Data sheet

6ES7531-7KF00-0AB0





SIMATIC S7-1500 analog input module AI 8xU/I/RTD/TC ST, 16 bit resolution, accuracy 0.3%, 8 channels in groups of 8; 4 channels for RTD measurement, common mode voltage 10 V; Diagnostics; Hardware interrupts; 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/RTD/TC ST
HW functional status	FS04
Firmware version	V2.0.0
FW update possible	Yes
Product function	
■ I&M data	Yes; I&M0 to I&M3
<ul> <li>Isochronous mode</li> </ul>	No
Prioritized startup	No
<ul> <li>Measuring range scalable</li> </ul>	No
<ul> <li>Scalable measured values</li> </ul>	No
<ul> <li>Adjustment of measuring range</li> </ul>	No
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V12 / V12
<ul> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 / -
<ul> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	V1.0 / V5.1
<ul> <li>PROFINET from GSD version/GSD revision</li> </ul>	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
nput current	
Current consumption, max.	240 mA; with 24 V DC supply
incoder supply	
24 V encoder supply	
Short-circuit protection	Yes
Output current, max.	20 mA; Max. 47 mA per channel for a duration < 10 s
ower	
Power available from the backplane bus	0.7 W
Power loss	

Power loss, typ.	2.7 W
Analog inputs	2.7 (1
Number of analog inputs	8
For current measurement	8
For voltage measurement	8
For resistance/resistance thermometer measurement     For the research measurement	4
For thermocouple 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
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
<ul><li>— Input resistance (1 V to 5 V)</li></ul>	100 kΩ
• -1 V to +1 V	Yes
<ul><li>— Input resistance (-1 V to +1 V)</li></ul>	10 ΜΩ
• -10 V to +10 V	Yes
<ul><li>— Input resistance (-10 V to +10 V)</li></ul>	100 kΩ
• -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	10 ΜΩ
• -25 mV to +25 mV	No
• -250 mV to +250 mV	Yes
- Input resistance (-250 mV to +250 mV)	10 ΜΩ
• -5 V to +5 V	Yes
<ul><li>Input resistance (-5 V to +5 V)</li></ul>	100 kΩ
• -50 mV to +50 mV	Yes
<ul><li>— Input resistance (-50 mV to +50 mV)</li></ul>	10 ΜΩ
• -500 mV to +500 mV	Yes
<ul><li>— Input resistance (-500 mV to +500 mV)</li></ul>	10 ΜΩ
• -80 mV to +80 mV	Yes
<ul><li>— Input resistance (-80 mV to +80 mV)</li></ul>	10 ΜΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	25 $\Omega$ ; Plus approx. 42 ohms for overvoltage protection by PTC
• -20 mA to +20 mA	Yes
- Input resistance (-20 mA to +20 mA)	25 $\Omega$ ; Plus approx. 42 ohms for overvoltage protection by PTC
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	25 $\Omega$ ; Plus approx. 42 ohms for overvoltage protection by PTC
Input ranges (rated values), thermocouples	
• Type B	Yes
Input resistance (Type B)	10 ΜΩ
• Type C	No
• Type E	Yes
— Input resistance (Type E)	10 ΜΩ
• Type J	Yes
— Input resistance (type J)	10 ΜΩ
• Type K	Yes
— Input resistance (Type K)	10 ΜΩ
• Type L	No
• Type N	Yes
Input resistance (Type N)	10 MΩ
Type R	Yes
**	10 MΩ
— Input resistance (Type R)	
Type S     Input resistance (Type S)	Yes $10 \text{ M}\Omega$
— Input resistance (Type S)	
Type T  Input resistance (Type T)	Yes
— Input resistance (Type T)	10 MO

Cut 10   C	Type TXK/TXK(L) to GOST	No
Cut 10     Cut 10 according to GOST     No     Cut 20     Cut 30 according to GOST     No     Cut 100 according to GOST     No     Cut 100 according to GOST     No     No     No     10 it 10 according to GOST     No     Ni 100 according to GOST     No     No     Pt 10 according to GOST     No     Pt 100 according to GOST     No     No     Pt 100 according to GOST     No     Pt 100 according to GOST     No     No     Pt 100 according to GOST     No     No		
Cut 50     Cut 100     Cut 100 according to GOST     No     Cut 100 according to GOST     No     No 101 according to GOST     No     No 1000     — Imput resistance (N 100)     — Imput resistance (N 1000)     — Imput resistance (N 1000)     — Imput resistance (LG-N 1000)     — Imput resistance (LG-N 1000)     No 1000     — Imput resistance (LG-N 1000)     No 1000     — Imput resistance (LG-N 1000)     No 1000     No 10000     No 10000     No 10000     No 10000     No 100000000000000000000000000000000	• Cu 10	No
	Cu 10 according to GOST	No
Cut 100     Cut 100 according to GOST     No     Ni 10 according to GOST     No     Ni 10 according to GOST     No     Ni 10 according to GOST     No     Ni 100     — Input resistance (Ni 100)     Ni 1000     — Input resistance (Ni 100)     Ni 1000     — Input resistance (Ni 1000)     Ni 1000     — Input resistance (Ni 1000)     Ni 1000     — Input resistance (LG-Ni 1000)     Ni 120     — Input resistance (LG-Ni 1000)     Ni 120     Ni 120     Ni 120     Ni 120     Ni 120 according to GOST     No     Pt 150     No     Pt 150 according to GOST     No     Pt 150 according to GOST     No     Pt 120 according to GOST     No     Pt 1200 according to GOST     No     Pt 200 according to GOST     No	• Cu 50	No
• Out 100 according to GOST         No           • Ni 10         No           • Ni 10 according to GOST         No           • Ni 100         Yes. Standard/climate           — Input resistance (Ni 1000)         10 MΩ           • Ni 1000         Yes. Standard/climate           — Input resistance (Ni 1000)         10 MΩ           • Ni 1000 according to GOST         No           • IG-Ni 1000         Yes. Standard/climate           — Input resistance (IC-Ni 1000)         10 MΩ           • Ni 120 according to GOST         No           • Pi 10 according to GOST         No           • Pi 10 according to GOST         No           • Pi 100 according to GOST         No           • Pi 200 according to G	Cu 50 according to GOST	No
N	• Cu 100	No
• Ni 100 according to GOST         No           • Ni 100         Yes, Standard/climate           — Input resistance (NI 100)         10 MΩ           • Ni 100 according to GOST         No           • Ni 1000 according to GOST         No           • Input resistance (NI 1000)         10 MΩ           • Input resistance (LC-NI 1000)         Yes, Standard/climate           — Input resistance (LC-NI 1000)         10 MΩ           • Ni 120 according to GOST         No           • Ni 200 according to GOST         No           • Ni 800 according to GOST         No           • Ni 800 according to GOST         No           • Pt 10 according to GOST         No           • Pt 10 according to GOST         No           • Pt 100 according to GOST         No           • Pt 200 according to GOST         No	Cu 100 according to GOST	No
N 1 100	• Ni 10	No
Input resistance (Ni 100)  Ni 100 according to GOST  Ni 100 according to GOST  Ni 100 according to GOST  Ni Ni 120 according to GOST  Ni 120 according to GOST  Ni 1500 acco	Ni 10 according to GOST	No
Ni 100 according to GOST     Ni 1000	• Ni 100	Yes; Standard/climate
• Ni 1000         Yes; Standard/climate           — Input resistance (Ni 1000)         10 MΩ           • Ni 1000 according to GOST         No           • LG-Ni 1000         Yes; Standard/climate           — Input resistance (LG-Ni 1000)         10 MΩ           • Ni 120         No           • Ni 120 according to GOST         No           • Ni 120 according to GOST         No           • Ni 500         No           • Ni 500 according to GOST         No           • Pi 10         No           • Pi 10         No           • Pi 10         No           • Pi 10         No           • Pi 50         No           • Pi 50 according to GOST         No           • Pi 100         Yes; Standard/climate           • Pi 100         Yes; Standard/climate           • Pi 100 according to GOST         No           • Pi 100 according to GOST         No           • Pi 100 according to GOST         No           • Pi 1000 according to GOST         No           • Pi 1000 according to GOST         No           • Pi 200 according to GOST         No           • Pi 200 according to GOST         No           • Pi 200 according to GOST         No	— Input resistance (Ni 100)	10 ΜΩ
- Input resistance (Ni 1000)  Ni 1000 according to GOST  No  - Input resistance (I.G-Ni 1000)  Ni 120 according to GOST  No  Ni 150 according to GOST  No  Ni 150 according to GOST  No  Ni 150 according to GOST  No  Pit 10 according to GOST  No  Pit 50 according to GOST  No  Pit 100  - Input resistance (Pt 100)  - Input resistance (Pt 100)  - Pt 100 according to GOST  No  Pit 100  - Input resistance (Pt 100)  - Pt 100 according to GOST  No  Pit 100  - Input resistance (Pt 1000)  - Pt 100 according to GOST  No  Pit 200 according to GOST  No  No  No  No  No  No  No  No  No  N	Ni 100 according to GOST	No
<ul> <li>Ni 1000 according to GOST</li> <li>L.G-Ni 1000</li> <li>Yes, Standard/climate</li> <li>Input resistance (L.G-Ni 1000)</li> <li>Ni 120</li> <li>Ni 120 according to GOST</li> <li>No</li> <li>Ni 2000 according to GOST</li> <li>No</li> <li>Ni 500</li> <li>Ni 500</li> <li>Ni 500 according to GOST</li> <li>No</li> <li>Pi 10</li> <li>Pi 10</li> <li>Pi 10</li> <li>Pi 50 according to GOST</li> <li>No</li> <li>Pi 50 according to GOST</li> <li>No</li> <li>Pi 50 according to GOST</li> <li>No</li> <li>Pi 100</li> <li>Pi 50 according to GOST</li> <li>Pi 100 according to GOST</li> <li>Pi 100 according to GOST</li> <li>No</li> <li>Pi 100 Yes; Standard/climate</li> <li>Input resistance (Pi 1000)</li> <li>Pi 100 according to GOST</li> <li>No</li> <li>Pi 200</li> <li>Yes; Standard/climate</li> <li>Input resistance (Pi 200)</li> <li>No</li> <li>Pi 200</li> <li>Pi 200 according to GOST</li> <li>No</li> <li>Pi 500</li> <li>Pi 500</li> <li>Yes; Standard/climate</li> <li>Input resistance (Pi 500)</li> <li>No</li> <li>Pi 500 according to GOST</li> <li>No</li> <li>No</li> <li>Pi 500 according to GOST</li> <li>No</li> <li>No</li> <li>Pi 500 according to GOST</li> <li>No</li> <li>No</li> <li>Pi 500 occording to GOST</li> <li>No</li> <li>No</li> <li>Pi 500 occording to GOST</li> <li>No</li> <li>No</li> <li>No</li> <li>Pi 500 occording to GOST</li> <li>No</li> <li>No</li></ul>	• Ni 1000	Yes; Standard/climate
	— Input resistance (Ni 1000)	10 ΜΩ
- input resistance (LG-Ni 1000)  N il 120  No  Ni 120 according to GOST  No  Ni 1200 according to GOST  No  Ni 1500 according to GOST  Pit 100  Pit 10 according to GOST  No  Pit 50 according to GOST  No  Pit 50 according to GOST  No  Pit 100  Input resistance (Pt 100)  Pit 100 Coccording to GOST  No  Pit 100  Pit 100 Secording to GOST  No  Pit 100  Input resistance (Pt 100)  Pit 100 According to GOST  No  Pit 1000  Pit 100 According to GOST  No  Pit 1000  Pit 1000 Secording to GOST  No  No  Pit 1000  Pit 1000 According to GOST  No  No  Pit 1000 Yes; Standard/climate  Input resistance (Pt 1000)  Pit 1000 According to GOST  No  No  Pit 1000 According to GOST  No  No  Pit 1000 According to GOST  No  No  No  Pit 1000 According to GOST  No  No  No  No  No  Pit 500 According to GOST  No  No  No  No  No  No  No  No  No  N	<ul> <li>Ni 1000 according to GOST</li> </ul>	No
• Ni 120 according to GOST         No           • Ni 120 according to GOST         No           • Ni 500 according to GOST         No           • Ni 500 according to GOST         No           • Pt 10         No           • Pt 10         No           • Pt 10 according to GOST         No           • Pt 50         No           • Pt 50 according to GOST         No           • Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         No	• LG-Ni 1000	Yes; Standard/climate
• Ni 120 according to GOST         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 according to GOST         No           • Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100a according to GOST         No           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 1000 according to GOST         No           • Pt 200 according to GOST         No           • Pt 200 according to GOST         No           • Pt 200 according to GOST         No           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         10 MΩ           • 10 to 50 ohms         Yes           • 10 to 150 ohms         Yes           • 10 to 150 ohms         Yes	— Input resistance (LG-Ni 1000)	10 ΜΩ
• 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 p         No           • Pt 50 according to GOST         No           • Pt 100         Yes, Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 200         Yes, Standard/climate           • Pt 200 according to GOST         No           • Pt 500         Yes, Standard/climate           • Pt 500 according to GOST         No           • 1 put resistance (Pt 500)         Yes           • 1 o to 50 ohms         Yes           — Input resistance (0 to 150 ohms)         Yes           — Input resistance (0 to 600 ohms)         No	• Ni 120	No
• Ni 500         No           • Ni 500 according to GOST         No           • Pt 10         No           • Pt 10         No           • Pt 10         No           • Pt 150         No           • Pt 50 according to GOST         No           • Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 1000 cocording to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         10 MΩ           • 1 to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         Yes           — Input resistance (0 to 500 ohms)         Yes           — Input resistance (0 to 600 ohms)         Yes           — Inpu	<ul> <li>Ni 120 according to GOST</li> </ul>	No
• Ni 500 according to GOST         No           • Pi 10         No           • Pi 10 according to GOST         No           • Pi 50 according to GOST         No           • Pi 50 according to GOST         No           • Pi 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pi 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pi 1000 according to GOST         No           • Pi 1000 according to GOST         No           • Pi 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pi 200 according to GOST         No           • Pi 500 according to GOST         No           • O to 500 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • O to 500 ohms <t< td=""><td><ul> <li>Ni 200 according to GOST</li> </ul></td><td>No</td></t<>	<ul> <li>Ni 200 according to GOST</li> </ul>	No
• Pt 10         • Pt 10 according to GOST         No           • Pt 50         No           • Pt 50         No           • Pt 50         No           • Pt 50         No           • Pt 100         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         10 MΩ           • O to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • O to 300 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • O to 300 ohms         Yes     <	• Ni 500	No
• Pt 10 according to GOST         No           • Pt 50 according to GOST         No           • Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100 according to GOST         No           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           • Input resistance (0 to 150 ohms)         10 MΩ           • Pt 500 according to GOST         No           • Input resistance (0 to 150 ohms)         10 MΩ           • O to 150 ohms         Yes           — Input resistance (0 to 50 ohms)         10 MΩ           • O to 300 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ <t< td=""><td><ul> <li>Ni 500 according to GOST</li> </ul></td><td>No</td></t<>	<ul> <li>Ni 500 according to GOST</li> </ul>	No
• Pt 50         No           • Pt 100         Yes; Standard/climate           • Input resistance (Pt 100)         10 MΩ           • Pt 100 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           • Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           • Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           • Input resistance (Pt 500)         10 MΩ           • O to 150 ohms         Yes           • Input resistance (0 to 150 ohms)         10 MΩ           • O to 150 ohms         Yes           • Input resistance (0 to 600 ohms)         10 MΩ           • O to 600 ohms         Yes           • Input resistance (0 to 600 ohms)         10 MΩ           • O to 600 ohms         Yes           • Input resistance (PTC)	• Pt 10	No
• Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100 according to GOST         No           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           — Input resistance (Pt 200)         10 MΩ           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input resistance (Pt 500)         10 MΩ           • 0 to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)	<ul> <li>Pt 10 according to GOST</li> </ul>	No
• Pt 100         Yes; Standard/climate           — Input resistance (Pt 100)         10 MΩ           • Pt 100         Yes; Standard/climate           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input resistance (0 to 500 ohms)         Yes           — Input resistance (0 to 150 ohms)         Yes           — Input resistance (0 to 500 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         Yes           — Input resistance (PTC)         Yes           — Internal temperature compensation         Yes <tr< td=""><td>• Pt 50</td><td>No</td></tr<>	• Pt 50	No
- Input resistance (Pt 100) Pt 100 according to GOST Pt 1000 Pt 1000 according to GOST No Pt 1000   Pt 1000 according to GOST No Pt 200   Pt 200   Pt 200   Pt 200 according to GOST No Pt 200   Pt 200 according to GOST No Pt 500   Pt 500 according to GOST No Pt 500   Pt 500 according to GOST No	<ul> <li>Pt 50 according to GOST</li> </ul>	No
• Pt 100 according to GOST         No           • Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • 0 to 800 ohms         Yes           — Input resistance (0 to 600 ohms)         No           • 0 to 8000 ohms         Yes           — Input resistance (0 to 6000 ohms)         No           • 0 to 6000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)         Yes           — internal temperature compensation         Yes           — internal temperature compensation via RTD         Yes <t< td=""><td>• Pt 100</td><td>Yes; Standard/climate</td></t<>	• Pt 100	Yes; Standard/climate
• Pt 1000         Yes; Standard/climate           — Input resistance (Pt 1000)         10 MΩ           • Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           • Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • 0 to 3000 ohms         Yes           — Input resistance (0 to 6000 ohms)         Yes           — Input resistance (PTC)         Yes           — Input resistance (PTC)         10 MΩ           Temperature compensation         Yes           — internal temperature compensation         Yes           — external temperature compensation via RTD         Yes           — external temperature compensation of 0 °C reference point temperature         Yes; fixed value can be set	— Input resistance (Pt 100)	10 ΜΩ
- Input resistance (Pt 1000)  • Pt 1000 according to GOST  • Pt 200  • Pt 200  • Pt 200  • Pt 200  • Pt 200 Yes; Standard/climate  - Input resistance (Pt 200)  • Pt 500  • Pt 500  • Pt 500  • Input resistance (Pt 500)  • Pt 500 according to GOST  • No  Input ragistance (Pt 500)  • Ot 0 150 ohms  - Input resistance (0 to 150 ohms)  • 0 to 300 ohms  • Input resistance (0 to 300 ohms)  • Ot 0 600 ohms  - Input resistance (0 to 600 ohms)  • Ot 0 500 ohms  - Input resistance (0 to 600 ohms)  • Ot 0 to 600 ohms  - Input resistance (0 to 600 ohms)  • Ot 0 to 600 ohms  - Input resistance (0 to 600 ohms)  • Ot 0 to 600 ohms  - Input resistance (0 to 600 ohms)  • Ot 0 to 600 ohms  - Input resistance (PTC)  - Input resistance (PTC)  Temperature compensation  - parameterizable  - internal temperature compensation yes; fixed value can be set	<ul> <li>Pt 100 according to GOST</li> </ul>	No
• Pt 1000 according to GOST         No           • Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • 0 to 3000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)           Temperature compensation           — parameterizable         Yes           — internal temperature compensation via RTD         Yes           — external temperature compensation via RTD         Yes           — compensation for 0 °C reference point temperature         Yes; fixed value can be set	• Pt 1000	
• Pt 200         Yes; Standard/climate           — Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • 0 to 6000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)           Temperature compensation         Yes           — internal temperature compensation via RTD         Yes           — external temperature compensation via RTD         Yes           — compensation for 0 °C reference point temperature         Yes; fixed value can be set		10 ΜΩ
— Input resistance (Pt 200)         10 MΩ           • Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           • Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         10 MΩ           • 0 to 3000 ohms         Yes           — Input resistance (0 to 6000 ohms)         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Temperature compensation           — parameterizable         Yes           — internal temperature compensation via RTD         Yes           — external temperature compensation via RTD         Yes           — compensation for 0 °C reference point temperature         Yes; fixed value can be set	<u> </u>	
• Pt 200 according to GOST         No           • Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           • 0 to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         No           • 0 to 6000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)           Temperature compensation           — parameterizable         Yes           — internal temperature compensation via RTD         Yes           — external temperature compensation via RTD         Yes           — Compensation for 0 °C reference point temperature         Yes fixed value can be set	• Pt 200	
• Pt 500         Yes; Standard/climate           — Input resistance (Pt 500)         10 MΩ           • Pt 500 according to GOST         No           Input ranges (rated values), resistors         Ves           • 0 to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         No           • 0 to 6000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)           Temperature compensation           — parameterizable         Yes           — internal temperature compensation on Yes         Yes           — cxternal temperature compensation via RTD         Yes           — compensation for 0 °C reference point temperature         Yes; fixed value can be set		
- Input resistance (Pt 500)  • Pt 500 according to GOST No  Input ranges (rated values), resistors  • 0 to 150 ohms — Input resistance (0 to 150 ohms) 10 MΩ  • 0 to 300 ohms — Input resistance (0 to 300 ohms) 10 MΩ  • 0 to 600 ohms — Input resistance (0 to 600 ohms) 10 MΩ  • 0 to 3000 ohms — Input resistance (0 to 600 ohms) 10 MΩ  • 0 to 3000 ohms No • 0 to 6000 ohms FYES — Input resistance (0 to 6000 ohms) 10 MΩ  • 10 to 6000 ohms FYES — Input resistance (0 to 6000 ohms) 10 MΩ  • PTC — Input resistance (PTC) Thermocouple (TC)  Temperature compensation — parameterizable — internal temperature compensation — external temperature compensation via RTD — external temperature compensation via RTD — Compensation for 0 °C reference point temperature  Yes; fixed value can be set	-	
• Pt 500 according to GOST         No           Input ranges (rated values), resistors		
Input ranges (rated values), resistors		
• 0 to 150 ohms         Yes           — Input resistance (0 to 150 ohms)         10 MΩ           • 0 to 300 ohms         Yes           — Input resistance (0 to 300 ohms)         10 MΩ           • 0 to 600 ohms         Yes           — Input resistance (0 to 600 ohms)         No           • 0 to 6000 ohms         Yes           — Input resistance (0 to 6000 ohms)         10 MΩ           • PTC         Yes           — Input resistance (PTC)         10 MΩ           Thermocouple (TC)           Temperature compensation           — parameterizable         Yes           — internal temperature compensation         Yes           — external temperature compensation via RTD         Yes           — Compensation for 0 °C reference point temperature         Yes; fixed value can be set		No
- Input resistance (0 to 150 ohms)  • 0 to 300 ohms  — Input resistance (0 to 300 ohms)  • 0 to 600 ohms  — Input resistance (0 to 600 ohms)  • 0 to 3000 ohms  • 0 to 3000 ohms  • 0 to 6000 ohms  • 0 to 6000 ohms  • 10 MΩ  • 10 MΩ  • 10 to 6000 ohms  • 10 MΩ  • 10 to 6000 ohms  • 2 res  — Input resistance (0 to 6000 ohms)  • 10 MΩ  • PTC  — Input resistance (PTC)  Temperature compensation  — parameterizable  — internal temperature compensation via RTD  — external temperature compensation via RTD  — compensation for 0 °C reference point temperature  Yes; fixed value can be set		
<ul> <li>• 0 to 300 ohms         — Input resistance (0 to 300 ohms)         • 0 to 600 ohms         — Input resistance (0 to 600 ohms)         • 0 to 3000 ohms         • 0 to 3000 ohms         • 0 to 6000 ohms         • 0 to 6000 ohms         • Input resistance (0 to 6000 ohms)         • PTC         — Input resistance (0 to 6000 ohms)         • PTC         — Input resistance (PTC)         — Input resistance (PTC)         — Input resistance (PTC)         — external temperature compensation         — parameterizable         — internal temperature compensation via RTD         — external temperature compensation via RTD         — Compensation for 0 °C reference point temperature         Yes; fixed value can be set</li> </ul>		
Input resistance (0 to 300 ohms)  • 0 to 600 ohms  Input resistance (0 to 600 ohms)  • 0 to 3000 ohms  • 0 to 6000 ohms  • 0 to 6000 ohms  Input resistance (0 to 6000 ohms)  • PTC  Input resistance (PTC)  Temperature compensation  parameterizable  internal temperature compensation via RTD  external temperature compensation via RTD  Compensation for 0 °C reference point temperature  Yes  Temperature can be set		
• 0 to 600 ohms  — Input resistance (0 to 600 ohms)  • 0 to 3000 ohms  • 0 to 6000 ohms  — Input resistance (0 to 6000 ohms)  • PTC  — Input resistance (PTC)  Temperature compensation  — parameterizable  — internal temperature compensation via RTD  — external temperature compensation via RTD  — Compensation for 0 °C reference point temperature  Yes    Yes		
$- \text{Input resistance (0 to 600 ohms)} \qquad 10 \text{ M}\Omega$ $\bullet \text{ 0 to 3000 ohms} \qquad No$ $\bullet \text{ 0 to 6000 ohms} \qquad Yes$ $- \text{Input resistance (0 to 6000 ohms)} \qquad 10 \text{ M}\Omega$ $\bullet \text{ PTC} \qquad Yes$ $- \text{Input resistance (PTC)} \qquad 10 \text{ M}\Omega$ $\hline \text{Thermocouple (TC)}$ $\hline \text{Temperature compensation}$ $- \text{parameterizable} \qquad Yes$ $- \text{internal temperature compensation} \qquad Yes$ $- \text{external temperature compensation via RTD} \qquad Yes$ $- \text{compensation for 0 °C reference point temperature} \qquad Yes; fixed value can be set}$		
<ul> <li>0 to 3000 ohms</li> <li>0 to 6000 ohms</li> <li>— Input resistance (0 to 6000 ohms)</li> <li>PTC</li> <li>— Input resistance (PTC)</li> <li>Thermocouple (TC)</li> <li>Temperature compensation</li> <li>— parameterizable</li> <li>— internal temperature compensation</li> <li>— external temperature compensation via RTD</li> <li>— external temperature compensation of °C reference point temperature</li> <li>Yes; fixed value can be set</li> </ul>		
• 0 to 6000 ohms     — Input resistance (0 to 6000 ohms)     • PTC     — Input resistance (PTC)     — Input resistance (PTC)     10 MΩ  Thermocouple (TC)  Temperature compensation     — parameterizable     — internal temperature compensation     — external temperature compensation via RTD     — Compensation for 0 °C reference point temperature     Yes; fixed value can be set		
- Input resistance (0 to 6000 ohms)  • PTC  Yes  - Input resistance (PTC)  10 MΩ  Thermocouple (TC)  Temperature compensation  - parameterizable  - internal temperature compensation  - external temperature compensation via RTD  - Compensation for 0 °C reference point temperature  Yes; fixed value can be set		
PTC — Input resistance (PTC) — 10 MΩ  Thermocouple (TC)  Temperature compensation — parameterizable — internal temperature compensation — external temperature compensation via RTD — Compensation for 0 °C reference point temperature  Yes  Yes  Yes  Yes  Yes		
— Input resistance (PTC)     10 MΩ       Thermocouple (TC)       Temperature compensation       — parameterizable     Yes       — internal temperature compensation     Yes       — external temperature compensation via RTD     Yes       — Compensation for 0 °C reference point temperature     Yes; fixed value can be set		
Thermocouple (TC)  Temperature compensation  — parameterizable Yes  — internal temperature compensation Yes  — external temperature compensation via RTD Yes  — Compensation for 0 °C reference point temperature Yes; fixed value can be set		
Temperature compensation  — parameterizable Yes  — internal temperature compensation Yes  — external temperature compensation via RTD Yes  — Compensation for 0 °C reference point temperature Yes; fixed value can be set		TO MILE
<ul> <li>parameterizable</li> <li>internal temperature compensation</li> <li>external temperature compensation via RTD</li> <li>Compensation for 0 °C reference point temperature</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes; fixed value can be set</li> </ul>		
- internal temperature compensation  - external temperature compensation via RTD  - Compensation for 0 °C reference point temperature  Yes  Yes  Yes  Yes	·	Yes
<ul> <li>— external temperature compensation via RTD</li> <li>— Compensation for 0 °C reference point temperature</li> <li>Yes</li> <li>Yes; fixed value can be set</li> </ul>	•	
— Compensation for 0 °C reference point temperature Yes; fixed value can be set		
Reference channel of the module     Yes		
Cable length		
• shielded, max.  800 m; for U/I, 200 m for R/RTD, 50 m for TC	·	800 m; for U/I, 200 m for R/RTD, 50 m for TC
	Analog value generation for the inputs	

Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	16 bit
<ul> <li>Integration time, parameterizable</li> </ul>	Yes
<ul><li>Integration time (ms)</li></ul>	2,5 / 16,67 / 20 / 100 ms
<ul> <li>Basic conversion time, including integration time (ms)</li> </ul>	9 / 23 / 27 / 107 ms
<ul> <li>additional conversion time for wire-break monitoring</li> </ul>	9 ms (to be considered in R/RTD/TC measurement)
<ul> <li>additional conversion time for resistance</li> </ul>	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500,
measurement	Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
<ul> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	400 / 60 / 50 / 10 Hz
Time for offset calibration (per module)	Basic conversion time of the slowest channel
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
	820 Q
— Burden of 2-wire transmitter, max.	
for current measurement as 4-wire transducer	Yes Only for DTC
for resistance measurement with two-wire connection	Yes; Only for PTC
<ul> <li>for resistance measurement with three-wire connection</li> </ul>	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %
Temperature error (relative to input range), (+/-)	0.005 %/K; With TC type T 0.02 ± % / K
Crosstalk between the inputs, max.	-80 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.02 %
Temperature error of internal compensation	±6 °C
Operational error limit in overall temperature range	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.3 %
• Current, relative to input range, (+/-)	0.3 %
Resistance, relative to input range, (+/-)	0.3 %
Resistance thermometer, relative to input range, (+/-)	Ptxxx standard: ±1.5 K, Ptxxx climate: ±0.5 K, Nixxx standard: ±0.5 K, Nixxx
- Noolotanoo thomotor, rotatio to inpatriango, ( / /	climate: ±0.3 K
• Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±4.6 K, type E: > -200 °C ±1.5 K, type J: > -210 °C ±1.9 K, type K: > -200 °C ±2.4 K, type N: > -200 °C ±2.9 K, type R: > 0 °C ±4.7 K, type S: > 0 °C ±4.6 K, type T: > -200 °C ±2.4 K
Basic error limit (operational limit at 25 °C)	
Voltage, relative to input range, (+/-)	0.1 %
Current, relative to input range, (+/-)	0.1 %
Resistance, relative to input range, (+/-)	0.1 %
Resistance thermometer, relative to input range, (+/-)	Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx
Thermocouple, relative to input range, (+/-)	climate: ±0.15 K  Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K,
Thermocoupie, relative to input range, (**/-)	type K: > -200 °C ±1.7 K, type E: > -200 °C ±0.7 K, type S: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference	rence frequency
Series mode interference (peak value of interference <	40 dB
rated value of input range), min.	
<ul> <li>Common mode voltage, max.</li> </ul>	10 V
Common mode interference, min.	60 dB
nterrupts/diagnostics/status information	
Diagnostics function	Yes
- 0	
Alarms	
Alarms  • Diagnostic alarm	Yes
Diagnostic alarm	Yes  Yes: two upper and two lower limit values in each case
<ul><li>Diagnostic alarm</li><li>Limit value alarm</li></ul>	Yes Yes; two upper and two lower limit values in each case
Diagnostic alarm	

Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD
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
-	Yes; red LED
for module diagnostics     Potential separation	res, red LED
Potential separation  Potential separation channels	
·	No
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)
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E
Ecological footprint	
environmental product declaration	Yes
Global warming potential	
<ul><li>— global warming potential, (total) [CO2 eq]</li></ul>	38.6 kg
<ul> <li>global warming potential, (during production) [CO2 eq]</li> </ul>	14.4 kg
<ul> <li>global warming potential, (during operation) [CO2 eq]</li> </ul>	24.6 kg
<ul> <li>global warming potential, (after end of life cycle)</li> <li>[CO2 eq]</li> </ul>	-0.44 kg
product functions / security / header	
signed firmware update	No
data integrity	No
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-25 °C; From FS08
horizontal installation, max.	60 °C
vertical installation, min.	-25 °C; From FS08
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	2 3 2 3 3 11, Cool College Col
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	120 11111
	210 a
Weight, approx.	310 g
Other	ALEC II I I I I I I I I I I I I I I I I I
Note:	Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K
last modified:	10/9/2024 🖸