Data sheet
CPU 314SC/DPM (314-6CG13)

Technical data

Order no.	314-6CG13
Type	CPU 314SC/DPM
General information	
Note	-
Features	SPEED7 technology 24 x DI, 16 x DO, 8 x DIO, 4 x AI, 1 x AI Pt100, 2 x AO 256 kB work memory Memory extension (max. 1 MB) PROFIBUS-DP master / PtP (switchable) Also configurable via TIA-Portal
SPEED-Bus	-
Technical data power supply	
Power supply (rated value)	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V
Reverse polarity protection	✔
Current consumption (no-load operation)	350 mA
Current consumption (rated value)	1 A
Inrush current	11 A
I^2t	0.7 A^2s
Max. current drain at backplane bus	3 A
Power loss	14 W
Technical data digital inputs	
Number of inputs	24
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	✔
Current consumption from load voltage L+ (without load)	70 mA
Rated value	DC 24 V
Input voltage for signal "0"	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V
Input voltage hysteresis	-
Frequency range	-
Input resistance	-
Input current for signal "1"	6 mA
Connection of Two-Wire-BEROs possible	✔
Max. permissible BERO quiescent current	1.5 mA
Input delay of "0" to "1"	0.1 / 0.35 ms
Input delay of "1" to "0"	0.1 / 0.35 ms
Number of simultaneously utilizable inputs horizontal configuration	24
Number of simultaneously utilizable inputs vertical configuration	24

Publish date: 19.09.2014

Input characteristic curve	IEC 61131-2, type 1
Initial data size	3 Byte

Technical data digital outputs

Number of outputs	16
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	-
Current consumption from load voltage L+ (without load)	100 mA
Total current per group, horizontal configuration, 40°C	3 A
Total current per group, horizontal configuration, 60°C	2 A
Total current per group, vertical configuration	2 A
Output voltage signal "1" at min. current	L+ (-0.8 V)
Output voltage signal "1" at max. current	L+ (-0.8 V)
Output current at signal "1", rated value	0.5 A
Output current, permitted range to 40°C	5 mA to 0.6 A
Output current, permitted range to 60°C	5 mA to 0.6 A
Output current at signal "0" max. (residual current)	0.5 mA
Output delay of "0" to "1"	100 µs
Output delay of "1" to "0"	100 µs
Minimum load current	-
Lamp load	5 W
Parallel switching of outputs for redundant control of a load	possible
Parallel switching of outputs for increased power	not possible
Actuation of digital input	✔
Switching frequency with resistive load	max. 2.5 kHz
Switching frequency with inductive load	max. 0.5 Hz
Switching frequency on lamp load	max. 2.5 kHz
Internal limitation of inductive shut-off voltage	L+ (-52 V)
Short-circuit protection of output	yes, electronic
Trigger level	1 A
Number of operating cycle of relay outputs	-
Switching capacity of contacts	-
Output data size	2 Byte

Technical data analog inputs

Number of inputs	5
Cable length, shielded	200 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	✔
Current consumption from load voltage L+ (without load)	-
Voltage inputs	✔
Min. input resistance (voltage range)	100 kOhm
Input voltage ranges	-10 V ... +10 V 0 V ... +10 V
Operational limit of voltage ranges	+/-0.3%
Operational limit of voltage ranges with SFU	-
Basic error limit voltage ranges	+/-0.2%

Basic error limit voltage ranges with SFU	-
Destruction limit current	-
Current inputs	✔
Max. input resistance (current range)	100 Ohm
Input current ranges	-20 mA ... +20 mA 0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	+/-0.3%
Operational limit of current ranges with SFU	-
Basic error limit current ranges	+/-0.2%
Radical error limit current ranges with SFU	-
Destruction limit current inputs (electrical current)	-
Destruction limit current inputs (voltage)	-
Resistance inputs	✔
Resistance ranges	0 ... 600 Ohm
Operational limit of resistor ranges	+/-0.4%
Operational limit of resistor ranges with SFU	-
Basic error limit	+/-0.2%
Basic error limit with SFU	-
Destruction limit resistance inputs	-
Resistance thermometer inputs	-
Resistance thermometer ranges	Pt100
Operational limit of resistance thermometer ranges	+/-0.6%
Operational limit of resistance thermometer ranges with SFU	-
Basic error limit thermoresistor ranges	+/-0.4%
Basic error limit thermoresistor ranges with SFU	-
Destruction limit resistance thermometer inputs	-
Thermocouple inputs	-
Thermocouple ranges	-
Operational limit of thermocouple ranges	-
Operational limit of thermocouple ranges with SFU	-
Basic error limit thermoelement ranges	-
Basic error limit thermoelement ranges with SFU	-
Destruction limit thermocouple inputs	-
Programmable temperature compensation	-
External temperature compensation	-
Internal temperature compensation	-
Technical unit of temperature measurement	-
Resolution in bit	12
Measurement principle	successive approximation
Basic conversion time	0.5 ms
Noise suppression for frequency	80 dB
Initial data size	10 Byte

Technical data analog outputs

Number of outputs	2
Cable length, shielded	200 m
Rated load voltage	-
Reverse polarity protection of rated load voltage	-

Current consumption from load voltage L+ (without load)	-
Voltage output short-circuit protection	✔
Voltage outputs	✔
Min. load resistance (voltage range)	1 kOhm
Max. capacitive load (current range)	1 µF
Max. inductive load (current range)	25 mA
Output voltage ranges	-10 V ... +10 V 0 V ... +10 V
Operational limit of voltage ranges	+/-0.2%
Basic error limit voltage ranges with SFU	+/-0.1%
Destruction limit against external applied voltage	-
Current outputs	✔
Max. in load resistance (current range)	500 Ohm
Max. inductive load (current range)	10 mH
Max. inductive load (current range)	15 V
Output current ranges	-20 mA ... +20 mA 0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	+/-0.3%
Radical error limit current ranges with SFU	+/-0.2%
Destruction limit against external applied voltage	-
Settling time for ohmic load	0.5 ms
Settling time for capacitive load	0.5 ms
Settling time for inductive load	0.5 ms
Resolution in bit	12
Conversion time	1 ms
Substitute value can be applied	no
Output data size	4 Byte

Technical data counters

Number of counters	4
Counter width	32 Bit
Maximum input frequency	60 kHz
Maximum count frequency	60 kHz
Mode incremental encoder	✔
Mode pulse / direction	✔
Mode pulse	✔
Mode frequency counter	✔
Mode period measurement	✔
Gate input available	✔
Latch input available	✔
Reset input available	-
Counter output available	✔

Load and working memory

Load memory, integrated	1 MB
Load memory, maximum	1 MB
Work memory, integrated	256 KB

Work memory, maximal	1 MB
Memory divided in 50% program / 50% data	✓
Memory card slot	MMC-Card with max. 1 GB

Hardware configuration

Racks, max.	4
Modules per rack, max.	8
Number of integrated DP master	1
Number of DP master via CP	4
Operable function modules	8
Operable communication modules PtP	8
Operable communication modules LAN	8

Status information, alarms, diagnostics

Status display	yes
Interrupts	yes
Process alarm	yes
Diagnostic interrupt	yes
Diagnostic functions	no
Diagnostics information read-out	possible
Supply voltage display	green LED
Group error display	red SF LED
Channel error display	red LED per group

Command processing times

Bit instructions, min.	0.01 µs
Word instruction, min.	0.01 µs
Double integer arithmetic, min.	0.01 µs
Floating-point arithmetic, min.	0.06 µs

Timers/Counters and their retentive characteristics

Number of S7 counters	512
Number of S7 times	512

Data range and retentive characteristic

Number of flags	8192 Byte
Number of data blocks	4095
Max. data blocks size	64 KB
Max. local data size per execution level	510 Byte

Blocks

Number of OBs	15
Number of FBs	2048
Number of FCs	2048
Maximum nesting depth per priority class	8
Maximum nesting depth additional within an error OB	4

Time

Real-time clock buffered	✓
Clock buffered period (min.)	6 w

Accuracy (max. deviation per day)	10 s
Number of operating hours counter	8
Clock synchronization	✓
Synchronization via MPI	Master/Slave
Synchronization via Ethernet (NTP)	no

Address areas (I/O)

Input I/O address area	1024 Byte
Output I/O address area	1024 Byte
Input process image maximal	128 Byte
Output process image maximal	128 Byte
Digital inputs	7856
Digital outputs	7904
Digital inputs central	979
Digital outputs central	986
Integrated digital inputs	24 32
Integrated digital outputs	16 24
Analog inputs	494
Analog outputs	495
Analog inputs, central	253
Analog outputs, central	250
Integrated analog inputs	5
Integrated analog outputs	2

Communication functions

PG/OP channel	✓
Global data communication	✓
Number of GD circuits, max.	4
Size of GD packets, max.	22 Byte
S7 basic communication	✓
S7 basic communication, user data per job	76 Byte
S7 communication	✓
S7 communication as server	✓
S7 communication as client	-
S7 communication, user data per job	160 Byte
Number of connections, max.	32

PWM data

PWM channels	4
PWM time basis	-
Period length	-
Minimum pulse width	-
PtP communication	-

Functionality Sub-D interfaces

Type	X2
Type of interface	RS485

Connector	Sub-D, 9-pin, female
Electrically isolated	-
MPI	✓
MP²I (MPI/RS232)	-
DP master	-
DP slave	-
Point-to-point interface	✓

Type	X3
Type of interface	RS485
Connector	Sub-D, 9-pin, female
Electrically isolated	✓
MPI	-
MP²I (MPI/RS232)	-
DP master	yes
DP slave	yes
Point-to-point interface	✓

Functionality MPI

Number of connections, max.	32
PG/OP channel	✓
Routing	✓
Global data communication	✓
S7 basic communication	✓
S7 communication	✓
S7 communication as server	✓
S7 communication as client	-
Transmission speed, min.	19.2 kbit/s
Transmission speed, max.	187.5 kbit/s

Functionality PROFIBUS master

PG/OP channel	✓
Routing	✓
S7 basic communication	✓
S7 communication	✓
S7 communication as server	✓
S7 communication as client	-
Activation/deactivation of DP slaves	✓
Direct data exchange (slave-to-slave communication)	-
DPV1	✓
Transmission speed, min.	9.6 kbit/s
Transmission speed, max.	12 Mbit/s
Number of DP slaves, max.	32
Address range inputs, max.	1 KB

Publish date: 19.09.2014

Address range outputs, max.	1 KB
User data inputs per slave, max.	244 Byte
User data outputs per slave, max.	244 Byte

Functionality PROFIBUS slave

PG/OP channel	✓
Routing	✓
S7 communication	✓
S7 communication as server	✓
S7 communication as client	-
Direct data exchange (slave-to-slave communication)	-
DPV1	✓
Transmission speed, min.	9.6 kbit/s
Transmission speed, max.	12 Mbit/s
Automatic detection of transmission speed	-
Transfer memory inputs, max.	244 Byte
Transfer memory outputs, max.	244 Byte
Address areas, max.	32
User data per address area, max.	32 Byte

Point-to-point communication

PtP communication	✓
Interface isolated	✓
RS232 interface	-
RS422 interface	-
RS485 interface	✓
Connector	Sub-D, 9-pin, female
Transmission speed, min.	150 bit/s
Transmission speed, max.	115.5 kbit/s
Cable length, max.	500 m

Point-to-point protocol

ASCII protocol	✓
STX/ETX protocol	✓
3964(R) protocol	✓
RK512 protocol	-
USS master protocol	✓
Modbus master protocol	✓
Modbus slave protocol	-
Special protocols	-

Functionality RJ45 interfaces

Type	X5
Type of interface	Ethernet 10/100 MBit
Connector	RJ45
Electrically isolated	✓

PG/OP channel	✓
Number of connections, max.	4
Productive connections	-

Housing

Material	PPE
Mounting	Rail System 300

Mechanical data

Dimensions (WxHxD)	120 mm x 125 mm x 120 mm
Weight	610 g

Environmental conditions

Operating temperature	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C

Certifications

UL508 certification	yes