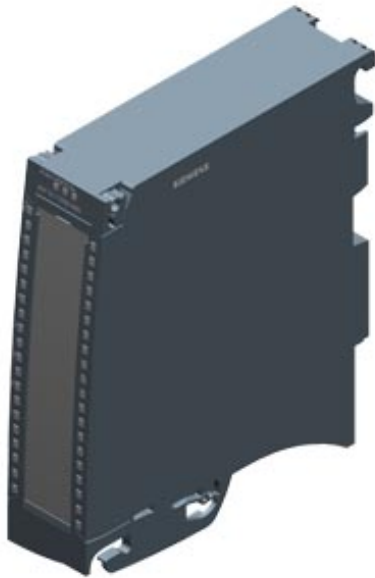


SIMATIC S7-1500 Analog input module, AI 8xU/I/R/RTD BA, 16 bit resolution, Accuracy 0.5%, 8 channels in groups of 8; Common mode voltage 4 V DC, Diagnostics; Hardware interrupts; Delivery including infeed element, shield bracket and shield terminal: Front connector (screw terminals or push-in) to be ordered separately



General information	
Product type designation	AI 8xU/I/R/RTD BA
HW functional status	FS01
Firmware version	V1.0.0
<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"> Prioritized startup 	No
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version 	V15.1 / V16
<ul style="list-style-type: none"> STEP 7 configurable/integrated as of version 	V5.5 SP3 / -
<ul style="list-style-type: none"> PROFIBUS as of GSD version/GSD revision 	V1.0 / V5.1
<ul style="list-style-type: none"> PROFINET as of 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	No
Power	
Power available from the backplane bus	0.85 W
Power loss	
Power loss, typ.	0.9 W
Analog inputs	
Number of analog inputs	8
<ul style="list-style-type: none"> • For current measurement • For voltage measurement • For resistance/resistance thermometer measurement 	8 8 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
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • 0 to +5 V • 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 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	
<ul style="list-style-type: none"> • 0 to 10 mA • 0 to 20 mA • Input resistance (0 to 20 mA) 	No Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC

- -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

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
 No

• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	10 M Ω
• Pt 100 according to GOST	No
• Pt 1000	Yes; Standard/climate
• Input resistance (Pt 1000)	10 M Ω
• 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	Yes
• Input resistance (0 to 600 ohms)	10 M Ω
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• Input resistance (0 to 6000 ohms)	10 M Ω
• PTC	Yes
• Input resistance (PTC)	10 M Ω
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.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	10 / 24 / 27 / 107 ms
— additional conversion time for wire-break monitoring	4 ms (to be considered in R/RTD/U 1 to 5 V measurement)
— additional conversion time for resistance measurement	8 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
Smoothing of measured values	
• parameterizable	Yes

- Step: None
- Step: low
- Step: Medium
- Step: High

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, (+/-)	0.5 %
• Current, relative to input range, (+/-)	0.5 %
• Resistance, relative to input range, (+/-)	0.5 %
• Resistance thermometer, relative to input range, (+/-)	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
Diagnostic messages	

- | | |
|---------------------------------|--|
| • 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 |

Isolation

Isolation tested with	707 V DC (type test)
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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 |

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
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last modified:	01/22/2020
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