

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS SIMATIC S7

6DL1136-6AA00-0PH1

F-AI 8-CHANNEL HART INPUT MODULE

Used with the applicable SIMATIC ET 200SP HA configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

Article number	6DL1136-6AA00-0PH1
General information	
Product type designation	F-AI 8xI 2-/4-wire HART HA
Firmware version	V1.0.0
• FW update possible	Yes
Color code for module-specific color identification plate	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
Redundancy	
• Redundancy capability	Yes; with TB type F1
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)	90 mA; without sensor supply
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes
• Output current per channel, max.	30 mA
Power	
Power available from the backplane bus	90 mW
Power loss	
Power loss, typ.	2.8 W
Address area	
Address space per module	
• Inputs	22 byte
• Outputs	5 byte
Analog inputs	
Number of analog inputs	
• For current measurement	8; destruction limit for current input 35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
– Input resistance (0 to 20 mA)	150 Ω
• 4 mA to 20 mA	Yes
– Input resistance (4 mA to 20 mA)	150 Ω
HART communication	
• Primary Master	Yes

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- Secondary Master - input resistance (with HART communication)	No 150 Ω; for operation with an external secondary master (e.g. communicator), an external load may be necessary to achieve a total impedance of 230 - 600 Ω.
Cable length	
shielded, max.	1 000 m; shielded, twisted pair
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/resolution per channel	
- Resolution with overrange (bit including sign), max. - Integration time, parameterizable - Integration time (ms) - Interference voltage suppression for interference frequency f1 in Hz	16 bit Yes 20 ms (at 50 Hz); 16.66 ms (at 60 Hz) 50 / 60 Hz
Smoothing of measured values	
parameterizable	Yes; in 4 stages (1, 4, 16, 64 conversion cycles), channel-by-channel
Encoder	
Connection of signal encoders	
- for current measurement as 2-wire transducer - for current measurement as 4-wire transducer	Yes Yes
Errors/accuracies	
Crosstalk between the inputs, min. Repeat accuracy in steady state at 25 °C (relative to input range), (+/-) safety-relevant accuracy - up to 40 °C, max. - up to 70 °C, max. note regarding accuracy	-70 dB 0.008 % 0.6 %; (0.7% in vertical installation) 0.9 % the safety-relevant accuracy consists of a basic error, a temperature-dependent drift, aging and internal safety measures
Influence of a HART signal modulated on the input signal in relation to input range	
- error at 16.6 ms integration time - error at 20 ms integration time	0.11 % 0.11 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
- Series mode interference (peak value of interference < rated value of input range), min. - Common mode voltage, max. - Common mode interference, min.	40 dB 35 V 80 dB

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Protocols	
HART protocol	Yes
• Protocol version	up to Revision 7
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Overflow/underflow	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	No
Permissible potential difference	
between the inputs (UCM)	30 V DC / 25 V AC
Isolation	
tested with	
• between backplane bus and load voltage	1 500 V DC (load voltage L+ and channels I+n bridged)
• between the backplane bus and functional ground (FE)	1 500 V DC
• between load voltage and functional ground (FE)	1 500 V DC (load voltage L+ and channels I+n bridged)
• between the channels and load voltage	370 V AC
• between the potential groups of the channels	370 V AC
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLd (PLe for 1oo2 voting on the F-CPU)
• Category according to ISO 13849-1	cat. 3 (cat. 4 for 1oo2 voting on the F-CPU)
• SIL acc. to IEC 61508	Up to SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
– Low demand mode: PFDavg in accordance with SIL3	< 27E-05 (< 9E-05 for 1oo2 voting on the F-CPU)

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– High demand/continuous mode: PFH in accordance with SIL3	< 4E-09 1/h (< 1E-09 1/h for 1oo2 voting on the F-CPU)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	220 g