SIEMENS

Product data sheet 6ES7313-6CF03-0AB0

SIMATIC S7-300,
CPU 313C-2DP COMPACT CPU WITH MPI,
16 DI/16 DO, 3 FAST COUNTERS (30 KHZ),
INTEGRATED DP INTERFACE,
INTEGRATED 24V DC POWER SUPPLY,
64 KBYTE WORKING MEMORY,
FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY CARD REQUIRED

-

General information	
Hardware product version	01
Firmware version	V2.6
Engineering with	
Programming package	STEP 7 V5.3 SP2 or higher with HW update
Supply voltage	
24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (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
Digital inputs	
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes

subject to modifications
© Copyright Siemens AG 2014

Digital outputs	
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	No
Input current	
Current consumption (rated value)	900 mA
Current consumption (in no-load operation), typ.	100 mA
Inrush current, typ.	11 A
I^2t	0.7 $A^2 \cdot s$
from supply voltage L+, max.	900 mA
Digital inputs	
from load voltage L+ (without load), max.	70 mA
Digital outputs	
from load voltage L+, max.	100 mA
Power loss	
Power loss, typ.	10 W
Memory	
Type of memory	other
Work memory	
integrated	64 kbyte
expandable	No
Load memory	
Plug-in (MMC)	Yes
Plug-in (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 processing times	
for bit operations, typ.	0.1 µs
for bit operations, max.	0.2 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	3 µs
CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	

subject to modifications
© Copyright Siemens AG 2014

Number, max.	511 ; Number range: 1 to 511
Size, max.	16 kbyte
FB	
Number, max.	1024 ; Number range: 0 to 2047
Size, max.	16 kbyte
FC	
Number, max.	1024 ; Number range: 0 to 2047
Size, max.	16 kbyte
OB	
Size, max.	16 kbyte
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 interrupt OBs	1 ; OB 35
Number of process alarm OBs	1 ; OB 40
Number of DPV1 alarm OBs	3 ; OB 55, 56, 57
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	5 ; OB 80, 82, 85, 86, 87
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	8
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
Number	256
of which retentive without battery	
adjustable	Yes
lower limit	0
upper limit	255
preset	8
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	8
Counting range	
lower limit	0
upper limit	999

subject to modifications
© Copyright Siemens AG 2014

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
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	
retentive data area, total	all
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 kbyte
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	

subject to modifications
© Copyright Siemens AG 2014

Inputs	1 kbyte
Outputs	1 kbyte
of which distributed	
Inputs	1006 byte ; max.
Outputs	1006 byte ; max.
Process image	
Inputs	128 byte
Outputs	128 byte
Default addresses of the integrated channels	
Digital inputs	124.0 to 125.7
Digital outputs	124.0 to 125.7
Digital channels	
Inputs	8064
Outputs	8064
Inputs, of which central	1008
Outputs, of which central	1008
Analog channels	
Inputs	503
Outputs	503
Inputs, of which central	248
Outputs, of which central	248
Hardware configuration	
Expansion devices, max.	3
Number of DP masters	
integrated	1
via CP	4
Number of operable FMs and CPs (recommended)	
FM	8
CP, point-to-point	8
CP, LAN	6
Rack	
Racks, max.	4
Modules per rack, max.	8 ; In rack 3 max. 7
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Deviation per day, max.	10 s

subject to modifications
© Copyright Siemens AG 2014

Backup time	6 wk
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
Clock synchronization	
supported	Yes
to MPI, master	Yes
to MPI, slave	Yes
to DP, master	Yes ; With DP slave only slave clock
to DP, slave	Yes
in AS, master	Yes
Digital inputs	
Number of digital inputs	16
of which inputs usable for technological functions	12
integrated channels (DI)	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
up to 40 °C, max.	16
up to 60 °C, max.	8
vertical installation	
up to 40 °C, max.	8
Input voltage	
Rated value, DC	24 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.	16 µs
Cable length	
Cable length, shielded, max.	1000 m ; 100 m for technological functions

subject to modifications
© Copyright Siemens AG 2014

Cable length unshielded, max.	600 m ; For technological functions: No
Technological functions	
shielded, max.	100 m
unshielded, max.	not allowed
Standard DI	
shielded, max.	1000 m
unshielded, max.	600 m
Digital outputs	
Number of digital outputs	16
of which high-speed outputs	4
integrated channels (DO)	16
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	
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 2 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	

subject to modifications
© Copyright Siemens AG 2014

up to 40 °C, max.	3 A
up to 60 °C, max.	2 A
vertical installation	
up to 40 °C, max.	2 A
Cable length	
Cable length, shielded, max.	1000 m
Cable length unshielded, max.	600 m
Analog inputs	
integrated channels (AI)	0
Analog outputs	
integrated channels (AO)	0
Encoder	
Connectable encoders	
2-wire sensor	Yes
permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of USB interfaces	0
Number of parallel interfaces	0
Number of 20 mA interfaces (TTY)	0
Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of other interfaces	0
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
Functionality	
MPI	Yes
DP master	No
DP slave	No
Point-to-point connection	No
MPI	
Number of connections	8
Transmission rate, max.	187.5 kbit/s
Services	

subject to modifications
© Copyright Siemens AG 2014

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	8
Functionality	
MPI	No
DP master	Yes
DP slave	Yes
PROFINET IO Controller	No
PROFINET CBA	No
Point-to-point connection	No
DP master	
Number of connections, max.	8 ; 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 ; I blocks only
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes
Equidistance mode support	Yes
Isochronous mode	No
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Direct data exchange (slave-to-slave communication)	Yes
DPV1	Yes
Address area	

© Copyright Siemens AG 2014

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	8
GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
Transmission rate, max.	12 Mbit/s
automatic baud rate search	Yes ; only with passive interface
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	No
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes
Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
Transfer memory	
Inputs	244 byte
Outputs	244 byte
Communication functions	
PG/OP communication	Yes
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

subject to modifications
© Copyright Siemens AG 2014

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 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	8
usable for PG communication	7
reserved for PG communication	1
adjustable for PG communication, min.	1
adjustable for PG communication, max.	7
usable for OP communication	7
reserved for OP communication	1
adjustable for OP communication, min.	1
adjustable for OP communication, max.	7
usable for S7 basic communication	4
reserved for S7 basic communication	0
adjustable for S7 basic communication, min.	0
adjustable for S7 basic communication, max.	4
usable for routing	4 ; max.
S7 message functions	
Number of login stations for message functions, max.	8
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	20
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

subject to modifications
© Copyright Siemens AG 2014

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	
Diagnostics indication LED	
Status indicator digital output (green)	Yes
Status indicator digital input (green)	Yes
Integrated Functions	
Number of counters	3 ; 3 channels (see "Technological Functions" manual)
Counting frequency (counter) max.	30 kHz
Frequency measurement	Yes
Number of frequency meters	3 ; 3 channels up to max. 30 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	3 ; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological Functions" manual)
Limit frequency (pulse)	2.5 kHz
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
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation tested with	600 V DC
Configuration	

subject to modifications
© Copyright Siemens AG 2014

Configuration software	
STEP 7	Yes ; V5.3 SP2 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
GRAPH	Yes
HiGraph®	Yes
Know-how protection	
User program protection/password protection	Yes
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	566 g
Status	Aug 5, 2014

subject to modifications
© Copyright Siemens AG 2014