

Overview



- 4 or 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Technical specifications

Article number	6ES7531-7QD00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
General information				
Product type designation	AI 4xU/I/RTD/TC ST	AI 8xU/I/RTD/TC ST	AI 8xU/I HS	AI 8xU/I HF
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable	No	No	No	No
• Scalable measured values	No	No	No	Yes
• Adjustment of measuring range	No	No	No	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13.0.2	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• Oversampling	No	No	Yes	No
• MSI	Yes	Yes	Yes	Yes
CiR – Configuration in RUN				
Reparameterization possible in RUN	Yes	Yes	Yes	Yes
Calibration possible in RUN	Yes	Yes	Yes	Yes
Supply voltage				
Type of supply voltage	DC	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes

SIMATIC S7-1500 Advanced Controllers

I/O modules

Analog modules

SM 531 analog input modules**Technical specifications (continued)**

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 S7-1500, AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8XU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8XU/I HF
Analog inputs				
Number of analog inputs	4	8	8	8
• For current measurement	4	8	8	8
• For voltage measurement	4	8	8	8
• For resistance/resistance thermometer measurement	2	4		
• For thermocouple measurement	4	8		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	28.8 V	28.8 V	28.8 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K		
Analog input with oversampling	No			
Standardization of measured values	No			
Input ranges (rated values), voltages				
• 0 to +5 V	No	No	No	No
• 0 to +10 V	No	No	No	No
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes		
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	No	Yes
• -25 mV to +25 mV	No	No	No	No
• -250 mV to +250 mV	Yes	Yes	No	No
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	No	No
• -500 mV to +500 mV	Yes	Yes	No	No
• -80 mV to +80 mV	Yes	Yes	No	No
Input ranges (rated values), currents				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
Input ranges (rated values), thermocouples				
• Type B	Yes	Yes	No	No
• Type C	No	No	No	No
• Type E	Yes	Yes	No	No
• Type J	Yes	Yes	No	No
• Type K	Yes	Yes	No	No
• Type L	No	No	No	No
• Type N	Yes	Yes	No	No
• Type R	Yes	Yes	No	No
• Type S	Yes	Yes	No	No
• Type T	Yes	Yes	No	No
• Type U	No			
• Type TXK/TXK(L) to GOST	No	No	No	No

Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 S7-1500, AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8XU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8XU/I HF
Input ranges (rated values), resistance thermometer				
• Cu 10	No	No	No	No
• Cu 10 according to GOST	No	No	No	No
• Cu 50	No	No	No	No
• Cu 50 according to GOST	No	No	No	No
• Cu 100	No	No	No	No
• Cu 100 according to GOST	No	No	No	No
• Ni 10	No	No	No	No
• Ni 10 according to GOST	No	No	No	No
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 100 according to GOST	No	No	No	No
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 1000 according to GOST	No	No	No	No
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 120	No	No	No	No
• Ni 120 according to GOST	No	No	No	No
• Ni 200	No	No	No	No
• Ni 200 according to GOST	No	No	No	No
• Ni 500	No	No	No	No
• Ni 500 according to GOST	No	No	No	No
• Pt 10	No	No	No	No
• Pt 10 according to GOST	No	No	No	No
• Pt 50	No	No	No	No
• Pt 50 according to GOST	No	No	No	No
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 100 according to GOST	No	No	No	No
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 1000 according to GOST	No	No	No	No
• Pt 200	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 200 according to GOST	No	No	No	No
• Pt 500	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 500 according to GOST	No	No	No	No
Input ranges (rated values), resistors				
• 0 to 150 ohms	Yes	Yes	No	No
• 0 to 300 ohms	Yes	Yes	No	No
• 0 to 600 ohms	Yes	Yes	No	No
• 0 to 3000 ohms	No	No	No	No
• 0 to 6000 ohms	Yes	Yes	No	No
• PTC	Yes	Yes	No	No
Thermocouple (TC)				
Temperature compensation				
- parameterizable	Yes	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	800 m	800 m

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I/O modules

Analog modules

SM 531 analog input modules

Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 S7-1500, AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8XU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8XU/I HF
Analog value generation for the inputs				
Integration and conversion time/ resolution per channel				
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	16 bit	16 bit	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32-bit REAL format); 16 bits when using the S7 format (16-bit INTEGER)
<ul style="list-style-type: none"> Integration time, parameterizable 	Yes	Yes		Yes
<ul style="list-style-type: none"> Integration time (ms) 	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms		Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
<ul style="list-style-type: none"> Basic conversion time, including integration time (ms) 	9 / 23 / 27 / 107 ms	9 / 23 / 27 / 107 ms		Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
<ul style="list-style-type: none"> - additional conversion time for wire-break monitoring 	9 ms (to be considered in R/RTD/TC measurement)	9 ms (to be considered in R/RTD/TC measurement)		
<ul style="list-style-type: none"> - additional conversion time for resistance measurement 	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms		
<ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz 	400 / 60 / 50 / 10	400 / 60 / 50 / 10 Hz		400 / 60 / 50 / 10 Hz
<ul style="list-style-type: none"> Basic execution time of the module (all channels released) 				Corresponds to the channel with the highest basic conversion time
<ul style="list-style-type: none"> Basic execution time of the module (all channels released) 			62.5 µs; independent of number of activated channels	
Smoothing of measured values				
<ul style="list-style-type: none"> parameterizable 	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
<ul style="list-style-type: none"> for voltage measurement 	Yes	Yes	Yes	Yes
<ul style="list-style-type: none"> for current measurement as 2-wire transducer 	Yes	Yes	Yes	Yes; with external transmitter supply
<ul style="list-style-type: none"> - Burden of 2-wire transmitter, max. 	820 Ω	820 Ω	820 Ω	
<ul style="list-style-type: none"> for current measurement as 4-wire transducer 	Yes	Yes	Yes	Yes
<ul style="list-style-type: none"> for resistance measurement with two-wire connection 	Yes; Only for PTC	Yes; Only for PTC	No	No
<ul style="list-style-type: none"> for resistance measurement with three-wire connection 	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	No
<ul style="list-style-type: none"> for resistance measurement with four-wire connection 	Yes; All measuring ranges except PTC	Yes; All measuring ranges except PTC	No	No

Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 S7-1500, AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8XU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8XU/I HF
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %	0.2 %	0.05 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.2 %	0.05 %
• Resistance, relative to input range, (+/-)	0.1 %	0.1 %		
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K	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 ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -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	Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -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 $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB		80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	10 V	10 V	10 V	60 V DC/30 V AC
• Common mode interference, min.	60 dB	60 dB	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	80 dB
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	No
Filtering and processing time (TCI), min.			80 µs	
Bus cycle time (TDP), min.			250 µs	
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Overflow/underflow	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

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I/O modules

Analog modules

SM 531 analog input modules**Technical specifications** (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 S7-1500, AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8XU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8XU/I HF
Isolation				
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Decentralized operation				
Prioritized startup	No	No	Yes	Yes
Dimensions				
Width	25 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	210 g	310 g	300 g	280 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	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		

Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
General information	
Product type designation	AI 8xU/R/RTD/TC HF
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
CiR – Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	8; Plus one additional RTD (reference) channel
• For voltage measurement	8; Plus one additional RTD (reference) channel
• For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel
• For thermocouple measurement	8; Plus one additional RTD (reference) channel
permissible input voltage for voltage input (destruction limit), max.	20 V
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	No
• -1 V to +1 V	Yes
• -10 V to +10 V	No
• -2.5 V to +2.5 V	No
• -25 mV to +25 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	No
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	No
• -20 mA to +20 mA	No
• 4 mA to 20 mA	No

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
Input ranges (rated values), thermocouples	
• Type B	Yes
• Type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; Standard/climate
• Cu 10 according to GOST	Yes; Standard/climate
• Cu 50	Yes; Standard/climate
• Cu 50 according to GOST	Yes; Standard/climate
• Cu 100	Yes; Standard/climate
• Cu 100 according to GOST	Yes; Standard/climate
• Ni 10	Yes; Standard/climate
• Ni 10 according to GOST	Yes; Standard/climate
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	Yes; Standard/climate
• Ni 120 according to GOST	Yes; Standard/climate
• Ni 200	Yes; Standard/climate
• Ni 200 according to GOST	Yes; Standard/climate
• Ni 500	Yes; Standard/climate
• Ni 500 according to GOST	Yes; Standard/climate
• Pt 10	Yes; Standard/climate
• Pt 10 according to GOST	Yes; Standard/climate
• Pt 50	Yes; Standard/climate
• Pt 50 according to GOST	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC) Temperature compensation	
- parameterizable	Yes
Cable length	
• shielded, max.	800 m; at U; 200 m at R/RTD/TC

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I/O modules

Analog modules

SM 531 analog input modules

Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32-bit REAL format); 16-bit for measuring mode R and U; 16 bits for all measuring modes when using the S7 format (16-bit INTEGER)
<ul style="list-style-type: none"> Integration time, parameterizable Integration time (ms) 	Yes Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
<ul style="list-style-type: none"> Basic conversion time, including integration time (ms) - additional conversion time for wire-break monitoring 	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms Thermocouples, 150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni50, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200: 4 ms; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt500, Pt1000: 13 ms
<ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz Basic execution time of the module (all channels released) 	400 / 60 / 50 / 10 Hz Corresponds to the channel with the highest basic conversion time
Smoothing of measured values	
<ul style="list-style-type: none"> parameterizable 	Yes
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> 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 	Yes No No Yes Yes; All measuring ranges except PTC; internal compensation of the cable resistances Yes; All measuring ranges except PTC
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) Resistance, relative to input range, (+/-) Resistance thermometer, relative to input range, (+/-) Thermocouple, relative to input range, (+/-) 	0.05 % 0.05 % Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	<ul style="list-style-type: none"> Series mode interference (peak value of interference < rated value of input range), min. Common mode voltage, max. Common mode interference, min. 	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode 60 V DC/30 V AC 80 dB
Isochronous mode		
Isochronous operation (application synchronized up to terminal)		No
Interrupts/diagnostics/status information		
Diagnostics function		Yes
Alarms		
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm 		Yes Yes; two upper and two lower limit values in each case
Diagnostic messages		
<ul style="list-style-type: none"> Monitoring the supply voltage Wire-break Overflow/underflow 		Yes Yes; Only with TC, R, RTD Yes
Diagnostics indication LED		
<ul style="list-style-type: none"> RUN LED ERROR LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics for module diagnostics 		Yes; Green LED Yes; Red LED Yes; Green LED Yes; Green LED Yes; Red LED Yes; Red LED
Potential separation		
Potential separation channels		
<ul style="list-style-type: none"> between the channels and backplane bus 		Yes
Isolation		
Isolation tested with		2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus
Ambient conditions		
Ambient temperature during operation		
<ul style="list-style-type: none"> horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. 		0 °C 60 °C 0 °C 40 °C
Decentralized operation		
Prioritized startup		Yes
Dimensions		
Width		35 mm
Height		147 mm
Depth		129 mm
Weights		
Weight, approx.		290 g
Other		
Note:		For the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement. This then requires two module cycles for a measured value.

Ordering data	Article No.	Article No.
SM 531 analog input modules		
4 x U/I/RTD/TC 4 analog inputs, ± 10 V, ± 5 V, ± 2.5 V, ± 1 V, ± 500 mV, ± 250 mV, ± 80 mV, ± 50 mV, 1 ... 5 V, 0/4 ... 20 mA, ± 20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms; 16 bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7QD00-0AB0	Accessories
8 x U/I HS 8 analog inputs, ± 10 V, ± 5 V, 1 ... 5 V or 0/4 ... 20 mA, ± 20 mA, 16 bit + sign; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7NF10-0AB0	Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin • Screw terminals • Push-in For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part
8 x U/I/RTD/TC 8 analog inputs ± 10 V, ± 5 V, ± 2.5 V, ± 1 V, ± 500 mV, ± 250 mV, ± 80 mV, ± 50 mV, 1 ... 5 V, 0/4 ... 20 mA, ± 20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms, 16 bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7KF00-0AB0	DIN A4 labeling sheets For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray
8 x U/I HF 8 analog inputs, ± 10 V, ± 5 V, 1 ... 5 V or 0/4 ... 20 mA, ± 20 mA, 16 bit + sign; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7NF00-0AB0	U connector 5 units; spare part
8 x U/R/RTD/TC 8 analog inputs, ± 1 V, ± 500 mV, ± 250 mV, ± 80 mV, ± 50 mV, ± 25 mV; thermocouples type B, E, J, K, N, R, S, T, TXK/TXK(L) according to GOST; resistance thermometers Cu 10, Cu 50, Cu 100, Ni 10, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt 10, Pt 50, Pt 100, Pt 200, Pt500, Pt 1000; resistors 0...150/300/600/ 6000 ohms, PTC; 16 bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	6ES7531-7PF00-0AB0	Universal front door for I/O modules For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part
		Shielding set I/O For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module). For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).
		Shield terminal element 10 units; spare part
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