



SIMATIC S7-1500 analog input module AI 8xU/I HF, up to 24 bit resolution, accuracy 0.1%, 8 channels in groups of 1; common mode voltage: 30 V AC/60 V DC, Diagnostics; Hardware interrupts Measured values scalable, measuring range adjustment, Calibrate in RUN; Delivery including infeed element, shield bracket and shield terminal: Front connector (screw terminals or push-in) to be ordered separately

General information

Product type designation	AI 8xU/I HF
HW functional status	From FS01
Firmware version	V1.1.0
• FW update possible	Yes

Product function

• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Prioritized startup	Yes
• Measuring range scalable	No
• Scalable measured values	Yes
• Adjustment of measuring range	Yes

Engineering with

• STEP 7 TIA Portal configurable/integrated from version	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -

Operating mode

• Oversampling	No
• MSI	Yes

CiR - Configuration in RUN

Reparameterization possible in RUN	Yes
Calibration 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, max.	50 mA; with 24 V DC supply
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Power

Power available from the backplane bus	0.85 W
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Power loss

Power loss, typ.	1.9 W
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Analog inputs

Number of analog inputs	8
• For current measurement	8
• For voltage measurement	8
permissible input voltage for voltage input (destruction limit), max.	28.8 V

permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	100 kΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
• -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	100 kΩ
• -25 mV to +25 mV	No
• -250 mV to +250 mV	No
• -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	100 kΩ
• -50 mV to +50 mV	No
• -500 mV to +500 mV	No
• -80 mV to +80 mV	No
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
Input ranges (rated values), thermocouples	
• Type B	No
• Type C	No
• Type E	No
• Type J	No
• Type K	No
• Type L	No
• Type N	No
• Type R	No
• Type S	No
• Type T	No
• Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	No
• Ni 10	No
• Ni 10 according to GOST	No
• Ni 100	No
• Ni 100 according to GOST	No
• Ni 1000	No
• Ni 1000 according to GOST	No
• LG-Ni 1000	No
• Ni 120	No
• Ni 120 according to GOST	No
• Ni 200	No
• Ni 200 according to GOST	No
• Ni 500	No
• Ni 500 according to GOST	No
• Pt 10	No
• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	No
• Pt 100 according to GOST	No
• Pt 1000	No

<ul style="list-style-type: none"> • Pt 1000 according to GOST • Pt 200 • Pt 200 according to GOST • Pt 500 • Pt 500 according to GOST 	No
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> • 0 to 150 ohms • 0 to 300 ohms • 0 to 600 ohms • 0 to 3000 ohms • 0 to 6000 ohms • PTC 	No
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	800 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration time (ms) • Basic conversion time, including integration time (ms) • Interference voltage suppression for interference frequency f1 in Hz • Basic execution time of the module (all channels released) 	<p>24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)</p> <p>Yes</p> <p>Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms</p> <p>Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms</p> <p>400 / 60 / 50 / 10 Hz</p> <p>Corresponds to the channel with the highest basic conversion time</p>
Smoothing of measured values	
<ul style="list-style-type: none"> • parameterizable • Step: None • Step: low • Step: Medium • Step: High 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection 	<p>Yes</p> <p>Yes; with external transmitter supply</p> <p>Yes</p> <p>No</p> <p>No</p> <p>No</p>
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, max.	-80 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.02 %
note regarding accuracy	at temperatures below 0 °C, the figures for operating error and temperature error are doubled
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	<p>0.1 %</p> <p>0.1 %</p>
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	<p>0.05 %</p> <p>0.05 %</p>
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
<ul style="list-style-type: none"> • Series mode interference (peak value of interference < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min. 	<p>80 dB; in the Standard operating mode, 40 dB in the Fast operating mode</p> <p>60 V DC/30 V AC</p> <p>80 dB</p>
Interrupts/diagnostics/status information	

Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels	Yes
• between the channels, in groups of 1	1
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
Permissible potential difference	
between different circuits	60 V DC/30 V AC; insulation rated for 120 V AC basic insulation: between the channels and the supply voltage L+; between the channels and the backplane bus; between the channels
Isolation	
Isolation tested with	2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; From FS02
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; From FS02
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g

last modified: 4/11/2022 