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Data sheet 6ES7288-1ST20-0AA0

	*** spare part *** SIMATIC S7-200 SMART, CPU ST20, standard CPU, DC/DC/DC, onboard I/O: 12 DI 24 V DC; 8 DO 24 V DC; power supply: DC 20.4-28.8V DC, program/data memory 20 KB
General information	
Product type designation	CPU ST20 DC/DC/DC
Engineering with	
● Programming package	STEP 7 Micro/WIN SMART
Installation type/mounting	
Rail mounting	Yes; Standard - DIN rail
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, max.	720 mA; 24 V DC
Inrush current, max.	11.7 A; at 28.8 V
Output current	
Current output, max.	300 mA; 24 V DC Sensor Power
for backplane bus (5 V DC), max.	1.4 A; max. 5 V DC for EM bus
Power loss	
Power loss, max.	20 W
Storage	
Type of memory	DDR
Flash	Yes
RAM	Yes
Memory available for user data	8 kbyte
Memory size	12 kbyte; Program memory
Micro Memory Card	Yes; microSDHC Card (optional)
Backup	
● present	Yes; Maintenance free, RTC requires 7 days.
CPU processing times	
for bit operations, typ.	150 ns; / instruction
for word operations, typ.	1.2 µs; / instruction
for floating point arithmetic, typ.	3.6 µs; / instruction
Address area	
I/O address area	
● Inputs	144 byte; 256 bit of digital inputs & 56 words of analog inputs
● Outputs	144 byte; 256 bit of digital outputs & 56 words of analog outputs
Time of day	
Clock	
● Type	Hardware clock, no battery backup
● Hardware clock (real-time)	Yes
● Backup time	7 d
● Deviation per day, max.	120 s; within 120s/month at 25 °C
Digital inputs	
Number of digital inputs	12
Input voltage	
● Type of input voltage	DC
● Rated value (DC)	24 V
● for signal "0"	I0.0 to I0.3 < 1 V DC; I0.4 to I2.7 < 5 V DC
● for signal "1"	I0.0 to I0.3 > 4V; I0.4 to I2.7 > 15V
Input current	

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● for signal "0", max. (permissible quiescent current)	1 mA
● for signal "1", typ.	4 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
for technological functions	
— parameterizable	Yes; 6 Single phase: 4 HSCs at 200 kHz; 2 HSCs at 30 kHz 4 A/B phase: 2 HSCs at 100 kHz; 2 HSCs at 20 kHz
Cable length	
● shielded, max.	500 m; 50 m for technological functions
● unshielded, max.	300 m; for technological functions: No
Digital outputs	
Number of digital outputs	8; Transistor
● of which high-speed outputs	3; 100 kHz Pulse Train Output
Short-circuit protection	No
Switching capacity of the outputs	
● with resistive load, max.	0.5 A
● on lamp load, max.	5 W
Output voltage	
● for signal "1", min.	20 V DC
Output current	
● for signal "1" rated value	0.5 A
● for signal "0" residual current, max.	10 µA
Output delay with resistive load	
● "0" to "1", max.	3 µs; of the standard outputs, max. 3 µs; of the pulse outputs, max. (Q a.0 to Q a.3) 1 µs
● "1" to "0", max.	200 µs; of the standard outputs, max. 200 µs; of the pulse outputs, max. (Q a.0 to Q a.3) 50 µs
Switching frequency	
● of the pulse outputs, with resistive load, max.	100 kHz
Relay outputs	
● Number of relay outputs	0
Cable length	
● shielded, max.	500 m
● unshielded, max.	150 m
Interfaces	
Number of industrial Ethernet interfaces	1
Number of RS 485 interfaces	1
1. Interface	
Interface type	PROFINET
Isolated	Yes; Transformer isolated, 1,500V AC
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
● RJ 45 (Ethernet)	Yes
Protocols	
● PROFINET IO Controller	Yes; Since V2.4
● PROFINET IO Device	Yes; I-Device since V2.5
PROFINET IO Controller	
● Transmission rate, max.	100 Mbit/s
Services	
— Number of connectable IO Devices, max.	8
— Updating time	4 ms; The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices

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	and the quantity of configured user data.
Address area	
— Inputs, max.	128 byte; Per device
— Outputs, max.	128 byte; Per device
2. Interface	
Interface type	RS 485 (max. 187.5 kbps)
Interface types	
● RS 485	Yes
PROFIBUS DP master	
Services	
— S7 communication	Yes
Protocols	
Supports protocol for PROFINET IO	Yes; RT Controller (since FW V2.4) & I-Device (since FW V2.5)
PROFIBUS	Yes; Via CM DP module
Protocols (Ethernet)	
● TCP/IP	Yes
Communication functions	
S7 communication	
● supported	Yes
● as server	Yes
● as client	Yes
Test commissioning functions	
Forcing	
● Forcing	Yes
Integrated Functions	
Counter	
● Number of counters	6
PID controller	Yes; PID closed-loop control function: Continuous controller outputs, binary controller outputs, automatic/manual mode, max. 8 loops
Number of pulse outputs	3
EMC	
Interference immunity against discharge of static electricity	
● Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes
— Test voltage at air discharge	8 kV
— Test voltage at contact discharge	4 kV
Interference immunity against high-frequency electromagnetic fields	
● Interference immunity against high-frequency radiation acc. to IEC 61000-4-3	Yes; 10 V/m, 80 to 1 000 MHz (to IEC 61000-4-3); 10 V/m, 900 MHz, 1.89 GHz, 50% ED (to IEC 61000-4-3)
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
● Interference immunity on signal cables acc. to IEC 61000-4-4	Yes; ±2 kV acc. to IEC 61000-4-4, Burst
Interference immunity against conducted variable disturbance induced by high-frequency fields	
● Interference immunity against high frequency current feed acc. to IEC 61000-4-6	Yes; 10 V, 150 kHz to 80 MHz (to IEC 61000-4-6)
Emission of radio interference acc. to EN 55 011	
● Limit class A, for use in industrial areas	Yes; EN 61000-6-4, interference emission: Intended for use in industrial areas.
Emission of conducted and non-conducted interference	
● Interference emission via line/AC current cables	EN 61000-6-4, interference emission: Intended for use in industrial areas.
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
Ambient conditions	
Free fall	
● Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
● min.	0 °C

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● max.	55 °C
● horizontal installation, min.	0 °C
● horizontal installation, max.	55 °C
● vertical installation, min.	0 °C
● vertical installation, max.	45 °C
Ambient temperature during storage/transportation	
● min.	-40 °C
● max.	70 °C
Air pressure acc. to IEC 60068-2-13	
● Storage/transport, min.	660 hPa
● Storage/transport, max.	1 080 hPa
Altitude during operation relating to sea level	
● Installation altitude, min.	-1 000 m
● Installation altitude, max.	2 000 m
Relative humidity	
● Operation at 25 °C without condensation, max.	95 %
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	81 mm
Weights	
Weight, approx.	320 g

Classifications

	Version	Classification
eClass	16	27-24-22-07
eClass	14	27-24-22-07
eClass	12	27-24-22-07
eClass	9.1	27-24-22-07
eClass	9	27-24-22-07
eClass	8	27-24-22-07
eClass	7.1	27-24-22-07
eClass	6	27-24-22-07
ETIM	10	EC000236
ETIM	9	EC000236
ETIM	8	EC000236
ETIM	7	EC000236
IDEA	4	3565
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

China RoHS

General Product Approval

Manufacturer Declaration

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