# **Data sheet**



SIMATIC S7-1500 Analog input module AI 8xU/I HS, 16 bit resolution, Accuracy 0.3% 8 channels in groups of 8; Common mode voltage 10 V; Diagnostics; Hardware interrupts 8 channels in 0.0625 ms Oversampling; Delivery including infeed element, shield bracket and shield terminal: Front connector (screw terminals or push-in) to be ordered separately

Figure similar

General information	
Product type designation	AI 8xU/I HS
HW functional status	From FS01
Firmware version	V2.1.0
<ul> <li>FW update possible</li> </ul>	Yes
Product function	
● I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Prioritized startup	Yes
Measuring range scalable	No
<ul> <li>Scalable measured values</li> </ul>	No
<ul> <li>Adjustment of measuring range</li> </ul>	No
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V14 / -
<ul> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 / -
<ul> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	V1.0 / V5.1

<ul> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3 / -
Operating mode	, 2.0
Oversampling	Yes
MSI	Yes
• IVIOI	163
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, max.	240 mA; with 24 V DC supply
·	2.0 m., 2.0 cspp,
Encoder supply	
24 V encoder supply	
Short-circuit protection	Yes
Output current, max.	20 mA; Max. 47 mA per channel for a duration < 10 s
Power	
Power available from the backplane bus	1.15 W
Power loss	
1 OWEI 1033	
Power loss, tvp.	3.4 W
Power loss, typ.	3.4 W
Analog inputs	
Analog inputs  Number of analog inputs	8
Analog inputs  Number of analog inputs  • For current measurement	8 8
Analog inputs  Number of analog inputs  • For current measurement  • For voltage measurement	8 8 8
Analog inputs  Number of analog inputs  • For current measurement	8 8
Analog inputs  Number of analog inputs  • For current measurement  • For voltage measurement  permissible input voltage for voltage input	8 8 8
Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction	8 8 8 8 28.8 V
Analog inputs  Number of analog inputs  • For current measurement  • For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.	8 8 8 8 28.8 V
Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.  Input ranges (rated values), voltages	8 8 8 28.8 V 40 mA
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Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.  Input ranges (rated values), voltages  0 to +5 V  0 to +10 V  1 V to 5 V  Input resistance (1 V to 5 V)	8 8 8 28.8 V 40 mA No No Yes 50 kΩ
Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.  Input ranges (rated values), voltages  O to +5 V  O to +10 V  Input resistance (1 V to 5 V)  Input resistance (1 V to 5 V)	8 8 8 28.8 V 40 mA No No Yes 50 kΩ Yes
Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.  Input ranges (rated values), voltages  O to +5 V  O to +10 V  Input resistance (1 V to 5 V)  Input resistance (-10 V to +10 V)	8 8 8 28.8 V 40 mA No No Yes 50 kΩ Yes 100 kΩ
Analog inputs  Number of analog inputs  For current measurement  For voltage measurement  permissible input voltage for voltage input (destruction limit), max.  permissible input current for current input (destruction limit), max.  Input ranges (rated values), voltages  O to +5 V  O to +10 V  Input resistance (1 V to 5 V)  Input resistance (1 V to 5 V)	8 8 8 28.8 V 40 mA No No Yes 50 kΩ Yes

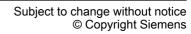


• -250 mV to +250 mV	No	
• -5 V to +5 V	Yes	
— Input resistance (-5 V to +5 V)	50 kΩ	
• -50 mV to +50 mV	No	
• -500 mV to +500 mV	No	
• -80 mV to +80 mV	No	
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
— Input resistance (0 to 20 mA)	41 $\Omega$ ; Plus approx. 42 ohms for overvoltage protection by PTC	
• -20 mA to +20 mA	Yes	
— Input resistance (-20 mA to +20 mA)	41 $\Omega$ ; Plus approx. 42 ohms for overvoltage protection by PTC	
• 4 mA to 20 mA	Yes	
— Input resistance (4 mA to 20 mA)	41 $\Omega$ ; 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	
<ul> <li>Type TXK/TXK(L) to GOST</li> </ul>	No	
Input ranges (rated values), resistance thermometer		
• Cu 10	No	
<ul> <li>Cu 10 according to GOST</li> </ul>	No	
• Cu 50	No	
<ul> <li>Cu 50 according to GOST</li> </ul>	No	
• Cu 100	No	
<ul> <li>Cu 100 according to GOST</li> </ul>	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	



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• Ni 200	No
<ul> <li>Ni 200 according to GOST</li> </ul>	No
• Ni 500	No
Ni 500 according to GOST	No
● Pt 10	No
<ul> <li>Pt 10 according to GOST</li> </ul>	No
● Pt 50	No
<ul> <li>Pt 50 according to GOST</li> </ul>	No
● Pt 100	No
<ul> <li>Pt 100 according to GOST</li> </ul>	No
● Pt 1000	No
<ul> <li>Pt 1000 according to GOST</li> </ul>	No
• Pt 200	No
<ul> <li>Pt 200 according to GOST</li> </ul>	No
● Pt 500	No
<ul> <li>Pt 500 according to GOST</li> </ul>	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	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	16 bit
<ul> <li>Basic execution time of the module (all channels released)</li> </ul>	62.5 μs; independent of number of activated channels
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



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— Burden of 2-wire transmitter, max.	820 Ω
• 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.	-60 dB	
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.02 %	
Operational error limit in overall temperature range		
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.3 %	
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.3 %	
Basic error limit (operational limit at 25 °C)		
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.2 %	
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.2 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
Common mode voltage, max.	10 V	
<ul> <li>Common mode interference, min.</li> </ul>	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	

Isochronous mode	
Filtering and processing time (TCI), min.	80 µs
Bus cycle time (TDP), min.	250 μs

Yes
Yes
Yes; two upper and two lower limit values in each case
Yes
Yes; only for 1 5 V and 4 20 mA
Yes
Yes; green LED
Yes; red LED
Yes; green LED
Yes; green LED
Yes; red LED



Yes; red LED

Potential	cono	ration
otential	Sepa	rauon

### Potential separation channels

No • between the channels 8

• between the channels, in groups of

• between the channels and backplane bus

• between the channels and the power supply of

the electronics

Yes Yes

Permissible	potential	l difference
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between the inputs (UCM) 20 V DC Between the inputs and MANA (UCM) 10 V DC

Isolation tested with 707 V DC (type test)

### Ambient conditions

### Ambient temperature during operation

• horizontal installation, min. -25 °C; From FS02

60 °C • horizontal installation, max.

-25 °C; From FS02 • vertical installation, min.

40 °C • vertical installation, max.

## Altitude during operation relating to sea level

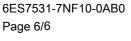
• Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m, see

Width 35 mm Height 147 mm Depth 129 mm

# Weights

300 g Weight, approx.

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