SIEMENS

Data sheet

6ES7431-1KF00-0AB0



SIMATIC S7-400, analog input SM 431, isolated 8 AI, resolution 13 bit, U/IResistor

Figure similar

| Supply voltage | | |
|-----------------------------------------------------------------------|-------------------------|--|
| Load voltage L+ | | |
| Rated value (DC) | not necessary | |
| Input current | | |
| from backplane bus 5 V DC, max. | 350 mA | |
| Power loss | | |
| Power loss, typ. | 1.8 W | |
| Analog inputs | | |
| Number of analog inputs | 8 | |
| For voltage/current measurement | 8 | |
| For resistance measurement | 4 | |
| permissible input voltage for voltage input (destruction limit), max. | 50 V | |
| permissible input current for current input (destruction limit), max. | 50 mA; 40 mA continuous | |
| Constant measurement current for resistance-type transmitter, typ. | 1.67 mA | |
| Input ranges | | |
| Voltage | Yes | |
| Current | Yes | |
| Thermocouple | No | |
| Resistance thermometer | No | |
| Resistance | Yes | |
| Input ranges (rated values), voltages | | |
| • 1 V to 5 V | Yes | |
| — Input resistance (1 V to 5 V) | 200 kΩ | |
| • -1 V to +1 V | Yes | |
| — Input resistance (-1 V to +1 V) | 200 kΩ | |
| • -10 V to +10 V | Yes | |
| — Input resistance (-10 V to +10 V) | 200 kΩ | |
| Input ranges (rated values), currents | | |
| • -20 mA to +20 mA | Yes | |
| — Input resistance (-20 mA to +20 mA) | 80 Ω | |
| • 4 mA to 20 mA | Yes | |
| — Input resistance (4 mA to 20 mA) | 80 Ω | |
| Input ranges (rated values), resistors | | |
| • 0 to 600 ohms | Yes | |
| — Input resistance (0 to 600 ohms) | usable up to 500 ohms | |
| Cable length | | |
| • shielded, max. | 200 m | |

| Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Basic conversion time (ms) Integration integration time (ms) Integration with two wire connection Integration time (ms) Integration with (ms) Inte | Analog value generation for the inputs | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------|--|
| Resolution with overrange (bit including sign), max. Integration time (ms) Resist conversion time of the module (all channels released) Resist conversion time of the module (all channels released) Resist conversion time of the module (all channels released) Resistance of signal encoders Resistance of signal encoders Resistance measurement as 2-wire transducer Resistance measurement as 4-wire transducer Resistance measurement as 4-wire transducer Resistance measurement with two-wire connection Resistance measurement with throu-wire connection Resistance resistance in input range, (+/-) Resistance, relative to input range, (+/ | | | |
| Integration time, parameterizable Pasic conversion time (ms) 23 / 25 ms Integration time (ms) 16,7 / 20 ms Interference voltage suppression for interference frequency fil in ½ Basic execution time of the module (all channels released) Basic execution time of the module (all channels released) Connection of Signal encoders Freedoctor Connection of Signal encoders For our current measurement as 2-wire transducer For current measurement as 2-wire transducer For current measurement as 2-wire transducer For current measurement as 4-wire transducer For current measurement with thore-wire connection For resistance measurement with thore-wire connection For resistance measurement with thore-wire connection For resistance measurement with four-wire connection For resistance m | | 13 bit | |
| Interference votage suppression for interference frequency (1 in Hz So 60 Hz | Integration time, parameterizable | Yes | |
| Interference voltage suppression for interference frequency f1 in Hz Basic execution time of the module (all channels released) Facodor Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 2-wire transducer • for current measurement with tree-wire connection • for resistance measurement with two-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection • for resistance measurement with frow-wire connection • for resistance measurement with frow-wire connection • for resistance measurement with four-wire connection Firorsiacouracies Temperature error (relative to input range), (+/-) • Current, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Current, relative to input range, (+/-) • Current, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resis | | 23 / 25 ms | |
| Frequency f1 in Hz Basic execution time of the module (all channels released) Finoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for current measurement with two-wire connection • for resistance measurement with two-wire connection • for resistance measurement with four-wire connection • for resistance relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/ | Integration time (ms) | 16,7 / 20 ms | |
| released) Encoder Connection of signal encoders • for voltage measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection Errors/accuraclos Temperature error (relative to input range), (+/-) Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, r | | 50 / 60 Hz | |
| of crurent measurement as 2-wire transducer of or current measurement as 2-wire transducer of or current measurement as 4-wire transducer of or resistance measurement with two-wire connection of or resistance measurement with four-wire connection of or resistance are also measured of ves; Line resistances are also measured of ves; L | · · | 200 ms; 184 / 200 ms | |
| • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection • for sistance measurement with four-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection • for sistance measurement with four-wire connection • for sistance sare also measured • for current plan of the four plan of the feasuring range; ±0.007 % in all other measuring range; ±0.007 % at ±10 V; ±0.7 % at ±10 V; ± | Encoder | | |
| • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection **Terrors/accuracies** Temperature error (relative to input range), (+/-) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Current, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance are also measured Yes; Line resistances are also measured Yes Line resistances are also measured Yes Line resistances are also measured Yes Line resistance are a | Connection of signal encoders | | |
| • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection Errors/accuracies Temperature error (relative to input range), (+/-) Operational error limit in overall temperature range • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Potential separation Interrupts/diagnostics/status information Diagnostics function Potential separation analog inputs • Detween the channels • Detween the channels and backplane bus Isolation Isolation tested with 2 120 V DC between bus and analog part, 500 V DC between bus and local ground Dimensions Width 2 25 mm Height Depth Potential Separation Potential Separation Potential Separation analog part and local ground | for voltage measurement | Yes; possible | |
| • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection • for resistance measurement with four-wire connection Frors/accuracies Temperature error (relative to input range), (+/-) Operational error limit in overall temperature range • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Current, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Potential separational of input range, (+/-) • Potential separation Diagnostics function Potential separation Potential separation analog inputs • Potential separation analog | • for current measurement as 2-wire transducer | Yes; with external transmitter supply | |
| • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection Ferrors/accuracles Temperature error (relative to input range), (+/-) Operational error limit in overall temperature ange • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Current, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) | • for current measurement as 4-wire transducer | Yes | |
| • for resistance measurement with four-wire connection Errors/accuracies Temperature error (relative to input range), (+/-) O.02 %/K; ±0.02 %/K in impedance measuring range; ±0.007 % in all other measuring ranges Operational error limit in overall temperature range • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • O.7 %; 0.7 % at ±1 V; 0.4% at ±10 V; 0.5% at 1 to 5 V • Current, relative to input range, (+/-) • Resistance, relative to input range, to the to 5 % on the top top the top | • for resistance measurement with two-wire connection | Yes; Line resistances are also measured | |
| Temperature error (relative to input range), (+/-) Temperature error (relative to input range), (+/-) Operational error limit in overall temperature range • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) 1 %; at ±20 mA, 4 to 20 mA • Resistance, relative to input range, (+/-) 8 Diagnostics function Potential separation analog inputs • Detween the channels • Detween the channels and backplane bus Isolation Isolation tested with 25 mm Width 25 mm Depth Diagnostics States in invertice and part in the province of t | • for resistance measurement with three-wire connection | Yes; Line resistances are also measured | |
| Temperature error (relative to input range), (+/-) Operational error limit in overall temperature range • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input | • for resistance measurement with four-wire connection | Yes | |
| measuring ranges Operational error limit in overall temperature range ● Voltage, relative to input range, (+/-) ● Current, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) ● Voltage, relative to input range, (+/-) ● Voltage, relative to input range, (+/-) ● Voltage, relative to input range, (+/-) ● Current, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) ● Current, relative to input range, (+/-) ● Resistance, re | Errors/accuracies | | |
| Voltage, relative to input range, (+/-) Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) Voltage, relative to input range, (+/-) Voltage, relative to input range, (+/-) Current, relative to input range, (+/-) Resistance, relative to input range of 600 ohms) Interrupts/diagnostics/status information Diagnostics/status information No Potential separation Potential separation analog inputs Petential separation analog inputs Potential separation analog inputs Petential separation analog inputs Potential separation analog inputs Potential separation analog inputs Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation Potential separation | Temperature error (relative to input range), (+/-) | | |
| Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) Resistance, relative to input range, (+/-) Notage, relative to input range, (+/-) Current, relative to input range, (+/-) Resistance, relative to input range of 600 ohms) Interrupts/diagnostics/status information No Potential separation Potential separation analog inputs Potential separation P | Operational error limit in overall temperature range | | |
| Resistance, relative to input range, (+/-) Basic error limit (operational limit at 25 °C) Voltage, relative to input range, (+/-) Current, relative to input range, (+/-) Resistance, relative to 10 5 V Resistance, relative t | Voltage, relative to input range, (+/-) | 1 %; ±1.0 % at ±1 V; ±0.6 % at ±10 V; ±0.7 % at 1 to 5 V | |
| Basic error limit (operational limit at 25 °C) • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input sat ±10 V, 0.5% at ±10 | Current, relative to input range, (+/-) | 1 %; at ±20 mA, 4 to 20 mA | |
| Voltage, relative to input range, (+/-) Current, relative to input range, (+/-) Resistance, relative to 20 mA No Potential separation No Potential separation Resistance, relative to 20 mA Yes; internal/external No Yes; internal/external No Yes Isolation Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth Weights | Resistance, relative to input range, (+/-) | 1.25 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms) | |
| Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) No.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms) Interrupts/diagnostics/status information Diagnostics function No Potential separation Potential separation analog inputs Potential separation Potential separation Potential separation analog inputs Potential separation No Potential separat | Basic error limit (operational limit at 25 °C) | | |
| Resistance, relative to input range, (+/-) Interrupts/diagnostics/status information Diagnostics function Potential separation Potential separation analog inputs Potential separation Potential separation Potential separation analog inputs Potential separation Potential separation Potential separation analog inputs Potential separation Potential separation No Potential separation Potential separation Potential separation No Potential separation Potential separation Potential separation No Potential separation Potential separation No Potential separation No Potential separation No Potential separation Potential separation No Potent | Voltage, relative to input range, (+/-) | 0.7 %; 0.7% at ±1 V; 0.4% at ±10 V; 0.5% at 1 to 5 V | |
| Interrupts/diagnostics/status information Diagnostics function Potential separation Potential separation analog inputs • Potential separation analog inputs • Potential separation analog inputs • between the channels • between the channels obetween the channels and backplane bus Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | Current, relative to input range, (+/-) | 0.7 %; at ±20 mA, 4 to 20 mA | |
| Diagnostics function Potential separation Potential separation analog inputs Potential separation a | Resistance, relative to input range, (+/-) | 0.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms) | |
| Potential separation Potential separation analog inputs Potential separation analog inputs Potential separation analog inputs between the channels between the channels and backplane bus Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | Interrupts/diagnostics/status information | | |
| Potential separation analog inputs Yes; internal/external No Yes Isolation Isolation Isolation tested with Potential separation analog inputs Yes Isolation Isolation Isolation Isolation tested with Potential separation analog inputs Yes; internal/external No Yes Isolation Isolation Isolation tested with Potential separation analog inputs Yes; internal/external No Yes Isolation Isolation Isolation tested with Potential separation analog inputs Yes; internal/external No Yes Isolation Isolation Isolation tested with Potential separation analog inputs Yes Isolation Isolati | Diagnostics function | No | |
| Potential separation analog inputs between the channels between the channels and backplane bus Possiblation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | Potential separation | | |
| ● between the channels ● between the channels and backplane bus Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm | Potential separation analog inputs | | |
| ● between the channels and backplane bus Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | Potential separation analog inputs | Yes; internal/external | |
| Isolation Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | between the channels | No | |
| Isolation tested with 2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground Dimensions Width 25 mm Height 290 mm Depth 210 mm | between the channels and backplane bus | Yes | |
| Dimensions Width 25 mm Height 290 mm Depth 210 mm Weights | Isolation | | |
| Width 25 mm Height 290 mm Depth 210 mm Weights | Isolation tested with | | |
| Height 290 mm Depth 210 mm Weights | Dimensions | | |
| Depth 210 mm Weights | Width | 25 mm | |
| Weights | Height | 290 mm | |
| | Depth | 210 mm | |
| Weight, approx. 500 g | Weights | | |
| | Weight, approx. | 500 g | |

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