



SIMATIC S7-1500, ANALOG INPUT MODULE AI 8 X U/I HF, 16 BITS OF RESOLUTION, ACCURACY 0.1%, 8 CHANNELS IN GROUPS OF 1; COMMON MODE VOLTAGE: 30V AC/60V DC, DIAGNOSIS, PROCESSALARMS; SCALABLE MEASURED VALUES, ADJUSTMENT OF MEASURING RANGE, CALIBRATION AT RUN INCL. INFEEED ELEMENT, SHIELD CLAMP AND SHIELD TERMINAL

General information	
Product type designation	AI 8xU/I HF
HW functional status	FS01
Firmware version	V1.1.0
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Measuring range scalable</li> </ul>	No
<ul style="list-style-type: none"> <li>Scalable measured values</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Adjustment of measuring range</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V14 / -
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated as of version</li> </ul>	V5.5 SP3 / -
<ul style="list-style-type: none"> <li>PROFIBUS as of GSD version/GSD revision</li> </ul>	V1.0 / V5.1
<ul style="list-style-type: none"> <li>PROFINET as of GSD version/GSD revision</li> </ul>	V2.3 / -
Operating mode	
<ul style="list-style-type: none"> <li>Oversampling</li> </ul>	No
<ul style="list-style-type: none"> <li>MSI</li> </ul>	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)	20.4 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"> <li>• For current measurement</li> <li>• For voltage measurement</li> </ul>	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"> <li>• 0 to +5 V</li> <li>• 0 to +10 V</li> <li>• 1 V to 5 V</li> <li>• Input resistance (1 V to 5 V)</li> <li>• -10 V to +10 V</li> <li>• Input resistance (-10 V to +10 V)</li> <li>• -2.5 V to +2.5 V</li> <li>• Input resistance (-2.5 V to +2.5 V)</li> <li>• -25 mV to +25 mV</li> <li>• -250 mV to +250 mV</li> <li>• -5 V to +5 V</li> <li>• Input resistance (-5 V to +5 V)</li> <li>• -50 mV to +50 mV</li> <li>• -500 mV to +500 mV</li> <li>• -80 mV to +80 mV</li> </ul>	<ul style="list-style-type: none"> <li>No</li> <li>No</li> <li>Yes</li> <li>100 k<math>\Omega</math></li> <li>Yes</li> <li>100 k<math>\Omega</math></li> <li>Yes</li> <li>100 k<math>\Omega</math></li> <li>No</li> <li>No</li> <li>Yes</li> <li>100 k<math>\Omega</math></li> <li>No</li> <li>No</li> <li>No</li> </ul>
Input ranges (rated values), currents	
<ul style="list-style-type: none"> <li>• 0 to 20 mA</li> </ul>	Yes

- Input resistance (0 to 20 mA)
- -20 mA to +20 mA
- Input resistance (-20 mA to +20 mA)
- 4 mA to 20 mA
- Input resistance (4 mA to 20 mA)

25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC  
 Yes  
 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC  
 Yes  
 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC

**Input ranges (rated values), thermocouples**

- Type B
- Type C
- Type E
- Type J
- Type K
- Type L
- Type N
- Type R
- Type S
- Type T
- Type TXK/TXK(L) to GOST

No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No

**Input ranges (rated values), resistance thermometer**

- Cu 10
- Cu 10 according to GOST
- Cu 50
- Cu 50 according to GOST
- Cu 100
- Cu 100 according to GOST
- Ni 10
- Ni 10 according to GOST
- Ni 100
- Ni 100 according to GOST
- Ni 1000
- Ni 1000 according to GOST
- LG-Ni 1000
- Ni 120
- Ni 120 according to GOST
- Ni 200
- Ni 200 according to GOST
- Ni 500
- Ni 500 according to GOST
- Pt 10
- Pt 10 according to GOST
- Pt 50
- Pt 50 according to GOST

No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 No  
 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
<b>Input ranges (rated values), resistors</b>	
• 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
<b>Cable length</b>	
• shielded, max.	800 m
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• 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 bits 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
<b>Smoothing of measured values</b>	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• 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 %
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.05 %
• Current, relative to input range, (+/-)	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1</math> = interference frequency</b>	
• 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

### Isochronous mode

Isochronous operation (application synchronized up to terminal)	No
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### Interrupts/diagnostics/status information

Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• 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
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## 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
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## Ambient conditions

Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C

## Decentralized operation

Prioritized startup	Yes
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## Dimensions

Width	35 mm
Height	147 mm
Depth	129 mm

## Weights

Weight, approx.	280 g
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**last modified:** 03/16/2017