



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
<ul style="list-style-type: none"> FW update possible 	Yes
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	No
<ul style="list-style-type: none"> Prioritized startup 	Yes
<ul style="list-style-type: none"> Measuring range scalable 	No
<ul style="list-style-type: none"> Scalable measured values 	Yes
<ul style="list-style-type: none"> Adjustment of measuring range 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V14 / -
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.5 SP3 / -
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	V1.0 / V5.1
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	V2.3 / -
Operating mode	
<ul style="list-style-type: none"> Oversampling 	No
<ul style="list-style-type: none"> 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
Power	
Power available from the backplane bus	0.85 W
Power loss	
Power loss, typ.	1.9 W
Analog inputs	
Number of analog inputs	8

<ul style="list-style-type: none"> • For current measurement 	8
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • 0 to +5 V 	No
<ul style="list-style-type: none"> • 0 to +10 V 	No
<ul style="list-style-type: none"> • 1 V to 5 V <ul style="list-style-type: none"> — Input resistance (1 V to 5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -10 V to +10 V <ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -2.5 V to +2.5 V <ul style="list-style-type: none"> — Input resistance (-2.5 V to +2.5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -25 mV to +25 mV 	No
<ul style="list-style-type: none"> • -250 mV to +250 mV 	No
<ul style="list-style-type: none"> • -5 V to +5 V <ul style="list-style-type: none"> — Input resistance (-5 V to +5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -50 mV to +50 mV 	No
<ul style="list-style-type: none"> • -500 mV to +500 mV 	No
<ul style="list-style-type: none"> • -80 mV to +80 mV 	No
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA <ul style="list-style-type: none"> — Input resistance (0 to 20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
<ul style="list-style-type: none"> • -20 mA to +20 mA <ul style="list-style-type: none"> — Input resistance (-20 mA to +20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
<ul style="list-style-type: none"> • 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> • Type B 	No
<ul style="list-style-type: none"> • Type C 	No
<ul style="list-style-type: none"> • Type E 	No
<ul style="list-style-type: none"> • Type J 	No
<ul style="list-style-type: none"> • Type K 	No
<ul style="list-style-type: none"> • Type L 	No
<ul style="list-style-type: none"> • Type N 	No
<ul style="list-style-type: none"> • Type R 	No
<ul style="list-style-type: none"> • Type S 	No
<ul style="list-style-type: none"> • Type T 	No
<ul style="list-style-type: none"> • Type TXK/TXK(L) to GOST 	No
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • Cu 10 	No
<ul style="list-style-type: none"> • Cu 10 according to GOST 	No
<ul style="list-style-type: none"> • Cu 50 	No
<ul style="list-style-type: none"> • Cu 50 according to GOST 	No
<ul style="list-style-type: none"> • Cu 100 	No
<ul style="list-style-type: none"> • Cu 100 according to GOST 	No
<ul style="list-style-type: none"> • Ni 10 	No
<ul style="list-style-type: none"> • Ni 10 according to GOST 	No
<ul style="list-style-type: none"> • Ni 100 	No
<ul style="list-style-type: none"> • Ni 100 according to GOST 	No
<ul style="list-style-type: none"> • Ni 1000 	No
<ul style="list-style-type: none"> • Ni 1000 according to GOST 	No
<ul style="list-style-type: none"> • LG-Ni 1000 	No
<ul style="list-style-type: none"> • Ni 120 	No
<ul style="list-style-type: none"> • Ni 120 according to GOST 	No
<ul style="list-style-type: none"> • Ni 200 	No
<ul style="list-style-type: none"> • 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
• Pt 1000 according to GOST	No
• Pt 200	No
• Pt 200 according to GOST	No
• Pt 500	No
• Pt 500 according to GOST	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	No
• 0 to 300 ohms	No
• 0 to 600 ohms	No
• 0 to 3000 ohms	No
• 0 to 6000 ohms	No
• PTC	No
Cable length	
• shielded, max.	800 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	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)
• Integration time, parameterizable	Yes
• Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)	Corresponds to the channel with the highest basic conversion time
Smoothing of measured values	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes; with external transmitter supply
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	No
• for resistance measurement with three-wire connection	No
• for resistance measurement with four-wire connection	No
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 %

Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %
• Current, relative to input range, (+/-)	0.05 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	60 V DC/30 V AC
• Common mode interference, min.	80 dB
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
• 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:	4/29/2021 