

Technical Data

CPU 314SC/DPM

Module name	314-6CG03
Dimensions and weight	
Dimensions W x H x D	120 x 125 x 120mm
Weight	610g
Voltages, Currents, Potentials	
Power supply (rated value)	DC 24V
- Permitted range	20.4 ... 28.8V
- Reverse polarity protection	yes
Current consumption (no-load operation)	350mA
Inrush current typ.	11A
Power consumption (nominal value)	1A
I^2t	0.7A ² s
External fusing of power supply lines (recommended)	2A
Power loss	14W
Accumulator	Lithium
- Clock back-up period	30 days
Memory	
Work memory	
- integrated	128kByte
- expandable	up to 1MByte
Processing times	
Processing times for	
- Bit instructions	0.011μs
- Word instructions	0.011μs
- Double integer arithmetic	0.011μs
- Floating-point arithmetic	0.063μs
Timers/Counters and their retentive characteristics	
S7 counters	512
- Retentivity	adjustable
- Preset	up C0 to C7
- Counting value	0 up to 999
IEC counters	yes
- Type	SFB
- Number	unlimited (limited only by RAM size)
S7 timers	512
- Retentivity	adjustable
- Preset	not retentive
- Time range	10ms to 9990s
ICE timers	yes
- Type	SFB
- Number	unlimited (limited only by RAM size)
Data areas and their retentive characteristics	
Bit memories	8192Byte
- Adjustable retentivity	adjustable
- Preset	MB0 to MB15
Clock memories	8 (1 flag byte)
Data blocks	max. 4095
- Size	64kByte
Local data	
- per priority class	510Byte

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Module name	314-6CG03
Blocks	
OBs	see the instruction list
- Size	64kByte
Nesting dept	
- per priority class	8
- additional levels within an error OB	4
FBs	2048
- Size	64kByte
FCs	2048
- Size	64kByte
Address areas (I/O)	
Total address areas	1024Byte/1024Byte
I/O Process image	128Byte/128Byte
Digital channels	7856/7904
- centralized	979/986
- integrated channels	24DI/16DO (32DI/24DO)
Analog channels	494/495
- centralized	253/250
- integrated channels	4+1AI/2AO
Configuration	
Number of racks	max. 4
Modules per rack	max. 8; max. 7 in rack 3
Number of integral DP masters	1
Time	
Real-time clock	yes (HW clock)
- Backed-up	yes
- buffered period	6 Weeks
- Accuracy	Deviation per day < 10s
Operating hours counter	1
- Number	0
- Value range	2 ¹⁵
- Selectivity	1hour
- Retentive	yes, must be manually restarted after every restart
Testing and commissioning functions	
Status/Modify Variables	yes
- Variable	E, A, M, DB, T, Z
- Number of variables	30
of those as status variable	30
of those as control variable	14
Force	yes
- Variable	I, O
- Number of Variables	10
Block status	yes
Single step	yes
Break points	3
Diagnostic buffer	yes
- Number of entries (not configurable)	100

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Module name	314-6CG03
Communication functions	
PG/OP communication	yes
Global Data communication	yes
- Number of GD circuit	4
- Number of GD circuit	4
Sending stations	4
Receiving stations	4
- Length of GD packets	22Byte
S7 basic communication	yes
- User data per job	76Byte
consistent data	76Byte (for X_SEND or X_RCV)
	64Byte (for X-PUT or X_GET as the Server)
Interfaces	
Hardware description 1. interface	
Physics	RS 485
electrically isolated	no
Interface power supply (15 up to 30V DC)	200mA
Functionality 1. interface	
MPI	yes
Profibus DP	yes
Point-to-Point connection	yes
MPI 1. interface	
Services	
- PG-/OP communication	yes
- Global data communication	yes
- S7 basis communication	yes
- S7 Communication	
as Server	yes
as Client	no
- Transmission rates	187.5kbit/s
Hardware description 2. interface	
Physics	RS 485
Electrically isolated	yes
Interface power supply (15 up to 30V DC)	200mA
Functionality 2. interface	
MPI	no
Profibus DP	yes
Point-to-Point connection	yes
- Transmission rate half duplex	max. 115.2kbit/s
- Protocols	
- ASCII	yes
- STX/ETX	yes
- 3964(R)	yes
- USS	yes
- Modbus Master	yes
Hardware description 3. interface	
Physics	RJ 45
Functionality 3. interface	
Profinet	Ethernet
Services	
- PG/OP communication	yes

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Integrated functions	
Number of counters	4
- Counter frequency max.	60kHz
Programming	
Programming language	KOP/FUP/AWL
Instruction set	see the instruction list
Nesting levels	8
System functions (SFC)	see the instruction list
System function blocks (SFB)	see the instruction list
User program protection	yes

Digital Input	314-6CG03
Data for specific module	
Number of inputs	24
Length of cable	
- unshielded	600m
- shielded	1000m
Voltages, Currents, Potentials	
Rated load voltage L+	DC 24V
Reverse polarity protection	yes
Isolation	
- between channels and backplane bus	yes
- between channels	no
permitted potential difference	
- between the different circuits	DC 75V / AC 60V
Isolation tested with	DC 500V
Current consumption	
- from the power supply L+	70mA
Status, Interrupts, Diagnostics	
Status display	green LED per channel
Interrupts	none
Diagnostic functions	none
Data for selecting a Sensor	
Input voltage	
- Rated value	DC 24V
- for Signal "1"	15V to 28.8V
- for Signal "0"	0V to 5V
Input current	
- for Signal "1"	6mA
Input delay (at nominal value of the input voltage range)	
- Inputs parameterizable	0.13ms-0.43ms
Input characteristic curve according	to IEC 1131, Type 1
Connection of 2-wire-BEROs	possible
- permitted bias current	max. 1.5mA

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Digital Output	314-6CG03
Data for specific module	
Number of outputs	16
Length of cable	
- unshielded	600m
- shielded	1000m
Voltages, Currents, Potentials	
Rated load voltage L+	DC 24V
Reverse polarity protection	no
Total current of the outputs	
- horizontal configuration up to 40°C	3A
- horizontal configuration up to 60°C	2A
- vertical configuration up to 40°C	2A
Isolation	
- Between the channels and backplane bus	yes
- Between the channels	no
in groups of 8	yes
Permitted potential difference	
- between the different circuits	DC 75V / AC 60V
Insulation tested with	DC 500V
Current consumption	
- from load voltage L+	100mA
Status, Interrupts, Diagnostics	
Status display	green LED per channel
Interrupts	none
Diagnostic functions	
- Group error display	red F-LED per group
- supply voltage display	green LED per group
- Channel error display	none
Data for selecting an actuator	
Output voltage	
- for Signal "1"	min. L+ (-0.8V)
Output current	
- at Signal "1"	0.5A
Rated value	5mA to 0.6A
- at Signal "0"	0.5mA
Load resistor range	48Ω to 4kΩ
Lamp load	5W
Parallel connection of 2 outputs	
- for redundant triggering of a load	possible
- to increase performance	not possible
Actuation of digital input	possible
Switch rate	
- for resistive load	2.5kHz
- for inductive load (IEC 947-5 DC 13)	0.5Hz
- for lamp load	2.5kHz
Limitation (internal) voltage induced on circuit interruption at	typ. L+ (-52V)
Short-circuit protection of the outputs	
- Threshold on	yes, electronic typ. 1A

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Analog Input	314-6CG03		
Data for specific Module			
Number of inputs	4 channels with current/voltage input 1 channel with Pt100		
Length - shielded	200m		
Programming specifications			
Input data	10Byte (1Word per channel)		
Parameter data	13Byte		
Voltages, Currents, Potentials			
Resistance input - no-load voltage - Measuring current	2.5V up to 3.3mA		
Isolation - Between channels and backplane bus - Between channels and power supply - Between channels	yes yes no		
Permitted potential difference - between the inputs (U_{CM}) - between M_{ANA} and M_{intern} (U_{CM})	DC 8V DC 75V / AC 60V		
Insulation tested with	DC 500V		
Analog value generation			
Measuring principle	gradual approximation		
Integration time-/Conversion time/Resolution (per Channel) - parameterizable - Basic conversion time - Integration time in ms - Resolution incl. overrange - Noise suppression for frequency f1 in Hz	1.25 800	yes 0.5 16.6 12Bit 60	20 50
Basic execution time	0.5ms		
Smoothing of the measured values	none		
Suppression of interference, Limits of error			
Noise suppression for $f=n \times (f1 \pm 1\%)$ ($f1$ = interference frequency, $n=1,2,\dots$) - Common mode interference ($U_{CM} < 8V$) - Series mode noise (peak value of noise < Nominal value of input range)	> 80dB > 80dB		
Crosstalk between the inputs	> 50dB		
Optional limit (in the entire temperature range, with reference to the input range) - Voltage input - Current input - Resistors - Resistance thermometer	0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA 0 ... 600 Ω Pt100	$\pm 0.4\%$ $\pm 0.3\%$ $\pm 0.3\%$ $\pm 0.6\%$ $\pm 0.8\%$ $\pm 0.4\%$ $\pm 0.6\%$	

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Analog Input	314-6CG03	
Basic error (operational limit at 25°C, referred to input range)		
- Voltage	0...10V	±0.3%
	±10V	±0.2%
	±20mA	±0.2%
- Current	0...20mA	±0.4%
	4...20mA	±0.5%
- Resistors	0 ... 600Ω	±0.2%
- Resistance thermometer	Pt100	±0.4%
Linearity error (with reference to the input range)	±0.05%	
Linearity error at resistor measurement	±0.2%	
Temperature error (with reference to the input range)	±0.005%/K	
Repeatability (in steady state at 25°C, referred to input range)	±0.05%	
Status, Interrupt, Diagnostics		
Interrupts	none	
Diagnostics functions	none	
Data for selecting an sensor		
	Input range	Input resistance
- Voltage	±10V, 0...10V	100kΩ
- Current	±20mA, 0...20mA, 4...20mA	100Ω
- Resistors	0 ... 600Ω	10MΩ
- Resistance thermometer	Pt100	10MΩ
Maximum input voltage for voltage input (destruction limit)	30V	
Maximum input current for current input (destruction limit)	50mA	
Connection of the sensor		
- for measuring voltage	possible	
- for measuring current	possible, with external power supply	
as 2-wire transmitter	possible	
as 4-wire transmitter	possible	
- for measuring resistance	possible	
as 2-conductor connection	not possible	
as 3-conductor connection	not possible	
as 4-conductor connection	not possible	
Characteristic linearization		
- for RDT	Pt100	
Temperature compensation	no	
Technical unit for temperature measurement	°C / °F / °K	

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Analog Output	314-6CG03			
Data for specific Module				
Number of the outputs	2			
Length of cable - shielded	200m			
Programming data				
Output data	4Byte (1Word per channel)			
Parameter data	13Byte			
Voltages, currents, potentials				
Load voltage - Reverse polarity protection	internal via CPU			
Isolation - between channels and backplane bus - between channels and power supply of the electronics - between channels	yes yes no			
Permitted potential difference - between M_{ANA} and $M_{INTERN}(U_{ISO})$	DC 75V / AC 60V			
Insulation tested with	DC 500V			
Analog value generation				
Resolution - Voltage - Current	<table><tr><td>$\pm 10V$ 0...10V $\pm 20mA$ 0...20mA, 4...20mA</td><td>11Bit + Sign 11Bit 11Bit + Sign 11Bit</td></tr></table>		$\pm 10V$ 0...10V $\pm 20mA$ 0...20mA, 4...20mA	11Bit + Sign 11Bit 11Bit + Sign 11Bit
$\pm 10V$ 0...10V $\pm 20mA$ 0...20mA, 4...20mA	11Bit + Sign 11Bit 11Bit + Sign 11Bit			
Conversion time (per channel)	1ms			
Settling time - for resistive load - for capacitive load - for inductive load	0.5ms 0.5ms 0.5ms			
Suppression of interference, Limits of error				
Crosstalk between outputs	> 40dB			
Operational limit (in the entire temperature range, with reference of the output range) - Voltage - Current	<table><tr><td>0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA</td><td>$\pm 0.4\%$ $\pm 0.2\%$ $\pm 0.3\%$ $\pm 0.6\%$ $\pm 0.8\%$</td></tr></table>		0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA	$\pm 0.4\%$ $\pm 0.2\%$ $\pm 0.3\%$ $\pm 0.6\%$ $\pm 0.8\%$
0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA	$\pm 0.4\%$ $\pm 0.2\%$ $\pm 0.3\%$ $\pm 0.6\%$ $\pm 0.8\%$			
Basic error (Operational limit, at 25°C, with reference of the output range) - Voltage - Current	<table><tr><td>0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA</td><td>$\pm 0.2\%$ $\pm 0.1\%$ $\pm 0.2\%$ $\pm 0.4\%$ $\pm 0.5\%$</td></tr></table>		0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA	$\pm 0.2\%$ $\pm 0.1\%$ $\pm 0.2\%$ $\pm 0.4\%$ $\pm 0.5\%$
0...10V $\pm 10V$ $\pm 20mA$ 0...20mA 4...20mA	$\pm 0.2\%$ $\pm 0.1\%$ $\pm 0.2\%$ $\pm 0.4\%$ $\pm 0.5\%$			
Temperature error (with reference to the output range)	$\pm 0.01\%/K$			
Linearity error (with reference to the output range)	$\pm 0.1\%$			
Repeatability (in steady state at 25°C, (with reference to the output range)	$\pm 0.05\%$			
Output ripple; Range 0 to 50kHz (with reference to the output range)	$\pm 0.05\%$			

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Analog Output	314-6CG03
Status, Interrupts, Diagnostics	
Interrupts	no
Diagnostics functions	no
Substitute value can be applied	no
Data for selecting an actuator	
Output value (rated values) - Voltages - Interrupts	$\pm 10V$ 0 ... 10V $\pm 20mA$ 0 ... 20mA 4 ... 20mA
Load resistance (in the nominal range of the outputs) - for voltage outputs capacitive load - for current outputs inductive load	min. 1k Ω max. 100nF max. 500 Ω max. 100 μH
Voltage outputs - Short-circuit protection - Short-circuit current	yes max. 25mA
Data for selecting an actuator	
Current outputs - No-load voltage	max. 16V
Destruction limit against voltages/currents - Voltages at outputs to M _{ANA} - Current	max. 16V (30V for 10s) max. 30V internal limited
Connection of actuators - for voltage output 2-conductor connection 4-conductor connection - for current output 2-conductor connection	possible not possible possible