SIEMENS

Product data sheet 6ES7314-6BG03-0AB0

SIMATIC S7-300, CPU 314C-2 PTP COMPACT CPU WITH MPI, 24 DI/16 DO, 4AI, 2AO, 1 PT100, 4 FAST COUNTERS (60 KHZ), INTEGRATED INTERFACE RS485, INTEGRATED 24V DC POWER SUPPLY, 96 KBYTE WORKING MEMORY, FRONT CONNECTOR (2 X 40PIN) AND MICRO MEMORY CARD REQUIRED

Product version	
Hardware product version	01
Firmware version	V2.6
associated programming package	STEP 7 V5.3 SP2 or higher with HW update
Supply voltages	
Rated value	
24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for supply cables (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Load voltage L+	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Current consumption	
Current consumption (rated value)	800 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	11 A
I^2t	0.7 $A^2 \cdot s$
from supply voltage L+, max.	800 mA
Power losses	
Power loss, typ.	14 W
Memory	
Work memory	
integrated	96 Kibyte ; For program and data
expandable	No
Load memory	

pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
Backup	
present	Yes ; guaranteed by MMC (maintenance-free)
without battery	Yes ; Program and data
CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	511 ; Number range: 1 to 511
Size, max.	16 Kibyte
FB	
Number, max.	1024 ; Sequence of numbers: 0 to 2047
Size, max.	16 Kibyte
FC	
Number, max.	1024 ; Sequence of numbers: 0 to 2047
Size, max.	16 Kibyte
OB	
Size, max.	16 Kibyte ; see instruction list
Number of free cycle OBs	1 ; OB 1
Number of time alarm OBs	1 ; OB 10
Number of delay alarm OBs	1 ; OB 20
Number of time alarm OBs	1 ; OB 35
Number of process alarm OBs	1 ; OB 40
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	4 ; OB 80, 82, 85, 87
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	8
additional within an error OB	4
CPU processing times	
for bit operations, min.	0.1 µs
for bit operations, max.	0.2 µs
for word operations, min.	0.2 µs

for fixed point arithmetic, min.	2 µs
for floating point arithmetic, min.	3 µs
Counters, timers and their retentivity	
S7 counter	
Number	256
of which retentive without battery	
can be set	Yes
lower limit	0
upper limit	255
preset	8
Retentivity	
can be set	Yes
lower limit	0
upper limit	255
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	
can be set	Yes
lower limit	0
upper limit	255
Retentivity	
can be set	Yes
lower limit	0
upper limit	255
preset	no retentivity
Time range	
lower limit	10 ms

upper limit	9990 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 ; Number range: 1 to 511
Size, max.	16 Kibyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	yes
Local data	
per priority class, max.	510 byte
Address area	
I/O address area	
Inputs	1 Kibyte
Outputs	1 Kibyte
of which, distributed	
Inputs	none
Outputs	none
Process image	
Inputs	128 byte
Outputs	128 byte
Digital channels	
Inputs	1016
Outputs	1008
Inputs, of which central	1016
Outputs, of which central	1008
Analog channels	
Inputs	253

Outputs	250
Inputs, of which central	253
Outputs, of which central	250
Hardware configuration	
Racks, max.	4
Modules per rack, max.	8 ; in rack 3 max. 7
Number of DP masters	
integrated	none
via CP	4
Number of operable FMs and CPs (recommended)	
FM	8
CP, point-to-point	8
CP, LAN	10
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Backup time	6 wk ; at 40°C ambient temperature
Deviation per day, max.	10 s
Runtime meter	
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
S7 message functions	
Number of login stations for message functions, max.	12 ; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	40

Test commissioning functions	
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
Status block	Yes
Single step	Yes
Number of breakpoints	2
Diagnostic buffer	
present	Yes
Number of entries, max.	100
Communication functions	
PG/OP communication	Yes
Routing	No
Global data communication	
supported	Yes
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	
supported	Yes
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	
supported	Yes
as server	Yes
as client	Yes ; via CP and loadable FB

User data per job, max.	180 Kibyte
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, max.	11
usable for OP communication	11
reserved for OP communication	1
adjustable for OP communication, max.	11
usable for S7 basic communication	8
Reserved for S7 basic communication	0
adjustable for S7 basic communication, max.	8
usable for routing	No
Connection method	
required front connector	2x 40-pin
MPI	
Cable length, max.	50 m ; without repeater
Point-to-point	
Cable length, max.	1200 m
Integrated protocol driver	
3964 (R)	Yes
ASCII	Yes
RK512	Yes
Transmission speed, RS 422/485	
with 3964 (R) protocol, max.	19.2 kbit/s ; 38.4 kBit/s half duplex; 19.2 kBit/s full duplex
with ASCII protocol, max.	19.2 kbit/s ; 38.4 kBit/s half duplex; 19.2 kBit/s full duplex
with RK 512 protocol, max.	19.2 kbit/s ; 38.4 kBit/s half duplex; 19.2 kBit/s full duplex
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485

Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
MPI	Yes
DP master	No
DP slave	No
Point-to-point connection	No
MPI	
Number of connections	12
Services	
PG/OP communication	Yes
Routing	No
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes
Transmission rate, max.	187.5 kbit/s
2nd interface	
Type of interface	integrated RS 422/ 485 interface
Physics	RS 422/RS 485 (X.27)
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	No
Number of connection resources	none
Functionality	
MPI	No
DP master	No
DP slave	No
PROFINET IO Controller	No
PROFINET CBA	No
Point-to-point connection	Yes
programming	
Programming language	
STEP 7	Yes ; V5.3 SP2 with HW update
LAD	Yes

FBD	Yes
STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Command set	see instruction list
Nesting levels	8
Know-how protection	
User program protection/password protection	Yes
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Digital inputs	
Number of inputs	24
of which, inputs usable for technological functions	16
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
Technological functions	
shielded, max.	50 m
unshielded, max.	not allowed
Standard DI	
shielded, max.	1000 m
unshielded, max.	600 m
Input characteristic curve acc. to IEC 1131, Type 1	Yes
Input voltage	
Rated value, DC	24 V
for signal "0"	-3 to +5 V
for signal "1"	15 to 30 V
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	
Cable length, shielded, max.	1000 m ; 50 m for technological functions
Cable length unshielded, max.	600 m ; For technological functions: No
Digital outputs	
Number of digital outputs	16
of which high-speed outputs	4
Short-circuit protection of the output	Yes ; clocked electronically
Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Lamp load, max.	5 W
Controlling a digital input	Yes
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 2 outputs	
for increased power	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
Aggregate current of outputs (per group)	
horizontal installation	
up to 40 °C, max.	3 A

up to 60 °C, max.	2 A
vertical installation	
up to 40 °C, max.	2 A
Load resistance range	
lower limit	48 Ω
upper limit	4 kΩ
Cable length	
Cable length, shielded, max.	1000 m
Cable length unshielded, max.	600 m
Analog inputs	
Number of analog inputs for voltage/current measurement	4
Number of analog inputs for resistance/temperature measurement	1
Cable length, shielded, max.	100 m
permissible input frequency for current input (destruction limit), max.	5 V ; permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA ; permanent
Technical unit for temperature measurement adjustable	Yes ; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
Current	Yes
Resistance thermometer	Yes
Resistance	Yes
Input ranges (rated values), voltages	
0 to +10 V	Yes
Input resistance (0 to 10 V)	100 kΩ
-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)	100 Ω
-20 to +20 mA	Yes
Input resistance (-20 to +20 mA)	100 Ω
4 to 20 mA	Yes

Input resistance (4 to 20 mA)	100 Ω
Input ranges (rated values), resistance thermometers	
Pt 100	Yes
Input resistance (Pt 100)	10 MΩ
Input ranges (rated values), resistors	
No-Load voltage, typ.	2.5 V
Measured current, typ.	1.8 to 3.3 mA
0 to 600 ohms	Yes
Input resistance (0 to 600 ohms)	10 MΩ
Voltage input	
permissible input voltage for voltage input (destruction limit), max.	30 V ; permanent
Current input	
permissible input current for current input (destruction limit), max.	50 mA ; Permanent
Characteristic linearization	
parameterizable	Yes ; by software
for resistance thermometer	Pt 100
Temperature compensation	
parameterizable	No
Analog outputs	
Number of analog outputs	2
Cable length, shielded, max.	200 m
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 to +10 V	Yes
Output ranges, current	
0 to 20 mA	Yes
-20 to +20 mA	Yes
4 to 20 mA	Yes
Connection of actuators	
for voltage output 2-conductor connection	Yes ; Without compensation of the line resistances
for voltage output 4-conductor connection	No

for current output 2-conductor 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
Analog value creation	
Measurement principle	Actual value encryption (successive approximation)
Integrations 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
Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz
Conversion time (per channel)	1 ms
Time constant of the input filter	0.38 ms
Basic execution time of the module (all channels released)	1 ms
Settling time	
for resistive load	0.6 ms
for capacitive load	1 ms
Encoder	
Connection of signal encoders	
for voltage measurement	Yes
for current measurement as 2-wire transducer	Yes ; with external supply
for current measurement as 4-wire transducer	Yes
for resistance measurement with 2-conductor connection	Yes ; without compensation of the line resistances
for resistance measurement with 3-conductor connection	No
for resistance measurement with 4-conductor connection	No

Connectable encoders	
2-wire BEROS	Yes
permissible quiescent current (2-wire BEROS), max.	1.5 mA
Errors/accuracies	
Temperature error (relative to input area)	+/- 0,006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0,06 %
Output ripple (based on output area, bandwidth 0 to 50 kHz)	+/- 0,1 %
Linearity error (relative to output area)	+/- 0,15 %
Temperature error (relative to output area)	+/- 0,01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in settled status at 25 °C (relative to output area)	+/- 0,06 %
Operational limit in overall temperature range	
Voltage, relative to input area	+/- 1 %
Current, relative to input area	+/- 1 %
Impedance, relative to input area	+/- 5 %
Voltage, relative to output area	+/- 1 %
Current, relative to output area	+/- 1 %
Basic error limit (operational limit at 25 °C)	
Voltage, relative to input area	+/- 0,7 % ; Linearity error +/- 0.06%
Current, relative to input area	+/- 0,7 % ; Linearity error +/- 0.06%
Impedance, relative to input area	+/- 3 % ; Linearity error +/- 0.2%
Resistance-type thermometer, relative to input area	+/- 3 %
Voltage, relative to output area	+/- 0,7 %
Current, relative to output area	+/- 0,7 %
Interference voltage suppression for f = n x (fl +/- 1%), fl = interference frequency	
Series mode interference (peak value of interference < rated value of input range), min.	30 dB
Common mode interference, min.	40 dB
Integrated Functions	
Number of counters	4 ; see "Technological Functions" manual
Counter frequency (counter) max.	60 kHz

Frequency measurement	Yes
controlled positioning	Yes
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
Interrupts/diagnostics/status information	
Diagnostics indication LED	
Status indicator digital output (green)	Yes
Status indicator digital input (green)	Yes
Isolation	
Isolation checked with	600 VDC
Galvanic isolation	
Galvanic isolation digital inputs	
Galvanic isolation digital inputs	Yes
between the channels	No
between the channels and the backplane bus	Yes
Galvanic isolation digital outputs	
Galvanic isolation digital outputs	Yes
between the channels	Yes
between the channels, in groups of	8
between the channels and the backplane bus	Yes
Galvanic isolation analog inputs	
Galvanic isolation analog inputs	Yes ; common for analog I/O
between the channels	No
between the channels and the backplane bus	Yes
Galvanic isolation analog outputs	
Galvanic isolation analog outputs	Yes ; common for analog I/O
between the channels	No
between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Dimensions and weight	
Dimensions	
Width	120 mm

Height	125 mm
Depth	130 mm
Weight	
Weight, approx.	676 g
Status	Jan 17, 2011