

*** SPARE PART*** SIMATIC C7-635 TOUCH, COMPACT UNIT WITH INTEGRATED COMPONENTS: S7-300 CPU314C-2 DP AND TP170B, 24 DI, 16 DO, 5 AI, 2 AO; MICRO MEMORY CARD AND CONNECTOR SET REQUIRED



Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> • 24 V DC 	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
<ul style="list-style-type: none"> • Rated value (DC) • permissible range, lower limit (DC) • permissible range, upper limit (DC) 	24 V 20.4 V 28.8 V
Input current	
Current consumption, typ.	150 mA; idling
Digital inputs	
<ul style="list-style-type: none"> • from load voltage L+ (without load), max. 	70 mA
Digital outputs	
<ul style="list-style-type: none"> • from load voltage L+, max. 	100 mA
Power loss	
Power loss, typ.	14 W

Memory	
Work memory	
<ul style="list-style-type: none"> integrated 	96 kbyte; For program and data
<ul style="list-style-type: none"> expandable 	No
Load memory	
<ul style="list-style-type: none"> Plug-in (MMC) 	Yes
<ul style="list-style-type: none"> Plug-in (MMC), max. 	8 Mbyte
Backup	
<ul style="list-style-type: none"> present 	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> without battery 	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 μ s
for bit operations, max.	0.2 μ s
for word operations, typ.	0.2 μ s
for fixed point arithmetic, typ.	2 μ s
for floating point arithmetic, typ.	3 μ s
CPU-blocks	
DB	
<ul style="list-style-type: none"> Number, max. 	511; Number range: 1 to 511
<ul style="list-style-type: none"> Size, max. 	16 kbyte
FB	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> Size, max. 	16 kbyte
FC	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> Size, max. 	16 kbyte
OB	
<ul style="list-style-type: none"> Number, max. 	see instruction list
<ul style="list-style-type: none"> Size, max. 	16 kbyte
<ul style="list-style-type: none"> Number of free cycle OBs 	1; OB 1
<ul style="list-style-type: none"> Number of time alarm OBs 	1; OB 10
<ul style="list-style-type: none"> Number of delay alarm OBs 	1; OB 20
<ul style="list-style-type: none"> Number of cyclic interrupt OBs 	1; OB 35
<ul style="list-style-type: none"> Number of process alarm OBs 	1; OB 40
<ul style="list-style-type: none"> Number of startup OBs 	1; OB 100
<ul style="list-style-type: none"> Number of asynchronous error OBs 	5; OB 80, 82, 85, 86, 87
Nesting depth	
<ul style="list-style-type: none"> per priority class 	8
<ul style="list-style-type: none"> additional within an error OB 	4
Counters, timers and their retentivity	
S7 counter	

• Number	256
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	255
Retentivity	
— adjustable	Yes
— preset	8
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	256
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	255
Retentivity	
— adjustable	Yes
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Flag	
• Number, max.	256 byte
• Retentivity available	Yes; MB 0 to MB 255
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Data blocks	
• Number, max.	511
• Size, max.	16 kbyte
Local data	

- per priority class, max.

510 byte

Address area

I/O address area

- Inputs 1 kbyte
- Outputs 1 kbyte

of which distributed

- Inputs 1 000 byte
- Outputs 1 008 byte

Process image

- Inputs 128 byte
- Outputs 128 byte

Default addresses of the integrated channels

- Digital inputs 124.0 to 126.7
- Digital outputs 124.0 to 125.7
- Analog inputs 752 to 761
- Analog outputs 752 to 755

Digital channels

- Inputs 8 192
 - of which central 1 016
- Outputs 8 192
 - of which central 1 008

Analog channels

- Inputs 512
 - of which central 253
- Outputs 512
 - of which central 250

Hardware configuration

Number of DP masters

- integrated 1
- via CP 4

Number of operable FMs and CPs (recommended)

- FM 8
- CP, PtP 8
- CP, LAN 10

Rack

- Racks, max. 4
- Modules per rack, max. 8; In rack 3 max. 7

Time of day

Clock

- Hardware clock (real-time) Yes

• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s
Operating hours counter	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 ³¹ hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
Digital inputs	
Number of digital inputs	24
• of which inputs usable for technological functions	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	24
— up to 60 °C, max.	12
vertical installation	
— up to 40 °C, max.	12
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms
— Rated value	3 ms
for counter/technological functions	
— at "0" to "1", max.	8 µs
Cable length	
• shielded, max.	1 000 m; 50 m for technological functions
• unshielded, max.	600 m; For technological functions: No
for technological functions	

— shielded, max.	50 m
— unshielded, max.	not allowed

Digital outputs

Number of digital outputs	16
• of which high-speed outputs	4
Short-circuit protection	Yes; Clocked electronically
• Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	500 mA
• for signal "1" permissible range, min.	5 mA
• for signal "1" permissible range, max.	0.6 A
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	100 Hz
• of the pulse outputs, with resistive load, max.	2.5 kHz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	3 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

Analog inputs

Number of analog inputs	
• For voltage/current measurement	4

<ul style="list-style-type: none"> • For resistance/resistance thermometer measurement 	1
integrated channels (AI)	4+1
permissible input voltage for current input (destruction limit), max.	2.5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
<ul style="list-style-type: none"> • Current 	Yes
<ul style="list-style-type: none"> • Resistance thermometer 	Yes
<ul style="list-style-type: none"> • Resistance 	Yes
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • 0 to +10 V 	Yes
<ul style="list-style-type: none"> • Input resistance (0 to 10 V) 	100 k Ω
<ul style="list-style-type: none"> • -10 V to +10 V 	Yes
<ul style="list-style-type: none"> • Input resistance (-10 V to +10 V) 	100 k Ω
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA 	Yes
<ul style="list-style-type: none"> • Input resistance (0 to 20 mA) 	50 Ω
<ul style="list-style-type: none"> • -20 mA to +20 mA 	Yes
<ul style="list-style-type: none"> • Input resistance (-20 mA to +20 mA) 	50 Ω
<ul style="list-style-type: none"> • 4 mA to 20 mA 	Yes
<ul style="list-style-type: none"> • Input resistance (4 mA to 20 mA) 	50 Ω
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • Pt 100 	Yes
<ul style="list-style-type: none"> • Input resistance (Pt 100) 	10 M Ω
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> • No-load voltage, typ. 	2.5 V
<ul style="list-style-type: none"> • Measuring current, typ. 	1.8 to 3.3 mA
<ul style="list-style-type: none"> • 0 to 600 ohms 	Yes
<ul style="list-style-type: none"> • Input resistance (0 to 600 ohms) 	10 M Ω
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
Characteristic linearization	
<ul style="list-style-type: none"> • parameterizable 	Yes; by software
— for resistance thermometer	Pt 100

Cable length	
• shielded, max.	100 m
Analog outputs	
Number of analog outputs	2
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	55 mA
Current output, no-load voltage, max.	17 V
Output ranges, voltage	
• 0 to 10 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes; Without compensation of the line resistances
• for voltage output four-wire connection	No
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 k Ω
• with voltage outputs, capacitive load, max.	0.1 μ F
• with current outputs, max.	300 Ω
• with current outputs, inductive load, max.	0.1 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	16 V; Permanent
• Current, max.	50 mA; Permanent
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Measurement principle	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Integration time, parameterizable	Yes; 2,5 / 16,6 / 20 ms
• permissible input frequency, max.	400 Hz
• Time constant of the input filter	0.38 ms
• Basic execution time of the module (all channels released)	1 ms
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	

<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	12 bit
<ul style="list-style-type: none"> Conversion time (per channel) 	1 ms
Settling time	
<ul style="list-style-type: none"> for resistive load 	0.6 ms
<ul style="list-style-type: none"> for capacitive load 	1 ms
<ul style="list-style-type: none"> for inductive load 	0.5 ms
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> for voltage measurement 	Yes
<ul style="list-style-type: none"> for current measurement as 2-wire transducer 	Yes; with external supply
<ul style="list-style-type: none"> for current measurement as 4-wire transducer 	Yes
<ul style="list-style-type: none"> for resistance measurement with two-wire connection 	Yes; Without compensation of the line resistances
<ul style="list-style-type: none"> for resistance measurement with three-wire connection 	No
<ul style="list-style-type: none"> for resistance measurement with four-wire connection 	No
Connectable encoders	
<ul style="list-style-type: none"> 2-wire sensor 	Yes
<ul style="list-style-type: none"> — permissible quiescent current (2-wire sensor), max. 	1.5 mA
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.06 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.1 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.06 %
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) 	1 %
<ul style="list-style-type: none"> Current, relative to input range, (+/-) 	1 %
<ul style="list-style-type: none"> Resistance, relative to input range, (+/-) 	5 %
<ul style="list-style-type: none"> Voltage, relative to output range, (+/-) 	1 %
<ul style="list-style-type: none"> Current, relative to output range, (+/-) 	1 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) 	0.7 %; Linearity error +/- 0.06 %
<ul style="list-style-type: none"> Current, relative to input range, (+/-) 	0.7 %; Linearity error +/- 0.06 %

• Resistance, relative to input range, (+/-)	3 %; Linearity error +/- 0.2%
• Resistance thermometer, relative to input range, (+/-)	3 %
• Voltage, relative to output range, (+/-)	0.7 %
• Current, relative to output range, (+/-)	0.7 %

Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency

• Series mode interference (peak value of interference < rated value of input range), min.	30 dB
• Common mode interference, min.	40 dB

Interfaces

MPI

• Cable length, max.	50 m; without repeater
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1. Interface

Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA

Functionality

• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	No

MPI

• Number of connections	12
• Transmission rate, max.	187.5 kbit/s

Services

— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes

2. Interface

Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Number of connection resources	12

Functionality

• MPI	No
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• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
DP master	
• Number of connections, max.	12; For PG/OP communication
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
Address area	
— Inputs, max.	1 kbyte
— Outputs, max.	1 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
DP slave	
• Number of connections	12
• GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
• Transmission rate, max.	12 kbit/s
• Address area, max.	32
• User data per address area, max.	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
— Direct data exchange (slave-to-slave communication)	Yes

— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Communication functions	
Global data communication	
• Number of GD loops, max.	4
• Number of GD packets, max.	4
• Number of GD packets, transmitter, max.	4
• Number of GD packets, receiver, max.	4
• Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	
• as server	Yes
• as client	Yes; Via CP and loadable FB
• User data per job, max.	180 kbyte; With PUT/GET
• User data per job (of which consistent), max.	64 byte
S5 compatible communication	
• supported	Yes; via CP and loadable FC
Number of connections	
• overall	12
• usable for PG communication	11
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	11
• usable for OP communication	11
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	11
• usable for S7 basic communication	8
— reserved for S7 basic communication	8
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	8
• usable for routing	4; max.
S7 message functions	

Number of login stations for message functions, max.	12; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	40

Test commissioning functions

Status block	Yes
Single step	Yes
Number of breakpoints	2

Status/control

• Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	30
— of which status variables, max.	30
— of which control variables, max.	14

Forcing

• Forcing	Yes
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Diagnostic buffer

• present	Yes
• Number of entries, max.	100

Integrated Functions

Number of counters	4; See "Technological Functions" manual
Counting frequency (counter) max.	60 kHz
Frequency measurement	Yes
Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes
integrated function blocks (closed-loop control)	PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz

Potential separation

Potential separation digital inputs

• Potential separation digital inputs	Yes
• between the channels	No
• between the channels and backplane bus	Yes

Potential separation digital outputs

• Potential separation digital outputs	Yes
• between the channels	Yes
• between the channels, in groups of	8
• between the channels and backplane bus	Yes

Potential separation analog inputs

• Potential separation analog inputs	Yes; common for analog I/O
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• between the channels	No
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• Potential separation analog outputs	Yes; common for analog I/O
• between the channels	No
• between the channels and backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC
Between the inputs and MANA (UCM)	8 V DC
between MANA and M internally (UISO)	75 V DC/60 V AC
Isolation	
Isolation tested with	500 V DC
Configuration	
Configuration software	
• STEP 7	Yes; V5.2 SP1 with HW update
Programming	
• Command set	see instruction list
• Nesting levels	8
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
• User program protection/password protection	Yes
Dimensions	
Width	260 mm
Height	199 mm
Depth	79 mm
Mounting cutout, width	231 mm
Mounting cutout, height	183 mm
Weights	
Weight, approx.	1 380 g
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