SIMATIC C7

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SIMATIC C7

■ Overview

- Control systems for the low-end performance range
- Combines SIMATIC S7-300 programmable controller and SIMATIC operator panel in one unit

- Ultra-compact complete machine control
- Highly suitable for industrial use

- User-friendly operation, simple fan-free design and reduced installation effort
- Easily adaptable to increasing requirements through the use of the extensive range of S7-300 modules

C7-613

■ Overview

- The low-cost entry point in the world of SIMATIC C7 control systems
- For all applications which require fast PLC performance and easy to use human-machine interface functionality

- With user-friendly, integrated I/O for space-saving implementation at the machine level
- Integral technology functions for counting, frequency measurement and closed-loop control.

For operation of the C7, a micro memory card and connector set are necessary

■ Technical specifications

General technical specifications	
Degree of protection	Front: IP 65 to IEC 529 Housing: IP 20 in accordance with IEC 529
Ambient temperature	
• Horizontal mounting position	0 to 40 °C (0 to 45 °C for 45° mounting angle)
• Vertical installation	0 to 50 °C
Relative humidity	5 to 95%, no condensation (RH severity level 2 in accordance with IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa

Ambient conditions	Not suitable for operation outdoors
Isolation	
• 24 V DC circuits	Insulation test voltage 500 V DC
Electromagnetic compatibility	Requirements of German EMC Legislation per EN 50082-2 (noise immunity), testing per : IEC 801-2, ENV 50140, IEC 801-4, ENV 50141, IEC 801-5; Emitted interference acc. to EN 50081-2, Testing acc. to EN 55011, Class A, Group 1

Technical specifications (continued)

Mechanical stress	
• Vibration, tested per/with	IEC 60068-2-6 during operation: 10 to 58 Hz; constant amplitude 0.075 mm; 58 to 500 Hz; constant acceleration 1 g; during storage: 5 to 9 Hz, amplitude 3.5mm 9-500 Hz, acceleration 1 g
• Impact, tested per/with	IEC 60068-2-29 during operation: Half-sine: strength of impact 15 g (peak value), duration 11 ms, 18 shocks during storage: 25 g, 6ms, 1000 shocks
Voltages, currents	
Supply voltage	
• Rated value	24 V DC
• Permissible range	20.4 to 28.8 V
Current consumption typ.	350 mA no-load operation
Inrush current, max.	1.0 A
Power losses, typ.	11 W
Dimensions	
Dimensions (H x W x D) in mm	215 x 165 x 79
Mounting dimensions (W x H) in mm	202 x 152
Weight, approx.	1350 g
CPU	
Memory	
RAM	
• Integrated	32 KB for program and data, but not display data
• Expandable	No
Load memory	
• Integrated	-
• Upgradable FEPROM	With micro memory card (MMC) up to 4 MB
Backup	Performed by MMC (maintenance free)
• With battery	-
• Without battery	Program and data
Execution times	
Processing times for	
• Bit operations, min.	0.1 µs to 0.2 µs
• Word operations, min.	0.5 µs
• Fixed-point addition, min.	1 µs
• Floating-point addition, min.	15 µs
Timers/counters and their retentivity	
S7 counters	256
• Retentivity selectable	From C 0 to C 256
• Counting range	1 to 999
IEC counters	Yes
• Type	SFB

S7 timers	256
• Retentivity selectable	From T 0 to T 256
• Range	10 ms to 9990 s
IEC timers	Yes
• Type	SFB
Data ranges and their retentivity	
Bit memories	2048
• Retentivity selectable	From MB 0 to MB 255
Blocks	
Max. block size	16 KB
Number of	
• Watchdog interrupts	1
• Process alarms	1
• Time-of-day interrupts	1
• Delay interrupts	1
Nesting depth	
• Per priority class	8
• Additional within an error OB	4
FBs, max.	128
FCs, max.	128
Data blocks, max.	127 (DB 0 reserved)
Programming	
Programming language	STEP 7 V5.1 SP3 (KOP, FUP, AWL); STEP 7 Lite, SCL, CFC, S7-GRAPH, HiGraph
Nesting levels	8
User program protection	Password protection
Address areas (inputs/outputs)	
Total I/O address area	1024 / 1024 byte (freely addressable)
Process image	128/128 byte
Digital channels	992 / 992 max.
Analog channels	248 / 124 max.
Design	
Expansion of C7-613	Max. 2 flat / Max. 4 deep
No. of modules per system	Max. 4
Number of DP masters	
• Integrated	-
• Using CP	1
Suitable modules (recommendation)	
• FMs	8
• CPs, point-to-point	4
• CPs, LAN	2
Time-of-day	
Clock	Yes
• Backed up	Yes
Hours counter	1
Time-of-day synchronization	Yes

Technical specifications (continued)

Communication functions	
Total number of connections	8
Usable for	
• Programming device communications	Yes
- reserved	1
- variable	1 to 7
• OP communications	Yes
- reserved	1
- variable	1 to 7
• S7 standard communication	Yes
- reserved	4
- variable	0 to 4
• Routing	-
S7 message functions	
Number of stations that can be defined for message functions (e.g. OS)	5
Interfaces	
1st interface	
Functionality	
• MPI	Yes
• DP master	No
• DP slave	No
• Electrical isolation	No
MPI	
Cable length (without repeater)	50 m
Transmission rates	Up to 187.5 kBit/s
Number of connections	8
Services	
• Programming device/OP communication	Yes
• Global data communication	Yes
• Number of GD circuits	
- sender, max.	4
- receiver, max.	4
• Size of the GD packets, max.	22 byte
S7 basic communication	Yes
• User data per job, max.	76 byte
S7 Communication	
• As server	Yes
• As client	No
• User data per job, max.	64 KB
On-board digital inputs	
Number of inputs	24
Input voltage	
• Rated value	24 V DC
• At "1" signal	15 to 30 V
• At "0" signal	-3 to +5 V
Electrical isolation	Yes
• In groups of	16 and 8
Input current	
• At "1" signal, typ.	8 mA

Input delay (at rated value of the input voltage)	
• For standard inputs, typ./max.	0.1/0.3/3/15 ms
• For process-related functions	16 µs
Connection of 2-wire BERO	
• Acceptable quiescent current	1.5 mA
Cable lengths	
• Unshielded	600 m
• Shielded	1000 m (100 m for process-related functions)
Integral digital outputs	
Number of inputs	16
Rated load voltage L+/L1	24 V DC
• Permissible range	20.4 to 28.8 V
Output voltage	
• At "1" signal, max.	L+ - 0.8 V
Electrical isolation	Yes
• In groups of	8
Maximum output current	
• At "1" signal	
- rated value at 40 °C	0.5 A
- rated value at 60 °C	0.5 A
- min. current	5 mA
• At "0" signal, max.	0.5 mA
Total load capability	
• At 40 °C	100%
• At 60 °C	50%
Switching frequency of outputs	
• For resistive load	100 Hz
• For inductive load	0.5 Hz
Voltage induced on circuit interruption limited to	Typ. (L+) –48V
Short-circuit protection	Electronic clocked
Cable lengths	
• Unshielded	600 m
• Shielded	1000 m
Integrated analog inputs (for current / voltage)	
• Number of inputs	4
• Voltage	±10 V, 0 to 10 V
• Current	±20 mA, 0/4 to 20 mA
Electrical isolation	Common for analog I/O
Bipolar resolution	11 bit +sign
Integration time (adjustable)	
• Per channel	2.5 / 16.6 / 20 ms
Basic error threshold (operating error threshold at 25°C, referred to input range)	±0.7%
Integrated analog inputs (for resistance / temperature)	
• Number of inputs	1
• Resistance	0 to 600 Ω, Pt 100

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Technical specifications (continued)

Electrical isolation	Common for analog I/O
Bipolar resolution	11 bit +sign
Integration time (adjustable)	
• Per channel	2.5 / 16.6 / 20ms
Basic error threshold (operating error threshold at 25°C, referred to input range)	±3%
Integrated analog outputs	
Number of inputs	2
Output ranges (rated values)	
• Voltage	±10 V, 0 to 10 V
• Current	±20 mA, 0/4 to 20 mA
Electrical isolation	Common for analog I/O
Conversion time per channel	1ms
Basic error (operational limit at 25 °C, referred to output range), max.	±0.7%
Integrated functions	
Counters	3
• Counting speed max.	30 kHz
Pulse outputs	3
• Switching frequency max.	2.5 kHz
Frequency measurement	Yes
Open-loop positioning	-
Integral "Closed loop control" function blocks	PID

Panel	
Display	LCD backlit
• MTBF display and backlighting at 25 °C, approx.	100,000 h
• Lines	4
• Characters	20 characters per line
Keyboard	4 softkeys 10 function keys, can also be used for numerical input
• Make-break operations	1 million
User memory	See RAM for the CPU
Micro memory card	Yes, all data stored on the MMC of the CPU
• Log. connections (also in a network)	1, fixed to integral CPU
Functionality	
• Displays	128
• Variables per display, max.	8
• Alarms	Yes, with buffer
• Graphical objects	Yes
• Info texts	128
• Password protection	Yes
• Online languages	3

C7-613

Ordering data	Order No.
C7-613 control system	**6ES7 613-1CA00-0AE3**
32 KB RAM (PLC), 24 DI, 16 DO, 5 AI, 2 AO onboard, backlit LCD (4 lines, 20 characters/line); with mounting accessories and set of connectors	
Micro memory card	
64 KB	**6ES7 953-8LF00-0AA0**
128 KB	**6ES7 953-8LG00-0AA0**
512 KB	**6ES7 953-8LJ00-0AA0**
2 MB	**6ES7 953-8LL00-0AA0**
4 MB	**6ES7 953-8LM00-0AA0**
8 MB	**6ES7 953-8LP10-0AA0**
Connector set	
for I/O and power supply	
With screw-type terminals	**6ES7 635-0AA00-4AA0**
With spring-loaded terminals	**6ES7 635-0AA00-4BA0**
C7-613 configuration tools	**6ES7 613-0CA00-7AA0**
Standard function blocks for configuring HMI functions; on CD-ROM	
C7-613 manual package	
C7-613 manual and S7-300 manual	
German	**6ES7 613-1CA00-8AA0**
English	**6ES7 613-1CA00-8BA0**
French	**6ES7 613-1CA00-8CA0**
Spanish	**6ES7 613-1CA00-8DA0**
Italian	**6ES7 613-1CA00-8EA0**
C7-613 manual	
German	**6ES7 613-1CA00-8AB0**
English	**6ES7 613-1CA00-8BB0**
French	**6ES7 613-1CA00-8CB0**
Spanish	**6ES7 613-1CA00-8DB0**
Italian	**6ES7 613-1CA00-8EB0**

	Order No.
Accessories	
I/O set	
for expansion of C7-613/C7-635 by max. 4 modules; assembly onto rear of system	
For 2 modules, flat mounting	**6ES7 635-0AA00-6AA0**
For 4 modules, deep mounting	**6ES7 635-0AA00-6BA0**
I/O expansion cable	**6ES7 635-0AA00-6CA0**
for external expansion of SIMATIC C7-621 by max. 4 modules; 1.5 m long	
Adapter frame	**6ES7 613-0CA00-1CA0**
for replacement of SIMATIC C7-62x/-633/-634 by C7-613	
SIMATIC Manual Collection	**6ES7 998-8XC01-8YE0**
Electronic manuals on CD-ROM, multi-language	
SIMATIC Manual Collection updating service for 1 year	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection CD as well as the three following updates	
Spare parts	
Service package	**6ES7 635-0AA00-3AA0**
3 seals, 10 clamps, for all SIMATIC C7-613 and C7-635	
Grounding rail	**6ES7 635-0AA00-6EA0**
with shield terminals for analog I/O	

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Overview

- For fast and easy automation tasks that require simple operator control and visualization functions
- C7-621 with integrated analog and digital I/O
- C7-621 ASi with Actuator-Sensor Interface, for use as a master with addressing and diagnostic functions

Technical specifications

General	
Degree of protection	Front: IP 65 acc. to IEC 529
	Housing: IP 20 acc. to IEC 529
Ambient temperature	
• Vertical operation	0 to 50 °C
• With 45° installation	0 to 45 °C, restricted readability with horizontal installation
Relative humidity	5 to 95% (RH severity level 2 in accordance with IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Isolation	
• 24 V DC circuit	500 V DC
Electromagnetic compatibility	Radio interference: class B / EN55022; conducted interference: IEC 1000-4-4, IEC 1000-4-5; Noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN50140
Mechanical rating	
• Vibrations tested with	IEC 68, Part 2-6 10 to 58 Hz; Amplitude 0.075 mm; 58 to 500 Hz: constant acceleration 9.8 m/s^2;
• Shock tested with	IEC 68, Part 2-29 half-sine: 100 m/s^2 (10 g), 16 ms; 100 shocks
Supply voltage	
• Rated value	24 V DC
• Permitted range	20.4 to 30.2 V
Current consumption, typ./max.	0.3 A/1 A
Power loss, typ.	8 W
Acceptance, certification	EN 61131-2 (IEC 1131-2); UL Listing UL 508; Canadian Standard Association (CSA) to Standard C22.2 Number 142; FM certification, FM standards no. 3611, 3600, 3810 Class I, Div. 2 Group A, B, C, D; DIN/ ISO 9001 certification of manufacturing and development
Dimensions	
• Device (W x H x D) in mm	168 x 120 x 69
• Cutout dimensions (W x H) in mm	158.5 x 110.5
Weight	800 g

PLC	
Memory (1 statement corresponds to an average of 3 byte)	32 KB/10 K statements RAM (integrated)
Load memory	
• Integral (for data)	48 KB RAM 48 KB FEPROM
• Pluggable, max.	–
Data backup	
• With battery	–
• Without battery, max.	144 byte, parameterizable for memory bits, timers, data
Program organization	Linear, structured
Types of blocks	Organization blocks (OB) Function blocks (FB) Functions (FC) Data blocks (DB) System functions (SFC)
Number of blocks, max.	128 FCs, 128 FBs, 127 DBs
Program execution	Start-up (OB 100) Free cycle (OB 1) Interrupt-controlled (OB 40) Error handling (OB 80, 81, 82, 85, 87, 121, 122)
System functions (SFCs)	Interrupt masking, data copying, clock functions, diagnostic functions, fault and error handling, module parameter assignment
Block nesting depth	8 for each program execution level
Nesting levels	8
User program protection	Password protection
Instruction set	Binary logic, parenthesis commands, result assignment, save, count, load, transfer, compare, shift, rotate, generate complement, call up blocks, fixed-point and floating point arithmetic functions, jump functions
Execution times	
• Bit operations	0.3 to 0.6 µs
• Word operations	1 µs
• Timer-/counter operations	12 µs
• Fixed-point addition	2 µs
• Floating-point addition	50 µs

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■ Technical specifications (continued)

Cycle time monitoring	150 ms (default); programmable 1 to 6000 ms		
Bit memories	2048		
• Of these retentive with battery	-		
• Of these retentive without battery	0 to 1023, programmable		
Counter	64		
• Of these retentive with battery	-		
• Of these retentive without battery	0 to 31, programmable		
• Counting range	1 to 999		
Timers	128		
• Of these retentive with battery	-		
• Of these retentive without battery	0 to 63, programmable		
• Range	1 to 9990 s		
Expansion with S7-300 modules	Max. 1-line		
S7-300 expansion modules	Max. 4		
I/O expansion			
• Digital inputs/outputs, max.	160		
• Analog inputs/outputs, max.	37		
Onboard interface module	--		
Suitable modules			
FMs	4		
CP, point-to-point	2		
CPs, LAN	1		
Total address areas I/O	78/78 byte		
Process image I/O	124/124 byte		
Communication			
Communication functions			
• Programming device/OP communications	Yes		
• Global data communication	Yes		
• Basic communication	Yes		
• Extended communications	Yes (server)		
• S5-compatible communications	-		
• Standard communication	-		
• Number of connections static/ dynamic	4/4		
MPI (multipoint interface)	Yes		
• No. of stations, max.	32; PG/PC, OP, C7, S7-300/-400, M7		
• Data transmission rate, max.	187.5 kbit/s		

Distance between 2 adjacent nodes	Without repeaters 50 m, with 2 repeaters: 1100 m with 10 repeaters in series: 9100 m, via fiber-optic cables: 23.8 km (with star couplers or OLMs)		
Suitable programming devices	SIMATIC PG/PC, Standard-PC		
PROFIBUS DP interface	-		
• Integrated	-		
• Transmission procedure	-		
• Data transmission rate	-		
• Number of DP lines per C7 (integral interface/CP342-5)	-/1		
• Number of DP stations per master C7 (integral interface/ CP 342-5)	-/8		
• Address area per DP station	64 byte		
Number of modules per ET200M	8		
• DP connection (Master/ Slave)	1 (CP342-5)		

	C7-621	C7-621 ASi
Integrated AS master interface	-	1
Digital inputs	**16**	**-**
Input voltage		-
• Rated value	24 V DC	-
• At "1" signal	15 to 30 V	-
• At "0" signal	-3 to +5 V	-
Electrical isolation	No	-
• In groups of	-	-
Input delay, typ./max.	3/4.8 ms	-
Input current at "1" signal, max.	11.5 mA	-
Connection of two-wire BEROs		
• Permissible quiescent current, max.	2 mA	-
Cable lengths		
• Unshielded	600 m	-
• Shielded	1000 m	-
Digital outputs	**16**	**-**
Rated load voltage	24 V DC	-
• Permitted range	20.4 to 28.8 V	-
Output voltage		
• At "1" signal, max.	L+ > U > L+ - 0.8 V	-
Electrical isolation	No	-
• In groups of	-	-
Output current		-
• At "1" signal		-
• Rated value	0.5 A	-

Technical specifications (continued)

	C7-621	C7-621 ASi
C7-621		-
• At "0" signal , max.	0.5 mA	-
Total current per group of 8		
• At 20 °C	4 A	-
• At 40 °C	2 A	-
Lamp load, max.	5 W	-
Switching frequency		
• For resistive load	100 Hz	-
• For inductive load	0.5 Hz	-
Voltage induced on circuit interruption limited to	48 V	-
Short-circuit protection	Yes, electr. clocked	-
Cable lengths		
• Unshielded	600 m	-
• Shielded	1000 m	-
Universal inputs	**-**	**-**
Electrical isolation	-	-
Input voltage		-
• Rated value	-	-
• At "1" signal	-	-
• At "0" signal	-	-
Input current at "1" signal, typ.	-	-
Cable lengths	-	-
• Unshielded	-	-
• Shielded	-	-
Counter frequency, max.	-	-
Counter	-	
• Principle	-	-
• Counting range	-	-
• Limit value (setpoint) specification	-	-
• Count interrupt up counter	-	-
• Count interrupt down counter	-	-
• Enable	-	-
Period duration counter, max.	-	-
• Principle	-	-
Counting range	-	-
• Period duration, max.	-	-
Frequency counter, max.	-	-
• Principle	-	-
• Counting range	-	-
• Gate width	-	-
Analog inputs	**4**	**-**
Input ranges/input resistance (programmable)	-10 b. 10 V/50 kΩ -20 to 20 mA/ 105.5Ω	-
Permissible input voltage for voltage input, max.	30 V	-
Permissible input current for current input, max.	30 mA	-
Electrical isolation	No	-

	C7-621	C7-621 ASi
Cycle time (all channels)	-	-
Conversion time per channel	100 µs	-
Resolution	12 bits incl. sign	-
Operational limit (in the entire temperature range, referred to input range)		
• Voltage	+/-1.0%	-
• Current	+/-1.0%	-
Basic error limit (operating error limit at 25 °C, referred to the input range)		
• Voltage	+/-0.9%	-
• Current	+/-0.8%	-
Interrupts		
• Limit value interrupt	-	-
• Diagnostics interrupt	-	-
Alarm cycle		-
Analog outputs	**1**	**-**
Output ranges		-
• Voltage output	-10 to 10 V	-
• Current output	-20 to 20 mA	-
Load impedance		
• For voltage outputs, min.	2 kΩ	-
• For current outputs, max.	0.5 kΩ	-
• For capacitive load, max.	1 µF	-
• For inductive loads, max.	1 mH	-
Voltage output		
Short-circuit protection	Yes	-
• Short-circuit current	11 mA	-
Current output		
Open-circuit voltage, max.	15 V	-
Electrical isolation	No	-
Cycle time (all channels)	0.5 ms	-
Resolution	12 bit incl. sign	-
Transient recovery time		
• For resistive load, max.	0.6 ms	-
• For capacitive load, max.	3 ms	-
• For inductive load, max.	0.5 ms	-
Substitute values assignable		-
Operating error limit (0 to 60°C, referred to the output range)		
• Voltage	+/-1.0%	-
• Current	+/-1.0%	-
Basic error threshold (operating error threshold at 25 °C, with reference to output range)		
• Voltage	+/-0.8%	-
• Current	+/-0.9%	-
Interrupts		
• Diagnostics interrupt	No	-

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Technical specifications (continued)

	C7-621	C7-621 ASi
Cable length, shielded	100 m	-
Programming, planning, configuring		
Programming software	STEP 7, STEP 7-Lite	STEP 7, STEP 7-Lite
Configuring HMI	ProTool/Lite, ProTool, ProTool/Pro	ProTool/Lite, ProTool, ProTool/Pro
Suitable software		
Software controllers	8 loops	8 loops
Process diagnostics	Yes (C7-CPU)	Yes (C7-CPU)
S7-GRAPH	-	-
S7-HiGraph	-	-
S7-SCL	Yes	Yes
CFC	-	
Human machine interface		
Display	LC display, LED backlit	LC display, LED backlit
Service life of the back-lighting, approx.	100.000 h (approx. 11 years)	100.000 h (approx. 11 years)
Number of lines x characters per line	2 x 20	2 x 20
Character height	5 mm	5 mm
Resolution	-	-
Active screen surface (W x D) in mm	-	-
Number of soft keys/function keys	5/-	5/-
User memory, permanently integrated	128 KB flash	128 KB flash

	C7-621	C7-621 ASi
RAM (dyn.)	-	-
Operating messages, max.	499	499
Operating message buffer, max.	-	-
Scroll operating messages, max.	50	50
Fault signal buffers, max.	-	-
Max. variables in message text	8	8
Number of pictures	40	40
Entries per picture	20	20
Pixel graphics	-	-
Semi graphics	-	-
Symbol/character sets	1	1
Dynamic objects	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields
Recipes, max.	-	-
Recipe data memory	-	-
Data records per recipe, max.	-	-
Entries per data record, max.	-	-
Online languages	3	3
Password levels	9	9
Clock	Software clock	Software clock
Printer interface	-	-

Ordering data

	Order No.
C7-621 control system	**6ES7 621-1AD02-0AE3**
32 KB RAM (PLC), 16 DI, 16 DO, 4 AI, 1 AO onboard; 128 KB flash EPROM for HMI data, LED backlit LCD (2 lines, 20 characters/line, 5 mm character height); with mounting accessories and set of connectors	
C7-621 ASi control system	**6ES7 621-6BD02-0AE3**
32 KB RAM (PLC), integral AS-Interface (master) 128 KB flash EPROM for HMI data, LED backlit LCD (2 lines, 20 characters/line, 5 mm character height); with mounting accessories and set of connectors	
C7-621, C7-621 ASi manual	
German	**6ES7 621-1AD00-8AA0**
English	**6ES7 621-1AD00-8BA0**
French	**6ES7 621-1AD00-8CA0**
Spanish	**6ES7 621-1AD00-8DA0**
Italian	**6ES7 621-1AD00-8EA0**

	Order No.
Accessories	
SIMATIC C7 simulator	**6ES7 620-0AA00-4AA0**
for all SIMATIC C7s, with 16 onboard DIs and 16 onboard DOs; with switches and LEDs for simulating 16 DIs and 16 DOs	
IM 621 interface module	**6ES7 621-1AD00-6AE3**
for expansion of SIMATIC C7-621 by max. 4 modules (1 ER); incl. connecting cable	
Connector set	**6ES7 623-1AE01-4AA0**
for I/O and power supply	
SIMATIC Manual Collection	**6ES7 998-8XC01-8YE0**
Electronic manuals on CD-ROM, multi-language	
SIMATIC Manual Collection updating service for 1 year	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection CD as well as the three following updates	
Spare parts	
Service package	**6ES7 623-1AE00-3AA0**
Seal, 4 clamps, 2 connectors; for all SIMATIC C7s	

Overview

- Cost-effective control systems
- For all applications which require fast PLC performance and easy to use human-machine interface functionality
- Featuring larger user memory for extensive application programs
- Offers the additional benefits of the convenient HMI functions provided by the SIMATIC Operator Panel OP7

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Technical specifications

	C7-633 DP	C7-633/P
General		
Degree of protection	Front: IP 65 acc. to IEC 529 Housing: IP 20 acc. to IEC 529	
Ambient temperature		
• Vertical operation	0 to 50 °C	
• At 45° angle of installation	0 to 45 °C	
Relative humidity	5 to 95% at 25 °C (no condensation), tested in accordance with DIN IEC 68-2-3	
Atmospheric pressure	795 to 1080 hPa	
Isolation		
• 24 V DC circuit	500 V DC	
Electromagnetic compatibility	Radio interference Class A / EN55022; conducted interference: IEC 1000-4-4, IEC 1000-4-5; Noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN50140	
Mechanical rating		
• Vibrations tested with	IEC 68, Part 2-6 10 to 58 Hz; Amplitude 0.075 mm; 58 to 500 Hz: constant acceleration 9.8 m/s2;	
• Shock tested with	IEC 68, Part 2-29 half-sine: 100 m/s2 (10 g), 16 ms; 100 shocks	
Supply voltage		
• Rated value	24 V DC	
• Permitted range	20.4 to 30.2 V	
Current consumption, typ./ max.	550 mA/1 A	
Power losses, typically	12 W	
Acceptance, certification	EN 61131-2 (IEC 1131-2); UL Listing UL 508; Canadian Standard Association (CSA) to Standard C22.2 Number 142; FM permit, FM-Standards No. 3611, 3600, 3810 Class I, Div. 2 Group A, B, C, D; DIN/ISO 9001 certification	
Dimensions		
• Device (W x H x D) in mm	240 x 203.5 x 74.4	240 x 203.5 x 90
• Cutout dimensions (W x H) in mm	231 x 159	231 x 159

	C7-633 DP	C7-633/P
Weight	1600 g	1800 g
PLC		
Memory (1 statement corresponds to an average of 3 byte)	64 KB/ 20 K statements RAM	48 KB/ 16 K statements RAM
Load memory		
• Integral (for data)	96 KB RAM	80 KB RAM
• Pluggable, max.	512 KB	512 KB
Data backup		
• With battery	All data	
• Without battery, max.	4736 byte, byte, parameterizable for bit memories, timers, counters, data	
Real-time clock	Yes	
Program organization	Linear, structured	
Types of blocks	Organization blocks (OBs)	
	Function blocks (FBs)	
	Functions (FCs)	
	Data blocks (DBs)	
	System functions (SFCs)	
Number of blocks, max.	192 FC, 192 FB, 255 DB	
Program execution	Restart (OB 100)	
	Free cycle (OB 1)	
	Real-time controlled (OB 10)	
	Time-driven (OB 35)	
	Interrupt controlled (OB 40)	
	Error handling (OB 80, 81, 82, 85, 86, 87, 121, 122)	
System functions (SFCs)	Interrupt masking, data copying, clock functions, diagnostic functions, fault and error handling, module parameter assignment	
Block nesting depth	8 for each program execution level	
Nesting levels	8	
User protection program	Password protection	

C7-633

Technical specifications (continued)

	C7-633 DP	C7-633/P
Instruction set	Binary logic, parenthesis commands, result assignment, save, count, load, transfer, compare, shift, rotate, generate complement, call up blocks, fixed-point and floating point arithmetic functions, jump functions	
Processing times for		
• Bit operations	0.3 to 0.6 µs	
• Word operations	1 µs	
• Timer-/counter operations	12 µs	
• Fixed-point addition	2 µs	
• Floating-point addition	50 µs	
Cycle time monitoring	150 ms (default); programmable 1 to 6000 ms	
Bit memories	2048	
• Of these retentive with battery	0 to 2047, adjustable	
• Of these retentive without battery	0 to 2047, adjustable	
Counter	64	
• Of these retentive with battery	0 to 63, settable	
• Of these retentive without battery	0 to 63, settable	
• Counting range	1 to 999	
Timers	128	
• Of these retentive with battery	0 to 127, adjustable	
• Of these retentive without battery	0 to 127, adjustable	
• Range	10 ms to 9990 s	
Expansion with S7-300 modules	Max. 3-line	
Expansion modules S7-300	Max. 24	
I/O expansion		
• Digital inputs/outputs, max.	768	
• Analog inputs/outputs, max.	192	
Interface module onboard	IM 360	
Suitable modules		
• FMs	8	
• CP, point-to-point	4	
• CPs, LAN	2	
Total address areas I/O	1024/1024 byte	
Process image I/O	128/128 byte	
Communication		
Communication functions		
• PG/OP communication	Yes	
• Global data communication.	Yes	
• Basic communication.	Yes	
• Extended communication	Yes (server)	

	C7-633 DP	C7-633/P
Communication functions		
• S5-compatible communication	Yes	
• Standard communication	Yes	
• Number of connections static/dynamic	4/8	
MPI (multipoint interface)	Yes, occupies 2 nodes per unit (1x CPU, 1x OP)	
• Number of nodes, max.	32; PG/PC, OP, C7, S7-300/400, M7;	
• Data transmission rate, max.	187.5 kbit/s	
• Distance between 2 adjacent nodes	Without repeaters 50 m with 2 repeaters: 1000 m with 10 repeaters in series: 9100 m via fiber-optic cables: 23.8 km (with star couplers or OLMs)	
Suitable programming devices	SIMATIC PG/PC, Standard PC	
PROFIBUS DP interface	1	
• Transmission procedure	PROFIBUS DP to DIN 19245 Part 3, DP master, DP slave	
• Data transmission rate	12 Mbit/s	
• Number of DP lines per C7 (integral interface/CP342-5)	1/1	-/1
• Number of DP stations per master C7 (integral interface/CP 342-5)	64/32	-/32
• Address area per DP station	122 byte	122 byte
No. of modules per ET200M	8	8
DP connection (Master/slave)	1 (integral, master/slave) 1 (CP342-5)	1 (CP342-5)
Integrated AS master interface	-	-
Digital inputs	**-**	**16**
Input voltage		
• Rated value	-	24 V DC
• At "1" signal	-	11 to 30 V
• At "0" signal	-	-3 to +5 V
Electrical isolation		Yes, using optocoupler
• In groups of	-	16
Input delay, typ./max.	-	3 / 4.8 ms
Input current at "1" signal, max.	-	11.5 mA
Connection of two-wire BEROs		
• Permissible quiescent current, max.	-	2 mA
Cable lengths		
• Unshielded	-	600 m
• Shielded	-	1000 m

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Technical specifications (continued)

	C7-633 DP	C7-633/P
Digital outputs	**-**	**16**
Rated load voltage		24 V DC
• Permitted range	-	20.4 to 28.8 V
Output voltage		
• At "1" signal, max.	-	L+ > U > L+ - 0.8 V
Electrical isolation	-	Yes; via optocouplers
• In groups of	-	2 groups of 8
Output current		
• At "1" signal		
- rated value	-	0.5 A
- minimum current	-	5 mA
• At "0" signal , max.	-	0.5 mA
Total current per group of 8		
• At 20 °C	-	4 A
• At 40 °C	-	2 A
Lamp load, max.	-	5 W
Switching frequency		
• For resistive load	-	100 Hz
• For inductive load	-	0.5 Hz
Voltage induced on circuit interruption limited to	-	48 V
Short-circuit protection	-	Yes; electronic clocked
Cable lengths		
• Unshielded	-	600 m
• Shielded	-	1000 m
Universal inputs		**4**
Can be used as	-	UI1 digital/interrupt input. 24 V DC or up/down counter UI2 digital/interrupt input. 24 V DC or up/down counter UI3 digital/interrupt input 24 V DC or up/down counter or frequency/period duration counter UE4 digital/alarm input 24 V DC
Electrical isolation	-	No
Input voltage		
• Rated value	-	24 V DC
• At "1" signal	-	11 to 30 V
• at "0" signal	-	-3 to +5 V
Input current at "1" signal, typ.	-	11.5 mA
Cable lengths		
• Shielded	-	1000 m
Counter frequency, max.	-	10 kHz

	C7-633 DP	C7-633/P
Counters, max.	-	3 (UE1, UE2, UE3)
• Principle	-	Counting slopes;
• Counting range UI1, UI2	-	Forwards: 0 to 65535, reverse: 65535 to 0
• Counting range UI3	-	Forwards: 0 to 16777215, reverse: 16777215 to 0
• Limit value (setpoint) specification	-	One counter per value
• Count interrupt up counter	-	On reaching the limit value
• Count interrupt down counter	-	On reaching "0"
• Enable	-	In the program
Period duration counter, max.	-	1 (UE3)
• Principle	-	Counting fixed time units between two positive slopes
• Counting range	-	0 to 16777214
• Period duration, max.	-	8.38 s bzw. 0.12 Hz
Frequency counter, max.	-	1 (UE3)
• Principle	-	Counting pulses within a time period
• Counting range	-	0 to 16777215
• Gate width	-	0,1 s; 1 s; 10 s (programmable)
External gate counter		3
• Principle		Counting edges within a gate time using an external pin
• Counting range UI1, UI2		0 to 65535
• Counting range UI3		0 to 16777215
Analog inputs	**-**	**4**
Input ranges/ input resistance (programmable)	-	-10 to 10 V/ 50 kΩ -20 to 20 mA/ 105.5 Ω 4 to 20 mA/ 105.5 Ω
Permissible input voltage for voltage input, max.	-	30 V
Permissible input current for current input, max.	-	30 mA
Electrical isolation	-	Yes, shared with AO
Cycle time (all channels)	-	2 ms
Conversion time per channel	-	0.5 ms
Resolution	-	12 bit incl. sign

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Technical specifications (continued)

	C7-633 DP	C7-633/P
Operating error limit (in overall temperature range referred to the input range)	-	
• Voltage	-	+/-0.8%
• Current	-	+/-0.8%
Basic error limit (operating error limit at 25°C, referred to the input range)		
• Voltage	-	+/-0.6%
• Current	-	+/-0.6%
Interrupts		
• Limit value interrupt	-	-
• Diagnostics interrupt	-	Measuring range violation, wire break detection at 4 to 20 mA per software
• Alarm cycle	-	Yes (programmable)
Analog outputs	**-**	**4**
Output ranges		
• Voltage output	-	-10 to 10 V
• Current output	-	-20 to 20 mA, 4 to 20 mA
Load impedance		
• For voltage outputs, min.	-	2 kΩ
• For current outputs, max.	-	0.5 kΩ
• For capacitive load, max.	-	1 µF
• For inductive loads, max.	-	1 mH
Voltage output		
• Short-circuit protection	-	Yes
• Short-circuit current, max.	-	25 mA
Current output		
• Open-circuit voltage, max.	-	+/-16 V
Electrical isolation	-	Yes, shared with AI
Operating cycle time (all channels) typ./max.	-	2/4 ms
Resolution	-	12 bits incl. sign
Transient recovery time		
• For resistive load, max.	-	0.1 ms
• For capacitive load, max.	-	3.3 ms
• For inductive load, max.	-	0.5 ms
Substitute values assignable	-	Yes, parameterizable
Operating error limit (0 to 60°C, referred to the output range)		
• Voltage	-	+/-0.8%
• Current	-	+/-1%

	C7-633 DP	C7-633/P
Basic error limit (operating error limit at 25°C, referred to the output range)		
• Voltage	-	+/-0.5%
• Current	-	+/-0.6%
Interrupts		
• Diagnostics interrupt	-	Yes, programmable for parameter errors
Cable length, shielded	-	200 m
Programming, planning, configuring		
Programming software	STEP 7, STEP 7-Lite	STEP 7, STEP 7-Lite
Configuring HMI	ProTool/Lite, ProTool, ProTool/Pro	ProTool/Lite, ProTool, ProTool/Pro
Suitable software		
Software controllers	16 loops	16 loops
Process diagnostics	Yes (C7-CPU)	Yes (C7-CPU)
S7-GRAPH	Yes	Yes
S7-HiGraph	Yes	Yes
S7-SCL	Yes	Yes
CFC	Yes	Yes
Human machine interface		
Display	LC display, LED backlit	LC display, LED backlit
Service life of the back-lighting, approx.	100,000 h (approx. 11 Jahre)	100,000 h (approx. 11 Jahre)
Number of lines x characters per line	4 x 20	4 x 20
Character height	8 mm	8 mm
Resolution	-	-
Active screen surface (W x D) in mm	-	-
Number of soft keys/function keys	4/16	4/16
User memory, permanently integrated	128 KB flash	128 KB flash
RAM (dyn.)	-	-
Operating messages, max.	499	499
Operating message buffer, max.	256 entries	256 entries
Scroll operating messages, max.	256	256
Fault messages, max.	499	499
Fault signal buffers, max.	256 entries	256 entries
Max. variables in message text	8	8
Number of pictures	99	99
Entries per picture	99	99
Pixel graphics	-	-
Semi graphics	Within the bounds of the character set	Within the bounds of the character set

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Technical specifications (continued)

	C7-633 DP	C7-633/P
Symbol/character sets	1	1
Dynamic objects	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields
Recipes, max.	99	99
Recipe data memory	4 KB	4 KB

	C7-633 DP	C7-633/P
Data records per recipe, max.	99	99
Entries per data record, max.	99	99
Online languages	3	3
Password levels	9	9
Clock	Software clock	Software clock
Printer interface	RS232	RS232

Ordering data

	Order No.
C7-633 DP control system	**6ES7 633-2BF02-0AE3**
64 KB RAM (PLC), with PROFIBUS DP interface, without onboard I/O; 128 KB flash EPROM for HMI data, LED backlit LCD (4 lines, 20 characters/line, 8 mm character height); with installation accessories, 24 V DC connector and backup battery	
C7-633/P control system	**6ES7 633-1DF02-0AE3**
48 KB RAM (PLC), 16 DI, 16 DO, 4 AI, 4 AO, 4 UI onboard; 128 KB flash EPROM for HMI data, LED backlit LCD (4 lines, 20 characters/line, 8 mm character height); with mounting accessories and backup battery	
C7-633, C7-634 documentation package	
comprising C7-633, C7-634 manual, S7-300 manual, OP7, OP17 manual	
German	**6ES7 633-1AF01-8AA0**
English	**6ES7 633-1AF01-8BA0**
French	**6ES7 633-1AF01-8CA0**
Spanish	**6ES7 633-1AF01-8DA0**
Italian	**6ES7 633-1AF01-8EA0**
Manual "Communication for SIMATIC S7-300/-400"	**6ES7 398-8EA00-8■A0**
Technical overview "From SIMATIC S5 to SIMATIC S7"	**6ES7 398-8AA01-8■B0**
German	**A**
English	**B**
French	**C**
Spanish	**D**
Italian	**E**
SIMATIC Manual Collection	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection updating service for 1 year	**6ES7 998-8XC01-8YE2**

	Order No.
Accessories	
FEPROM memory card	
16 KB	**6ES7 951-0KD00-0AA0**
32 KB	**6ES7 951-0KE00-0AA0**
64 KB	**6ES7 951-0KF00-0AA0**
128 KB	**6ES7 951-0KG00-0AA0**
512 KB	**6ES7 951-0KJ00-0AA0**
SIMATIC C7 simulator	**6ES7 620-0AA00-4AA0**
for all SIMATIC C7s, with 16 onboard DIs and 16 onboard DOs; with switches and LEDs for simulating 16 DIs and 16 DOs	
Connector set	**6ES7 623-1AE01-4AA0**
for I/O and power supply	
Backup battery 3.6 V; 1.5 Ah	**6ES7 623-1AE01-5AA0**
PROFIBUS DP bus connector; PROFIBUS bus components	See page 4/33
Spare parts	
Service package	**6ES7 623-1AE00-3AA0**
Seal, 4 clamps, 2 connectors; for all SIMATIC C7s	

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SIMATIC C7
Control systems

Overview

- Control systems for all applications that require high PLC performance and advanced HMI capabilities
- Expanded user memory for larger application programs and enhanced HMI capability
- Controller section offers performance range of C7-633
- C7-634 additionally offers the convenience of the SIMATIC OP17 Operator Panel

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Technical specifications

	C7-634 DP	C7-634/P
General		
Degree of protection	Front: IP 65 acc. to IEC 529 Housing: IP 20 acc. to IEC 529	
Ambient temperature		
• Vertical operation	0 to 50 °C	
• At 45° angle of installation	0 to 45 °C	
Relative humidity	5 to 95% at 25 °C (no condensation), tested in accordance with DIN IEC 68-2-3	
Atmospheric pressure	795 to 1080 hPa	
Isolation		
• 24 V DC circuit	500 V DC	
Electromagnetic compatibility	Emitted interferance: Class A / EN55022; cableled disturbance: IEC 1000-4-4, IEC 1000-4-5; Noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN50140	
Mechanical rating		
• Vibrations tested with	IEC 68, Part 2-6 10 to 58 Hz; Amplitude 0.075 mm; 58 to 500 Hz: constant acceleration 9.8 m/s^2;	
• Shock tested with	IEC 68, Part 2-29 half-sine:100 m/s^2 (10g), 16ms; 100 shocks	
Supply voltage		
• Rated value	24 V DC	
• Permitted range	20.4 to 30.2 V	
Current consumption, typ./ max.	550 mA/1 A	
Power losses, typically	12 W	
Acceptance, certification	EN 61131-2 (IEC 1131-2); UL Listing UL 508; Canadian Standard Association (CSA) to Standard C22.2 Number 142; FM permit, FM-Standards No. 3611, 3600, 3810 Class I, Div. 2 Group A, B, C, D; DIN/ISO 9001 Certification	
Dimensions		
• Device (W x H x D) in mm	240 x 203.5 x 74.4	240 x 168 x 89.4
• Cutout dimensions (W x H) in mm	231 x 159	231 x 159
Weight	1700 g	1900 g

	C7-634 DP	C7-634/P
PLC		
Memory (1 statement corresponds to an average of 3 byte)	64 KB/ 20 K statements RAM	48 KB/ 16 K statements RAM
Load memory		
• Integral (for data)	96 KB RAM	80 KB RAM
• Pluggable, max.	512 KB	512 KB
Data backup		
• With battery	All data	
• Without battery, max.	4736 byte, parameterizable for bit memories, timers, counters, data	
Real-time clock	Yes	
Program organization	Linear, structured	
Types of blocks	• Organization blocks (OB) • Function blocks (FB) • Functions (FC) • Data blocks (DB) • System functions (SFC)	
Number of blocks, max.	192 FC, 192 FB, 255 DB	
Program execution	• Restart (OB 100) • Free cycle (OB 1) • Real-time controlled (OB 10) • Time-driven (OB 35) • Interrupt controlled (OB 40) • Error handling (OB 80, 81, 82, 85, 86, 87, 121, 122)	
System functions (SFCs)	Interrupt masking, data copying, clock functions, diagnostic functions, fault and error handling, module parameter assignment	
Block nesting depth	8 for each program execution level	
Nesting levels	8	
User program protection	Password protection	
Instruction set	Binary logic, parenthesis commands, result assignment, save, count, load, transfer, compare, shift, rotate, generate complement, call up blocks, fixed-point and floating point arithmetic functions, jump functions	

Technical specifications (continued)

	C7-634 DP	C7-634/P
Processing times for		
• Bit operations	0.3 to 0.6 µs	
• Word operations	1 µs	
• Timer-/counter operations	12 µs	
• Fixed-point addition	2 µs	
• Floating-point addition	50 µs	
Cycle time monitoring	150 ms (default); programmable 1 to 6000 ms	
Bit memories	2048	
• Of these retentive with battery	0 to 2047, settable	
• Of these retentive without battery	0 to 2047, settable	
Counter	64	
• Of these retentive with battery	0 to 63, settable	
• Of these retentive without battery	0 to 63, settable	
• Counting range	1 to 999	
Timers	128	
• Of these retentive with battery	0 to 127, settable	
• Of these retentive without battery	0 to 127, settable	
• Range	10 ms to 9990 s	
Expansion with S7-300 modules	Max. 3-line	
S7-300 expansion modules	Max. 24	
I/O expansion		
• Digital inputs/outputs, max.	768	
• Analog inputs/outputs, max.	192	
Onboard interface module	IM 360	
Suitable modules		
FMs	8	
CP, point-to-point	4	
CPs, LAN	2	
Total address areas I/O	1024/1024 byte	
Process image I/O	128/128 byte	
Communication		
Communication functions		
• Programming device/ OP communications	Yes	
• Global data communication	Yes	
• Basic communication	Yes	
• Extended communications	Yes (server)	
• S5-compatible communications	Yes	
• Standard communication	Yes	
• Number of connections static/dynamic	4/8	

	C7-634 DP	C7-634/P
MPI (multipoint interface)	Yes, occupies 2 nodes per unit (1x CPU, 1x OP)	
• No. of stations, max.	32; PG/PC, OP, C7, S7-300/400, M7;	
• Data transmission rate, max.	187.5 kbit/s	
• Distance between 2 adjacent nodes	Without repeaters 50 m with 2 repeaters:1100 m with 10 repeaters in series: 9100 m via fiber-optic cables: 23.8 km (with star couplers or OLMs)	
Suitable programming devices	SIMATIC PG/PC, Standard-PC	
PROFIBUS DP interface	1	-
Transmission procedure	PROFIBUS DP to DIN 19245 Part 3, DP master, DP slave	-
Data transmission rate	12 Mbit/s	12 Mbit/s
Number of DP lines per C7 (integral interface/CP342-5)	1/1	-/1
Number of DP stations per master C7 (integral interface/CP 342-5)	64/32	-/32
Address area per DP station	122 byte	122 byte
No. of modules per ET200M	8	8
DP connection (master/slave)	1 (integral, master/slave) 1 (CP342-5)	1 (CP342-5)
Integrated AS master interface	-	-
Digital inputs	**-**	**16**
Input voltage		
• Rated value	-	24 V DC
• At "1" signal	-	11 to 30 V
• At "0" signal	-	-3 to +5 V
Electrical isolation	-	Yes, via optocouplers
• In groups of	-	16
Input delay, typ./max.	-	3/4.8 ms
Input current at "1" signal, max.	-	11.5 mA
Connection of two-wire BEROs		
• Permissible quiescent current, max.	-	2 mA
Cable lengths		
• Unshielded	-	600 m
• Shielded	-	1000 m
Digital outputs	**-**	**16**
Rated load voltage	-	24 V DC
• Permitted range	-	20.4 to 28.8 V
Output voltage		
• At "1" signal, max.	-	L+ > U > L+ - 0.8V

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C7-634

■ **Technical specifications** (continued)

	C7-634 DP	C7-634/P
Electrical isolation	-	Yes; via optocouplers
• In groups of	-	2 groups of 8
Output current		
• At "1" signal		
Rated value	-	0,5 A
Min. current	-	5 mA
• At "0" signal, max.	-	0.5 mA
Total current per group of 8		
• At 20 °C	-	4 A
• At 40 °C	-	2 A
Lamp load, max.	-	5 W
Switching frequency		
• For resistive load	-	100 Hz
• For inductive load	-	0.5 Hz
Voltage induced on circuit interruption limited to	-	48 V
Short-circuit protection	-	Yes; electronic clocked
Cable lengths		
• Unshielded	-	600 m
• Shielded	-	1000 m
Universal inputs		**4**
Can be used as	-	UI1 digital/interrupt input 24 V DC or up/down counter UI2 digital/interrupt input 24 V DC or up/down counter UI3 digital/interrupt input 24 V DC or up/down counter or frequency/ period duration counter UI4 digital interrupt input 24 V DC
Electrical isolation	-	No
Input voltage		
• Rated value	-	24 V DC
• At "1" signal	-	11 to 30 V
• At "0" signal	-	-3 to +5 V
Input current at "1" signal, typ.	-	11.5 mA
Cable lengths		
• Shielded	-	1000 m
Counter frequency, max.	-	10 kHz

	C7-634 DP	C7-634/P
Counters, max.	-	3 (UE1, UE2, UE3)
• Principle	-	counting slopes;
• Counting range UI1, UI2	-	Forwards: 0 to 65535, reverse: 65535 to 0
• Counting range UI3	-	Forwards: 0 to 16777215, reverse: 16777215 to 0
• Limit value (setpoint) specification	-	One counter per value
• Count interrupt up counter	-	On reaching the limit value
• Count interrupt down counter	-	On reaching "0"
• Enable	-	in the program
Period duration counter, max.	-	1 (UE3)
• Principle	-	Counting fixed time units between two positive slopes
• Counting range	-	0 to 16777214
• Period duration, max.	-	8.38 s or 0.12 Hz
Frequency counter, max.	-	1 (UE3)
Principle	-	Counting pulses within a time period
Counting range	-	0 to 16777215
Gate width	-	0.1 s; 1 s; 10 s (programmable)
External gate counter		3
• Principle	**-**	Counting edges within a gate time using an external pin
• Counting range UI1, UI2	**-**	0 to 65535
• Counting range UI3	**-**	0 to 16777215
Analog inputs		**4**
Input ranges/ input resistance (programmable)	-	-10 to 10 V/50 k Ω -20 to 20 mA/105.5 Ω 4 to 20 mA/105.5 Ω
Permissible input voltage for voltage input, max.	-	30 V
Permissible input current for current input, max.	-	30 mA
Electrical isolation	-	Yes, shared with AA
Cycle time (all channels)	-	2 ms
Conversion time per channel	-	0.5 ms
Resolution	-	12 bit incl. sign

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Technical specifications (continued)

	C7-634 DP	C7-634/P
Operational limit (in the entire temperature range, referred to input range)		
• Voltage	-	+/-0.8%
• Current	-	+/-0.8%
Basic error limit (operating error limit at 25 °C, referred to the input range)		
• Voltage	-	+/-0.6%
• Current	-	+/-0.6%
Interrupts		
• Limit value interrupt	-	-
• Diagnostics interrupt	-	Measuring range violation, wire break detection at 4 to 20 mA per software
• Alarm cycle	-	Yes (settable)
Analog outputs	**-**	**4**
Output ranges		
• Voltage output	-	-10 to 10 V
• Current output	-	-20 to 20 mA, 4 to 20 mA
Load resistor		
• For voltage outputs, min.	-	2 kΩ
• For current outputs, max.	-	0.5 kΩ
• For capacitive load, max.	-	1 µF
• For inductive loads, max.	-	1 mH
Voltage output		
• Short-circuit protection	-	Yes
• Short-circuit current, max.	-	25 mA
Current output		
Open-circuit voltage, max.	-	+/-16 V
Electrical isolation	-	Yes, shared with AE
Operating cycle time (all channels) typ./max.	-	2 / 4 ms
Resolution	-	12 bit incl. sign
Transient recovery time		
• For resistive load, max.	-	0.1 ms
• For capacitive load, max.	-	3.3 ms
• For inductive load, max.	-	0.5 ms
Substitute values assignable	-	Yes, parameterizable
Operating error limit (0 to 60°C, referred to the output range)		
• Voltage	-	+/-0.8%
• Current	-	+/-1%

	C7-634 DP	C7-634/P
Basic error threshold (operating error threshold at 25 °C, with reference to output range)		
• Voltage	-	+/-0.5%
• Current	-	+/-0.6%
Interrupts		
• Diagnostics interrupt	-	Yes, parameterizable for parameter errors
Cable length, shielded	-	200 m
Programming, planning, configuring		
Programming software	STEP 7, STEP 7-Lite	STEP 7, STEP 7-Lite
Configuring HMI	ProTool/Lite, ProTool, ProTool/Pro	ProTool/Lite, ProTool, ProTool/Pro
Suitable software		
Software controllers	16 loops	16 loops
Process diagnostics	Yes (C7-CPU)	Yes (C7-CPU)
S7-GRAPH	Yes	Yes
S7-HiGraph	Yes	Yes
S7-SCL	Yes	Yes
CFC	Yes	Yes
Human machine interface		
Display	LC display, LED backlit	LC display, LED backlit
Service life of the backlighting, approx.	100.000 h (approx. 11 years)	100.000 h (approx. 11 years)
Number of lines x characters per line	4 x 20 / 8 x 40	4 x 20 / 8 x 40
Character height	11 / 6 mm	11 / 6 mm
Resolution	-	-
Active screen surface (W x D) in mm	-	-
Number of soft keys/function keys	8/16	8/16
User memory, permanently integrated	256 KB flash	256 KB flash
RAM (dyn.)	-	-
Operating messages, max.	999	999
Operating message buffer, max.	256 entries	256 entries
Scroll operating messages, max.	256	256
Fault messages, max.	999	999
Fault signal buffers, max.	256 entries	256 entries
Number of variables in message text, max.	8	8
Number of pictures	99	99
Entries per picture	99	99
Pixel graphics	8	-
Semi graphics	99	Within the bounds of the character set
Symbols/fonts	1	1

Technical specifications (continued)

	C7-634 DP	C7-634/P
Dynamic objects	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields	Input, output, input/output fields, date/time-of-day fields, symbolic input/output fields
Recipes, max.	99	99
Recipe data memory	20 KB	20 KB

	C7-634 DP	C7-634/P
Data records per recipe, max.	99	99
Entries per data record, max.	99	99
Online languages	3	3
Password levels	9	9
Clock	Real-time clock (hardware clock)	Real-time clock (hardware clock)
Printer interface	RS232	RS232

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Ordering data

	Order No.
C7-634 DP control system	**6ES7 634-2BF02-0AE3**
64 KB RAM (PLC), with PROFIBUS DP interface, without onboard I/O; 256 KB flash EPROM for HMI data, LED backlit LCD (4 lines, 20 characters/line, 8 mm character height or 8 lines, 40 characters/line, 6 mm character height); with installation accessories, 24 V DC connector and backup battery	
C7-634/P control system	**6ES7 634-1DF02-0AE3**
48 KB RAM (PLC), 16 DI, 16 DO, 4 AI, 4 AO, 4 UI onboard; 256 KB flash EPROM for HMI data, LED backlit LCD (4 lines, 20 characters/line, 8 mm character height or 8 lines, 40 characters/line, 6 mm character height); with mounting accessories and backup battery	
C7-633, C7-634 documentation package	
comprising C7-633, C7-634 manual, S7-300 manual, OP7, OP17 manual	
German	**6ES7 633-1AF01-8AA0**
English	**6ES7 633-1AF01-8BA0**
French	**6ES7 633-1AF01-8CA0**
Spanish	**6ES7 633-1AF01-8DA0**
Italian	**6ES7 633-1AF01-8EA0**
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.
Technical overview "From SIMATIC S5 to SIMATIC S7"	
German	**6ES7 398-8AA01-8AB0**
English	**6ES7 398-8AA01-8BB0**
French	**6ES7 398-8AA01-8CB0**
Spanish	**6ES7 398-8AA01-8DB0**
Italian	**6ES7 398-8AA01-8EB0**
SIMATIC Manual Collection	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection updating service for 1 year	**6ES7 998-8XC01-8YE2**
Accessories	
FEPROM memory card	
16 KB	**6ES7 951-0KD00-0AA0**
32 KB	**6ES7 951-0KE00-0AA0**
64 KB	**6ES7 951-0KF00-0AA0**
128 KB	**6ES7 951-0KG00-0AA0**
512 KB	**6ES7 951-0KJ00-0AA0**
SIMATIC C7 simulator	**6ES7 620-0AA00-4AA0**
for all SIMATIC C7s, with 16 onboard DIs and 16 onboard DOs; with switches and LEDs for simulating 16 DIs and 16 DOs	
Connector set	**6ES7 623-1AE01-4AA0**
for I/O and power supply	
Backup battery 3.6 V; 1.5 Ah	**6ES7 623-1AE01-5AA0**
PROFIBUS DP bus connector; PROFIBUS bus components	See page 4/33
Spare parts	
Service package	**6ES7 623-1AE00-3AA0**
Seal, 4 clamps, 2 connectors; for all SIMATIC C7s	

Overview

- The Control Systems for high-performance applications
- With integated I/O for implementation directly at the machine
- With integrated PROFIBUS DP connection for distributed structures
- Version with context-sensitive Touch functionality
- Graphical visualization and operator support for particularly convenient use

A micro memory card and connector set are necessary for operating the C7, ,

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Technical specifications

General technical specifications	
Degree of protection	Front: IP 65 acc. to IEC 529 Housing: IP 20 acc. to IEC 529
Ambient temperature	
• Horizontal mounting position	0 to 40 °C (0 to 40 °C for 45° mounting angle)
• Vertical installation	0 to 50 °C
Relative humidity	5 to 95%, no condensation (RH severity level 2 in accordance with IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Ambient conditions	Not suitable for operation outdoors
Isolation	
• 24 V DC circuits	Insulation test voltage 500 V DC
Electromagnetic compatibility	Requirements of German EMC Legislation per EN 50082-2 (noise immunity), testing per : IEC 801-2, ENV 50140, IEC 801-4, ENV 50141, IEC 801-5; Emitted interference acc. to EN 50081-2, Testing acc. to EN 55011, Class A, Group 1
Mechanical stress	
• Vibration, tested per/with	IEC 68, Part 2-6/10 to 58 Hz; constant amplitude 0.075 mm; 58 to 150 Hz; constant acceleration 1 g; Duration of vibrations: 10 frequency progressions per axis in each direction of the three mutually perpendicular axes
• Impact, tested per/with	IEC 68, Part 2-27/semisinusoidal: impact 15 g (peak value), duration 11 ms
Voltages, currents	
Supply voltage	
• Rated value	24 V DC
• Permissible range	20.4 to 28.8 V
Current consumption typ.	350 mA no-load operation
Inrush current, max.	1.0 A
Power losses, typ.	14 W

Dimensions	
Dimensions (H x W x D) in mm	260 x 199 x 79
Mounting dimensions (W x H) in mm	231 x 183
Weight, approx.	1380 g (Touch), 1450 g (Keys)
CPU	
Memory	
RAM	
• Integrated	64 KB for program and data
• Expandable	No
Load memory	
• Integrated	-
• Upgradable FEPROM	With micro memory card (MMC) up to 4 MB
Backup	Performed by MMC (maintenance free)
• With battery	-
• Without battery	Program and data
Execution times	
Processing times for	
• Bit operations, min.	$0.1\ \mu s$ to $0.2\ \mu s$
• Word operations, min.	$0.5\ \mu s$
• Fixed-point addition, min.	$1\ \mu s$
• Floating-point addition, min.	$15\ \mu s$
Timers/counters and their retentivity	
S7 counters	256
• Retentivity selectable	From Z 0 to Z 256
• Counting range	1 to 999
IEC counters	Yes
• Type	SFB
S7 timers	256
• Retentivity selectable	von T 0 to T 256
• Range	10 ms to 9990 s
• IEC timers	Yes
• Type	SFB

■ **Technical specifications** (continued)

Data ranges and their retentivity	
Bit memories	2048
• Retentivity selectable	From MB 0 to MB 256
Blocks	
Max. block size	16 KB
Number of	
• Watchdog interrupts	1
• Process alarms	1
• Time-of-day interrupts	1
• Delay interrupts	1
Nesting depth	
• Per priority class	8
• Additional within an error OB	4
FBs, max.	128
FCs, max.	128
Data blocks, max.	127 (DB 0 reserved)
Programming	
Programming language	STEP 7 V5.1 SP3 (LAD, FBD, STL); STEP 7 Lite, SCL, CFC, GRAPH, HiGraph
Configuring HMI	Pro/Tool/Lite, Pro/Tool, ProTool/Pro
Nesting levels	8
User program protection	Password protection
Address areas (inputs/outputs)	
Total I/O address area	1024 / 1024 byte (freely addressable)
Process image	128 / 128 byte
Digital channels	Max. 992 / 992
Analog channels	Max. 248 / 124
Design	
Expansion of C7-635	Max. 2 flat
	Max. 4 deep
No. of modules per system	Max. 23
Number of DP masters	
• Integrated	1
• Using CP	1
Suitable modules (recommendation)	
• FMs	8
• CPs, point-to-point	4
• CPs, LAN	2
Time-of-day	
Clock	Yes
• Backed up	Yes
Hours counter	1
Time-of-day synchronization	Yes
Communication functions	
Total number of connections usable for	12
• Programming device communications	Yes
- reserved	1
- variable	1 to 11

Communication functions	
• OP communications	Yes
- reserved	1
- variable	1 to 11
• S7 basic communication	Yes
- reserved	8
- variable	0 to 8
• Routing	4
S7 message functions	
Number of stations that can be defined for message functions (e.g. OS)	7
Interfaces	
1st interface	
Functionality	
• MPI	Yes
• DP master	No
• DP slave	No
• Electrical isolation	No
MPI	
Cable length (without repeater)	50 m
Transmission rates	Up to 187.5 kbit/s
Number of connections	12
Services	
• Programming device/OP communication	Yes
• Global data communication	Yes
• Number of GD circuits	
- sender, max.	4
- receiver, max.	4
• Size of the GD packets, max.	22 byte
S7 standard communication	Yes
• User data per job, max.	76 byte
S7 communication	
• As server	Yes
• As client	No
• User data per job, max.	64 KB
2nd interface	
Functionality	
• MPI	No
• DP master	Yes
• DP slave	Yes
• Electrical isolation	Yes
DP master	
Number of connections	12 for PG/OP communication
• Of these reserved	1 for PG, 1 for OP
Services	
• Programming device/OP communication	Yes
• Support for internode traffic	Yes
• Clock synchronism	Yes
• SYNC/FREEZE	Yes
• Global data communication	No
• S7 basic communication	No

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Technical specifications (continued)

Services	
• S7 communication	
- as server	No
- as client	No
Transmission rates	Up to 12 Mbit/s
Number of DP slaves, max.	32
Address range max. (I/O)	1024 / 1024 byte
User data per DP slave, max. (I/O)	244 / 244 byte
On-board digital inputs	
Number of inputs	24
Input voltage	
• Rated value	24 V DC
• At "1" signal	15 to 30 V
• At "0" signal	-3 to +5 V
Isolation	Yes
• In groups of	16
Input current	
• At "1" signal, typ.	8 mA
Input delay (at rated value of the input voltage)	
• For standard inputs, typ./max.	0.1/0.3/3/15 ms
• For process-related functions	8 µs
Connection of 2-wire BERO	
• Acceptable quiescent current	1.5 mA
Cable lengths	
• Unshielded	600 m
• Shielded	1000 m (100 m for process-related functions)
Integral digital outputs	
Number of inputs	16
Rated load voltage L+/L1	24 V DC
• Permissible range	20.4 to 28.8 V
Output voltage	
• At "1" signal, max.	L+ - 0.8 V
Isolation	Yes
• In groups of	8
Maximum output current	
• At "1" signal	
- rated value at 40 °C	0.5 A
- rated value at 60 °C	0.5 A
- min. current	5 mA
• At "0" signal, max.	0.5 mA
Total load capability	
• At 40 °C	100%
• At 60 °C	50%
Switching frequency of outputs	
• For resistive load	100 Hz
• For inductive load	0.5 Hz
Voltage induced on circuit interruption limited to	Type (L+) –48V
Short-circuit protection	Electronic clocked

Cable lengths	
• Unshielded	600 m
• Shielded	1000 m
Integrated analog inputs (for current / voltage)	
• Number of inputs	4
• Voltage	±10 V, 0 to 10 V
• Current	±20 mA, 0/4 to 20 mA
Isolation	Common for analog I/O
Bipolar resolution	11 bit +sign
Integration time (adjustable)	
• Per channel	2.5 / 16.6 / 20ms
Basic error threshold (operating error threshold at 25°C, referred to input range)	±0.7%
Integrated analog inputs (for resistance / temperature)	
• Number of inputs	1
• Resistance	0 to 600 Ω, Pt 100
Isolation	Common for analog I/O
Bipolar resolution	11 bit +sign
Integration time (adjustable)	
• Per channel	2.5 / 16.6 / 20ms
Basic error threshold (operating error threshold at 25°C, referred to input range)	±3%
Integrated analog outputs	
Number of inputs	2
Output ranges (rated values)	
• Voltage	±10 V, 0 to 10 V
• Current	±20 mA, 0/4 to 20 mA
Isolation	Common for analog I/O
Conversion time per channel	1ms
Basic error (operational limit at 25 °C, referred to output range), max.	±0.7%
Integrated functions	
Counters	4
• Counting speed max.	60 kHz
Pulse outputs	4
• Switching frequency max.	2.5 kHz
Frequency measurement	Yes
Open-loop positioning	Yes
Integral "Closed loop control" function blocks	PID
Touch Panel	
Display	STN, CCFL backlit
• MTBF display and backlighting at 25 °C	Approx. 50.000 h
• Resolution (pixels)	320 x 240
• Display area	5.7" Blue Mode (4 shades of blue)

Technical specifications (continued)

Keyboard • Keys	Touch (resistive/analog) 14 softkeys 10 function keys	• Displays	Yes
• Make-break operations	1 million	• Variables	Yes
Processor	32-bit RISC/66 MHz	• Text elements	Yes
Operating system	Windows CE	• Graphical objects	Yes
User memory	512 KB flash	• Variables per display, max.	50
Compact flash card • Printers	Yes (optional) Yes, serial	• Recipes/records/entries	Yes
• Log. connections (also in a network)	Max. 4 (1 fixed to integral CPU)	• Alarm messages	Yes (no buffer)
Clock	Yes	• Status messages	Yes (no buffer)
		• Info texts	Yes
		• Password levels	9
		• Online languages	3
Functionality	The capacity of the user memory is designed for small and medium configurations (typ. for TP170B: 50 process displays, 50 graphics, 200 messages, 200 buttons, 10 bar displays, 5 curve displays, 50 fixed texts, dynamic response, etc. and approx. 200 variables)	Configuring	SIMATIC ProTool/Lite, SIMATIC ProTool or SIMATIC ProTool/Pro Configuration Version 6.0 Service Pack 1 upwards.

Ordering data

	Order No.		Order No.
C7-635 Keys control system 64 KB RAM (PLC), 24 DI, 16 DO, 5 AI, 2 AO onboard; with integral operator panel: 512 KB flash EPROM for HMI data, STN LCD, CCFL backlit (320 x 240 pixels); with mounting accessories and set of connectors	**6ES7 635-2EC00-0AE3**	**C7-635 manual** German English French Spanish Italian	**6ES7 635-1AA00-8AA0** **6ES7 635-1AA00-8BA0** **6ES7 635-1AA00-8CA0** **6ES7 635-1AA00-8DA0** **6ES7 635-1AA00-8EA0**
		Accessories	
C7-635 Touch control system 64 KB RAM (PLC), 24 DI, 16 DO, 5 AI, 2 AO onboard; with integral touch panel: 512 KB flash EPROM for HMI data, STN LCD, CCFL backlit (320 x 240 pixels); with mounting accessories and set of connectors	**6ES7 635-2EB00-0AE3**	**I/O set** for expansion of C7-613/C7-635 by max. 4 modules; assembly onto rear of system For 2 modules, flat mounting For 4 modules, deep mounting	 **6ES7 635-0AA00-6AA0** **6ES7 635-0AA00-6BA0**
Micro memory card absolutely necessary for operation 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB	 **6ES7 953-8LF00-0AA0** **6ES7 953-8LG00-0AA0** **6ES7 953-8LJ00-0AA0** **6ES7 953-8LL00-0AA0** **6ES7 953-8LM00-0AA0** **6ES7 953-8LP10-0AA0**	**I/O expansion cable** for external expansion of SIMATIC C7-621 by max. 4 modules; 1.5 m long	**6ES7 635-0AA00-6CA0**
		SIMATIC Manual Collection Electronic manuals on CD-ROM, multi-language	**6ES7 998-8XC01-8YE0**
Connector set for I/O and power supply With screw-type terminals With spring-loaded terminals	 **6ES7 635-0AA00-4AA0** **6ES7 635-0AA00-4BA0**	**SIMATIC Manual Collection updating service for 1 year** Current S7 Manual Collection CD as well as the three following updates	**6ES7 998-8XC01-8YE2**
CF card, 16 MB	**6AV6 574-2AC00-2AA0**	**Spare parts**	
C7-635 manual package comprising C7-635 manual, S7-300 manual and OP 170B manual German English French Spanish Italian	 **6ES7 635-1EA00-8AA0** **6ES7 635-1EA00-8BA0** **6ES7 635-1EA00-8CA0** **6ES7 635-1EA00-8DA0** **6ES7 635-1EA00-8EA0**	**Service package** 3 seals, 10 clamps, for all SIMATIC C7-613 and C7-635	**6ES7 635-0AA00-3AA0**
		Grounding rail with shield terminals for analog I/O	**6ES7 635-0AA00-6EA0**

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Overview

- SIMATIC C7-626/P:
  the control system for
  complex applications
- SIMATIC C7-626/P DP:
  the control system for
  complex applications that
  also demand distributed
  structures
- With large program memory
  and powerful HMI functions
- Graphical visualization and
  operator support for particu-
  larly convenient use

Technical specifications

	C7-626/P	C7-626/P DP
General		
Degree of protection	Front: IP 65 acc. to IEC 529, Housing: IP 20 acc. to IEC 529	
Ambient temperature		
• Vertical operation	0 to 45 °C	
• At 45° angle of installation	0 to 30 °C, with forced ventilation and horizontal mounting max. 45°C possible	
Relative humidity	5 to 95 % (RH severity level 2 in accordance with IEC 1131-2)	
Atmospheric pressure	795 to 1080 hPa	
Isolation		
• 24 V DC circuit	500 V DC	
Electromagnetic compatibility	Radio interference: Class A / EN55022; conducted interference: IEC 1000-4-4, IEC 1000-4-5; noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN50140	
Mechanical rating		
• Vibrations tested with	IEC 68, Part 2-6 10 to 58 Hz; Amplitude 0.075 mm; 58 to 500 Hz: constant acceleration 9.8m/s^2;	
• Shock tested with	IEC 68, Part 2-29 half-sine: 100 m/s^2 (10 g), 16 ms; 100 shocks	
Supply voltage		
• Rated value	24 V DC	
• Permitted range	20.4 to 30.2 V	
Current consumption, typ./max.	700 mA/2 A	
Power losses, typically	17 W	
Acceptance, certification	EN 61131-2 (IEC 1131-2); UL Listing UL 508; Canadian Standard Association (CSA) to Standard C22.2 Number 142; FM permit, FM-Standards No. 3611, 3600, 3810 Class I, Div. 2 Group A, B, C, D; DIN/ISO 9001 certification of manufacturing and development	

	C7-626/P	C7-626/P DP
Dimensions		
• Device (W x H x D) in mm	240 x 168 x 69	
• Cutout dimensions (W x H) in mm	231 x 159	
Weight	1780 g	
PLC		
Memory (1 statement corresponds to an average of 3 byte)	96 KB RAM/ 32 K statements (integrated)	128 KB RAM/ 42 K statements (integrated)
Load memory		
• Integral (for data)	180 KB RAM, 512 KB FEPROM	260 KB RAM, 512 KB FEPROM
• Pluggable, max.	-	-
Data backup		
• With battery	All data	
• Without battery, max.	4736 byte, parameterizable for bit memories, timers, counters, data	
Real-time clock	Yes	
Program organization	Linear, structured	
Types of blocks	• Organization blocks (OBs) • Function blocks (FBs) • Functions (FC) • Data blocks (DBs) • System functions (SFCs)	
Number of blocks, max.	192 FC, 192 FB, 255 DB	
Program execution	• Restart (OB 100) • Free cycle (OB 1) • Real-time controlled (OB 10) • Time-driven (OB 35) • Interrupt controlled (OB 40) • Error handling (OB 80, 81, 82, 85, 86, 87, 121, 122)	
System functions (SFCs)	Interrupt masking, data copying, clock functions, diagnostic functions, fault and error handling, module parameter assignment	
Block nesting depth	8 for each program execution level	
Nesting levels	8	

Technical specifications (continued)

	C7-626/P	C7-626/P DP
User program protection	Password protection	
Instruction set	Binary logic, parenthesis commands, result assignment, save, count, load, transfer, compare, shift, rotate, generate complement, call up blocks, fixed-point and floating point arithmetic functions, jump functions	
Processing times for		
• Bit operations	0.3 to 0.6 μs	
• Word operations	1 μs	
• Timer-/counter operations	12 μs	
• Fixed-point addition	2 μs	
• Floating-point addition	50 μs	
Cycle time monitoring	150 ms (default); programmable 1 to 6000 ms	
Bit memories	2048	
• Of these retentive with battery	0 to 2047, settable	
• Of these retentive without battery	0 to 2047, settable	
Counter	64	
• Of these retentive with battery	0 to 63, settable	
• Of these retentive without battery	0 to 63, settable	
• Counting range	1 to 999	
Timers	128	
• Of these retentive with battery	0 to 127, settable	
• Of these retentive without battery	0 to 127, settable	
• Range	10 ms to 9990 s	
Expansion with S7-300 modules	Max. 3-line	
S7-300 expansion modules	Max. 24	
I/O expansion		
• Digital inputs/outputs, max.	768	
• Analog inputs/outputs, max.	192	
Onboard interface module	IM 360	
Suitable modules		
FMs	8	
CP, point-to-point	4	
CPs, LAN	2	
Total address areas I/O	1024/1024 byte	
Process image I/O	128/128 byte	
Communication		
Communication functions		
• Programming device/ OP communications	Yes	
• Global data communication	Yes	
• Basic communication	Yes	

	C7-626/P	C7-626/P DP
Communication functions		
• Extended communications	Yes (server)	
• S5-compatible communications	Yes	
• Standard communication	Yes, occupies 2 nodes per unit (1x CPU, 1x OP)	
• Number of connections - static/dynamic	4/8	
MPI (multipoint interface)	Yes	
• No. of stations, max.	32; PG/PC, OP, C7, S7-300/400, M7;	
• Transmission rate, max.	187.5 kbit/s	
• Distance between 2 adjacent nodes	Without repeaters 50 m with 2 repeaters: 1100 m with 10 repeaters in series: 9100 m via fiber-optic cables: 23.8 km (with star couplers or OLMs)	
Suitable programming devices	SIMATIC PG/PC, Standard-PC	
PROFIBUS DP interface	-	1
• Transmission procedure	-	PROFIBUS-DP to DIN 19245 Part 3, DP master, DP slave
• Data transmission rate		12 Mbit/s
• Number of DP lines per C7 (integral interface/ CP 342-5)	-/1	1/1
• Number of DP stations per master C7 (integral interface/ CP 342-5)	-/32	64/32
• Address area per DP station	122 byte	122 byte
Number of modules per ET200M	8	8
• DP connection (master/ slave)	1 (CP 342-5)	1 (integral, master/ slave) 1 (CP 342-5)
Integrated AS master interface	-	-
Digital inputs	**16**	
Input voltage		
• Rated value	24 V DC	24 V DC
• At "1" signal	15 to 30 V	11 to 30 V
• At "0" signal	-3 to +5 V	-3 to +5 V
Electrical isolation	Yes	
• In groups of	16	
Input delay, typ./max.	3/4.8 ms	
Input current at "1" signal, max.	11.5 mA	
Connection of two-wire BEROs		
• Permissible quiescent current, max.	2 mA	
Cable lengths		
• Unshielded	600 m	
• Shielded	1000 m	

Technical specifications (continued)

	C7-626/P	C7-626/P DP
Digital outputs	**16**	
Rated load voltage	24 V DC	
• Permitted range	20.4 to 28.8 V	
Output voltage		
• At "1" signal, max.	L+ > U > L+ - 0.8 V	
Electrical isolation	Yes; via optocouplers	
• In groups of	2 groups of 8	
Output current		
• At "1" signal		
- rated value	0.5 A	
- Min. current	5 mA	
• At "0" signal, max.	0.5 mA	
Total current per group of 8		
• At 20 °C	4 A	
• At 40 °C	2 A	
Lamp load, max.	5 W	
Switching frequency		
• For resistive load	100 Hz	
• For inductive load	0.5 Hz	
Voltage induced on circuit interruption limited to	48 V	
Short-circuit protection	Yes, electronic clocked	
Cable lengths		
• Unshielded	600 m	
• Shielded	1000 m	
Universal inputs	**4**	
Can be used as	UI1 digital/interrupt input. 24V DC or up/down counter UI2 digital/interrupt input. 24V DC or up/down counter UI3 digital/interrupt input 24V DC or up/down counter or frequency/period duration counter UE4 digital/alarm input 24 V DC	
Electrical isolation	No	
Input voltage		
• Rated value	24 V DC	
• At "1" signal	11 to 30 V	
• At "0" signal	-3 to +5 V	
Input current at "1" signal, typ.	11.5 mA	
Cable lengths		
• Shielded	1000 m	
Counter frequency, max.	10 kHz	
Counters, max.	3 (UE1, UE2, UE3)	
• Principle	Counting slopes;	
• Counting range UI1, UI2	Forwards: 0 to 65535, reverse: 65535 to 0	
• Counting range UI3	Forwards: 0 to 16777215, reverse: 16777215 to 0	
• Limit value (setpoint) specification	One counter per value	

	C7-626/P	C7-626/P DP
Counters, max.	3 (UE1, UE2, UE3)	
• Count interrupt up counter	On reaching the limit value	
• Count interrupt down counter	On reaching "0"	
• Enable	In the program	
Period duration counter, max.	1 (UE3)	
• Principle	Counting fixed time units between two positive slopes	
• Counting range	0 to 16777214	
• Period duration, max.	8.38 s bzw. 0.12 Hz	
• Frequency counter, max.	1 (UE3)	
• Principle	Counting pulses within a time period	
• Counting range	0 to 16777215	
• Gate width	0.1 s; 1 s; 10 s (programmable)	
Analog inputs	**4**	
Input ranges/input resistance (programmable)	-10 to 10 V/50 kΩ -20 to 20 mA/ 105.5Ω 4 to 20 mA/ 105.5 Ω	
Permissible input voltage for voltage input, max.	30 V	
Permissible input current for current input, max.	30 mA	
Electrical isolation	Yes, shared with AO	
Cycle time (all channels)	2 ms	
Conversion time per channel	0.5 ms	
Resolution	12 bit incl. sign	
Operational limit (in the entire temperature range, referred to input range)		
Voltage	+/-0.8%	
Current	+/-0.8%	
Basic error threshold (operating error threshold at 25°C, with reference to output range)		
Voltage	+/-0.6%	
Current	+/-0.6%	
• Interrupts		
• Limit value interrupt	-	
• Diagnostics interrupt	Measuring range violation, wire break detection at 4 to 20 mA per software	
• Alarm cycle	Yes (programmable)	
Analog outputs	**4**	
Output ranges		
• Voltage output	-10 to 10 V	
• Current output	-20 to 20 mA, 4 to 20 mA	
Load impedance		
• For voltage outputs, min.	2 kΩ	
• For current outputs, max.	0.5 kΩ	
• For capacitive load, max.	1 µF	
• For inductive loads, max.	1 mH	

Technical specifications (continued)

	C7-626/P	C7-626/P DP
Voltage output		
• Short-circuit protection	Yes	
• Short-circuit current	25 mA	
Current output		
• Open-circuit voltage, max.	+/-16 V	
Electrical isolation	Yes, shared with AI	
Operating cycle time (all channels) typ./max.	2 / 4 ms	
Resolution	12 bit incl. sign	
Transient recovery time		
• For resistive load, max.	0.1 ms	
• For capacitive load, max.	3.3 ms	
• For inductive load, max.	0.5 ms	
Substitute values assignable	Yes, parameterizable	
Operating error limit (0 to 60°C, referred to the output range)		
• Voltage	+/-0.8	
• Current	+/-1	
Basic error threshold (operating error threshold at 25 °C, with reference to output range)		
• Voltage	+/-0.5%	
• Current	+/-0.6%	
Interrupts		
• Diagnostics interrupt	Yes, programmable for parameter errors	
Cable length, shielded	200 m	
Programming, planning, configuring		
Programming software	STEP 7, STEP 7-Lite	
Configuring HMI	ProTool, ProTool/Pro	
Suitable software		
Software controllers	16 loops	
Process diagnostics	Yes (C7-CPU and C7-OP)	
S7-GRAPH	Yes	
S7-HiGraph	Yes	
S7-SCL	Yes	
CFC	Yes	

	C7-626/P	C7-626/P DP
Human machine interface		
Display	LC Display, CCFL backlit, passive b/w	
Service life of the back-lighting, approx.	20.000 h (approx. 2.2 years)	
Number of lines x characters per line	-	
Character height	-	
Resolution	320 x 240 pixels	
Active screen surface (W x D) in mm	105 x 79	
Number of soft keys/function keys	14/10	
User memory, permanently integrated	1 MB flash for firmware and user data	
RAM (dyn.)	2 MB	
Operating messages, max.	2000 (depending on user memory)	
Operating message buffer, max.	512 entries in cyclic buffer	
Scroll operating messages, max.	512	
Fault messages, max.	2000 (depending on user memory)	
Fault signal buffers, max.	512 entries in cyclic buffer	
Max. variables in message text	8	
Number of pictures	Depends on user memory	
Entries per picture	-	
Pixel graphics	Yes, access to external editors	
Semi graphics	Yes	
Symbol/character sets	4	
Dynamic objects	Input, output, input/output fields, date/time fields, symbolic input/output fields, bars, curves, figure output etc.	
Human machine interface		
Recipes, max.	255	
Recipe data memory	64 KB	
Data records per recipe, max.	500	
Entries per data record, max.	500	
Online languages	3	
Password levels	9	
Clock	Real-time clock (hardware clock)	
Printer interface	RS232	

Ordering data	Order No.		Order No.
C7-626/P control system	**6ES7 626-1DG04-0AE3**	**SIMATIC Manual Collection**	**6ES7 998-8XC01-8YE0**
96 KB RAM (PLC), 16 DI, 16 DO, 4 AI, 4 AO, 4 UI onboard; 1 MB flash EPROM for HMI data, CCFL backlit LCD (320 x 240 pixels); with installation accessories, connector set, backup battery and one set of labeling strips		**SIMATIC Manual Collection updating service for 1 year**	**6ES7 998-8XC01-8YE2**
		Accessories	
		SIMATIC C7 simulator	**6ES7 620-0AA00-4AA0**
C7-626/P DP control system	**6ES7 626-2DG04-0AE3**	for all SIMATIC C7s, with 16 onboard DIs and 16 onboard DOs; with switches and LEDs for simulating 16 DIs and 16 DOs	
128 KB RAM (PLC), with PROFIBUS DP interface; 16 DI, 16 DO, 4 AI, 4 AO, 4 UI onboard; 1 MB flash EPROM for HMI data, CCFL backlit LCD (320 x 240 pixels); with installation accessories, connector set, backup battery and one set of labeling strips		**Connector set**	**6ES7 623-1AE01-4AA0**
		for I/O and power supply	
		Backup battery 3.6 V; 1.5 Ah	**6ES7 623-1AE01-5AA0**
		PROFIBUS DP bus connector; PROFIBUS bus components	See page 4/33
C7-626 manual		**Spare parts**	
German	**6ES7 626-1AG00-8AA0**	**Labeling strips**	**6ES7 623-1AE00-1AA0**
English	**6ES7 626-1AG00-8BA0**	5 pages for C7-623 to C7-626	
French	**6ES7 626-1AG00-8CA0**	**Service package**	**6ES7 623-1AE00-3AA0**
Spanish	**6ES7 626-1AG00-8DA0**	Seal, 4 clamps, 2 connectors; for all SIMATIC C7s	
Italian	**6ES7 626-1AG00-8EA0**		
Technical overview "From SIMATIC S5 to SIMATIC S7"			
German	**6ES7 398-8AA01-8AB0**		
English	**6ES7 398-8AA01-8BB0**		
French	**6ES7 398-8AA01-8CB0**		
Spanish	**6ES7 398-8AA01-8DB0**		
Italian	**6ES7 398-8AA01-8EB0**		

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SIMATIC C7
Expansion components

Customized design

■ Overview

- Custom design for the SIMATIC C7
- Free choice of company logo, selectable color specifications for the unit front panel and keyboard labeling
- For control systems to be integrated into customers' plants

■ Ordering data	Order No.		Order No.
Company logo in two colors	On request	**Additional color** (for logo or key labeling)	On request
Company logo in two colors and a special membrane color	On request	**Bezel in special color** (extra charge per unit)	On request
Company logo in two colors, special membrane color, and specific key labeling	On request		

SIMATIC C7 I/O module

■ Overview

- For expanding the onboard I/O directly on the SIMATIC C7 control system (not C7-621) with an additional 16 DI, 16 DO, 4 AI, 4 AO and 4 UI.

■ Technical specifications

Technical specifications for 16 DI, 16 DO, 4 AI, 4 AO, 4 UI	See under C7-633/P	Dimensions when installed (B x H x T)	230 x 158 x 56

■ Ordering data	Order No.		Order No.
SIMATIC C7 input/output module 16 DI, 16 DO, 4 AI, 4 AO, 4 UI, for use on the SIMATIC C7; incl. bus connecting cable, connector set	**6ES7 630-0DA00-0AB0**		

IM 621 interface module

Overview

- For expanding the SIMATIC C7-621 with up to 4 SIMATIC S7-300 modules
- Can be plugged into the S7-300 subrack

Technical specifications

nterfaces per C7-621, max.	1	Dimensions (W x H x D) in mm	40 x 125 x 120
Supply voltage (external)	--	Weight, approx.	220 g

Ordering data

	Order No.		Order No.
IM 621 interface module ▶	**6ES7 621-1AD00-6AE3**		
for expansion of SIMATIC C7-621 by max. 4 modules (1 ER); incl. connecting cable			

SIMATIC S7-300 I/O modules

Overview

SIMATIC S7-300 I/O modules are available for expansion of the SIMATIC S7.

For further information about these modules, see Section 4.

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