SIEMENS

## Data sheet 6ES7531-7NF10-0AB0

Figure similar

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

| | |
|---|---|
| **General information** | |
| Product type designation | AI 8xU/I HS |
| HW functional status | From FS01 |
| Firmware version | V2.1.0 |
| ● FW update possible | Yes |
| Product function | |
| ● I&M data | Yes; I&M0 to I&M3 |
| ● Isochronous mode | Yes |
| ● Prioritized startup | Yes |
| ● Measuring range scalable | No |
| ● Scalable measured values | No |
| ● Adjustment of measuring range | No |
| 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 | Yes |
| ● 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. | 240 mA; with 24 V DC supply |
| **Encoder supply** | |
| 24 V encoder supply | |
| ● Short-circuit protection | 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 |
| **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 |
| ● -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 |
| ● -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 | 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 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 x (f1 +/- 1 %), f1 = 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** | |
| 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) |
| **product functions / security / header** | |
| signed firmware update | No |
| data integrity | No |
| **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:** 4/25/2024