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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

CE EG-Konf. | Miscellaneous | UKCA | Declaration of Conformity | KC | RCM

General Product Approval

EAC | China RoHS | CE EG-Konf. | Miscellaneous | UKCA | Manufacturer Declaration

For use in hazardous locations

IECEx | Declaration of Conformity | CCC | UL | ATEX | IECEx

For use in hazardous locations

Miscellaneous

Maritime application

ABS | Bureau Veritas | DNV | LRS | NK / Nippon Kaiji Kyokai

Maritime application

RINA | CCS (China Classification Society)

Environment

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