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Data sheet 6ES7288-1ST20-0AA1

	SIMATIC S7-200 SMART, CPU ST20, standard CPU, DC/DC/DC, onboard I/O: 12 DI 24 V DC; 8 DQ 24 V DC; power supply: DC 20.4 - 28.8 V DC, program/data memory 20 KB web server support
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	
Rated value (DC)	24 V
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
● of which inputs usable for technological functions	6; HSC (High Speed Counting)
Sourcing/sinking input	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	12

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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	
● 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
● of which high-speed outputs	3; 100 kHz Pulse Train Output
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	

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● 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 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	
Status/control	
● Status/control variable	Yes
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.
Standards, approvals, certificates	
CE mark	Yes
Ambient conditions	

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Free fall	
● Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
● min.	-20 °C
● max.	60 °C
● horizontal installation, min.	0 °C
● horizontal installation, max.	60 °C
● vertical installation, min.	0 °C
● vertical installation, max.	50 °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

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General Product Approval

Manufacturer Declaration

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