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Data sheet 6ES7146-6FF00-0AB0



SIMATIC DP, ET 200eco PN, F-DI 8x24 V /F-DQ 3x24 V 2 A, M12 PROFIsafe, up to PL e (ISO 13849), up to SIL 3 (IEC 61508), degree of protection IP65/67, including eCoding plug-in connector

General information	
HW functional status	from FS01
Firmware version	V1.0.0
● FW update possible	Yes
Vendor identification (VendorID)	02AH
Device identifier (DeviceID)	0306H
Product function	
● I&M data	Yes
● Isochronous mode	No
● IRT	No; module will participate within an IRT topology
● Fast startup	No
● Prioritized startup	No
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	V15 with HSP 204
● PROFINET from GSD version/GSD revision	GSDML V2.34
Operating mode	
● DI	Yes
● DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
power supply according to NEC Class 2 required	Yes
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
Load voltage 2L+	
● 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
Input current	
Current consumption, typ.	200 mA
from supply voltage 1L+, max.	4 A
from load voltage 2L+, max.	4 A
Encoder supply	
Number of outputs	2; Vs
24 V encoder supply	

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● Short-circuit protection	Yes; electronic (response threshold 1.4 A to 4.5 A)
● Output current, max.	800 mA; per output
Power loss	
Power loss, typ.	9 W
Address area	
Address space per module	
● Inputs	8 byte
● Outputs	6 byte
Digital inputs	
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 60 °C, max.	8
Input voltage	
● Rated value (DC)	24 V
● for signal "0"	-30 V DC to +5 V DC
● for signal "1"	15 V DC to 30 V DC
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Cable length	
● unshielded, max.	30 m
Digital outputs	
Number of digital outputs	3
● in groups of	3
Short-circuit protection	Yes; Electronic
● Response threshold, typ.	10 A
Limitation of inductive shutdown voltage to	PM-switching: Typ. -26 V to (-48 V)
Controlling a digital input	No
Switching capacity of the outputs	
● on lamp load, max.	10 W
Output current	
● for signal "1" rated value	2 A
● for signal "1" permissible range, max.	2.4 A
● for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
● for uprating	No
● for redundant control of a load	No
Switching frequency	
● with resistive load, max.	30 Hz
● with inductive load, max.	0.1 Hz
● on lamp load, max.	10 Hz
Total current of the outputs (per group)	
all mounting positions	
— up to 60 °C, max.	3.9 A
Cable length	
● unshielded, max.	30 m
Encoder	
Connectable encoders	
● 2-wire sensor	No
— permissible quiescent current (2-wire sensor), max.	0.5 mA
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	

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● M12 port	Yes
● integrated switch	Yes
Protocols	
● PROFINET IO Device	Yes
● Open IE communication	No
PROFINET IO Device	
Services	
— IRT	No; module will participate within an IRT topology
— Prioritized startup	No
— Shared device	No
Interface types	
M12 port	
● Autonegotiation	Yes
● Autocrossing	Yes
● Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	Yes
EtherNet/IP	No
Modbus TCP	No
Redundancy mode	
● PROFINET system redundancy (S2)	Yes
● PROFINET system redundancy (R1)	No
● H-Sync forwarding	No
Media redundancy	
— MRP	Yes
— MRPD	No
Open IE communication	
● TCP/IP	No
● SNMP	Yes
● DCP	Yes
● LLDP	Yes
● ping	Yes
● ARP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
● Diagnostic alarm	Yes
Diagnoses	
● Diagnostic information readable	Yes
● Monitoring the supply voltage	Yes; green "ON" LED
● Wire-break in actuator cable	Yes
● Wire-break in signal transmitter cable	Yes
● short-circuit	Yes
● Short-circuit encoder supply	Yes
● Group error	Yes; Red/yellow "SF/MT" LED
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
● between the channels	No
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

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Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Highest safety class achievable in safety mode	
● Performance level according to ISO 13849-1	PLe
● SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
● SILCL according to IEC 62061	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL2	< 6.00E-04, 1oo1 evaluation
— Low demand mode: PFDavg in accordance with SIL3	< 1.00E-05, 1oo2 evaluation
— High demand/continuous mode: PFH in accordance with SIL2	< 1.00E-08 1/h, 1oo1 evaluation
— High demand/continuous mode: PFH in accordance with SIL3	< 2.00E-10 1/h, 1oo2 evaluation
Probability of failure of the digital outputs (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
— High demand/continuous mode: PFH in accordance with SIL3	< 7.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
● min.	-25 °C
● max.	60 °C
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	940 g

Classifications

	Version	Classification
eClass	16	27-24-26-04
eClass	14	27-24-26-04
eClass	12	27-24-26-04
eClass	9.1	27-24-26-04
eClass	9	27-24-26-04
eClass	8	27-24-26-04
eClass	7.1	27-24-26-04
eClass	6	27-24-26-04
ETIM	10	EC001599
ETIM	9	EC001599
ETIM	8	EC001599
ETIM	7	EC001599
IDEA	4	3566
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

China RoHS

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