

SIMATIC C7-633/P, COMPACT UNIT WITH INTEGRATED  
COMPONENTS: S7-300 CPU 315, OP7, IM360 16DI, 16DO, 4AI,  
4AO, 4 UI

### Operator control and monitoring

Password protection	Yes
• Password levels	9

### Graphics object

• Character graphics	Yes; As part of the character set
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### 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 of recipes, 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
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### Control elements

#### Keyboard fonts

• Function keys	
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— Number of function keys	16
— Number of softkeys	4

### Supply voltage

Rated value (DC)	
• 24 V DC	Yes
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
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### Memory

Work memory	
• integrated	48 kbyte; 16 K instructions RAM
Load memory	
• expandable FEPRM	Yes
• expandable FEPRM, 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 $\mu$ s
for bit operations, max.	0.6 $\mu$ s
for word operations, typ.	1 $\mu$ s
for fixed point arithmetic, typ.	2 $\mu$ s
for floating point arithmetic, typ.	50 $\mu$ s
for timer/counter operations, typ.	12 $\mu$ s

### CPU-blocks

DB	
• Number, max.	255; DB 0 reserved
FB	
• Number, max.	192; see instruction list

<b>FC</b>	
• Number, max.	192; see instruction list
<b>OB</b>	
• 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
<b>Nesting depth</b>	
• per priority class	8
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	64
of which retentive with battery	
— can be set	Yes
— lower limit	0
— upper limit	63
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	63
<b>Counting range</b>	
— lower limit	0
— upper limit	999
<b>S7 times</b>	
• Number	128
of which retentive with battery	
— adjustable	Yes
— lower limit	0
— upper limit	127
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	127
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>Data areas and their retentivity</b>	
<b>Flag</b>	

- Number, max. 256 byte
- Retentivity available Yes
- 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
<b>Input current</b>	
• for signal "1", typ.	11.5 mA
<b>Input delay (for rated value of input voltage)</b>	
for standard inputs	
— at "0" to "1", max.	4.8 ms; typically 3 ms
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Digital outputs</b>	
Number of digital outputs	16
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	48 V
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• 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
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
<b>Total current of the outputs (per group)</b>	
all mounting positions	
— up to 20 °C, max.	4 A
— up to 40 °C, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Universal inputs</b>	
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
Counter frequency, max.	10 kHz
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V

<b>Input current</b>	
• for signal "1"	typ. 11.5 mA
<b>Cable length</b>	
• shielded, max.	1 000 m
<b>Analog inputs</b>	
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
<b>Input ranges</b>	
• Voltage	Yes
• Current	Yes
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	50 k $\Omega$
<b>Input ranges (rated values), currents</b>	
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	105.5 k $\Omega$
<b>Analog outputs</b>	
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
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	2 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F
• with current outputs, max.	0.5 k $\Omega$
• with current outputs, inductive load, max.	1 mH
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation for the inputs</b>	
Integration and conversion time/resolution per channel	

• Resolution with overrange (bit including sign), max.	12 bit
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### 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
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#### 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)
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### 1. Interface

#### Functionality

• 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	
Diagnostic functions	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
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
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### EMC

EMC interference immunity	Noise immunity: IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-6, EN 50140
Emission of radio interference acc. to EN 55 022	
• Interference emission acc. to EN 55022, class A	Yes; Noise emission: Class A / EN 55022; conducted interference: IEC 1000-4-4, IEC 1000-4-5

### 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	
• 45 degree installation, min.	0 °C
• 45 degree installation, max.	45 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C

<b>Air pressure acc. to IEC 60068-2-13</b>	
• permissible range, lower limit	795 hPa
• permissible range, upper limit	1 080 hPa
<b>Relative humidity</b>	
• Operation, min.	5 %
• Operation, max.	95 %; no condensation
<b>Vibrations</b>	
• 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/s <sup>2</sup> )
<b>Shock test</b>	
• tested according to IEC 60068-2-29	Yes; IEC 68, Part 2-29 half-sine: 100 m/s <sup>2</sup> (10 g), 16 ms, 100 shocks
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7	Yes
• STEP 7 Lite	Yes
• ProTool	Yes
• ProTool/Lite	Yes
• ProTool/Pro	Yes
<b>Programming</b>	
• Command set	see instruction list
• Nesting levels	8
• Program organization	Linear, structured
• System functions (SFC)	see instruction list
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
<b>Software libraries</b>	
— Process diagnostics	Yes; C7-CPU
— Software controller	Yes; 16 circles
<b>Know-how protection</b>	
• User program protection/password protection	Yes
<b>Cycle time monitoring</b>	
• 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

**last modified:** 03/28/2017