

**Siemens
EcoTech**



SIMATIC S7-1500 Analog input module, AI 8xU/I/R/RTD BA, 16 bit resolution, Accuracy 0.5%, 8 channels in groups of 8; Common mode voltage 4 V DC, Diagnostics; Hardware interrupts; 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/R/RTD BA
HW functional status	FS01
Firmware version	V1.0.0
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Prioritized startup	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V15.1 / V16
• 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	No
Power	
Power consumption from the backplane bus	0.85 W
Power loss	
Power loss, typ.	0.9 W
Analog inputs	
Number of analog inputs	8
• For current measurement	8
• For voltage measurement	8
• For resistance/resistance thermometer measurement	8
permissible input voltage for voltage input (destruction limit), max.	12 V; 12 V continuous, 30 V for max. 1 s
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	230 ... 370 µA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• 0 to +5 V	No

- 0 to +10 V
- 1 V to 5 V
 - Input resistance (1 V to 5 V)
- -1 V to +1 V
 - Input resistance (-1 V to +1 V)
- -10 V to +10 V
 - Input resistance (-10 V to +10 V)
- -2.5 V to +2.5 V
- -25 mV to +25 mV
- -250 mV to +250 mV
- -5 V to +5 V
 - Input resistance (-5 V to +5 V)
- -50 mV to +50 mV
 - Input resistance (-50 mV to +50 mV)
- -500 mV to +500 mV
 - Input resistance (-500 mV to +500 mV)
- -80 mV to +80 mV

No
Yes
10 MΩ
Yes
10 MΩ
Yes
10 MΩ
No
No
No
Yes
10 MΩ
Yes
10 MΩ
Yes
10 MΩ
No

Input ranges (rated values), currents

- 0 to 20 mA
 - 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)

Yes
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 U
- Type TXK/TXK(L) to GOST

No
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
 - Input resistance (Ni 100)
- Ni 100 according to GOST
- Ni 1000
 - Input resistance (Ni 1000)
- Ni 1000 according to GOST
- LG-Ni 1000
 - Input resistance (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

No
No
No
No
No
No
No
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
No
No
No
No
No
No

• Pt 10 according to GOST • Pt 50 • Pt 50 according to GOST • Pt 100 — Input resistance (Pt 100) • Pt 100 according to GOST • Pt 1000 — Input resistance (Pt 1000) • Pt 1000 according to GOST • Pt 200 • Pt 200 according to GOST • Pt 500 • Pt 500 according to GOST	No No No Yes; Standard/climate 10 MΩ No Yes; Standard/climate 10 MΩ No No No No No No
Input ranges (rated values), resistors	
• 0 to 150 ohms • 0 to 300 ohms • 0 to 600 ohms — Input resistance (0 to 600 ohms) • 0 to 3000 ohms • 0 to 6000 ohms — Input resistance (0 to 6000 ohms) • PTC — Input resistance (PTC)	No No Yes 10 MΩ No Yes 10 MΩ Yes 10 MΩ
Cable length	
• shielded, max.	200 m; 50 m at 50 mV
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration time (ms) • Basic conversion time, including integration time (ms) — additional conversion time for wire-break monitoring — additional conversion time for resistance measurement • Interference voltage suppression for interference frequency f1 in Hz	16 bit Yes 2,5 / 16,67 / 20 / 100 ms 10 / 24 / 27 / 107 ms 4 ms (to be considered in R/RTD/U 1 to 5 V measurement) 8 ms 400 / 60 / 50 / 10 Hz
Smoothing of measured values	
• parameterizable • Step: None • Step: low • Step: Medium • Step: High	Yes Yes Yes Yes Yes
Encoder	
Connection of signal encoders	
• 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	Yes Yes; with external supply Yes Yes; Only for PTC Yes; All measuring ranges except PTC; internal compensation of the cable resistances
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.1 %
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, max.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.1 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-)	0.5 % 0.5 % 0.5 % Ptxxx Standard: ±1.2 K, Ptxxx Climate: ±0.8 K, Nixxx Standard: ±0.8 K, Nixxx

Climate: ±0.8 K	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.3 %
• Current, relative to input range, (+/-)	0.3 %
• Resistance, relative to input range, (+/-)	0.3 %
• Resistance thermometer, relative to input range, (+/-)	Ptxxx Standard: ±1.0 K, Ptxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K
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.	40 dB
• Common mode voltage, max.	4 V
• Common mode interference, min.	60 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	No
• Wire-break	Yes; Only for 1 ... 5 V, 4 ... 20 mA, R, and RTD
• Short-circuit	No
• Group error	No
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	No
• 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	No
• between the channels, in groups of	8
• between the channels and backplane bus	Yes
Permissible potential difference	
between the inputs (UCM)	8 V DC
Between the inputs and MANA (UCM)	4 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Siemens Eco Profile (SEP)	Siemens EcoTech
Ecological footprint	
• environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	38.6 kg
— global warming potential, (during production) [CO2 eq]	14.4 kg
— global warming potential, (during operation) [CO2 eq]	24.6 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-0.44 kg
product functions / security / header	
signed firmware update	No
data integrity	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; From FS05
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; From FS05
• vertical installation, max.	40 °C

Altitude during operation relating to sea level																																								
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual																																							
Dimensions																																								
Width	35 mm																																							
Height	147 mm																																							
Depth	129 mm																																							
Weights																																								
Weight, approx.	250 g																																							
Classifications																																								
	<table><tr><th></th><th>Version</th><th>Classification</th></tr><tr><td>eClass</td><td>14</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>12</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>9.1</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>9</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>8</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>7.1</td><td>27-24-22-01</td></tr><tr><td>eClass</td><td>6</td><td>27-24-22-01</td></tr><tr><td>ETIM</td><td>9</td><td>EC001420</td></tr><tr><td>ETIM</td><td>8</td><td>EC001420</td></tr><tr><td>ETIM</td><td>7</td><td>EC001420</td></tr><tr><td>IDEA</td><td>4</td><td>3562</td></tr><tr><td>UNSPSC</td><td>15</td><td>32-15-17-05</td></tr></table>		Version	Classification	eClass	14	27-24-22-01	eClass	12	27-24-22-01	eClass	9.1	27-24-22-01	eClass	9	27-24-22-01	eClass	8	27-24-22-01	eClass	7.1	27-24-22-01	eClass	6	27-24-22-01	ETIM	9	EC001420	ETIM	8	EC001420	ETIM	7	EC001420	IDEA	4	3562	UNSPSC	15	32-15-17-05
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