SIEMENS

Data sheet 6ES7636-2EB00-0AE3

Spare part SIMATIC C7-636 Touch, Complete unit with integrated components: S7-300 CPU 315-2 DP and TP 270, 24 DI, 16 DO, 5 AI, 2 AO; Micro Memory Card and connector set required

Operator control and monitoring	
Password protection	Yes
• Password levels	10
Text elements	Yes
Info texts	Yes
Graphics object	Yes
Process images	Yes
Alarms	Yes; Fault messages, operating messages
Graphics object	
• Character graphics	Yes
• Pixel graphics	Yes
Process images	
• Number of process images	300
• Number of variables per image, max.	200
• Number of variables in message text, max.	8
Operating-/fault messages	
• Number of entries in operational log, max.	Message archive limited by storage medium
• Number of entries in fault message buffer, max.	Message archive limited by storage medium
Recipes	

• Number, max.	300
• Data records per recipe, max.	500
• Entries per data record, max.	1 000
Display	
Design of display	CSTN, CCFL backlit; 10.4" color (256 colors)
Resolution (pixels)	
• Horizontal image resolution	640 Pixel
• Vertical image resolution	480 Pixel
Backlighting	
• MTBF backlighting (at 25 °C)	60 000 h
Control elements	
Touch operation	
• Design as touch screen	Yes
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 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
Digital inputs	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
Digital outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
Analog outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
Input current	
Current consumption, typ.	650 mA; idling
Current consumption, max.	1.5 A
Inrush current, max.	3 A; 3 A for 10 ms, then 2 A for 70 ms
Digital inputs	
• from load voltage L+ (without load), max.	70 mA
Digital outputs	
• from load voltage L+, max.	20 mA; per group
Power loss	

Power loss, typ.	24 W
Memory	
Micro Memory Card	Yes
Work memory	
• integrated	128 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
• with battery	Yes; Option for the panel
• without battery	Yes; Program and data of the CPU
Battery	
Backup battery	
• Backup battery (optional)	Yes
CPU processing times	
for bit operations, typ.	0.1 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	3 µs
CPU-blocks	
DB	
• Number, max.	1 023; DB 0 reserved
• Size, max.	16 kbyte
FB	
• Number, max.	2 048; see instruction list
• Size, max.	16 kbyte
FC	
• Number, max.	2 048; see instruction list
• Size, max.	16 kbyte
OB	
• Number, max.	see instruction list
• Size, max.	16 kbyte
Nesting depth	
• per priority class	8
• additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
• Number	256

Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	256
— preset	Z 0 to Z 7
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
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	256
— 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	
Retentive data area (incl. timers, counters, flags), max.	all
Flag	
• Number, max.	2 048 byte
• Retentivity available	Yes; MB 0 to MB 255
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Local data	
• per priority class, max.	1 024 byte; max. 510 bytes per block
Address area	
I/O address area	
• Inputs	2 kbyte
• Outputs	2 kbyte
of which distributed	

— Inputs	2 000 byte
— Outputs	2 000 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
— Analog outputs	761
Digital channels	
• Inputs	16 384
— of which central	992
• Outputs	16 384
— of which central	992
Analog channels	
• Inputs	1 024
— of which central	248
• Outputs	1 024
— of which central	248

Hardware configuration	
Number of modules per system, max.	23
Number of DP masters	
• integrated	1
• via CP	1
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10
Expansion modules	
• Number of expansion modules, max.	4; max. 2 flat arrangement, max. 4 deep arrangement, max. 23 via IM
Rack	
• Racks, max.	4
• Modules per rack, max.	8; Modules in subrack 0: 4 max.; modules in subracks 1 and 2: 8 max.; modules in subrack 3: 7 max.
• Number of lines, max.	4

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 h
• 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.	12
vertical installation	
— up to 40 °C, max.	18
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.	7 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 technological functions	
— at "0" to "1", max.	8 µs
Cable length	
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m
for technological functions	
— shielded, max.	50 m; at maximum count frequency
— 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	0.5 A
• for signal "1" permissible range, min.	5 mA
• for signal "1" permissible range, max.	0.6 A
• for signal "1" permissible range for 0 to 40 °C, max.	0.5 A
• for signal "1" permissible range for 40 to 60 °C, max.	0.5 A; Up to 50 °C
• 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)	
all mounting positions	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A; Up to 50 °C
horizontal installation	
— up to 40 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	3 A
Cable length	
• shielded, max.	1 000 m

• unshielded, max.	600 m

Analog inputs	
Number of analog inputs	4
• For voltage/current measurement	4
• For resistance/resistance thermometer measurement	1
integrated channels (AI)	4; + 1 AI
permissible input voltage for current input (destruction limit), max.	2.5 V; max. 2.5 V permanent; max. 24 V for short time
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
No-load voltage for resistance-type transmitter, typ.	2.5 V
Constant measurement current for resistance-type transmitter, typ.	1.8 to 3.3 mA
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
• Voltage	Yes
• Current	Yes
• Resistance thermometer	Yes
• Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	50 Ω
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	50 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
• Input resistance (Pt 100)	10 MΩ
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	10 MΩ
Thermocouple (TC)	

Temperature compensation	
— parameterizable	No
Characteristic linearization	
• 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 kΩ
• with voltage outputs, capacitive load, max.	0.1 µF
• 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	Measurement principle momentary value encoding (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
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz

• 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	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	1 ms
Settling time	
• for resistive load	0.6 ms
• for capacitive load	1 ms
• for inductive load	0.5 ms
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.06 %
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	50 dB; at Ucm = 0 V
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	
• Voltage, relative to input range, (+/-)	1 %
• Current, relative to input range, (+/-)	1 %
• Resistance, relative to input range, (+/-)	5 %
• Voltage, relative to output range, (+/-)	1 %
• Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.7 %
• Current, relative to input range, (+/-)	0.7 %
• Resistance, relative to input range, (+/-)	3 %

• 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 x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	30 dB
• Common mode interference, min.	40 dB

Interfaces	
Number of printer interfaces	1; serial, USB for panel
MPI	
• Cable length, max.	50 m; without repeater

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
Protocols	
• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
MPI	
• Number of connections	16
• 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	Yes; Via CP and loadable FB
— 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	16
Protocols	
• MPI	No
• PROFIBUS DP master	Yes

• PROFIBUS DP slave	Yes
PROFIBUS DP master	
• Number of connections, max.	16; For PG/OP communication
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	125
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— S7 communication, as client	No
— S7 communication, as server	No
— Equidistance	Yes
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
Address area	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• Number of connections	16
• Transmission rate, max.	12 Mbit/s
• Address area, max.	32
• User data per address area, max.	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Communication functions	
Global data communication	
• Number of GD packets, max.	8

• Number of GD packets, transmitter, max.	8
• Number of GD packets, receiver, max.	8
• 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 byte; With PUT/GET
• User data per job (of which consistent), max.	64 byte
S5 compatible communication	
• supported	Yes; via CP and loadable FC
Standard communication (FMS)	
• supported	No
Number of connections	
• overall	16
• usable for PG communication	15
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	15
• usable for OP communication	15
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	15
• usable for S7 basic communication	12
— reserved for S7 basic communication	12
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	12

S7 message functions	
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
• Forcing, variables	Inputs, outputs
• Number of variables, max.	10
Diagnostic buffer	
• present	Yes
• Number of entries, max.	100
— adjustable	No

Interrupts/diagnostics/status information	
Alarms	Yes; No interrupts when used as standard I/O; when using the technological functions, see the manual S7-300 Programmable Controller, CPU31xC Technological Functions
Diagnostics function	No; No interrupts when used as standard I/O; when using the technological functions, see the manual S7-300 Programmable Controller, CPU31xC Technological Functions

Integrated Functions	
Number of counters	4; 4 channels in total
Counting frequency (counter) max.	60 kHz
Frequency measurement	Yes
Number of frequency meters	4; 4 channels in total
controlled positioning	Yes
integrated function blocks (closed-loop control)	Yes
PID controller	Yes
Number of pulse outputs	4; 4 channels in total
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
• between the channels	No

• between the channels and backplane bus	Yes
Potential separation analog outputs	
• Potential separation analog outputs	Yes
• 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

EMC	
Interference immunity against discharge of static electricity	
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes; ±6 kV contact discharge acc. to IEC 61000-4-2, ESD; ±8 kV air discharge acc. to IEC 61000-4-2, ESD
Interference immunity against high-frequency electromagnetic fields	
• Interference immunity against high-frequency radiation acc. to IEC 61000-4-3	Yes; 10 V/m, with 80% amplitude modulation at 1 kHz, 80 MHz to 1 GHz (to IEC 61000-4-3); 10 V/m, pulse-modulated 50% duty cycle at 900 MHz and 1.89 GHz (to IEC61000-4-3)
Interference immunity to cable-borne interference	
• Interference immunity on supply lines acc. to IEC 61000-4-4	Yes; ±2 kV acc. to IEC 61000-4-4, burst; surge measurements with additional protective elements
• Interference immunity on signal cables acc. to IEC 61000-4-4	Yes
Interference immunity against voltage surge	
• on the supply lines acc. to IEC 61000-4-5	Yes; ±1 kV acc. to IEC 61000-4-5, µs pulse/line to line; ±2 kV acc. to IEC 61000-4-5, µs pulse/line to ground
Interference immunity against conducted variable disturbance induced by high-frequency fields	
• Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes; 10 V/m, with 80% amplitude modulation at 1 kHz
Emission of radio interference acc. to EN 55 011	
• Limit class A, for use in industrial areas	Yes

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

Standards, approvals, certificates	
CSA approval	Yes
UL approval	Yes
FM approval	Yes

Ambient conditions

Suited for outdoor use	No
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	40 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
• permissible range, lower limit	795 hPa
• permissible range, upper limit	1 080 hPa
Relative humidity	
• Operation, min.	5 %
• Operation, max.	85 %; at <40 °C (no condensation)
• Storage, max.	85 %; at <40 °C (no condensation)
• Transportation, max.	85 %; at <40 °C (no condensation)
Vibrations	
• Operation, tested according to IEC 60068-2-6	Yes; Operation 10 Hz to 58 Hz, amplitude 0.075 mm; 58 Hz to 150 Hz, acceleration 9.8 m/s²
• Transport, tested acc. to IEC 60068-2-6	Yes; 5 to 9 Hz: Amplitude 3.5 mm; 9 to 500 Hz: Acceleration 9.8 m/s2
Shock testing	
• tested according to IEC 60068-2-29	Yes; Half-sine: 150 m/s2 (15 g), 11 ms, 18 shocks

Operating systems

pre-installed operating system	
• Windows CE	Yes

Configuration

Configuration software	
• STEP 7	Yes; V5.2 SP1 HSP or higher
• ProTool	Yes; as of V6.0 SP3 with Setup C7-636
• ProTool/Lite	Yes; as of version 6.0 SP3 and setup C7-636
• ProTool/Pro	Yes; as of version 6.0 SP3 and setup C7-636
• WinCC flexible Compact	Yes
• WinCC flexible Standard	Yes
• WinCC flexible Advanced	Yes
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

Languages	
Online languages	
• Number of online/runtime languages	5

Dimensions	
Width	335 mm
Height	275 mm
Depth	100 mm
Mounting cutout, width	310 mm; Tolerance: +1 mm
Mounting cutout, height	248 mm; Tolerance: +1 mm

Weights	
Weight, approx.	3 980 g

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