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Data sheet 6ES7144-6JF00-0BB0

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SIMATIC ET 200eco PN, AI 8xRTD/TC, M12-L, 8x M12, 16-bit resolution, channel diagnostics for wire break at input, shared device with 2 controllers, prioritized startup, MSI, MRP, S2 redundancy, I&M0...3, multi-fieldbus, PN IO, Ethernet IP, Modbus TCP, degree of protection IP67 / IP69K



General information	
HW functional status	FS03
Firmware version	V5.1.x
● FW update possible	Yes
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Manufacturer ID according to ODVA (VendorID)	04E3H
Device ID according to ODVA (Product code)	0FAAH
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
● IRT	Yes
● Prioritized startup	Yes
● Measuring range scalable	Yes
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0369
● PROFINET from GSD version/GSD revision	GSDML V2.4.x
● Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	
● MSI	Yes
CiR - Configuration in RUN	
Calibration possible in RUN	Yes
Supply voltage	
power supply according to NEC Class 2 required	No
Load voltage 1L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	20.4 V
● permissible range, upper limit (DC)	28.8 V
● Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	85 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Power loss	
Power loss, typ.	6.3 W
Address area	

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Address space per module	
● Inputs	16 byte; + 1 byte for QI information
Hardware configuration	
Submodules	
● Number of configurable submodules, max.	2
Analog inputs	
Number of analog inputs	8
● For voltage measurement	8
● For resistance/resistance thermometer measurement	8
● For thermocouple measurement	8
permissible input voltage for voltage input (destruction limit), max.	24 V
Constant measurement current for resistance-type transmitter, typ.	0.7 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages	
● -80 mV to +80 mV	Yes; 16 bit incl. sign
— Input resistance (-80 mV to +80 mV)	10 MΩ
Input ranges (rated values), thermocouples	
● Type B	Yes; 16 bit incl. sign
— Input resistance (Type B)	10 MΩ
● Type C	Yes; 16 bit incl. sign
— Input resistance (Type C)	10 MΩ
● Type E	Yes; 16 bit incl. sign
— Input resistance (Type E)	10 MΩ
● Type J	Yes; 16 bit incl. sign
— Input resistance (type J)	10 MΩ
● Type K	Yes; 16 bit incl. sign
— Input resistance (Type K)	10 MΩ
● Type L	Yes; 16 bit incl. sign
— Input resistance (Type L)	10 MΩ
● Type N	Yes; 16 bit incl. sign
— Input resistance (Type N)	10 MΩ
● Type R	Yes; 16 bit incl. sign
— Input resistance (Type R)	10 MΩ
● Type S	Yes; 16 bit incl. sign
— Input resistance (Type S)	10 MΩ
● Type T	Yes; 16 bit incl. sign
— Input resistance (Type T)	10 MΩ
● Type U	Yes; 16 bit incl. sign
— Input resistance (Type U)	10 MΩ
Input ranges (rated values), resistance thermometer	
● Ni 100	Yes; Standard/climate
— Input resistance (Ni 100)	10 MΩ
● Ni 1000	Yes; Standard/climate
— Input resistance (Ni 1000)	10 MΩ
● Ni 120	Yes; Standard/climate
— Input resistance (Ni 120)	10 MΩ
● Ni 200	Yes; Standard/climate
— Input resistance (Ni 200)	10 MΩ
● Ni 500	Yes; Standard/climate
— Input resistance (Ni 500)	10 MΩ
● Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	10 MΩ
● Pt 1000	Yes; Standard/climate
— Input resistance (Pt 1000)	10 MΩ
● Pt 200	Yes; Standard/climate

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— Input resistance (Pt 200)	10 MΩ
● Pt 500	Yes; Standard/climate
— Input resistance (Pt 500)	10 MΩ
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)	10 MΩ
● 0 to 3000 ohms	Yes
— Input resistance (0 to 3000 ohms)	10 MΩ
● 0 to 6000 ohms	Yes
— Input resistance (0 to 6000 ohms)	10 MΩ
Thermocouple (TC)	
Temperature compensation	
— Parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	Yes
— dynamic reference temperature value	Yes
— fixed reference temperature	Yes
Cable length	
● shielded, max.	30 m
Analog value generation for the inputs	
Analog value display	SIMATIC S7 format
Measurement principle	integrating
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	16 bit
● Integration time, parameterizable	Yes; channel by channel
● Integration time (ms)	0.84 / 16.7 (50) / 20 (60) / 60 (180)
● Basic conversion time, including integration time (ms)	4.50 / 21.5 (54) / 24 (64) / 64 (184)
— additional conversion time for wire-break monitoring	2 ms; for 3/4-wire transducer 4 ms
● Interference voltage suppression for interference frequency f1 in Hz	none / 60 / 50 / 16.7
Smoothing of measured values	
● parameterizable	Yes
● Step: None	Yes; 1x cycle time
● Step: low	Yes; 4x cycle time
● Step: Medium	Yes; 16x cycle time
● Step: High	Yes; 32x cycle time
Encoder	
Connection of signal encoders	
● for resistance measurement with two-wire connection	Yes
● for resistance measurement with three-wire connection	Yes
● for resistance measurement with four-wire connection	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
Temperature error of internal compensation	±1,5 °C
Operational error limit in overall temperature range	
● Voltage, relative to input range, (+/-)	0.2 %
● Resistance, relative to input range, (+/-)	0.1 %; See deviations in the manual
● Resistance thermometer, relative to input range, (+/-)	0.1 %; See deviations in the manual
● Thermocouple, relative to input range, (+/-)	0.3 %
Basic error limit (operational limit at 25 °C)	
● Voltage, relative to input range, (+/-)	0.1 %

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● Resistance, relative to input range, (+/-)	0.05 %; See deviations in the manual
● Resistance thermometer, relative to input range, (+/-)	0.05 %; See deviations in the manual
● Thermocouple, relative to input range, (+/-)	0.15 %
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency	
● Series mode interference (peak value of interference < rated value of input range), min.	100 dB; at basic conversion time 4.5 / 21.5 / 24 / 64 ms: 46 dB
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
● M12 port	Yes; 2x M12, 4-pin, D-coded
● Number of ports	2
● integrated switch	Yes
Protocols	
● PROFINET IO device	Yes
● Open IE communication	Yes
PROFINET IO Device	
Services	
— IRT	Yes; 250 µs to 4 ms in 125 µs frame
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
● Autonegotiation	Yes
● Autocrossing	Yes
● Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
● PROFINET system redundancy (S2)	Yes
— on S7-1500R/H	Yes
— on S7-400H	Yes
● PROFINET system redundancy (R1)	No
● H-Sync forwarding	Yes
Media redundancy	
— MRP	Yes
— MRPD	No
EtherNet/IP	
Services	
— CIP Implicit Messaging	Yes
— CIP Explicit Messaging	Yes
— CIP Safety	No
— Shared device	Yes; 2x EtherNet/IP Scanner
— Number of scanners with shared device, max.	2
Updating times	
— Requested Packet Interval (RPI)	2 ms
Redundancy mode	
— DLR (Device Level Ring)	No
Address area	
— Address space per module, max.	38 byte
— LargeForwardOpen (Class3)	No
Modbus TCP	
Services	

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— read coils (code=1)	Yes
— read discrete inputs (code=2)	Yes
— Read Holding Registers (Code=3)	Yes
— write single coil (code=5)	Yes
— write multiple coils (code=15)	Yes
— Write Multiple Registers (Code=16)	Yes
— Parameter change by master	No
— Modbus TCP Security Protocol	No
Address space per station	
— Address space per station, max.	38 byte
— Access-consistent address space	2 byte
Updating time	
— I/O request interval	2 ms
Connections	
— number of connections per device	12
Open IE communication	
● TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
● SNMP	Yes
● LLDP	Yes
● ARP	Yes
Interrupts/diagnostics/status information	
Alarms	
● Diagnostic alarm	Yes; Parameterizable
● Maintenance interrupt	Yes; Parameterizable
● Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
● Diagnostic information readable	Yes
● Monitoring the supply voltage	Yes
— Parameterizable	Yes
● Wire break	Yes; Not for ±80 mV
● Overflow/Underflow	Yes
Diagnostics indication LED	
● RUN LED	Yes; green LED
● ERROR LED	Yes; red LED
● MAINT LED	Yes; Yellow LED
● NS LED	Yes; green/red LED
● MS LED	Yes; green/red LED
● IO LED	Yes; red/green/yellow LEDs
● Channel status display	Yes; green LED
● for channel diagnostics	Yes; red LED
● Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
● between the channels	No
● between the channels and the power supply of the electronics	Yes
Isolation	
tested with	
● 24 V DC circuits	707 V DC (type test)
● Test voltage for interface, rms value [Vrms]	1 500 V; According to IEEE 802.3
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
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 F
Highest safety class achievable for safety-related tripping of standard modules	

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● Performance level according to ISO 13849-1	PL d
● Category according to ISO 13849-1	Cat. 3
● SIL acc. to IEC 62061	SIL 2
● remark on safety-oriented shutdown	https://support.industry.siemens.com/cs/de/en/view/39198632
Use in hazardous areas	
● Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
● Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security	
signed firmware update	Yes
securely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
● min.	-40 °C
● max.	60 °C
Altitude during operation relating to sea level	
● Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	780 g

Classifications

	Version	Classification
eClass	16	27-24-26-01
eClass	14	27-24-26-01
eClass	12	27-24-26-01
eClass	9.1	27-24-26-01
eClass	9	27-24-26-01
eClass	8	27-24-26-01
eClass	7.1	27-24-26-01
eClass	6	27-24-26-01
ETIM	10	EC001596
ETIM	9	EC001596
ETIM	8	EC001596
ETIM	7	EC001596
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

Miscellaneous | Manufacturer Declaration | CE EG-Konf. | UKCA | Declaration of Conformity | UL

General Product Approval			For use in hazardous locations		
RCM	EAC	China RoHS	CCC-Ex	ATEX	IECEx

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For use in hazardous locations		Maritime application			
Miscellaneous	CCC-Ex	ABS	BUREAU VERITAS	DNV	LRS

Maritime application				other	Food, Pharmaceut-ical, Medical
NK / Nippon Kaiji Ky-okai	RINA	CCS (China Classifica-tion Society)	KR (Korean Register of Shipping)		Confirmation

Environment		Industrial Communication
EPD	Siemens EcoTech	PROFINET

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