S7 communication, max.	16 [1]
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. [2]	16
Data volume as useful data for open communication (SEND/RECEIVE) per connection, max.	240 bytes
Multi-protocol	
Number of active connections in multi-protocol operation	48

1) depending on the CPU type
2) also S5-compatible communication

Ordering Data

	Order No.
CP 343-5 communications processor Communications processor for connection of S7-300 to PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on CD-ROM	**6GK7 343-5FA01-0XE0**
STEP 7 Version 5.4 *Target system:* SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement:* Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation	
• Floating license on CD	**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours	**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)	**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD	**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days	**6ES7 810-4CC08-0YA7**

	Order No.
PROFIBUS FastConnect bus connector RS485 With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• without PG interface	**6ES7 972-0BA51-0XA0**
• with PG interface	**6ES7 972-0BB51-0XA0**
PROFIBUS bus connector IP20 With connection to PPI, MPI, PROFIBUS	
• without PG interface	**6ES7 972-0BA12-0XA0**
• with PG interface	**6ES7 972-0BB12-0XA0**
PROFIBUS bus terminal 12M Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	**6GK1 500-0AA10**
SIMATIC S7-300 DM 370 Dummy module; used for module replacement	**6ES7 370-0AA01-0AA0**

CP 343-1 Lean

Overview

ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●				●	●

- Interface for the SIMATIC S7-300 to Industrial Ethernet (not for SINUMERIK)
  - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection (with autosensing for automatic switchover and autocrossover function)
  - Integral 2-port real-time switch ERTEC
  - Multi-protocol operation with TCP and UDP transport protocol and PROFINET I/O
  - Keep Alive function
- Communication services:
  - Open communication (TCP/IP and UDP)
  - PG/OP communication
  - S7 communication (server)
  - PROFINET I/O device
- Multicast for UDP
- Remote programming and initial start-up is possible exclusively over Industrial Ethernet
- IT communication
  - Web function
- Integration into network management through SNMP
- Configuration with STEP 7
- Cross-network programming device/operator panel communication through S7 routing
- Diagnostic possibilities in STEP 7 and with web browser

Technical specifications

Order No.	6GK7 343-1CX10-0XE0
Product type description	**CP 343-1 Lean**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	10 Mbit/s
• Maximum	100 Mbit/s
Interfaces	
Electrical connection version	
• at Industrial Ethernet interface 1	2 x RJ45 socket (TP)
• for voltage supply	2-pin plug-in terminal strip
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
• Relative positive tolerance at 24 V DC	20%
• Relative negative tolerance at 24 V DC	15%
Current consumption	
Current consumed	
• from backplane bus at 5 V DC, max.	200 mA
• from external supply voltage at 24 V DC typical	160 mA
• from external supply voltage at 24 V DC max.	200 mA
Effective power loss	
Effective power loss	5.8 W

Order No.	6GK7 343-1CX10-0XE0
Product type description	**CP 343-1 Lean**
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	S7-300 compact module, single width
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Net weight	220 g
Performance data	
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. [1]	8
Number of multicast stations	8
Data volume as useful data for open communication by means of SEND/RECEIVE blocks	
• per TCP connection, max.	8 Kibyte
• per UDP connection, max.	2 Kibyte

1) also S5-compatible communication

Technical specifications (continued)

Order No.	6GK7 343-1CX10-0XE0
Product type description	**CP 343-1 Lean**
S7 communication	
Number of possible connections for S7 communication, max.	4
PG/OP communication	
Number of operable OP connections, max.	4
Multi-protocol operation	
Number of active connections in multi-protocol operation	12
Performance data PROFINET communication as PN IO-Device	
Data volume	
• as useful data for input variables as PROFINET IO device, max.	512 bytes
• as useful data for output variables as PROFINET IO device, max.	512 bytes

Order No.	6GK7 343-1CX10-0XE0
Product type description	**CP 343-1 Lean**
Data volume	
• as useful data for input variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for output variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for the consistency area for each sub-module	240 bytes
Number of sub-modules per PROFINET IO device	32
Configuration	
Configuration software for full functional scope in STEP 7 V5.4 or higher	Yes

Ordering Data

	Order No.
CP 343-1 Lean communications processor For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, integral 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM	**6GK7 343-1CX10-0XE0**
IE FC TP Standard Cable GP 2x2 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	**6XV1 840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1 873-2A**
SCALANCE X204-2 Industrial Ethernet switch Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	**6GK5 204-2BB10-2AA3**

	Order No.
Compact Switch Module CSM 377 Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic equipment manual on CD-ROM	**6GK7 377-1AA00-0AA0**
IE FC RJ45 Plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables with 180° cable outlet;	
• 1 pack = 1 unit	**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1 901-1BB10-2AE0**
SOFTNET Edition 2007 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2, Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; German/English	

CP 343-1 Lean

Ordering Data		Order No.
SOFTNET-S7 Edition 2007 for Industrial Ethernet		
up to 64 connections		
• Single license for 1 installation	B3	**6GK1 704-1CW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1CW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1CW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1CW00-3AE1**
SOFTNET-S7 Lean Edition 2007 for Industrial Ethernet		
up to 8 connections		
• Single License for 1 installation	B3	**6GK1 704-1LW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1LW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1LW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1LW00-3AE1**
S7-1613 Edition 2007		
Software for S7 and open communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, SP2; Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; for CP 1613/CP 1613 A2/CP 1623; German/English		
• Single License for 1 installation	B3	**6GK1 716-1CB70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 716-1CB00-3AL0**
• Upgrade S7-1613 from V6.4 to 2007 Edition	B3	**6GK1 716-1CB00-3AE0**
• Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to S7-1613 Edition 2007	B3	**6GK1 716-1CB00-3AE1**
STEP 7 Version 5.4		
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement*: Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation		
• Floating License on CD		**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours		**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)		**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD		**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days		**6ES7 810-4CC08-0YA7**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

Overview

ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●				●	●

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection with autosensing/autonegotiation and autocrossover function
  - Integral 2-port real-time switch ERTEC
  - Multi-protocol operation with ISO, TCP and UDP transport protocol and PROFINET I/O
  - Adjustable Keep Alive function
- Communication services:
  - Open communication (ISO, TCP/IP and UDP)
  - PROFINET IO Controller or PROFINET IO Device
  - Programming device/operator panel communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection by means of configurable access list
- Remote programming and initial startup via Industrial Ethernet
- Configuration with STEP 7
- Automatic setting of the CPU clock via Ethernet with NTP or SIMATIC procedure
- IT communication
  - Web function
- Integration in network management systems over SNMP (MIB2 diagnostic information)
- Diagnostic possibilities in STEP 7 and with web browser

Technical specifications

Order No.	**6GK7 343-1EX30-0XE0**
Product type description	**CP 343-1**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	10 Mbit/s
• Maximum	100 Mbit/s
Interfaces	
Electrical connection version	
• at Industrial Ethernet interface 1	2 x RJ45 (TP)
• for voltage supply	2-pin plug-in terminal strip
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
• Relative positive tolerance at 24 V DC	20%
• Relative negative tolerance at 24 V DC	15%
Current consumption	
Current consumed	
• from backplane bus at 5 V DC typical	200 mA
• from external supply voltage at 24 V DC typical	-
• from external supply voltage at 24 V DC max.	200 mA

Order No.	**6GK7 343-1EX30-0XE0**
Product type description	**CP 343-1**
Effective power loss	
Effective power loss	5,8 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	S7-300 compact module, single width
• Width	40 mm
• Height	125 mm
• Depth	120 mm
Net weight	220 g3
Performance data	
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. [1]	16
Number of multicast stations	16

1) also S5-compatible communication

Technical specifications (continued)

Order No.	6GK7 343-1EX30-0XE0
Product type description	**CP 343-1**
Data volume as useful data for open comm. by means of SEND/RECEIVE blocks	
• per ISO connection, max.	8 KB
• per ISO on TCP connection, max.	8 KB
• per TCP connection, max.	8 KB
• per UDP connection, max.	2 KB
S7 communication	
Number of possible connections for S7 communication, max.	16
PG/OP communication	
Number of possible connections for S7 communication for OP connections, max.	16
Multi-protocol operation	
Number of active connections in multi-protocol operation	32
Performance data, PROFINET communication as PN IO controller	
Number of PN IO devices operable as PROFINET IO controllers	32
Data volume	
• as useful data for input variables as PROFINET IO controller	1 024 bytes
• as useful data for output variables as PROFINET IO controller	1 024 bytes
• as useful data for input variables per PN IO device as PROFINET IO controller, max.	240 bytes
• as useful data for output variables per PN IO device as PROFINET IO controller, max.	240 bytes
Performance data PROFINET communication as PN IO-Device	
Data volume	
• as useful data for input variables as PROFINET IO device, max.	512 bytes
• as useful data for output variables as PROFINET IO device, max.	512 bytes
• as useful data for input variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for output variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for the consistency area for each sub-module	240 bytes
Number of sub-modules per PROFINET IO device	32
Configuration	
Configuration software for full functional scope in STEP 7 V5.4 or higher	Yes

Ordering Data	Order No.
CP 343-1 communications processor For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO Controller or PROFINET IO Device, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD	**6GK7 343-1EX30-0XE0**
IE FC TP Standard Cable GP 2x2 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	**6XV1 840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1 873-2A**
SCALANCE X204-2 Industrial Ethernet switch Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	**6GK5 204-2BB10-2AA3**
Compact Switch Module CSM 377 Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic device manual on CD-ROM	**6GK7 377-1AA00-0AA0**
IE FC RJ45 Plug 145 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 145° cable outlet	
• 1 pack = 1 unit	**6GK1 901-1BB30-0AA0**
• 1 pack = 10 units	**6GK1 901-1BB30-0AB0**
• 1 pack = 50 units	**6GK1 901-1BB30-0AE0**
SOFTNET Edition 2007 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32 bit Windows XP Professional SP1, 2, Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; German/English	

		Order No.
SOFTNET-S7 Edition 2007 for Industrial Ethernet up to 64 connections		
• Single license for 1 installation	B3	**6GK1 704-1CW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1CW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1CW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1CW00-3AE1**
SOFTNET-S7 Lean Edition 2007 for Industrial Ethernet up to 8 connections		
• Single License for 1 installation	B3	**6GK1 704-1LW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1LW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1LW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1LW00-3AE1**
S7-1613 Edition 2007 Software for S7 and open communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, SP2; Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; for CP 1613/CP 1613 A2/CP 1623; German/English		
• Single License for 1 installation	B3	**6GK1 716-1CB70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 716-1CB00-3AL0**
• Upgrade S7-1613 from V6.4 to 2007 Edition	B3	**6GK1 716-1CB00-3AE0**
• Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to S7-1613 Edition 2007	B3	**6GK1 716-1CB00-3AE1**
STEP 7 Version 5.4 *Target system*: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement*: Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation		
• Floating License on CD		**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours		**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)		**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD		**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days		**6ES7 810-4CC08-0YA7**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

CP 343-1 Advanced

Overview

ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●				●	●

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - Multi-protocol operation with TCP and UDP transport protocol
  - Adjustable Keep Alive function
- Two separate interfaces (integrated network separation):
  - Gigabit interface with an RJ45 connection with 10/100/1000 Mbit/s full/half duplex with auto-sensing functionality
  - PROFINET interface with two RJ45 connections with 10/100 Mbit/s full/half duplex with auto-sensing and auto-crossover functionality via integrated 2-port switch
- Communication services via both interfaces:
  - Open communication (TCP/IP and UDP): Multicast for UDP, incl. routing between both interfaces
  - PG/OP communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing) incl. routing between both interfaces
  - IT communication: HTTP communication allows access to process data via own web sites; e-mail client function, sending of e-mails with authentication directly from the user program; FTP communication allows program-controlled FTP client communication; access to data blocks via FTP servers
- Communication services via PROFINET interfaces:
  - PROFINET IO Controller and IO Device with real-time properties (RT and IRT)[1)]
  - PROFINET CBA
  - IP address assignment via DHCP, simple PC tool or via program block (e.g. for HMI)
- Configuration with STEP 7
- Access protection by means of a configurable IP access list
- Module replacement without PG; all information is stored on the C-PLUG (also file system for IT functions
- Extensive diagnostic functions for all modules in the rack
- IT communication
  - Web function
  - E-mail function
  - FTP
- Integration into network management systems through the support of SNMP V1 MIB-II

1) Possible combinations in parallel mode:
- IO Controller with IRT and IO Device with RT
- IO Controller with RT and IO Device using IRT

Technical specifications

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
Transfer rate	
Transmission rate at Interface 1	
• Minimum	10 Mbit/s
• Maximum	1 000 Mbit/s
Transmission rate at Interface 2	
• Minimum	10 Mbit/s
• Maximum	100 Mbit/s
Electrical connection version	
• at Industrial Ethernet interface 1	1 x RJ45 (TP)
• at Industrial Ethernet interface 2	2 x RJ45 (TP)
• for voltage supply	2-pin plug-in terminal strip
Slot version of the swap medium	C-PLUG

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
Supply voltage	
Type of supply voltage	DC
Supply voltage	24 V
• Relative positive tolerance at 24 V DC	20 %
• Relative negative tolerance at 24 V DC	15 %
Current consumption	
Current consumed	
• from backplane bus at 5 V DC typical	140 mA
• from external supply voltage at 24 V DC typical	-
• from external supply voltage at 24 V DC max.	620 mA

Technical specifications (continued)

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
Effective power loss	
Effective power loss	14.7 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Maximum relative humidity at 25 °C during operation	95%
Design, dimensions and weight	
Module format	Compact module S7-300, double width
• Width	80 mm
• Height	125 mm
• Depth	120 mm
Net weight	600 g
Performance data	
Open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks, max. 1)	16
Number of multicast stations	16
Data volume as useful data for open communication by means of SEND/RECEIVE blocks	
• per ISO connection, max.	8 KB
• per ISO on TCP connection, max.	8 KB
• per TCP connection, max.	8 KB
• per UDP connection, max.	2 KB
S7 communication	
Number of possible connections for S7 communication, max.	16
PG/OP communication	-
Number of possible connections for S7 communication for OP connections, max.	16
Multi-protocol operation	
Number of active connections in multi-protocol operation	48

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
IT functions	
Number of possible connections as client by means of FTP, max.	10
Number of possible connections as server by means of FTP, max.	2
Number of possible connections as server by means of HTTP, max.	4
Number of possible connections to an e-mail server as e-mail client, max.	1
Data volume as useful data (incl. e-mail header information) for e-mail communication by means of SEND/RECEIVE blocks	8 KB
Memory capacity of the user memory	
• as Flash memory file system	28 MB
• as RAM	30 MB
Number of possible write cycles of the flash memory cells	100 000
Performance data, PROFINET communication as PN IO controller	
Number of PN IO devices operable on PROFINET IO controller	128
• of which, PN IO IRT devices	32
Number of external PN IO lines with PROFINET per subrack	1
Data volume	
• as useful data for input variables as PROFINET IO controller, max.	4 KB
• as useful data for output variables as PROFINET IO controller	4 KB
• as useful data for input variables per PN IO device as PROFINET IO controller	240 bytes
• as useful data for output variables per PN IO device as PROFINET IO controller	240 bytes
Performance data PROFINET communication as PN IO-Device	
Data volume	
• as useful data for input variables as PROFINET IO device, max.	1 KB
• as useful data for output variables as PROFINET IO device, max.	1 KB
• as useful data for input variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for output variables per sub-module as PROFINET IO device, max.	240 bytes
• as useful data for the consistency area for each sub-module	240 bytes
Number of sub-modules per PROFINET IO device	32

1) also S5-compatible communication

Technical specifications (continued)

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
Performance data PROFINET CBA	
Number of remote interconnection partners in the case of PROFINET CBA	64
Total number of interconnections in the case of PROFINET CBA	1 000
Data volume	
• as useful data for digital inputs in the case of PROFINET CBA, max.	8 KB
• as useful data for digital outputs in the case of PROFINET CBA, max.	8 KB
• as useful data for arrays and data types	
- in case of acyclic transmission with PROFINET CBA, max.	8 KB
- in case of cyclic transmission with PROFINET CBA, max.	450 bytes
- in case of local interconnection with PROFINET CBA, max.	2 400 bytes
Performance data PROFINET CBA, remote interconnections with acyclic transmission	
Send cycle of the remote interconnections in the case of acyclic transmission with PROFINET CBA min.	100 ms
Number of remote interconnections	
• with input variables in case of acyclic transmission with PROFINET CBA, max.	128
• with output variables in case of acyclic transmission with PROFINET CBA, max.	128
Data volume	
• as useful data for remote interconnections with input variables in the case of acyclic transmission with PROFINET CBA	8 KB
• as useful data for remote interconnections with output variables in the case of acyclic transmission with PROFINET CBA	8 KB
Performance data PROFINET CBA, remote interconnections with cyclic transmission	
Send cycle of the remote interconnections in the case of cyclic transmission with PROFINET CBA min.	8 ms
Number of remote interconnections	
• with input variables in case of cyclic transmission with PROFINET CBA, max.	200
• with output variables in case of cyclic transmission with PROFINET CBA, max.	200
Data volume	
• as useful data for remote interconnections with input variables in the case of cyclic transmission with PROFINET CBA, max.	2 000 bytes
• as useful data for remote interconnections with output variables in the case of cyclic transmission with PROFINET CBA, max.	2 000 bytes

Order No.	6GK7 343-1GX30-0XE0
Product type description	**CP 343-1 Advanced**
Performance data PROFINET CBA, HMI variables via PROFINET (acyclic)	
Number of HMI stations with login capability for HMI variables in the case of acyclic transmission with PROFINET CBA	3
Send cycle of the HMI variables in the case of acyclic transmission with PROFINET CBA	500 ms
Send cycle of the HMI variables in the case of acyclic transmission with PROFINET CBA max.	200
Data volume as useful data for HMI variables in the case of acyclic transmission with PROFINET CBA max.	8 KB
Performance data PROFINET CBA, device-internal interconnections	
Number of internal interconnections in the case of PROFINET CBA, max	256
Data volume of internal interconnections in the case of PROFINET CBA, max	2 400 bytes
Performance data PROFINET CBA, interconnections with constants	
Number of interconnections with constants in the case of PROFINET CBA, max	200
Data volume as useful data for interconnections with constants in the case of PROFINET CBA, max	4 096 bytes
Performance data PROFINET CBA, PROFIBUS proxy functionality	
Product function in the case of PROFINET CBA, PROFIBUS proxy functionality	No
Number of accesses to S7-extended variables in case of PROFINET CBA max.	32
Configuration	
Configuration software for full functional scope STEP 7 V5.4 SP4 or higher	Yes

Ordering Data		Order No.
CP 343-1 Advanced communications processor For the connection of SIMATIC S7-300 to Industrial Ethernet; PROFINET IO Controller and IO Device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, diagnostic expansions, multicast, web server, HTML diagnostics, FTP server, FTP client, e-mail client, setting of CPU's clock using SIMATIC and NTP procedures, access protection through IP access list, SNMP, DHCP, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD		**6GK7 343-1GX30-0XE0**
C-PLUG Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot		**6GK1 900-0AB00**
SOFTNET Edition 2007 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2; Windows 2003 Server SP1, R2, SP2; Windows Vista Business/Ultimate; German/English		
SOFTNET-S7 Edition 2007 for Industrial Ethernet up to 64 connections		
• Single License for 1 installation	B3	**6GK1 704-1CW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1CW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1CW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1CW00-3AE1**
SOFTNET-S7 Lean Edition 2007 for Industrial Ethernet up to 8 connections		
• Single License for 1 installation	B3	**6GK1 704-1LW70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 704-1LW00-3AL0**
• Upgrade from V6.4 to 2007 edition	B3	**6GK1 704-1LW00-3AE0**
• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition	B3	**6GK1 704-1LW00-3AE1**
S7-1613 Edition 2007 Software for S7 and open communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2; Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; for CP 1613/CP 1613 A2/CP 1623; German/English		
• Single License for 1 installation	B3	**6GK1 716-1CB70-3AA0**
• Software Update Service for 1 year, with automatic extension; requirement: Current software version		**6GK1 716-1CB00-3AL0**
• Upgrade S7-1613 from V6.4 to S7-1613 2007 Edition	B3	**6GK1 716-1CB00-3AE0**
• Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to S7-1613 2007 Edition	B3	**6GK1 716-1CB00-3AE1**
IE FC RJ45 Plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
• 1 pack = 1 unit		**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units		**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units		**6GK1 901-1BB10-2AE0**
IE FC RJ45 Plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
• 1 pack = 1 unit		**6GK1 901-1BB11-2AA0**
• 1 pack = 10 units		**6GK1 901-1BB11-2AB0**
• 1 pack = 50 units		**6GK1 901-1BB11-2AE0**
Compact Switch Module CSM 377 Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and as many as three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic equipment manual on CD-ROM		**6GK7 377-1AA00-0AA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

CP 343-1 Advanced

Ordering Data		Order No.
SCALANCE X204-2 Industrial Ethernet switch with four 10/100 Mbit/s RJ45 ports and two fiber-optic ports		**6GK5 204-2BB10-2AA3**
Industrial Ethernet switch SCALANCE X308-2 2 x 1000 Mbit/s multimode fiber-optic ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cables (multimode) up to a max. 750 m.		**6GK5 308-2FL00-2AA3**
STEP 7 Version 5.4 *Target system*: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC *Requirement*: Windows 2000 Prof./XP Prof. *Delivery package:* German, English, French, Spanish, Italian; incl. 3.5" authorization diskette, without documentation		
• Floating license on CD		**6ES7 810-4CC08-0YA5**
• Rental license for 50 hours		**6ES7 810-4CC08-0YA6**
• Software Update Service on CD (requires current software version)		**6ES7 810-4BC01-0YX2**
• Upgrade Floating License 3.x/4.x/5.x to V5.4; on CD		**6ES7 810-4CC08-0YE5**
• Trial License STEP 7 V5.4; on CD, runs for 14 days		**6ES7 810-4CC08-0YA7**

Ordering Data		Order No.
SIMATIC iMap V3.0 for configuring PROFINET CBA, *Requirement:* Windows 2000 Prof. with Service Pack 4 or later or Windows XP Prof. with Service Pack 1 or later or Windows 2003 Server with Service Pack 1 or later; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or later with Service Pack 3, PN OPC Server V6.3 or later *Type of supply:* German, English, with electronic documentation		
• Single License	B3	**6ES7 820-0CC04-0YA5**
• Software Update Service	B3	**6ES7 820-0CC01-0YX2**
• Upgrade to V3.0, Single License	B3	**6ES7 820-0CC04-0YE5**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

Overview

- For the simple and user-friendly connection of sensors and actuators to the S7-300 I/O modules
- For maintaining the wiring when replacing modules ("permanent wiring")
- With mechanical coding to avoid errors when replacing modules

Ordering Data

		Order No.
Front connectors		
20-pin, with screw contacts		
• 1 item		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with spring-loaded contacts		
• 1 item		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
20-pin, with FastConnect		
• 1 unit		**6ES7 392-1CJ00-0AA0**
40-pin, with screw contacts		
• 1 item		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin, with spring-loaded contacts		
• 1 item		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
40-pin, with FastConnect		
• 1 unit		**6ES7 392-1CM00-0AA0**
Front door, elevated design	B7	**6ES7 328-0AA00-7AA0**
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires		

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Fully modular connection

Overview

The fully modular connection is the standard connection for the SIMATIC S7-300/400. The fully modular connection facilitates convenient, fast, and correct connection of the I/O to the SIMATIC S7-300/400.

- Easy plugging in of front connector module, connecting cable and connection module
- Fast and low-cost wiring
- Supply voltage connectable to front connector module or connection module for digital and analog signals
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or by double-byte
- Each component can be replaced individually.

Every cable length can be configured without cutting, or pre-assembled cables can be used

Connecting cables

The connection cable is the linking element between the front connector module and the connection module. It transmits 8 signals and the supply voltage. The maximum bridgeable distance is 30 m. The connecting cable is available in two different versions:

- The pre-assembled round cable
- The round-sheath ribbon cable assembled by the user

Basic modules

In the case of the basic module, the connection modules are used with basic functionality. Here, the I/O signal is connected quickly and simply from the field to the module or from the module to the field.

The connection terminals for the I/O signals are designed as screw terminals or spring terminals. The connection modules are available for digital and analog signals.

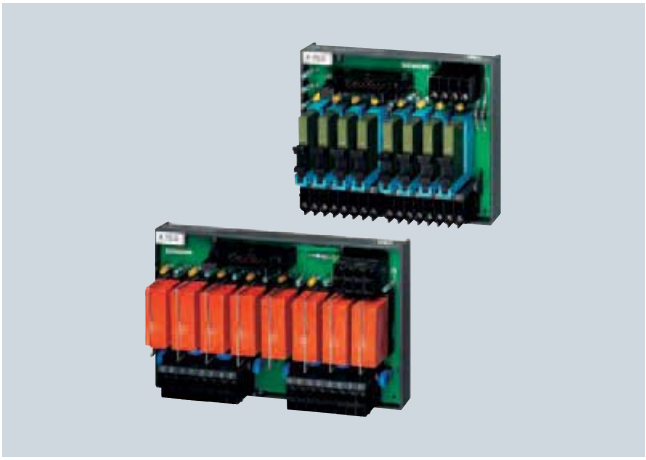
Signal modules

In the case of the signal module, the digital connection modules with LED are used. The yellow LEDs indicate the "active high" signal of the individual channels. This makes commissioning easier for you, and you always have an overview of the signal states of your I/O. At the same time, a green LED indicates when the 24 V DC is applied.

The connection terminals for the I/O signals are designed as screw terminals or spring terminals. The connection modules are available for digital signals.

Overview (continued)

Function modules



Function modules are implemented with digital connection modules fitted with relays or optocouplers.

If other voltage or power levels are required in the field, the connection module for output signals TPRo is used. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that converts the 230 V AC signal simply to 24 V DC. This means you always have the same voltage level on the module side.

Technical specifications Front connector modules

Technical data of front connector module	
Rated operating voltage	24 VDC
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible summation current	4 A/byte
Permissible ambient temperature	0 to + 60°C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

Wiring rules for front connector modules

	Front connector module SIMATIC TOP connect, connection for potential infeed	
	Spring connection	Screw connection
	Modules up to 4 connections	
Connectable cable cross-sections		
• solid cables	No	
• flexible cables with/without wire end ferrule	0,25 to 1.5 mm^2	
Number of wires per connection	1 or a combination of 2 conductors up to 1.5 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripping length of the cables		
• without insulating collar	6 mm	
• with insulating collar	-	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm^2	-	
• with insulating collar 1.5 mm^2	-	
Blade width of the screwdriver	Form A; 5 to 7 mm long	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

	Front connector module SIMATIC TOP connect, connection for potential infeed	
	Spring connection	Screw connection
	Modules up to 8 connections	
Connectable cable cross-sections		
• solid cables	No	
• flexible cables with/without wire end ferrule	0.25 to 0.75 mm^2	
Number of cables per connection	1 or a combination of 2 wires up to 0.75 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	2.0 mm	
Stripping length of the cables		
• without insulating collar	6 mm	
• with insulating collar	-	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm^2	-	
• with insulating collar 1.5 mm^2	-	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Fully modular connection

Technical specifications Connecting cables

Technical data of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. summation current	4 A/byte
Operating temperature	0 to +60°C
Outer diameter of pre-assembled round cable in mm, unshielded/shielded	Approx. 6.5/7.0
Outer diameter of round-sheath ribbon cable in mm , 16-pole/2 x 16-pole	Approx. 9.5/11.5

Technical specifications basic modules

Connection module TP1, TP3 and TPK	
Max. operating voltage	60 V DC
Continuous current per signal	1 A
Max. summation current (voltage infeed)	4 A/byte
Operating temperature	0 to + 60°C
Mounting position	Any
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3
Dimensions (W x H x D) in mm	
• 1-wire connection 6ES7 924-0AA10-0A_0	Approx. 55 x 43.2 x 63
• for 3-wire initiators 6ES7 924-0CA10-0A_0	Approx. 68 x 43.2 x 80
• for 2 x 8 signals 6ES7 924-1AA10-0A_0	Approx. 100 x 43.2 x 80

Connection module TP2	
Max. operating voltage	60 V DC
Continuous current signal conductor	2 A
Operating temperature	0 to + 60°C
Mounting position	Any
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3
Dimensions (W x H x D) in mm	
• for 2 ampere modules 6ES7 924-0BB10-0A_0	Approx. 68 x 43.2 x 80

Connection module TPA	
Max. operating voltage	60 V DC
Continuous current signal conductor	1 A
Operating temperature	0 to + 60°C
Mounting position	Any
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3
Dimensions (W x H x D) in mm	
• for 2 analog modules 6ES7 924-0CC10-0A_0	Approx. 68 x 43.2 x 80

Wiring rules for connection modules

	Connection module TPA, TP1, TP2, TP3, TPK	
	Spring connection	Screw connection
Connectable cable cross-sections		
• solid cables	No	
• flexible cables without wire end ferrule	0.5 to 2.5 mm^2	
• flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm^2	0.5 to 2.5 mm^2 (2.5 mm^2 with a crimp in accordance with EN 6047-1)
• flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm^2	
Number of cables per connection	1 or a combination of 2 cables up to the cross-sections specified above(total) in a shared wire end ferrule	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Technical specifications Signal modules

Connection module TP1, TP3 and TPK with LED	
Max. operating voltage	24 V DC
Continuous current per signal	1 A
Max. summation current (voltage infeed)	4 A/byte
Operating temperature	0 to + 60 °C
Mounting position	Any
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3
Dimensions (W x H x D) in mm	
• 1-wire connection with LED 6ES7 924-0AA10-0B_0	Approx. 55 x 43.2 x 63
• for 3-wire initiators with LED 6ES7 924-0CA10-0B_0	Approx. 68 x 43.2 x 80
• for 2 x 8 signals with LED 6ES7 924-1AA10-0B_0	Approx. 100 x 43.2 x 80

Connection module TP2 with LED	
Max. operating voltage	24 V DC
Continuous current per signal conductor	2 A
Operating temperature	0 to + 60 °C
Mounting position	Any
Air gaps and creepage distances	IEC Report 664, IEC 664 A, IEC 1131 T2, CSA C22.2 No 142 UL 508, VDE 0160 (12.90), overvoltage category II, pollution degree 3
Dimensions (W x H x D) in mm	
• for 2-ampere modules with LED 6ES7 924-0BB10-0B_0	Approx. 68 x 43.2 x 80

Wiring rules for connection modules

Connection module TP1 LED, TPK LED, TP2 LED, TP3 LED		
	Spring connection	Screw connection
Connectable cable cross-sections		
• solid cables	No	
• flexible cables without wire end ferrule	0.5 to 2.5 mm^2	
• flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm^2	0.5 to 2.5 mm^2 (2.5 mm^2 with a crimp in accordance with EN 60947-1)
• flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm^2	
Number of wiress per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared wire end ferrule	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Technical specifications Function modules

Connection module with relay for outputs (TPRo)	
Energizing side	
Operating voltage for coil	24 V DC
Input circuit	Reverse polarity protection and freewheeling diodes
Contact side	
Number of relay outputs	8 (NO contacts)
Contact design	Single contact, 1 NO contact
Switching capacity (resistive load)	max. 4 A/250 V AC, max. 3 A/30 V DC max. 0.6 A/48 V DC max. 0.4 A/60 V DC recommended minimum load ≥ 10 mA
Switching frequency	20 cycles/minute
Service life	
• mechanical	5 x 10^6 operating cycles
• electrical	3 x 10^4 operating cycles at 230 V AC/2 A/ cos φ = 1
Operating temperature	0 to +60 °C
Mounting position	Any
Air gaps and creepage distances	Basic standard IEC 60664-1; UL 508; CuI (Reference CSA C22.2 No. 142) overvoltage category III pollution degree 2
Dimensions (W x H x D) in mm	
6ES7 924-0BD10-0B_0	Approx. 100 x 45 x 80

Connection module with relay for inputs (TPRi)	
Energizing side	
Operating voltage for coil	230 V AC from 207 – 280 V AC
Input circuit	Varistors
Contact side	
Number of relay outputs	8 (NO contacts)
Contact design	Single contact, 1 NO contact
Switching capacity (resistive load)	max. 50 mA/24 V AC, max. 50 mA/48 V DC max. 50 mA/60 V DC recommended minimum load ≥ 5 mA
Switching frequency	200 cycles/minute
Service life	
• mechanical	10 x 10^6 operating cycles
• electrical	3 x 10^6 operating cycles at 230 V AC/50 mA/ cos φ = 1
Operating temperature	0 to +60 °C
Mounting position	Any
Air gaps and creepage distances	Basic standard IEC 60664-1; UL 508; CuI (Reference CSA C22.2 No. 142) overvoltage category III pollution degree 2
Dimensions (W x H x D) in mm	
6ES7 924-0BE10-0B_0	Approx. 120 x 45 x 80

Fully modular connection

Technical specifications Function modules (continued)

Wiring rules for the connection modules

	Connection modules TPRo and TPRi	
	Spring connection	Screw connection
Connectable cable cross-sections		
• Solid cables	No	
• flexible cables without wire end ferrule	0.5 to 2.5 mm^2	
• flexible cables with wire end ferrule in accordance with DIN 46228/1	0.5 to 1.5 mm^2	0.5 to 2.5 mm^2 (2.5 mm^2 with a crimp in accordance with EN 60947-1)
• flexible cables with wire end ferrule and plastic collar in accordance with DIN 46228/4	0.5 to 1.5 mm^2	
Number of wiress per connection	1 or a combination of 2 conductors up to the cross-sections specified above (total) in a shared wire end ferrule	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Ordering data

		Order No.
Front connector modules		
Front connector module (Compact CPU 312C)		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AJ20-0AA0**
• Screw terminals		**6ES7 921-3AK20-0AA0**
Front connector module (Compact CPU 313C/ 314C-2 PtP/314C-2 DP), slot X1		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AL20-0AA0**
• Screw terminals		**6ES7 921-3AM20-0AA0**
Front connector module (digital 2 x 8 I/O)		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AA00-0AA0**
• Screw terminals		**6ES7 921-3AB00-0AA0**
Front connector module (digital 4 x 8 I/O)		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AA20-0AA0**
• Screw terminals	B7	**6ES7 921-3AB20-0AA0**
Front connector module (1 x 8 outputs) for 2 ampere digital outputs		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AC00-0AA0**
• Screw terminals		**6ES7 921-3AD00-0AA0**
Front connector module 20-pole (analog)		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AF00-0AA0**
• Screw terminals		**6ES7 921-3AG00-0AA0**
Front connector module 40-pole (analog)		
Voltage infeed via		
• Spring terminals		**6ES7 921-3AF20-0AA0**
• Screw terminals		**6ES7 921-3AG20-0AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Ordering data Connecting cables		Order No.
Pre-assembled round cable		
16-pole, 0.14 mm ^{2}		
unshielded		
0.5 m		**6ES7 923-0BA50-0CB0**
1.0 m		**6ES7 923-0BB00-0CB0**
1.5 m		**6ES7 923-0BB50-0CB0**
2.0 m		**6ES7 923-0BC00-0CB0**
2.5 m		**6ES7 923-0BC50-0CB0**
3.0 m		**6ES7 923-0BD00-0CB0**
4.0		**6ES7 923-0BE00-0CB0**
5.0 m		**6ES7 923-0BF00-0CB0**
shielded		
1.0 m		**6ES7 923-0BB00-0DB0**
2.0 m		**6ES7 923-0BC00-0DB0**
2.5 m		**6ES7 923-0BC50-0DB0**
3.0 m		**6ES7 923-0BD00-0DB0**
4.0 m		**6ES7 923-0BE00-0DB0**
5.0 m		**6ES7 923-0BF00-0DB0**
Round-sheath ribbon cable		
16-pole, 0.14 mm ^{2}		
unshielded		
30 m		**6ES7 923-0CD00-0AA0**
60 m	B7	**6ES7 923-0CG00-0AA0**
shielded		
30 m		**6ES7 923-0CD00-0BA0**
60 m		**6ES7 923-0CG00-0BA0**
Round-sheath ribbon cable		
2 x 16-pole, 0.14 mm ^{2}		
unshielded		
30 m		**6ES7 923-2CD00-0AA0**
60 m		**6ES7 923-2CG00-0AA0**
8 connectors (16-pole) Insulation displacement system with 8 cable grips		**6ES7 921-3BE10-0AA0**
Accessories		
Crimping tool For processing the connectors (female ribbon cable connector)		**6ES7 928-0AA00-0AA0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

Ordering data Basic modules	Order No.
Connection module TP1	
for 1-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0AA10-0AB0**
• Screw terminals	**6ES7 924-0AA10-0AA0**
Connection module TP3	
for 3-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0CA10-0AB0**
• Screw terminals	**6ES7 924-0CA10-0AA0**
Connection module TPK	
for 2 x 8 signals	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-1AA10-0AB0**
• Screw terminals	**6ES7 924-1AA10-0AA0**
Connection module TP2	
for 2 A modules	
for 2-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0BB10-0AB0**
• Screw terminals	**6ES7 924-0BB10-0AA0**
Connection module TPA	
for analog signals	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0CC10-0AB0**
• Screw terminals	**6ES7 924-0CC10-0AA0**
Accessories	
Labeling plates for connection modules	
Insertable labeling plate PU = 200 units	**6ES7 928-2AB00-0AA0**
Self-adhesive labeling plate PU = 200 units	**6ES7 928-2BB00-0AA0**
Shield plate for analog connection module (4 units)	**6ES7 928-1BA00-0AA0**
Shield connection terminal for shield plate, 2 units, with cable diameter	
• 2 to 6 mm (2 cables)	**6ES7 390-5AB00-0AA0**
• 3 to 8 mm	**6ES7 390-5BA00-0AA0**
• 4 to 13 mm	**6ES7 390-5CA00-0AA0**

Fully modular connection

Ordering data Signal modules	Order No.
Connection module TP1 with LED	
for 1-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0AA10-0BB0**
• Screw terminals	**6ES7 924-0AA10-0BA0**
Connection module TP3 with LED	
for 3-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0CA10-0BB0**
• Screw terminals	**6ES7 924-0CA10-0BA0**
Connection module TPK with LED	
for 2 x 8 signals	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-1AA10-0BB0**
• Screw terminals	**6ES7 924-1AA10-0BA0**
Connection module TP2 with LED	
for 2 A modules	
for 2-wire initiators	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0BB10-0BB0**
• Screw terminals	**6ES7 924-0BB10-0BA0**
Accessories	
Labeling plates for connection modules	
Insertable labeling plate PU = 200 units	**6ES7 928-2AB00-0AA0**
Self-adhesive labeling plate PU = 200 units	**6ES7 928-2BB00-0AA0**

Ordering data Function modules	Order No.
Connection module TPRo for output signals	
for 2-wire connection	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0BD10-0BB0**
• Screw terminals	**6ES7 924-0BD10-0BA0**
Connection module TPRi for input signals	
for 2-wire connection	
Packaging unit (1 unit)	
• Spring terminals	**6ES7 924-0BE10-0BB0**
• Screw terminals	**6ES7 924-0BE10-0BA0**
Accessories	
Labeling plates for connection modules	
Insertable labeling plate PU = 200 units	**6ES7 928-2AB00-0AA0**
Self-adhesive labeling plate PU = 200 units	**6ES7 928-2BB00-0AA0**
Replacement relay for relay connection module PU = 4 units	
Replacement relay for TPRi	**6ES7 928-3BA00-4AA0**
Replacement relay for TPRo	**6ES7 928-3AA00-4AA0**
Optocoupler DC alternative for relay in the case of TPRo PU = 4 units	**6ES7 928-3DA00-4AA0**
Optocoupler AC alternative for relay in the case of TPRo PU = 4 units	**6ES7 928-3CA00-4AA0**

Overview

The flexible connection guarantees a fast and direct connection from the input/output modules of the SIMATIC S7-300/400 to the individual elements in the cabinet.

Already attached single cores reduce the wiring effort.

The core cross-sections of 0,5 mm^2 also allow higher currents.

Technical specifications

Front connector with single cores 16 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load on all cores, max.	1.5 A
Permissible ambient temperature	0 to +60°C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	20
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	Approx. 15
Color of core	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Fabrication	Screw or crimp contacts

Front connector with single cores 32 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to +60°C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	40
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	Approx. 17
Color of core	Blue, RAL 5010
Designation of cores:	Numbered from 1 to 40 (front connector contact = core number)
Fabrication	Screw or crimp contacts

Flexible connection

Ordering Data	Order No.		Order No.
Front connector with single cores for 16-channel digital modules SIMATIC S7-300, 20 x 0.5 mm²		**Front connector with single cores for 32-channel digital modules SIMATIC S7-300, 40 x 0.5 mm²**	
Core type H05V-K		**Core type H05V-K**	
Screw version		Screw version	
Packaging unit (1 unit) Length:		Packaging unit (1 unit) Length:	
• 2.5 m	**6ES7 922-3BC50-0AB0**	• 2.5 m	**6ES7 922-3BC50-0AC0**
• 3.2 m	**6ES7 922-3BD20-0AB0**	• 3.2 m	**6ES7 922-3BD20-0AC0**
• 5 m	**6ES7 922-3BF00-0AB0**	• 5.0 m	**6ES7 922-3BF00-0AC0**
• Special lengths	on request	• Special lengths	on request
Packaging unit (5 units) Length:		Packaging unit (5 units) Length:	
• 2.5 m	**6ES7 922-3BC50-5AB0**	• 2.5 m	**6ES7 922-3BC50-5AC0**
• 3.2 m	**6ES7 922-3BD20-5AB0**	• 3.2 m	**6ES7 922-3BD20-5AC0**
• 5.0 m	**6ES7 922-3BF00-5AB0**	• 5.0 m	**6ES7 922-3BF00-5AC0**
Crimp version		Crimp version	
Packaging unit (1 unit) Length:		Packaging unit (1 unit) Length:	
• 2.5 m	**6ES7 922-3BC50-0AF0**	• 2.5 m	**6ES7 922-3BC50-0AG0**
• 3.2 m	**6ES7 922-3BD20-0AF0**	• 3.2 m	**6ES7 922-3BD20-0AG0**
• 5.0 m	**6ES7 922-3BF00-0AF0**	• 5.0 m	**6ES7 922-3BF00-0AG0**
• Special lengths	on request	• Special lengths	on request
Core type UL/CSA-certified		**Core type UL/CSA-certified**	
Screw-type version		Screw version	
Packaging unit (1 unit) Lenth:		Packaging unit (1 unit) Length:	
• 3.2 m	**6ES7 922-3BD20-0UB0**	• 3.2 m	**6ES7 922-3BD20-0UC0**
• 5.0 m	**6ES7 922-3BF00-0UB0**	• 5.0 m	**6ES7 922-3BF00-0UC0**

Overview

- For connecting mounting racks in multi-tier SIMATIC S7-300 configurations
- IM 365: For design of central controller and max. 1 expansion unit.
  Limited use of modules in the expansion unit (e.g. no CPs or FMs)
- IM 360/IM 361: For design of central controller and max. 3 expansion units.
  No limitation in selection of modules in the expansion unit

Technical specifications

	6ES7 360-3AA01-0AA0	6ES7 361-3CA01-0AA0	6ES7 365-0BA01-0AA0
Supply voltages			
Rated value			
• DC 24 V		Yes	
Current consumption			
from backplane bus DC 5 V, max.	350 mA		100 mA
from supply voltage L+, max.		500 mA	
Current consumption/ power loss			
Power loss, typ.	2 W	5 W	0.5 W
Hardware config.			
Number of interfaces per CPU, max.	1	3	1; 1 pair
Dimensions			
Dimensions			
• Width	40 mm	80 mm	40 mm
• Height	125 mm	125 mm	125 mm
• Depth	120 mm	120 mm	120 mm
Weights			
• Weight, approx.	225 g	505 g	580 g

Ordering Data

	Order No.
IM 360 interface module	**6ES7 360-3AA01-0AA0**
for expanding the S7-300 with max. 3 EUs; can be plugged into CC	
IM 361 interface module	**6ES7 361-3CA01-0AA0**
for expanding the S7-300 with max. 3 EUs; can be plugged into EU	
Connecting cable	
between IM 360 and IM 361 or IM 361 and IM 361	
1 m	**6ES7 368-3BB01-0AA0**
2.5 m	**6ES7 368-3BC51-0AA0**
5 m	**6ES7 368-3BF01-0AA0**
10 m	**6ES7 368-3CB01-0AA0**

		Order No.
IM 365 interface module		**6ES7 365-0BA01-0AA0**
for expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)		
SIMATIC Manual Collection	B3	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year	B3	**6ES7 998-8XC01-8YE2**
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

SIPLUS IM 365 interface module

Overview

- SIPLUS IM 365: for configuring 1 central controller and no more than 1 expansion rack

Interface module	SIPLUS IM 365
Order No.	**6AG1 365-0BA01-2AA0**
Order No. based on	**6ES7 365-0BA01-0AA0**
Ambient temperature range	-25 °C to +60 °C, condensation permissible
Ambient conditions	Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres).
Technical data	The technical data are identical with the technical data of the based on modules.

Ordering Data

	Order No.
SIPLUS IM 365 interface module (extended temperature range and medial exposure) for expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)	**6AG1 365-0BA01-2AA0**
Accessories	see IM 365, page 4/227

Overview

- Load current supplies for S7-300/ET 200M
- To convert the line voltage to the required operating voltage (24 V DC)
- Output current 2 A, 5 A or 10 A

Technical specifications

Power supply, type	2 A	2 A	5 A	5 A	10 A
Order No.	**6ES7 307-1BA00-0AA0**	**6ES7 305-1BA80-0AA0**	**6ES7 307-1EA00-0AA0**	**6ES7 307-1EA80-0AA0**	**6ES7 307-1KA01-0AA0**
Order No. SIPLUS		**6AG1 305-1BA80-2AA0** 1)		**6AG1 307-1EA80-2AA0** 1)	
Input	Single-phase AC	DC voltage	Single-phase AC	Single-phase AC	Single-phase AC
Rated voltage $V_{in\ rated}$	**120/230 V AC** Set via switch on device	**24 V … 110 V DC** Wide-range input	**120/230 V AC** Set via switch on device	**120/230 V AC** Set via switch on device	**120/230 V AC** Set via switch on device
Voltage range	85 … 132 V AC/ 170 … 264 V AC	16.8 … 138 V DC	85 … 132 V AC/ 170 … 264 V AC	93 … 132 V AC/ 187 … 264 V AC	85 … 132 V AC/ 170 … 264 V AC
Overvoltage resistance	2.3 x Vin $_{rated}$, 1.3 ms	154 V; 0.1 s	2.3 x $V_{inrated}$, 1.3 ms	2.3 x $V_{inrated}$, 1.3 ms	2.3 x $V_{inrated}$, 1.3 ms
Line buffering at $I_{out\ rated}$	> 20 ms at V_{in} = 93/187 V	> 10 ms at $V_{in\ rated}$	> 20 ms at V_{in} = 93/187 V	> 20 ms at V_{in} = 93/187 V	> 20 ms at V_{in} = 93/187 V
Rated line frequency; rated line-frequency range	50/60 Hz, 47 … 63 Hz	-	50/60 Hz; 47 Hz … 63 Hz	50/60 Hz, 47 Hz … 63 Hz	50/60 Hz, 47 Hz … 63 Hz
Rated current$I_{in\ rated}$	0.9/0.6 A	2.7 … 0.6 A (4 … 0.9 A)	2.1/1.3 A	2.1/1.2 A	4.1/1.8 A
Switch-on current limit (+25 °C)	< 20 A, < 3 ms	< 20 A, < 10 ms	< 45 A, < 3 ms	< 45 A, < 3 ms	< 55 A, < 3 ms
I^2t	< 1.0 A^2s	< 5 A^2s	< 1.2 A^2s	< 1.8 A^2s (typ. 1.2 A^2s)	< 3.3 A^2s
Built-in line-side fuse	T 1.6 A/250 V (inaccessible)	T 6.3 A/250 V (inaccessible)	F 4 A/250 V (inaccessible)	T 3.15 A/250 V (inaccessible)	T 6.3 A/250 V (inaccessible)
Recommended miniature circuit breaker (IEC 898) in the supply line	3 A, Characteristic C	At and above 10 A, C characteristic, suitable for DC	At and above 6 A, C characteristic	at and above 10 A, Characteristic C or at and above 6 A, Characteristic D	At and above 10 A, C characteristic
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out\ rated}$	**24 V DC**	**24 V DC**	**24 V DC**	**24 V DC**	**24 V DC**
Total tolerance	±3 %	±3 %	±3 %	±3 %	±3 %
• Static line smoothing	approx. 0.1 %	approx. 0.2 %	approx. 0.1 %	approx. ±0.2 %	approx. 0.1 %
• Static load smoothing	approx. 0.2 %	approx. 0.4 %	approx. 0.2 %	approx. ±0.4 %	approx. 0.5 %
Ripple content (clock frequency: approx. 50 kHz; approx. 70 kHz with 6ES7 307-1BA00-0AA0)	< 150 mV_{pp} (typ. < 20 mV_{pp})	< 150 mV_{pp} (typ. < 30 mV_{pp})	< 150 mV_{pp} (typ. 40 mV_{pp})	< 150 mV_{pp} (typ. 40 mV_{pp})	< 150 mV_{pp} (typ. 40 mV_{pp})

1) SIPLUS module for temperature range -25 … +60°C and use under medial load (e.g. sulphur chloride atmosphere). This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).

Technical specifications (continued)

Power supply, type	2 A	2 A	5 A	5 A	10 A
Order No.	**6ES7 307-1BA00-0AA0**	**6ES7 305-1BA80-0AA0**	**6ES7 307-1EA00-0AA0**	**6ES7 307-1EA80-0AA0**	**6ES7 307-1KA01-0AA0**
Order No. SIPLUS		**6AG1 305-1BA80-2AA0** [1]		**6AG1 307-1EA80-2AA0** [1]	
Spikes (bandwidth: 20 MHz)	< 240 mV_{pp} (typ. < 150 mV_{pp})	< 240 mV_{pp} (typ. < 150 mV_{pp})	< 240 mV_{pp} (typ. 90 mV_{pp})	< 240 mV_{pp} (typ. 90 mV_{pp})	< 240 mV_{pp} (typ. 100 mV_{pp})
Adjustment range	-	-	-	-	-
Status indicator	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
Response on activation/deactivation	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay/ voltage rise	< 3 s/typ.60 ms	< 3 s (typ.7 ms)/ typ. 5 ms	< 2 s (typ.60 ms)	< 3 s/typ.100 ms	< 1.5 s/typ.80 ms
Rated current $I_{out\ rated}$	**2 A**	**2 A (3 A with Vin > 24 V)**	**5 A**	**5 A**	**10 A**
Current range					
• Up … +45 °C	0 A … 2 A	0 … 2 A (3 A)	0 A … 5 A	0 A … 5 A	0 A … 10 A
• Up … +60 °C	0 A … 2 A	0 … 3 A (3 A)	0 A … 5 A	0 A … 5 A	0 A … 10 A
Dynamic V/I at					
• Power-up on short-circuit	typ. 10 A for 90 ms	typ. 9 A for 270 ms	typ. 20 A for 75 ms	typ. 20 A for 180 ms	typ. 35 A for 80 ms
• Short-circuit during operation	typ. 10 A for 90 ms	typ. 9 A for 270 ms	typ. 20 A for 75 ms	typ. 20 A for 80 ms	typ. 35 A for 150 ms
Parallel switching for enhanced performance	not permissible	Yes, 2 units	not permissible	not permissible	not permissible
Efficiency					
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$	approx. 83 %	approx. 75 %	approx. 87 %	approx. 84 %	approx. 87 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$	approx. 10 W	approx. 16 W (24 W)	approx. 18 W	approx. 23 W	approx. 34 W
Closed-loop control					
Dynamic line smoothing ($V_{in\ rated}$ ±15 %)	±0.3 % V_{out}	±0.3 % V_{out}	±0.3 % V_{out}	±0.3 % V_{out}	±0.3 % V_{out}
Dynamic load smoothing (I_{out}: 50/100/50 %)	±0.8 % V_{out}	±2.5 % V_{out}	±2.5 % V_{out}	±3 % V_{out}	±2.5 % V_{out}
Load-step settling time					
• 50 at 100 %	< 5 ms (typ. 2.5 ms)	< 5 ms (typ. 2.5 ms)	typ. 0.1 ms	< 5 ms (typ. 0.2 ms)	< 5 ms
• 100 at 50 %	< 5 ms (typ. 2.5 ms)	< 5 ms (typ. 2.5 ms)	Typ. 0.1 ms	< 5 ms (typ. 0.2 ms)	< 5 ms
Protection and monitoring					
Output overvoltage protection	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart
Current limit	2.2 A … 2.6 A	3.3 A … 3.9 A	5.5 A … 6.5 A	5.5 A … 6.5 A	11 A … 12 A
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Sustained-short-circuit-current rms value	< 4 A	< 2 A	< 9 A	< 5 A	< 10 A
Overload/short-circuit indicator	-	-	-	-	-

1) SIPLUS module for temperature range -25 … +60°C and use under medial load (e.g. sulphur chloride atmosphere). This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).

Technical specifications (continued)

Power supply, type	2 A	2 A	5 A	5 A	10 A
Order No.	**6ES7 307-1BA00-0AA0**	**6ES7 305-1BA80-0AA0**	**6ES7 307-1EA00-0AA0**	**6ES7 307-1EA80-0AA0**	**6ES7 307-1KA01-0AA0**
Order No. SIPLUS		**6AG1 305-1BA80-2AA0** 1)		**6AG1 307-1EA80-2AA0** 1)	
Safety					
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage V_{out} to EN 60950 and EN 50178	Yes, safety extra-low output voltage V_{out} to EN 60950 and EN 50178, creepages and clearances > 5 mm	Yes, safety extra-low output voltage V_{out} to EN 60950 and EN 50178	Yes, safety extra-low output voltage V_{out} to EN 60950 and EN 50178, creepages and clearances > 8 mm	Yes, safety extra-low output voltage V_{out} to EN 60950 and EN 50178
Protection class	Class I	Class I	Class I	Class I	Class I
Leakage current	< 3.5 mA (typ. 0.7 mA)	< 3.5 mA (typ. 0.7 mA)	< 3.5 mA (typ. 0.3 mA)	< 3.5 mA (typ. 0.3 mA)	< 3.5 mA (typ. 0.5 mA)
German Technical Inspectorate approval	Yes	Yes	Yes	Yes	Yes
CE label	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	Yes, UL-listed (UL 508) File E143289, CSA (CSA22.2 No. 14-95)	Yes, UL-listed (UL 508), file E143289, CSA (CSA22.2 no. 14-95)	Yes, UL-listed (UL 508), file E143289, CSA (CSA 22.2 no. 14-95)	Yes, UL-Listed (UL 508) File E143289, CSA (CSA22.2 no. 14-95)	Yes, UL-listed (UL 508), file E143289, CSA (CSA22.2 no. 14-95)
FM approval	Yes, Class I Div. 2 Group A, B, C, D T4	-	Yes, Class I Div. 2 Group A, B, C, D, T 4	-	Yes, Class I Div. 2, A, B, C, D, T4
Marine type approval	in S7-300 system	Yes, GL, LRS	in S7-300 system	Yes, GL, LRS	in S7-300 system
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20	IP20
EMC					
Emitted interference	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B
Supply-harmonics limitation	Not applicable	Not applicable	EN 61000-3-2	-	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data					
Ambient temperature range	0°C … +60°C with natural convection	-25°C … +70°C with natural convection	0°C … +60°C with natural convection	-25°C … +70°C with natural convection	0°C … +60°C with natural convection
Transport/storage temperature range	-40 °C … +85 °C	- 40 … + 85 °C	-40 °C … +85 °C	- 40 … + 85 °C	- 40 … + 85 °C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K5 to EN 60721, transient condensation permitted	Climate class 3K3 to EN 60721, no condensation	Climate class 3K5 to EN 60721, transient condensation permitted	Climate class 3K3 to EN 60721, no condensation
Mechanical system					
Ports					
• Supply input L, N, PE (DC input: L+1, M1, PE)	Solid/finely-stranded per screw-type terminal for 0.5 … 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 … 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 … 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 … 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 … 2.5 mm^2
• Output L+	2 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	4 screw-type terminals for 0.5 … 2.5 mm^2
• Output M	2 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	3 screw-type terminals for 0.5 … 2.5 mm^2	4 screw-type terminals for 0.5 … 2.5 mm^2
Dimensions (W x H x D) in mm	50 x 125 x 120	80 x 125 x 120	80 x 125 x 120	80 x 125 x 120	120 x 125 x 120
Weight, approx.	0.42 kg	0.75 kg	0.74 kg	0.57 kg	1.1 kg
Assembly	Snaps onto S7 busbar	Snaps onto S7 busbar	Snaps onto S7 busbar	Snaps onto S7 busbar	Snaps onto S7 busbar
Accessories	Mounting adapter for DIN rail and PS-CPU power connector	Mounting adapter for DIN rail and PS-CPU power connector	Mounting adapter for DIN rail and power connector	Mounting adapter for DIN rail and power connector	Mounting adapter for DIN rail and PS-CPU power connector

1) SIPLUS module for temperature range -25 … +60°C and use under medial load (e.g. sulphur chloride atmosphere). This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).

Power supplies

Ordering Data	Order No.
PS 305/307 load power supply	
incl. power connector	
120/230 V AC / 24 V DC; 2 A	**6ES7 307-1BA00-0AA0**
24 … 110 V DC / 24 V DC; 2 A, for extended temperature range	**6ES7 305-1BA80-0AA0**
120/230 V AC / 24 V DC; 5 A	**6ES7 307-1EA00-0AA0**
120/230 V AC / 24 V DC; 5 A, for extended temperature range	**6ES7 307-1EA80-0AA0**
120/230 V AC / 24 V DC; 10 A	**6ES7 307-1KA01-0AA0**
SIPLUS load power supply PS 305/307	
for temperature range -25 … +60°C and use under medial load (e.g. sulphur chloride atmosphere). Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	
24 … 110 V DC / 24 V DC; 2 A	**6AG1 305-1BA80-2AA0**
120/230 V AC / 24 V DC; 5 A	**6AG1 307-1EA80-2AA0**
Installation adapter	**6ES7 390-6BA00-0AA0**
For snapping the PS 307 onto a 35 mm DIN rail (EN 50022)	
PS-CPU power connector	**6ES7 390-7BA00-0AA0**
Spare part	

DIN rail

Overview

- The mechanical mounting rack of the SIMATIC S7-300
- For accommodating the modules
- Can be screwed onto the wall

Ordering Data	Order No.
DIN rail	
160 mm	**6ES7 390-1AB60-0AA0**
482 mm	**6ES7 390-1AE80-0AA0**
530 mm	**6ES7 390-1AF30-0AA0**
830 mm	**6ES7 390-1AJ30-0AA0**
2000 mm	**6ES7 390-1BC00-0AA0**

Overview

Labeling sheets

- Film sheets for application-specific labeling of SIMATIC S7-300 I/O modules with commercial laser printers
- Single-color films, tear-resistant, dirt-resistant
- Easy handling:
  - Pre-perforated labeling sheets in DIN A4 format to allow easy separation of the labeling strips
  - The separated strips can be inserted directly into the I/O modules
- Different colors for distinction between module types or preferred areas of application:
  The labeling sheets are available in the colors teal, light beige, red and yellow. Yellow is reserved for failsafe systems.

Labeling strips.

- Teal-colored writable plastic strips
- For insertion in the front connector
- Spare part, 10 items

Label cover

- Teal-colored film
- To cover and hold user-made labeling strips on normal paper
- Accessories, 10 items

Technical specifications

Labeling sheets for S7-300	
Dimensions	DIN A4
Labeling strips per sheet, pre-perforated	10
Weight, approx.	0.1 kg

Ordering Data

	Order No.
Labeling sheets	
for 16-channel signal modules, DIN A4, for printing with laser printer; 10 pieces	
petrol	**6ES7 392-2AX00-0AA0**
light-beige	**6ES7 392-2BX00-0AA0**
yellow	**6ES7 392-2CX00-0AA0**
red	**6ES7 392-2DX00-0AA0**
for 32-channel signal modules, DIN A4, for printing with laser printer; 10 pieces	
petrol	**6ES7 392-2AX10-0AA0**
light-beige	**6ES7 392-2BX10-0AA0**
yellow	**6ES7 392-2CX10-0AA0**
red	**6ES7 392-2DX10-0AA0**
Labeling strips	
10 pieces (spare part)	
for modules with 20-pin front connector	**6ES7 392-2XX00-0AA0**
for modules with 40-pin front connector	**6ES7 392-2XX10-0AA0**
For fail-safe modules (spare part), 10 units	**6ES7 392-2XX20-0AA0**
Label cover	
10 pieces (spare part)	
for modules with 20-pin front connector	**6ES7 392-2XY00-0AA0**
for modules with 40-pin front connector	**6ES7 392-2XY10-0AA0**
For fail-safe modules (spare part), 10 units	**6ES7 392-2XY20-0AA0**