

Siemens 6ES7531-7NF00-0AB0 Manual

Brand	Siemens
Product Series	Siemens
Product Type	designation AI 8xU/I HF

Description

6ES7531-7NF00-0AB0

SIMATIC S7-1500 analog input module AI 8xU/I HF, up to 24 bit resolution, accuracy 0.1%, 8 channels in groups of 1; common mode voltage: 30 V AC/60 V DC, Diagnostics; Hardware interrupts Measured values scalable, measuring range adjustment, Calibrate in RUN; 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 HF

HW functional status From FS01

Firmware version V1.1.0

- FW update possible Yes

Product function

- I&M data Yes; I&M0 to I&M3
- Isochronous mode No
- Prioritized startup Yes
- Measuring range scalable No
- Scalable measured values Yes
- Adjustment of measuring range Yes

Engineering with

- STEP 7 TIA Portal configurable/integrated from version V14 / -
- 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 Yes

Supply voltage

Rated value (DC) 24 V

permissible range, lower limit (DC) 19.2 V

permissible range, upper limit (DC) 28.8 V

Reverse polarity protection Yes

Input current

Current consumption, max. 50 mA; with 24 V DC supply

Power

Power available from the backplane bus 0.85 W

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Power loss

Power loss, typ. 1.9 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) 100 k Ω
- -10 V to +10 V Yes
- Input resistance (-10 V to +10 V) 100 k Ω
- -2.5 V to +2.5 V Yes
- Input resistance (-2.5 V to +2.5 V) 100 k Ω
- -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) 100 k Ω
- -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) 25 Ω ; Plus approx. 42 ohms for overvoltage protection by PTC
- -20 mA to +20 mA Yes
- Input resistance (-20 mA to +20 mA) 25 Ω ; Plus approx. 42 ohms for overvoltage protection by PTC
- 4 mA to 20 mA Yes
- Input resistance (4 mA to 20 mA) 25 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

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- 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. 24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)

- Integration time, parameterizable Yes
- Integration time (ms) Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
- Basic conversion time, including integration time (ms) Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- Interference voltage suppression for interference

frequency f1 in Hz

400 / 60 / 50 / 10 Hz

- Basic execution time of the module (all channels)

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released)

Corresponds to the channel with the highest basic conversion time

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; with external transmitter supply
- 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. -80 dB

Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)

0.02 %

note regarding accuracy at temperatures below 0 °C, the figures for operating error and temperature error are doubled

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Operational error limit in overall temperature range

- Voltage, relative to input range, (+/-) 0.1 %
- Current, relative to input range, (+/-) 0.1 %

Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-) 0.05 %
- Current, relative to input range, (+/-) 0.05 %

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.

80 dB; in the Standard operating mode, 40 dB in the Fast operating mode

- Common mode voltage, max. 60 V DC/30 V AC
- Common mode interference, min. 80 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 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 Yes
- between the channels, in groups of 1
- between the channels and backplane bus Yes
- between the channels and the power supply of the

electronics

Yes

Permissible potential difference

between different circuits 60 V DC/30 V AC; insulation rated for 120 V AC basic insulation: between the channels and the supply voltage L+; between the channels and the backplane bus; between the channels

Isolation

Isolation tested with 2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus

Ambient conditions

Ambient temperature during operation

- horizontal installation, min. -30 °C; From FS02
- horizontal installation, max. 60 °C
- vertical installation, min. -30 °C; From FS02
- vertical installation, max. 40 °C

Dimensions

Width 35 mm

Height 147 mm

Depth 129 mm

Weights

Weight, approx. 280 g

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