6ES7531-7QD00-0AB0

## **Data sheet**



SIMATIC S7-1500 Analog input module AI 4xU/I/RTD/TC ST, 16 bit resolution, Accuracy 0.3%, 4 channels in groups of 4; 2 channels for RTD measurement; Common mode voltage 10 V; Diagnostics; Hardware interrupts; Delivery including push-in front connector, infeed element, shield bracket, and shield terminal

Product type designation AI AUJ/RTD/TC ST HW functional status From FS01 Fro	General information		
Firmware version  FW update possible  FVes  Product function  IkM data  Sectoronous mode  Prioritized startup  Measuring range scalable  Adjustment of measuring range  Adjustment of measuring range  FIEP 7 TIA Portal configurable/integrated from version  FROFIBUS from GSD version/GSD revision  PROFIBUS from GSD version/GSD revision  PROFIBUS from GSD version/GSD revision  Operating mode  Oversampling  Mo  MSI  Reparameterization possible in RUN  Reparameterization possible in RUN  Reparameterization possible in RUN  Supply voltage  Rated value (PC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissibl	Product type designation	AI 4xU/I/RTD/TC ST	
FW update possible  Product function  I & M data I scortronous mode Prioritized startup No Measuring range scalable Scalable measured values Scalable measured values No Adjustment of measuring range No Engineering with STEP 7 TIA Portal configurable/integrated from version PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision PROFINET from GSD version/GSD revision No MSI Pess CIR - Configuration in RUN Reparameterization possible in RUN Yes Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) PROFICE of protection Proversupply AV encoder supply Suport in rous. Prover version Prover supply Suport in rous. Prover supply Suport in rous. Prover supply Suport in rous. Prover suport suport suport in rous. Prover suport suport suport in rous. Prover suport supor	HW functional status	From FS01	
Product function  IsM data Isochronous mode Prioritized startup Mo Measuring range scalable Scalable measured values Adjustment of measuring range No  Engineering with STEP 7 TIA Portal configurable/integrated from version FROFIBUS from GSD version/GSD revision PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision V1.0 / V5.1 Pes  CIR. Configuration in RUN Pes  Current configuration in RUN Pes  Input current Current consumption, max.  140 mA; with 24 V DC supply Prover Prover available from the backplane bus  0.7 W  Power loss	Firmware version	V1.0.0	
I I&M data I Isochronous mode I Isochronous mode Prioritized startup Measuring range scalable Scalable measured values No Adjustment of measuring range No Engineering with STEP 7 TIA Portal configurable/integrated from version STEP 7 TIA Portal configurable/integrated from version STEP 7 configurable/integrated from version PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision MSI Ves  CIR-Configuration in RUN Reparameterization possible in RUN Reparameterization possible in RUN Yes  CIR-Calibration possible in RUN Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, sower limit (DC) Permissible range, upper limit (DC) Permissible range, sower limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, sower lim	FW update possible	Yes	
Isochronous mode Prioritized startup Mo Measuring range scalable Scalable measured values Adjustment of measuring range Programment STEP 7 TIA Portal configurable/integrated from version STEP 7 configurable/integrated from version PROFIBUS from GSD version/GSD revision PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision MSI PROFINET from GSD version/GSD revision PROFIDED Trom GSD version/GSD revision PROFIDED Trom GSD version/GSD revision PROFIDE Trom GSD v	Product function		
<ul> <li>Prioritized startup</li> <li>Measuring range scalable</li> <li>Scalable measured values</li> <li>Adjustment of measuring range</li> <li>No</li> <li>STEP 7 TIA Portal configurable/integrated from version</li> <li>STEP 7 configurable/integrated from version</li> <li>STEP 7 configurable/integrated from version</li> <li>STEP 7 configurable/integrated from version</li> <li>PROFIBUS from GSD version/GSD revision</li> <li>PROFIBUS from GSD version/GSD revision</li> <li>V1.0 / V5.1</li> <li>PROFIBUS from GSD version/GSD revision</li> <li>V2.3 / -</li> </ul> Operating mode <ul> <li>Oversampling</li> <li>No</li> <li>MSI</li> <li>Yes</li> </ul> CIR - Configuration in RUN Reparameterization possible in RUN <ul> <li>Yes</li> </ul> Calibration possible in RUN <ul> <li>Yes</li> </ul> Supply voltage Rated value (DC) <ul> <li>permissible range, upper limit (DC)</li> <li>28.8 V</li> </ul> Reverse polarity protection <ul> <li>Yes</li> </ul> Input current Current consumption, max <ul> <li>Ind mA; with 24 V DC supply</li> </ul> Encoder supply <ul> <li>Short-circuit protection</li> <li>Yes</li> <li>Output current, max.</li> <li>20 mA; Max. 47 mA per channel for a duration &lt; 10 s</li> </ul> Power Power vasilable from the backplane bus <ul> <li>0.7 W</li> </ul> Power loss	● I&M data	Yes; I&M0 to I&M3	
Measuring range scalable     Scalable measured values     Adjustment of measuring range     Requiremental measuring range     STEP 7 TIA Portal configurable/integrated from version     STEP 7 TIA Portal configurable/integrated from version     STEP 7 configurable/integrated from version     STEP 7 configurable/integrated from version     PROFIBUS from GSD version/GSD revision     PROFIBUS from GSD version/GSD revision     PROFINET from GSD version/GSD revision     PROFINET from GSD version/GSD revision     Oversampling     No     MSI     Yes  CIR - Configuration in RUN Reparameterization possible in RUN     Calibration possible in RUN     Yes  Calibration possible in RUN     Yes  Supply voltage  Rated value (DC)     permissible range, lower limit (DC)     permissible range, lower limit (DC)     permissible range, upper limit (DC)     28.8 V Reverse polarity protection     Yes  Input current  Current consumption, max.     140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  9 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     0.7 W  Power loss	<ul> <li>Isochronous mode</li> </ul>	No	
Scalable measured values Adjustment of measuring range  Engineering with STEP 7 TIA Portal configurable/integrated from version STEP 7 Tonfigurable/integrated from version PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision PROFINET from GSD version/GSD revision No PROFINET from GSD version/GSD revision No MSI Pess  CIR - Configuration in RUN Reparameterization possible in RUN Yes  Calibration possible in RUN Supply voltage Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper l	<ul> <li>Prioritized startup</li> </ul>	No	
Adjustment of measuring range Engineering with  STEP 7 TIA Portal configurable/integrated from version STEP 7 configurable/integrated from version PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision Operating mode Oversampling No MSI Yes  CIR - Configuration in RUN Reparameterization possible in RUN Yes Calibration possible in RUN Yes Calibration possible in RUN Permissible range, lower limit (DC) permissible range, upper limit (DC) Permissible range, upper limit (DC) Permosurent Current consumption, max.  Lurent consumption, max.  Encoder supply A Ves Condition of the Max with 24 V DC supply Prover a variable from the backplane bus Output current Output current, max.  Power Power variable from the backplane bus Output loss  Output loss Output from the backplane bus Output loss Output current Output current, max. Output current, max. Output current Output current, max. Output current curren	<ul> <li>Measuring range scalable</li> </ul>	No	
Engineering with  STEP 7 TIA Portal configurable/integrated from version STEP 7 configurable/integrated from version V5.5 SP3 /- V1.0 / V5.1 PROFIBUS from GSD version/GSD revision V2.3 /- Operating mode Oversampling MSI STEP 7 configuration in RUN Reparameterization possible in RUN Reparameterization possible in RUN Yes Calibration possible in RUN Yes Supply voltage Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, with repart of the repart of th	<ul> <li>Scalable measured values</li> </ul>	No	
STEP 7 TIA Portal configurable/integrated from version  STEP 7 configurable/integrated from version  PROFIBUS from GSD version/GSD revision  PROFINET from GSD version/GSD revision  No PROFINET from GSD version/GSD revision  No MSI  Substitute of the provided from the backplane bus  Prower loss  V13 / V13.0.2  V13 / V13.0.2  V13 / V13.0.2  V23 /-  V5.5 SP3 /-  V1.0 / V5.1  V2.3 /-  V2.3	Adjustment of measuring range	No	
version  STEP 7 configurable/integrated from version  PROFIBUS from GSD version/GSD revision  PROFINET from GSD version/GSD revision  V2.3 /-  Operating mode  Oversampling  MSI  CIR - Configuration in RUN  Reparameterization possible in RUN  Yes  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Short-circuit protection  Yes  Output current, max.  Power  Power available from the backplane bus  0.7 W  Power loss	Engineering with		
PROFIBUS from GSD version/GSD revision PROFINET from GSD version/GSD revision  PROFINET from GSD version/GSD revision  Operating mode  Oversampling No MSI  CiR - Configuration in RUN  Reparameterization possible in RUN  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, with the version of version of the version of version of the version of the version of the version of version of the version of version of the version of versi		V13 / V13.0.2	
PROFINET from GSD version/GSD revision  Operating mode  Oversampling  MSI  Reparameterization possible in RUN  Reparameterization possible in RUN  Reparameterization possible in RUN  Yes  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  24 V 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 loss	<ul> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 / -	
Operating mode  Oversampling  MSI  Yes  CIR - Configuration in RUN  Reparameterization possible in RUN  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  4 V encoder supply  Short-circuit protection  Yes  Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power loss	<ul> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	V1.0 / V5.1	
● Oversampling ● MSI Pes  CiR - Configuration in RUN  Reparameterization possible in RUN  Yes  Calibration possible in RUN Yes  Supply voltage  Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Pess  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  ● Short-circuit protection Pess ● Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power loss	PROFINET from GSD version/GSD revision	V2.3 / -	
MSI CiR - Configuration in RUN Reparameterization possible in RUN Yes Calibration possible in RUN Yes Supply voltage Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Yes Input current Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  4 V encoder supply Short-circuit protection Yes Output current, max.  Power Power available from the backplane bus  0.7 W  Power loss	Operating mode		
CiR - Configuration in RUN  Reparameterization possible in RUN  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  4 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  0.7 W	<ul> <li>Oversampling</li> </ul>	No	
Reparameterization possible in RUN  Calibration possible in RUN  Yes  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  24 V encoder supply  • Short-circuit protection  • Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power available from the backplane bus  0.7 W	• MSI	Yes	
Calibration possible in RUN  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  4 V encoder supply  • Short-circuit protection  • Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power available from the backplane bus  0.7 W  Power loss	CiR - Configuration in RUN		
Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  4 V encoder supply  • Short-circuit protection  • Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power available from the backplane bus  0.7 W  Power loss	Reparameterization possible in RUN	Yes	
Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  4 V encoder supply  Short-circuit protection  Output current, max.  Power  Power available from the backplane bus  0.7 W  Power loss	Calibration possible in RUN	Yes	
permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Input current  Current consumption, max.  Late of the supply  24 V encoder supply  Short-circuit protection  Output current, max.  Power  Power available from the backplane bus  Power loss  19.2 V  28.8 V  140 mA; with 24 V DC supply  140 mA; with 24 V DC supply  Yes  20 mA; Max. 47 mA per channel for a duration < 10 s	Supply voltage		
permissible range, upper limit (DC)  Reverse polarity protection  Yes  Input current  Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  • Short-circuit protection • Output current, max.  Power  Power available from the backplane bus  Power loss  28.8 V  Yes  140 mA; with 24 V DC supply  Yes  20 mA; Max. 47 mA per channel for a duration < 10 s	Rated value (DC)	24 V	
Reverse polarity protection  Input current  Current consumption, max.  Encoder supply  24 V encoder supply  • Short-circuit protection • Output current, max.  Power  Power available from the backplane bus  Yes  140 mA; with 24 V DC supply  Yes  140 mA; with 24 V DC supply  Yes  20 mA; with 24 V DC supply  Yes  0.7 W  Power loss	permissible range, lower limit (DC)	19.2 V	
Input current Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  • Short-circuit protection • Output current, max.  Power  Power available from the backplane bus  0.7 W  Power loss	permissible range, upper limit (DC)	28.8 V	
Current consumption, max.  140 mA; with 24 V DC supply  Encoder supply  24 V encoder supply  Short-circuit protection Output current, max.  Power  Power available from the backplane bus  0.7 W  140 mA; with 24 V DC supply  Yes 20 mA; with 24 V DC supply  Yes 20 mA; with 24 V DC supply  Yes 20 mA; with 24 V DC supply	Reverse polarity protection	Yes	
Encoder supply  24 V encoder supply  Short-circuit protection Output current, max.  Power  Power available from the backplane bus  O.7 W  Power loss	Input current		
24 V encoder supply  Short-circuit protection Output current, max.  Power  Power available from the backplane bus  O.7 W  Power loss	Current consumption, max.	140 mA; with 24 V DC supply	
Short-circuit protection     Output current, max.  Power  Power available from the backplane bus  O.7 W  Power loss  Yes 20 mA; Max. 47 mA per channel for a duration < 10 s  0.7 W	Encoder supply		
Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power available from the backplane bus  0.7 W  Power loss			
Output current, max.  20 mA; Max. 47 mA per channel for a duration < 10 s  Power  Power available from the backplane bus  0.7 W  Power loss	Short-circuit protection	Yes	
Power available from the backplane bus  0.7 W  Power loss	<ul> <li>Output current, max.</li> </ul>	20 mA; Max. 47 mA per channel for a duration < 10 s	
Power loss	Power		
Power loss	Power available from the backplane bus	0.7 W	
		2.3 W	

Analog inputs	
Number of analog inputs	4
For current measurement	4
For voltage measurement	4
For resistance/resistance thermometer	2
measurement	
For thermocouple measurement	4
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
Analog input with oversampling	No
Standardization of measured values	No
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
— Input resistance (-1 V to +1 V)	10 ΜΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	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
<ul><li>— Input resistance (-250 mV to +250 mV)</li></ul>	10 ΜΩ
● -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	100 kΩ
● -50 mV to +50 mV	Yes
— Input resistance (-50 mV to +50 mV)	10 ΜΩ
• -500 mV to +500 mV	Yes
— Input resistance (-500 mV to +500 mV)	10 ΜΩ
• -80 mV to +80 mV	Yes
— Input resistance (-80 mV to +80 mV)	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 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	V
• 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	
- True a M	No
Type N	Yes
— Input resistance (Type N)	Yes 10 MΩ
<ul><li>— Input resistance (Type N)</li><li>● Type R</li></ul>	Yes $10 \ \text{M}\Omega$ Yes
— Input resistance (Type N)	Yes 10 MΩ

Input registance (Type S)	10 ΜΩ
— Input resistance (Type S)	Yes
• Type T	
— Input resistance (Type T)	10 ΜΩ
• Type U	No
Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer  • Cu 10	No
	No
Cu 10 according to GOST	
• Cu 50	No
Cu 50 according to GOST     Cu 100	No
• Cu 100	No
Cu 100 according to GOST	No
• Ni 10	No
Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
— Input resistance (Ni 100)	10 ΜΩ
Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
— Input resistance (Ni 1000)	10 ΜΩ
Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
<ul><li>— Input resistance (LG-Ni 1000)</li></ul>	10 ΜΩ
• Ni 120	No
<ul> <li>Ni 120 according to GOST</li> </ul>	No
• Ni 200	No
<ul> <li>Ni 200 according to GOST</li> </ul>	No
● Ni 500	No
<ul> <li>Ni 500 according to GOST</li> </ul>	No
● Pt 10	No
<ul> <li>Pt 10 according to GOST</li> </ul>	No
● Pt 50	No
<ul> <li>Pt 50 according to GOST</li> </ul>	No
• Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	10 ΜΩ
<ul> <li>Pt 100 according to GOST</li> </ul>	No
• Pt 1000	Yes; Standard/climate
— Input resistance (Pt 1000)	10 ΜΩ
<ul> <li>Pt 1000 according to GOST</li> </ul>	No
• Pt 200	Yes; Standard/climate
— Input resistance (Pt 200)	10 ΜΩ
<ul> <li>Pt 200 according to GOST</li> </ul>	No
• Pt 500	Yes; Standard/climate
— Input resistance (Pt 500)	10 ΜΩ
Pt 500 according to GOST	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
<ul><li>— Input resistance (0 to 150 ohms)</li></ul>	10 ΜΩ
• 0 to 300 ohms	Yes
<ul><li>— Input resistance (0 to 300 ohms)</li></ul>	10 ΜΩ
• 0 to 600 ohms	Yes
<ul><li>— Input resistance (0 to 600 ohms)</li></ul>	10 ΜΩ
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
<ul> <li>Input resistance (0 to 6000 ohms)</li> </ul>	10 ΜΩ
• PTC	Yes
— Input resistance (PTC)	10 ΜΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
internal temperature compensation	Yes
- F	

<ul> <li>external temperature compensation via RTD</li> </ul>	Yes
<ul> <li>Compensation for 0 °C reference point</li> </ul>	Yes; fixed value can be set
temperature  — Reference channel of the module	No
Cable length	140
• shielded, max.	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	
Resolution with overrange (bit including sign), max.	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 measurement</li> </ul>	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
<ul> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	400 / 60 / 50 / 10
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 anadors	
Connection of signal encoders	V
• for voltage measurement	Yes Yes
for current measurement as 2-wire transducer  Burden of 2 wire transmitter, may	820 Ω
— Burden of 2-wire transmitter, max.	Yes
for current measurement as 4-wire transducer     for registered measurement with two wire	
for resistance measurement with two-wire connection	Yes; Only for PTC
for resistance measurement with three-wire connection	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.  Repeat accuracy in steady state at 25 °C (relative to input	-80 dB 0.02 %
range), (+/-)	10.80
Temperature error of internal compensation	±6 °C
note regarding accuracy	at temperatures below 0 °C, the figures for operating error and temperature error are doubled
Operational error limit in overall temperature range	0.0.04
Voltage, relative to input range, (+/-)	0.3 %
Current, relative to input range, (+/-)     Designation of relative to input range, (+/-)	0.3 %
Resistance, relative to input range, (+/-)      Resistance the research relative to input range (+/-)	0.3 %
<ul> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	0.3 %; Ptxxx standard: ±1.5 K, Ptxxx climate: ±0.5 K, Nixxx standard: ±0.5 K, Nixxx climate: ±0.3 K
Thermocouple, relative to input range, (+/-)	0.3 %; 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)	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.1 %
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.1 %
<ul> <li>Resistance, relative to input range, (+/-)</li> </ul>	0.1 %
<ul> <li>Resistance thermometer, relative to input range, (+/-</li> </ul>	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: $>$ 600 °C $\pm$ 1.7 K, type E: $>$ -200 °C $\pm$ 0.7 K, type J: $>$ -210

0 °C  $\pm$ 1.9 K, type S: > 0 °C  $\pm$ 1.9 K, type T: > -200 °C  $\pm$ 0.8 K Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency • Series mode interference (peak value of 40 dB interference < rated value of input range), min. 10 V · Common mode voltage, max. • Common mode interference, min. 60 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 Wire-break Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD Overflow/underflow 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 4 • between the channels and backplane bus Yes • between the channels and the power supply of the Yes electronics 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) **Ambient conditions** Ambient temperature during operation -25 °C; From FS03 · horizontal installation, min. · horizontal installation, max. 60 °C · vertical installation, min. -25 °C; From FS03 · 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 25 mm Height 147 mm Depth 129 mm Weights Weight, approx. 210 g Other Note: Supplied incl. 40-pole push-in front connectors. 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; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K

 $^{\circ}$ C ±0.8 K, type K: > -200  $^{\circ}$ C ±1.2 K, type N: > -200  $^{\circ}$ C ±1.2 K, type R: >

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