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Datasheet 6ES7531-7NF10-0AB0

SIMATIC S7-1500, ANALOG INPUT MODULE AI 8 X U/I HS, 16 BITS OF RESOLUTION, ACCURACY 0.3 %; 8 CHANNELS IN GROUPS OF 8; COMMON MODE VOLTAGE APPR. 10V; DIAGNOSIS, PROCESSALARMS; 8 CHANNELS IN 0,125 MS INCL. INFEED ELEMENT, SHIELD CLAMP AND SHIELD TERMINAL

General information	
Hardware product version	E01
Firmware version	V2.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12
• STEP 7 can be configured/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	
• MSI	Yes
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V

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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	Yes
• Output current, max.	53 mA
Power	
Power available from the backplane bus	1.2 W
Power losses	
Power loss, typ.	3.4 W
Analog inputs	
Number of analog inputs	8
Number of analog inputs with current measurement	8
Number of analog inputs 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	
• 1 to 5 V	Yes
• Input resistance (1 to 5 V)	50 kΩ
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 kΩ
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	50 kΩ
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 to +20 mA	Yes
• Input resistance (-20 to +20 mA)	41 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• 4 to 20 mA	Yes
• Input resistance (4 to 20 mA)	41 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
Cable length	
• Cable length, shielded, max.	800 m

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Analog value creation	
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
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	-60 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.02 %
Operational limit in overall temperature range	
• Voltage, relative to input area, (+/-)	0.3 %
• Current, relative to input area, (+/-)	0.3 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	0.2 %
• Current, relative to input area, (+/-)	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• common mode voltage, max.	10 V
• Common mode interference, min.	60 dB; (At 400 Hz: 50 dB)
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	80 µs
Bus cycle time (TDP), min.	250 µs

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Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Wire break	Yes; Only for 1 ... 5V and 4 ... 20mA
• Overflow/underflow	Yes
Diagnostics indication 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
Galvanic isolation	
Electrical isolation channels	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	Yes
Permissible potential difference	
between the inputs (UCM)	20 V DC
between inputs and MANA (UCM)	10 V DC
between M internally and the inputs	75 VDC / 60 VAC
Isolation	
Isolation checked with	707 V DC
Ambient conditions	
Operating temperature	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Decentralized operation	
Prioritized startup	No
Dimensions	
Width	35 mm

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Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	200 g

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