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Data sheet 6DL1138-6EA00-0EH1



SIMATIC ET 200SP HA, Fast Multi IO and counter 4xAI, 8xAQ, 4xDI, 6xDI/DQ suitable for terminal block H1, M1, color code CC00,

General information	
Product type designation	Fast Multi IO & Counter
HW functional status	FS01
Firmware version	V1.0
● FW update possible	Yes
Color code for module-specific color identification plate	CC00
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
Engineering with	
● SPPA-T3000 can be configured/integrated from version	V8.2 SP2
Operating mode	
● DI	Yes
● Counter	Yes
● DQ	Yes
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	
Current consumption (rated value)	150 mA; without load
Current consumption, max.	2 A; At 24 V DC
from backplane bus 24 V DC, max.	21 mA
Encoder supply	
Number of outputs	6; max. depending on parameterization
Output voltage (DC)	24 V
Output voltage, min.	18.2 V
Short-circuit protection	Yes; per channel, electronic
24 V encoder supply	
● 24 V	Yes
● Short-circuit protection	Yes; per channel, electronic
● Output current per channel, max.	0.5 A
● Output current per module, max.	2 A
Power loss	
Power loss, typ.	4 W

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Address area	
Address space per module	
● Address space per module, max.	130 byte; Quick input and output: 30 bytes. Of which 13 bytes for inputs, 17 bytes for outputs. Quick input and output and counter function: 130 bytes. Of which 57 bytes for inputs, 73 bytes for outputs. Quick input and output and speed measurement: 42 bytes. Of which 25 bytes for inputs, 17 bytes for outputs
Hardware configuration	
Automatic encoding	
● Mechanical coding element	Yes; A, B coding; mounting position B8
Digital inputs	
Number of digital inputs	10; Of these, 6 combined DI/DQ
Digital inputs, parameterizable	Yes
Source/sink input	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Pulse extension	Yes
● Length	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable	
● Gate start/stop	Yes; Selectable: Standard DI, encoder signals A, B, N, gate start, gate stop, set counter
● Freely usable digital input	Yes
● Counter	Yes
— Number, max.	4
— Counting frequency, max.	70 kHz; 70 kHz for DI; 7 kHz for DI/DQ; each for P/M encoder and 50 m cable length; 10 kHz for DI; 0.7 kHz for DI/DQ; each for P encoder and 50 m cable length
— Counting width	32 bit
— Counting direction up/down	Yes
● Digital input with oversampling	
— Number, max.	4
Input voltage	
● Rated value (DC)	24 V
● for signal "0"	0 ... 5 V
● for signal "1"	+11 to +30V
Input current	
● for signal "1", typ.	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ
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)
for technological functions	
— parameterizable	Yes; Adjustable filter: 5 µs, 25 µs
Cable length	
● shielded, max.	1 000 m
Digital outputs	
Number of digital outputs	6; max. depending on parameterization
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
● Response threshold, typ.	0.95 A
Open-circuit detection	Yes
● Response threshold, typ.	45 mA
Overload protection	Yes
● Response threshold, typ.	950 mA
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
● Switching tripped by comparison values	Yes; As output signal of a high-speed counter
— Hysteresis	Yes; Parameterizable
● Freely usable digital output	Yes
Switching capacity of the outputs	
● with resistive load, max.	0.5 A

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Load resistance range	
● lower limit	48 Ω
Output voltage	
● for signal "1", min.	18.1 V
Output current	
● for signal "1" rated value	0.5 A
Output delay with resistive load	
● "0" to "1", typ.	1 ms
● "1" to "0", typ.	100 µs
Parallel switching of two outputs	
● for logic links	No
● for uprating	No
● for redundant control of a load	Yes
Switching frequency	
● with resistive load, max.	800 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
Analog inputs	
Number of analog inputs	4
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA; Protection available against destruction
Input ranges	
● Voltage	Yes; 0 ... 10 V, -10 ... 10 V, 0 ... 20 V, -20 ... 0 V
● Current	Yes; 0 ... 20 mA, 4 ... 20 mA, -20 ... 20 mA, -30 ... 30 mA, -20 ... 0 mA
Input ranges (rated values), voltages	
● 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 kΩ
● -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
Input ranges (rated values), currents	
● 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA
— Input resistance (0 to 20 mA)	70 Ω
● -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	70 Ω
● 4 mA to 20 mA	Yes; and 0 to 20 mA
— Input resistance (4 mA to 20 mA)	70 Ω
Cable length	
● shielded, max.	600 m
Analog outputs	
Number of analog outputs	8; 4 AQ-I, 4 AQ-U
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis
Voltage output, short-circuit current, max.	10 mA
Current output, no-load voltage, max.	24 V
Current signal at analog output	Yes; -50 ... 50 mA
Output ranges, voltage	
● -10 V to +10 V	Yes
Output ranges, current	
● 0 to 20 mA	Yes
● -20 mA to +20 mA	Yes; ±30 mA, ±50 mA
● 4 mA to 20 mA	Yes
Connection of actuators	
● for voltage output two-wire connection	Yes
Load impedance (in rated range of output)	
● with current outputs, max.	330 Ω; 150 ohms at ±50 mA
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)

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Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	24 bit
Smoothing of measured values	
● parameterizable	Yes
● Step: None	Yes
● Step: low	Yes
● Step: Medium	Yes
● Step: High	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	16 bit
Encoder	
Connection of signal encoders	
● for voltage measurement	Yes
● for current measurement as 2-wire transducer	Yes
Connectable encoders	
● Single contact / changeover contact unconnected	Yes
● 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.05 %
Temperature error (relative to input range), (+/-)	0.0025 %/K
Crosstalk between the inputs, min.	60 dB
Operational error limit in overall temperature range	
● Voltage, relative to input range, (+/-)	0.3 %
● Current, relative to input range, (+/-)	0.3 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
● Diagnostic alarm	Yes
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire-break	Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3
● Short-circuit to M	Yes; Encoder supply to M, channel by channel
● Short-circuit to L+	Yes; Analog inputs
● Group error	Yes
● Overflow/underflow	Yes
Diagnostics indication LED	
● RUN LED	Yes; green LED
● MAINT LED	Yes; Yellow LED
● Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
● for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Frequency measurement	Yes; Speed measurement
Counting functions	
● Continuous counting	Yes
● Counter response parameterizable	Yes
● Hardware gate via digital input	Yes
● Software gate	Yes
Measuring functions	
● Dynamic measurement period adjustment	Yes; Speed measurement
Measuring range	
— Frequency measurement, min.	0.1 Hz
— Frequency measurement, max.	70 kHz; 70 kHz for DI; 7 kHz for DI/DQ; each for P/M encoder and 50 m cable length; 10 kHz for DI; 0.7 kHz for DI/DQ; each for P encoder and 50 m cable length
Potential separation	
Potential separation channels	
● between the channels and backplane bus	Yes
Permissible potential difference	

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between different circuits	75 V DC/60 V AC between L+ and backplane bus
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
Altitude during operation relating to sea level	
● Installation altitude above sea level, max.	3 500 m
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	200 g

Classifications

	Version	Classification
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

China RoHS

KC

General Product Approval	For use in hazardous locations

Declaration of Conformity

For use in hazardous locations	Environment

Miscellaneous

last modified: 10/23/2025

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