SIEMENS

Data sheet 6ES7633-1DF02-0AE3

SIMATIC C7-633/P, Complete unit with integrated components: S7-300 CPU 315, OP7, IM 360 16 DI, 16 DO, 4 AI, 4 AO, 4 UI

Operator control and monitoring	
Password protection	Yes
• Password levels	9
Graphics object	
• Character graphics	Yes; As part of the character set
Process images	
• Number of process images	99
• Number of variables in message text, max.	8
• Entries per process image	99
Operating-/fault messages	
• Number of operating messages, max.	499
• Scroll operating messages, max.	256
• Number of entries in operational log, max.	256
• Number of fault message, max.	499
• Number of entries in fault message buffer, max.	256
• Number of symbol/character sets	1
Recipes	
• Number, max.	99
• Data records per recipe, max.	99
• Entries per data record, max.	99
• Recipe data memory, max.	4 kbyte
Display	
Design of display	LCD backlit
dynamic objects	Input, output, input/output fields, date/time fields, symbolic input/output fields
Line display	
• Number of lines	4
• Number of characters per line	20
• Character size	8 mm
Backlighting	
• MTBF backlighting (at 25 °C)	100 000 h; about 11 years
Control elements	
Keyboard fonts	
• Function keys	
— Number of function keys	16

— Number of softkeys	4
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	30.2 V
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	550 mA
Current consumption, max.	1 A
Power loss	
Power loss, typ.	12 W
Memory	
Work memory	
• integrated	48 kbyte; 16 K instructions RAM
Load memory	
• expandable FEPROM	Yes
• expandable FEPROM, max.	512 kbyte
• integrated RAM, max.	80 kbyte
Backup	
• present	Yes
• with battery	Yes; all data
• without battery	Yes; 4736 Byte: parameterizable for memory bits, times, counters, data
CPU processing times	
for bit operations, typ.	0.3 µs
for bit operations, max.	0.6 µs
for word operations, typ.	1 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	50 µs
for timer/counter operations, typ.	12 µs
CPU-blocks	
DB	
• Number, max.	255; DB 0 reserved
FB	
• Number, max.	192; see instruction list
FC	
• Number, max.	192; see instruction list

OB	
• Number, max.	see instruction list
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of cyclic interrupt OBs	1; OB 35
• Number of process alarm OBs	1; OB 40
• Number of startup OBs	1; OB 100
• Number of asynchronous error OBs	7; OB 80, 81, 82, 85, 87, 121, 122
Nesting depth	
• per priority class	8

Counters, timers and their retentivity	
S7 counter	
• Number	64
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	63
Counting range	
— lower limit	0
— upper limit	999
S7 times	
• Number	128
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	127
Time range	
— lower limit	10 ms
— upper limit	9 990 s

Data areas and their retentivity	
Flag	
• Number, max.	256 byte
• of which retentive with battery	0 to 2047
• of which retentive without battery	0 to 2047

Address area	
I/O address area	
• Inputs	1 kbyte
• Outputs	1 kbyte
Process image	
• Inputs	128 byte

• Outputs	128 byte
Hardware configuration	
connectable programming devices/PCs	SIMATIC PG/PC, standard PC
Number of modules per system, max.	8
Number of modules per DP slave interface, max.	32; 122 byte address space per DP station
Interface modules	
• Interface module IM 360 integrated	Yes
Number of DP masters	
• integrated	0
• via CP	1; CP 342-5
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	4
• CP, LAN	2
Expansion modules	
• Analog inputs/outputs, max.	192
• Digital inputs/outputs, max.	768
• Number of expansion modules, max.	24
Rack	
• Modules per rack, max.	8
• Number of lines, max.	3
Time of day	
Clock	
• Hardware clock (real-time)	Yes; CPU
• Software clock	Yes; OP
Digital inputs	
Number of digital inputs	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	11.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— at "0" to "1", max.	4.8 ms; typically 3 ms
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	

Number of digital outputs	16
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	48 V
Switching capacity of the outputs	
• on lamp load, max.	5 W
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
Total current of the outputs (per group)	
all mounting positions	
— up to 20 °C, max.	4 A
— up to 40 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

Universal inputs	
Number of universal inputs	4
usable as	UI1, UI2: Digital/alarm input 24 V DC or up/down counter; UI3: Digital/alarm input 24 V DC or up/down counter or frequency/period duration counter; UI4: Digital/alarm input 24 V DC
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1"	typ. 11.5 mA
Cable length	
• shielded, max.	1 000 m

Analog inputs	
Number of analog inputs	4
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	30 mA
Cycle time (all channels), typ.	2 ms

Input ranges	
• Voltage	Yes
• Current	Yes
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	50 kΩ
Input ranges (rated values), currents	
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	105.5 kΩ

Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	25 mA
Current output, no-load voltage, max.	16 V; ±
Cycle time (all channels) max.	4 ms; typ. 2 ms
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	0.5 kΩ
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	200 m

Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit

Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	0.5 ms
Settling time	
• for resistive load	0.1 ms
• for capacitive load	3.3 ms
• for inductive load	0.5 ms

Encoder	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	2 mA
Errors/accuracies	
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.8 %
• Current, relative to input range, (+/-)	0.8 %
• Voltage, relative to output range, (+/-)	0.8 %
• Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.6 %
• Current, relative to input range, (+/-)	0.6 %
• Voltage, relative to output range, (+/-)	0.5 %
• Current, relative to output range, (+/-)	0.6 %
Interfaces	
Number of printer interfaces	1; RS 232
MPI	
• Cable length, max.	9 100 m; without repeaters 50 m; with 2 repeaters: 1100 m; with 10 repeaters in series: 9100 m; via fiber optic cable: 23.8 km (with star hubs or OLMs)
1. Interface	
Protocols	
• MPI	Yes; occupies 2 nodes per device (1 x CPU, 1 x OP)
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
MPI	
• Number of nodes, max.	32; PG/PC, OP, C7, S7-300/400, M7
• Transmission rate, max.	187.5 kbit/s
Communication functions	
S7 communication	
• S7 extended communication	Yes; Server
S5 compatible communication	
• supported	Yes
Standard communication (FMS)	
• supported	Yes
Number of connections	
• overall	
— of which dynamic	8
— of which static	4

Interrupts/diagnostics/status information	
Diagnostics function	Yes; C7-CPU
Substitute values connectable	Yes; Parameterizable
Alarms	
• Alarm cycle	Yes; Parameterizable
• Diagnostic alarm	Yes; Measurement overrange, wire break detection at 4 to 20 mA by means of software; parameterizable for parameter errors

Counter	
Number of counter inputs	3; UE1, UE2, UE3
Principle	Counting of edges
Counting range, description	UI1, UI2: up: 0 to 65535, down: 65535 to 0; UI3: up: 0 to 16777215, down: 16777215 to 0
Counter frequency, max.	10 kHz
Counting alarm backward counter	on reaching "0"
Counting alarm forward counter	on reaching limit value
Enable	In the program
Limit value (setpoint) default	one counter per value
External gate counters	
• Number of external gate counters	3
• Principle	Counting of edges within a gate time via external pin
• Counting range	UE1, UE2: 0 to 65535; UE3: 0 to 16777215
Frequency counter	
• Number	1; UI3
• Principle	Counting of pulses within a time period
• Gate width, adjustable	Yes
• Gate width	0.1 / 1 / 10 s (adjustable)
• Counting range	0 to 16777215
Cycle duration counter	
• Number	1; UI3
• Cycle duration, max.	8.38 s; or 0.12 Hz
• Principle	Counting of fixed time units between two positive edges
• Counting range, lower limit	0
• Counting range, upper limit	16 777 214

Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	Yes; Optocoupler
• between the channels, in groups of	16
Potential separation digital outputs	
• Potential separation digital outputs	Yes; Optocoupler
• between the channels, in groups of	8
Potential separation analog inputs	

• Potential separation analog inputs	Yes; shared with AO
Potential separation analog outputs	
• Potential separation analog outputs	Yes; shared with AI
Potential separation channels	
• Potential separation universal inputs	No

Isolation	
Isolation tested with	500 V DC

EMC	
EMC interference immunity	Noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN 50140

Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes; Housing
• IP65	Yes; Front

Standards, approvals, certificates	
CSA approval	Yes; to Standard C22.2 number 142
UL approval	Yes; UL 508
FM approval	Yes; FM-Standards No. 3611, 3600, 3810 Class I, Division 2, Group A, B, C, D
developed in accordance with IEC 61131	Yes; EN 61131-2 (IEC 1131-2)
DIN/ISO 9001	Yes

Ambient conditions	
Ambient temperature during operation	
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Air pressure acc. to IEC 60068-2-13	
• permissible range, lower limit	795 hPa
• permissible range, upper limit	1 080 hPa
Relative humidity	
• Operation, min.	5 %
• Operation, max.	95 %; no condensation
Vibrations	
• Operation, tested according to IEC 60068-2-6	Yes; IEC 60068-2-6; 10 Hz to 58 Hz; (constant amplitude 0.075 mm); 58 Hz to 500 Hz; (constant acceleration 9.8 m/s²)
Shock testing	
• tested according to IEC 60068-2-29	Yes; IEC 68, Part 2-29 half-sine: 100 m/s² (10 g), 16 ms, 100 shocks

Configuration	
Configuration software	
• STEP 7	Yes
• STEP 7 Lite	Yes

• ProTool	Yes
• ProTool/Lite	Yes
• ProTool/Pro	Yes
Programming	
• Command set	see instruction list
• Nesting levels	8
• Program organization	Linear, structured
• System functions (SFC)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Software libraries	
— Process diagnostics	Yes; C7-CPU
— Software controller	Yes; 16 circles
Know-how protection	
• User program protection/password protection	Yes
Cycle time monitoring	
• lower limit	1 ms
• upper limit	6 000 ms
• adjustable	Yes
• preset	150 ms

Languages	
Online languages	
• Number of online/runtime languages	3

Dimensions	
Width	240 mm
Height	203.5 mm
Depth	90 mm
Mounting cutout, width	231 mm
Mounting cutout, height	159 mm

Weights	
Weight, approx.	1 800 g

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