SIEMENS

Data sheet

6ES7531-7NF10-0AB0



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

Product yee designation	General information	
HW functional status From FS01 Firmware version V2.1.0 Firmware version V2.1.0 Firmware version V2.1.0 Firmware version V2.1.0 FV update possible Yes Product function I &M data Yes; I&M0 to I&M3 I slockrinorus mode Prioritized startup Yes Measuring range scalable No Scalable measured values No Scalable measured values No Scalable measured values No From FS01 For TiA Portal configurable/integrated from version V14 /- STEP 7 TIA Portal configurable/integrated from version V5.5 SP3 /- PROFIBUS from GSD version/GSD revision V1.0 / V5.1 PROFIBUS from GSD version/GSD revision V1.0 / V5.1 PROFINET from GSD version/GSD revision V2.3 /- Operating mode Oversampling Yes MSI Yes GIR Configuration in RUN Reparameterization possible in RUN Yes Calibration possible in RUN Yes Supply votage Rated value (DC) 24 V permissible range, lower limit (DC) 19.2 V permissible range, upper limit (DC) Yes Permissible range, upper limit (DC) Yes Input current Current consumption, max. 240 mA; with 24 V DC supply Encoder supply 24 V encoder supply Short-circuit protection Yes Council current Yes Power loss. typ. 3.4 W		AL 8x11/LHS
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permissible range, upper limit (DC) 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 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 Power loss, typ. 3.4 W	Rated value (DC)	24 V
Reverse polarity protection Input current Current consumption, max. 240 mA; with 24 V DC supply Encoder supply 24 V encoder supply • Short-circuit protection • Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	permissible range, lower limit (DC)	19.2 V
Input current Current consumption, max. 240 mA; with 24 V DC supply Encoder supply 24 V encoder supply • Short-circuit protection • Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	permissible range, upper limit (DC)	28.8 V
Current consumption, max. 240 mA; with 24 V DC supply Encoder supply 24 V encoder supply Short-circuit protection Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	Reverse polarity protection	Yes
Encoder supply 24 V encoder supply Short-circuit protection Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	Input current	
24 V encoder supply • Short-circuit protection • Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	Current consumption, max.	240 mA; with 24 V DC supply
Short-circuit protection Output current, max. Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	Encoder supply	
● 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 Power loss, typ. 3.4 W	24 V encoder supply	
Power available from the backplane bus Power loss Power loss, typ. 3.4 W	Short-circuit protection	Yes
Power available from the backplane bus 1.15 W Power loss Power loss, typ. 3.4 W	 Output current, max. 	20 mA; Max. 47 mA per channel for a duration < 10 s
Power loss Power loss, typ. 3.4 W	Power	
Power loss, typ. 3.4 W	Power available from the backplane bus	1.15 W
***	Power loss	
Analog inputs	Power loss, typ.	3.4 W
	Analog inputs	

Number of analog inputs	8
For current measurement	8
For voltage measurement	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	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	50 kΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
• -2.5 V to +2.5 V	No
• -2.5 v to +2.5 v • -25 mV to +25 mV	No
• -250 mV to +250 mV	No
• -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	50 kΩ
- input resistance (-5 v to +5 v) • -50 mV to +50 mV	No
• -500 mV to +500 mV • -500 mV to +500 mV	No No
• -80 mV to +80 mV	
● -80 mV to +80 mV Input ranges (rated values), currents	No
o 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	41 12, Flus approx. 42 offits for overvoltage protection by FTC
• 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 Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	110
• 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
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• 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: Medium Step: High	Yes
Encoder	165
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	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	0.02 %
range), (+/-)	
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 x (f1 +/- 1 %), f1 = interference	erence 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	
Filtering and processing time (TCI), min.	80 µs
Bus cycle time (TDP), min.	250 μs
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 	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. 	-25 °C; From FS02
 horizontal installation, max. 	60 °C
 vertical installation, min. 	-25 °C; From FS02
 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.	300 g

last modified: 4/29/2021 🖸