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Data sheet 6DL1133-6EW00-0PH1

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SIMATIC ET 200SP HA, configurable I/O module, AI-DI16/DQ16X24VDC HART, suitable for terminal block H1, M1, color code CC00, channel diagnostics, 16-bit, +/-0.1%,

General information	
Product type designation	AI-DI 16/DQ 16x24VDC HART HA
Firmware version	V1.1
● FW update possible	Yes; The firmware update can take more than 5 minutes.
Usable terminal block	type H1, M1, N0, H0, M0 (for details see the system manual)
Color code for module-specific color-coded label	CC00
Product function	
● I&M data	Yes; I&M0 to I&M3
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	V16
● STEP 7 configurable/integrated from version	V5.6
● PCS 7 configurable/integrated from version	V9.0
● PCS neo can be configured/integrated from version	V3.0
● PROFINET from GSD version/GSD revision	GSDML V2.3
Operating mode	
● AI	Yes
● AQ	No
● HART	Yes
● DI	Yes
● Counter	Yes
● DQ	Yes
● DQ with energy-saving function	No
● PWM	No
● Oversampling	No
● MSI	No
● MSO	No
Redundancy	
● Redundancy capability	Yes; With TB type M1
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	

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Current consumption (rated value)	80 mA; without sensor supply
Current consumption, max.	90 mA; without sensor supply
Encoder supply	
Number of outputs	16
Output voltage, min.	18.2 V
Short-circuit protection	Yes; per channel, electronic
24 V encoder supply	
● 24 V	Yes
● Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.5 A)
● Output current per channel, max.	0.5 A
● Output current per module, max.	2 A
Power loss	
Power loss, typ.	4.5 W; without sensor supply
Address area	
Address space per module	
● Address space per module in mixed operation, max.	42 byte; 34 bytes for inputs, 2 bytes for outputs and 6 bytes for QI information
● Address space per module in mixed operation with HART, max.	82 byte; 34-byte inputs, 2-byte outputs, 40 bytes for HART secondary variables, and 6 bytes for QI information
● Address space per module in mixed operation with multiHART, max.	70 byte; 34-byte inputs, 2-byte outputs, 24-byte HART inputs, 4-byte HART outputs, and 6 bytes for QI information
● Address space per module in purely digital operation, max.	26 byte; 2 bytes for inputs, 2 bytes for outputs, 18 bytes for high-precision time stamping and 4 bytes for QI information.
● Address space per module in purely digital operation with counter/frequency measurement, max.	88 byte; 2 bytes for inputs, 2 bytes for outputs, 40 bytes for counter input data, 40 bytes for counter output data and 4 bytes for QI information.
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamp	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
Digital input functions, parameterizable	
● Gate start/stop	Yes; Partner channel of n+8 counter
● Freely usable digital input	Yes; Parameterizable input filter
● Counter	Yes; Incl. frequency measurement
— Number, max.	8; Counter channel n=0 ... 7
— Counting frequency, max.	5 kHz
— Counting width	32 bit; Without sign
— Counting direction up/down	Yes; Up
Input voltage	
● Rated value (DC)	24 V
● for signal "0"	-30 to +5 V
● for signal "1"	+11 to +30V
Input current	
● for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Cable length	
● shielded, max.	1 000 m
● unshielded, max.	600 m
Digital outputs	
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes

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Short-circuit protection	Yes; Response threshold 0.7 A to 1.3 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)
Controlling a digital input	Yes
Switching capacity of the outputs	
● with resistive load, max.	0.5 A
● on lamp load, max.	5 W
Load resistance range	
● lower limit	48 Ω
● upper limit	12 kΩ
Output current	
● for signal "1" rated value	0.5 A
● for signal "0" residual current, max.	0.7 mA
Output delay with resistive load	
● "0" to "1", typ.	50 µs
● "1" to "0", typ.	100 µs
Parallel switching of two outputs	
● for uprating	No
● for redundant control of a load	Yes
Switching frequency	
● with resistive load, max.	100 Hz
● on lamp load, max.	10 Hz
Total current of the outputs	
● Current per channel, max.	0.5 A
● Current per module, max.	2 A
Cable length	
● shielded, max.	1 000 m
● unshielded, max.	600 m
Analog inputs	
Number of analog inputs	16
permissible input current for current input (destruction limit), max.	30 mA
Input ranges (rated values), currents	
● 0 to 10 mA	Yes
— Input resistance (0 to 10 mA)	250 Ω
● 0 to 20 mA	Yes; 16 bit incl. sign
— Input resistance (0 to 20 mA)	250 Ω
● 4 mA to 20 mA	Yes; 16 bit incl. sign
— Input resistance (4 mA to 20 mA)	250 Ω
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	16 bit; Resolution with overrange (bit including sign), max. 16 bits, exception: 15 bits at 60 Hz interference suppression and 0 to 10 mA
● Integration time, parameterizable	Yes; channel by channel
Smoothing of measured values	
● parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Encoder	
Connection of signal encoders	
● for current measurement as 2-wire transducer	Yes
Connectable encoders	
● 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %

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Operational error limit in overall temperature range	
● Current, relative to input range, (+/-)	0.5 %
Basic error limit (operational limit at 25 °C)	
● Current, relative to input range, (+/-)	0.1 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
● Diagnostic alarm	Yes
● Maintenance interrupt	Yes
● Limit value alarm	Yes; two upper and two lower limit values in each case
● Hardware interrupt	Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire break	Yes; channel by channel
● Short-circuit to ground	Yes; Encoder supply to M, channel by channel
● Group error	Yes
● Overflow/Underflow	Yes; channel by channel
Diagnostics indication LED	
● MAINT LED	Yes; Yellow LED
● Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
● Channel status display	No
● for channel diagnostics	No
● for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Frequency measurement	Yes
● Number of frequency meters	8
Counting functions	
● Continuous counting	Yes
● Counter response parameterizable	Yes
● Hardware gate via digital input	Yes; Via partner channel (digital input n+8)
● Software gate	Yes
Measuring functions	
● Dynamic measurement period adjustment	Yes
Measuring range	
— Frequency measurement, min.	0.1 Hz
— Frequency measurement, max.	5 kHz
Accuracy	
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
● between the channels	No
● between the channels and backplane bus	Yes
● Between the channels and load voltage L+	No
Isolation	
Isolation tested with	1 500 V DC/1 min, type test
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	-40 °C
● horizontal installation, max.	70 °C; Observe derating
● vertical installation, min.	-40 °C
● vertical installation, max.	60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	150 g

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Classifications

	Version	Classification
eClass	16	27-23-01-90
eClass	14	27-23-01-90
eClass	12	27-23-01-90
eClass	9.1	27-23-01-90
eClass	9	27-23-01-90
eClass	8	27-23-01-90
eClass	7.1	27-23-01-90
eClass	6	27-23-01-90
ETIM	10	EC000236
ETIM	9	EC000236
ETIM	8	EC000236
ETIM	7	EC000236

Approvals / Certificates

General Product Approval

Miscellaneous

Declaration of Conformity

General Product Approval

China RoHS

Miscellaneous

Manufacturer Declaration

For use in hazardous locations

Declaration of Conformity

For use in hazardous locations

Maritime application

Miscellaneous

NK / Nippon Kaiji Kyokai

Maritime application

CCS (China Classification Society)

Environment

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