

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 incl. infeed element, Shield bracket and shield terminal



Figure similar

General information	
Product type designation	AI 8xU/I HS
HW functional status	FS01
Firmware version	V2.1.0
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -
Operating mode	

- Oversampling
- MSI

Yes

Yes

## 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

## Encoder supply

24 V encoder supply

- Short-circuit protection
- Output current, max.

Yes

20 mA; Max. 47 mA per channel for a duration < 10 s

## Power

Power available from the backplane bus

1.15 W

## Power loss

Power loss, typ.

3.4 W

## Analog inputs

Number of analog inputs

8

- For current measurement
- For voltage measurement

8

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

- 0 to +5 V
- 0 to +10 V
- 1 V to 5 V
- Input resistance (1 V to 5 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

No

No

Yes

50 k $\Omega$

Yes

100 k $\Omega$

No

No

No

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 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	41 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	41 Ω; 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
• Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	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
• Ni 200	No
• 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.	16 bit
• Basic execution time of the module (all channels released)	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
— Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes

- for resistance measurement with two-wire connection
- for resistance measurement with three-wire connection
- for resistance measurement with four-wire connection

No  
No  
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

- Voltage, relative to input range, (+/-) 0.3 %
- Current, relative to input range, (+/-) 0.3 %

#### Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-) 0.2 %
- Current, relative to input range, (+/-) 0.2 %

#### Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency

- Common mode voltage, max. 10 V
- Common mode interference, min. 50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz

#### Isochronous mode

Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	80 $\mu$ s
Bus cycle time (TDP), min.	250 $\mu$ s

#### Interrupts/diagnostics/status information

Diagnostics function	Yes
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#### Alarms

- Diagnostic alarm Yes
- Limit value alarm Yes; two upper and two lower limit values in each case

#### Diagnostic messages

- 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	No
• between the channels, in groups of	8
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
Permissible potential difference	
between the inputs (UCM)	20 V DC
Between the inputs and MANA (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
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
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g
<b>last modified:</b>	07/17/2018