SIEMENS

Data sheet 6ES7531-7TF00-0AB0

Siemens EcoTech

SIMATIC S7-1500, analog input module AI 8xHART HF, accuracy 0.1%, 8 channels in groups of 4, common mode voltage: 30 V AC/60 V DC, diagnostics; hardware interrupts calibrate in RUN; delivery including infeed element, shielding bracket and shield terminal

General information	
Product type designation	AI 8xHART HF
HW functional status	from FS01
Firmware version	V1.0.0
● FW update possible	Yes
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
● Prioritized startup	No
● Measuring range scalable	No
● Scalable measured values	No
● Adjustment of measuring range	No
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	V17/V18 with HSP 383
● STEP 7 configurable/integrated from version	V5.5 SP3 / -
● PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
● PROFINET from GSD version/GSD revision	V2.42 / -
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
Input current	
Current consumption, max.	163 mA
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 consumption from the backplane bus	1.15 W
Power loss	
Power loss, typ.	1.8 W
Address area	
Address space per module	
● Address space per module with HART, max.	57 byte
● Inputs	16 byte
● Outputs	0 byte
Analog inputs	
Number of analog inputs	8
● For current measurement	8
permissible input current for current input (destruction limit),	40 mA

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max.	
Analog input with oversampling	No
Standardization of measured values	No
Input ranges (rated values), currents	
● 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	125 Ω
● -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	125 Ω
● 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	125 Ω; plus approx. 17 Ohm when using the switch against M
Cable length	
● shielded, max.	800 m
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	16 bit
● Integration time, parameterizable	Yes
● Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
● Basic conversion time, including integration time (ms)	Fast Mode: 7 / 22 / 25 / 106 ms; Standard Mode: 12 / 55 / 65 / 308 ms
● Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz
● Basic execution time of the module (all channels released)	channel 0 and 4, 1 and 5, etc. measure in pairs simultaneously. The slower channel of each pair determines the basic execution time of the channel pair. The basic execution time of the module is calculated by adding the basic conversion times of the channel pairs.
Smoothing of measured values	
● Number of smoothing levels	4
● parameterizable	Yes
● Step: None	Yes
● Step: low	Yes
● Step: Medium	Yes
● Step: High	Yes
Encoder	
Connection of signal encoders	
● for voltage measurement	No
● for current measurement as 2-wire transducer	Yes
— Burden of 2-wire transmitter, max.	820 Ω; at 24 V input voltage
● for current measurement as 4-wire transducer	Yes
● for resistance measurement with two-wire connection	No
● for resistance measurement with three-wire connection	No
● for resistance measurement with four-wire connection	No
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, max.	-80 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.02 %
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	
● Current, relative to input range, (+/-)	0.1 %; without HART communication
Basic error limit (operational limit at 25 °C)	
● Current, relative to input range, (+/-)	0.05 %; without HART communication
Influence of a HART signal modulated on the input signal in relation to input range	
● error occurred at interference frequency suppression: 400 Hz	0.19 %; in the Standard operating mode, 0.55 % in the Fast operating mode
● error occurred at interference frequency suppression: 60 Hz	0.05 %; in the Standard operating mode, 0.1 % in the Fast operating mode
● error occurred at interference frequency suppression: 50 Hz	0.04 %; in the Standard operating mode, 0.09 % in the Fast operating mode
● error occurred at interference frequency suppression: 10 Hz	0.02 %; in the Standard operating mode, 0.03 % in the Fast operating mode

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Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
● Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
● Common mode voltage, max.	60 V DC/30 V AC
● Common mode interference, min.	80 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	Yes
● Wire break	Yes; With 4 mA to 20 mA, channel by channel
● short-circuit	No
● Group error	No
● Overflow/Underflow	Yes
Diagnostics indication LED	
● RUN LED	Yes; green LED
● ERROR LED	Yes; red LED
● MAINT LED	No
● 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 analog inputs	
● between the channels	No; however, increased permissible potential difference between the inputs.
● between the channels, in groups of	8
● between the channels and backplane bus	Yes
● between the channels and the power supply of the electronics	No
Potential separation channels	
● between the channels	No
● between the channels and backplane bus	Yes
● between the channels and the power supply of the electronics	No
Permissible potential difference	
between different circuits	60 V DC/30 V AC
between the inputs (UCM)	60 V DC/30 V AC
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Siemens Eco Profile (SEP)	Siemens EcoTech
Suitable for applications according to AMS 2750	No
Suitable for applications according to CQI-9	No
Ecological footprint	
● environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	38.6 kg
— global warming potential, (during production) [CO2 eq]	14.4 kg
— global warming potential, (during operation) [CO2 eq]	24.6 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-0.44 kg
Security	
signed firmware update	No
safely removing data	No
data integrity	No
Ambient conditions	

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Ambient temperature during operation	
● horizontal installation, min.	-30 °C
● horizontal installation, max.	60 °C
● vertical installation, min.	-30 °C
● 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
Absolute humidity	
● dew point, min.	-60 °C; suitable for dry room applications

Dimensions

Width	35 mm
Height	147 mm
Depth	129 mm

Weights

Weight, approx.	270 g

Classifications

	Version	Classification
eClass	16	27-24-22-01
eClass	14	27-24-22-01
eClass	12	27-24-22-01
eClass	9.1	27-24-22-01
eClass	9	27-24-22-01
eClass	8	27-24-22-01
eClass	7.1	27-24-22-01
eClass	6	27-24-22-01
ETIM	10	EC001420
ETIM	9	EC001420
ETIM	8	EC001420
ETIM	7	EC001420

Approvals / Certificates

General Product Approval

EG-Konf. | UK CA | | Miscellaneous | Manufacturer Declaration | UL

General Product Approval				EMV	For use in hazardous locations
	RCM	China RoHS	Manufacturer Declaration		UL

For use in hazardous locations

FM	CCC-Ex	ATEX	Type Examination Certificate	IECEx	Miscellaneous

For use in hazardous locations	Maritime application

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CCC-Ex

ABS

BUREAU VERITAS

DNV

LRS

NK / Nippon Kaiji Kyokai

Maritime application				Environment	
RINA	RMRS	CCS (China Classification Society)	KR (Korean Register of Shipping)	EPD	Siemens EcoTech

last modified: 5/12/2026

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