6ES7142-6BG00-0BB0

Data sheet



SIMATIC ET 200eco PN, DQ 8x 24 V DC/0.5 A, M12-L, 8x M12, single and double assignment, source output (PNP,switching to P potential), substitute value output, channel diagnostics for wire break and short-circuit at the output, shared device with 2 controllers, 0.25 ms isochronous mode, prioritized startup, MSO, MRP, S2 redundancy, I&M0...3, multi-fieldbus, PN IO, Ethernet IP, Modbus TCP, degree of protection IP67 / IP69K

General information	
HW functional status	FS02
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)	0FA6H
Product function	
• I&M data	Yes; I&M0 to I&M3
Isochronous mode	Yes
Prioritized startup	Yes
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0363
PROFINET from GSD version/GSD revision	GSDML V2.3.x
Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	
• DQ	Yes
• MSO	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
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; against destruction; load increasing
Input current	
Current consumption (rated value)	65 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.	7 W
Address area	
Address space per module	

 Outputs 	1 byte
Hardware configuration	.,,-
Submodules	
Number of configurable submodules, max.	2
Digital outputs	
Number of digital outputs	8
Current-sourcing	Yes
Short-circuit protection	Yes; per channel, electronic
Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	Typ. 2L+ (-52 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
with resistive load, max.	0.5 A
 with inductive load, max. 	0.5 A
on lamp load, max.	5 W
Load resistance range	
 lower limit 	48 Ω
• upper limit	4 kΩ
Output voltage	
● for signal "1", min.	2L+ (-0,8 V)
Output current	
for signal "1" rated value	0.5 A
for signal "1" permissible range, max.	0.5 A
for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
● "0" to "1", max.	50 μs; at rated load
● "1" to "0", max.	100 μs; at rated load
Parallel switching of two outputs	
• for uprating	No
for redundant control of a load	Yes
Switching frequency	
with resistive load, max.	100 Hz
with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	4.0
Current per module, max. Cable largeth	4 A
Cable length	20
unshielded, max. Interfaces	30 m
Interfaces	4
Number of PROFINET interfaces	1
1. Interface	DDOCINET 400 MAN CHAIL A MOODAGE TVO
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	Voc. 2v M2. 4 pip. D coded
M12 port	Yes; 2x M12, 4-pin, D-coded
Number of ports integrated quiteb	2 Voa
• integrated switch	Yes
Protocols	Von
PROFINET IO Device Open IF communication	Yes
Open IE communication Interface types	Yes
Interface types	
M12 port	Vac
Autorossing	Yes
Autocrossing Transmission rate, may	Yes
Transmission rate, max. Protocols	100 Mbit/s
	Voc
Supports protocol for PROFINET IO	Yes
PROFIsafe EtherNet/ID	No You
EtherNet/IP Medibus TCP	Yes
Modbus TCP	Yes
PROFINET IO Device	

Services		
— Picoritzed startup Yes — Shared divicio Yes — Number of IO Controllers with shared device, mix. 2 Restandancy modes — on S7-150/0RH Yes — on S7-150/0RH Yes — on S7-400H Yes — PROFINET system redundancy (R1) No — HASyno Avadraing Yes — MRP Yes — MRP Yes — MRP Yes — CIP Implicit Messaging Yes — CIP Implicit Messaging Yes — CIP Safety No — Shared device Yes — Shared device Yes — Number of scanners with shared device, max 2 — Updating sizes — Requested Packet Interval (RPI) 2 ms Redundency mode — DLR (Device Level Ring) No Address acea per module, max 20 byte — Large-Forward/Cyen (Class3) No Modulus TCP Yes — read discrete inputs (code=2) Yes — write multiple codes (code=3) Yes — write multi	Services	
Shared device New		
Number of IO Controllers with shared device, max.	·	
PROFINET system redundancy (S2)	 Shared device 	Yes
PROCRINET system redundancy (S2)	Number of IO Controllers with shared device, max.	2
on S7-1900PH on S7-1900PH on S7-400PH PROFINET system redundancy (R1) PROFINET system redundancy (R1) PROFINET system redundancy (R1) HIS-ync forwarding MIRP MIRP MIRP MIRP MIRP STANCES CIP Proplicit Messaging CIP Explicit Messaging CIP Explicit Messaging CIP Explicit Messaging CIP Safety No No No Starter device Number of scames with shared device, max Starter device Number of scames with shared device, max Requested Packet Interval (RPI) Read-undancy mode DLR (Device Level Ring) Address space per module, max Address space per station read discrete inputs (code=2) read discrete inputs (code=2) read discrete inputs (code=2) write single coil (code=5) write single coil (code=5) write fulliple coils (code=15) Write Multiple Registers (Code=16) Address space per station Address space per stat	Redundancy mode	
— PROFINET system redundancy (R1)	 PROFINET system redundancy (S2) 	Yes
	— on S7-1500R/H	Yes
Media redundancy	— on S7-400H	Yes
Media redundancy	 PROFINET system redundancy (R1) 	No
MRP	H-Sync forwarding	Yes
Services	Media redundancy	
Services	— MRP	Yes
CIP Implicit Messaging	EtherNet/IP	
	Services	
CIP Safety Shared device Requested Packet Interval (RPI) Redundancy mode OLR (Device Level Ring) Address space per module, max Large Forward Open (ClassS) No Modbus TDP Services read colis (code=1) read disis (code=1) Read Holding Registers (Code=3) write multiple coils (code=15) write multiple coils (code=15) write multiple coils (code=16) Parameter change by master No Modbus TDP Security Protocol Address space per station Address spa	— CIP Implicit Messaging	Yes
Shared device 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. 20 byte LargeForwardOpen (Class3) No Modus TGP Services read coils (code=1) Yes read discrete inputs (code=2) Yes read discrete inputs (code=3) Yes write single coil (code=65) Yes write multiple coils (code=16) Yes write multiple coils (code=16) Yes Parameter change by master No Address space per station Modus TGP Search Code=16) No Address space per station Address space per station max. 20 byte Address space per station Number of connections per slave Popen I Connections Number of connections per slave Popen I Connections Number of connections per slave Number of connections per slave Yes Number of connections per slave Yes Access consistency Yes	— CIP Explicit Messaging	Yes
Shared device 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. 20 byte LargeForwardOpen (Class3) No Modus TGP Services read coils (code=1) Yes read discrete inputs (code=2) Yes read discrete inputs (code=3) Yes write single coil (code=65) Yes write multiple coils (code=16) Yes write multiple coils (code=16) Yes Parameter change by master No Address space per station Modus TGP Search Code=16) No Address space per station Address space per station max. 20 byte Address space per station Number of connections per slave Popen I Connections Number of connections per slave Popen I Connections Number of connections per slave Number of connections per slave Yes Number of connections per slave Yes Access consistency Yes	— CIP Safety	No
— Number of scanners with shared device, max. 2		Yes; 2x EtherNet/IP Scanner
Updating times	 Number of scanners with shared device, max. 	
Redundancy mode		
Redundancy mode		2 ms
DLR (Device Level Ring)		
Address area	•	No
	in the second	
— LargeForwardOpen (Class3) No Modbus TCP Services — 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 No — Address space per station, max. 20 byte — Access-consistent address space 2 byte Updating time 2 ms — I/O request interval 2 ms Connections 12 — Number of connections per slave 12 Open IE communication Yes: (only EtherNet/IP or Modbus TCP) • SNMP Yes • LDP Yes • ARP Yes Isochronous mode 250 μs Equidistance Yes shortest lock pulse 250 μs max. cycle 4 ms		20 byte
Modbus TCP Services		
Services		
- read coils (code=1) Yes - read discrete inputs (code=2) Yes - Read Holding Registers (Code=3) Yes - write multiple coils (code=15) Yes - write multiple coils (code=15) Yes - write multiple coils (code=16) Yes - write Multiple Registers (Code=16) 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. 20 byte - Access-consistent address space 2 byte - Updating time - I/O request interval 2 ms - Number of connections per slave - Number of connections per slave - Ves: (only EtherNet/IP or Modbus TCP) - SNMP - SNMP - SNMP - Yes - ARP - Yes - Sochronous mode - Equidistance - Shortest clock pulse - shortest clock pulse - max. 10 μs - Interrupts/diagnostics/status information - Ves: Parameterizable - Namiter and Press Parameterizable - Namiter and Press Parameterizable - Namiter and Press Parameterizable - Maintenance interrupt - Yes; Parameterizable - Maintenance interrupt - Yes; Parameterizable - Diagnosses		
read discrete inputs (code=2) Read Holding Registers (Code=3) write single coil (code=15) write multiple coils (code=15) Wres write multiple coils (code=16) Parameter change by master Modbus TCP Security Protocol Address space per station Address space per station Address space per station Address-consistent address space Updating time - I/O request interval Open IE communication TCP/IP SNMP SNMP ARP Yes LLDP ARP Yes Shortest clock pulse Equidistance Yes Shortest clock pulse Equidistance Yes Shortest clock pulse max. cycle Jaims Diagnostics latim Plagnostic alarm Plagnostics Plagnostics Pes Parameterizable Piss Parameterizable Diagnoses		Yes
- Read Holding Registers (Code=3) - write single coll (code=5) - write multiple coils (code=15) - write Multiple Registers (Code=16) - Parameter change by master - Modbus TCP Security Protocol No Address space per station - Address space per station, max Access-consistent address space 2 byte Updating time - I/O request interval Connections - Number of connections per slave 12 Open IE communication • TCP/IP		
— 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. 20 byte — Access-consistent address space 2 byte Updating time — I/O request interval 2 ms Connections — Number of connections per slave 12 Open IE communication 12 • TCP/IP Yes; (only EtherNet/IP or Modbus TCP) • SNMP Yes • LLDP Yes • ARP Yes Isochronous mode Yes Equidistance Yes shortest clock pulse 250 μs max. cycle 4 ms uitter, max. 10 μs Interrupts/diagnostics/status information Yes Substitute values connectable Yes • Diagnostic alarm Yes; Parameterizable • Diagnostics alarm Yes; Parameterizable Diagnosti	. , ,	
- 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 - Access-consistent address space 2 byte Updating time - I/O request interval 2 ms Connections - Number of connections per slave 12 Open IE communication • TCP/IP Yes; (only EtherNet/IP or Modbus TCP) • SNMP Yes • LLDP Yes • ARP Yes Isochronous mode Equidistance Yes shortest clock pulse 250 µs max. cycle 4 ms Jitter, max. 10 µs Interrupts/diagnostics/status information Ves; Parameterizable • Maintenance interrupt • Maintenance interrupt • Maintenance interrupt Diagnoses		
- Write Multiple Registers (Code=16) - Parameter change by master - Modbus TCP Security Protocol No Address space per station - Address space per station, max Access-consistent address space 2 byte Updating time - I/O request interval Connections - Number of connections per slave 12 Open IE communication **TCP/IP** **SNMP** **LLDP** **SNMP** **LLDP** **ARP** **Pes* Isochronous mode Equidistance Yes shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Yes; Parameterizable Diagnosses 10 Ves; Varameterizable Diagnosses		
Parameter change by master Modbus TCP Security Protocol Address space per station Address space per station, max Access-consistent address space Updating time I/O request interval Number of connections per slave Open IE communication TCP/I/P SNMP Yes ARP ARP Yes ARP ARP Yes ARP		
- Modbus TCP Security Protocol Address space per station - Address space per station, max Address space per station, max Address space per station, max. 20 byte Updating time - I/O request interval 2 ms Connections - Number of connections per slave 12 Open IE communication • TCP/IP • SMMP • LLDP • SMMP • LLDP • ARP • LLDP • ARP Isochronous mode Equidistance Shortest clock pulse max. cycle Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable • Diagnostic alarm • Diagnostic clarm • Maintenance interrupt Diagnoses		
Address space per station		
- Address space per station, max Access-consistent address space Updating time - I/O request interval - Number of connections per slave 12 Open IE communication • ΤCP/I/P • SNMP • SNMP • LLDP • ARP LLDP • ARP Isochronous mode Equidistance Shortest clock pulse max. cycle Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnosses Diagnoses	·	NO
	·	20 hyta
Updating time - I/O request interval 2 ms Connections - Number of connections per slave 12 Open IE communication • TCP/IP • SNMP Yes; (only EtherNet/IP or Modbus TCP) • SNMP Yes • LLDP Yes • LLDP Yes • ARP Yes Isochronous mode Equidistance shortest clock pulse 250 µs max. cycle 4 ms Jitter, max. 10 µs Interrupts/diagnostics/status information Substitute values connectable Yes Alarms • Diagnostic alarm Yes; Parameterizable • Maintenance interrupt Diagnoses	·	
- I/O request interval 2 ms Connections - Number of connections per slave 12 Open IE communication • TCP/IP Yes; (only EtherNet/IP or Modbus TCP) • SNMP Yes • LLDP Yes • ARP Yes Isochronous mode Equidistance Yes shortest clock pulse 250 μs max. cycle 4 ms Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Yes Alarms • Diagnostic alarm Yes; Parameterizable Diagnoses		2 byte
Connections Number of connections per slave Open IE communication • TCP/IP • SNMP • SNMP • LLDP • ARP Isochronous mode Equidistance Equidistance Shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses 12 25 Yes; (only EtherNet/IP or Modbus TCP) Yes Yes Yes Yes Yes Yes Yes Ye		2 mc
- Number of connections per slave Open IE communication • TCP/IP • SNMP • SNMP • LLDP • ARP Isochronous mode Equidistance Equidistance Yes shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses 12 Yes; (only EtherNet/IP or Modbus TCP) Yes; (only EtherNet/IP or Modbus TCP) Yes Yes Yes 4 ms 15 10 μs Yes Parameterizable Yes Parameterizable Yes; Parameterizable Diagnoses		2 1115
Open IE communication • TCP/IP • SNMP • SNMP • LLDP • LLDP • ARP Isochronous mode Equidistance shortest clock pulse max. cycle Jitter, max. Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses		40
TCP/IP SNMP Yes LLDP Yes ARP Yes Isochronous mode Equidistance Equidistance Shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms Diagnostic alarm Maintenance interrupt Diagnoses Yes; (only EtherNet/IP or Modbus TCP) Yes Yes Yes Yes Yes Parameterizable Yes Parameterizable Parameterizable Diagnoses		12
• SNMP • LLDP • ARP • ARP • Yes Isochronous mode Equidistance Equidistance shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses	·	Voc. (only Ethanlot/ID or Mr. II TOD)
LLDP		
● ARP Isochronous mode Equidistance Shortest clock pulse max. cycle Jitter, max. Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms ● Diagnostic alarm ● Maintenance interrupt Diagnoses		
Equidistance Equidistance Shortest clock pulse max. cycle Jitter, max. Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses		
Equidistance shortest clock pulse max. cycle Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses		Yes
shortest clock pulse max. cycle Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses		
max. cycle Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm • Maintenance interrupt Diagnoses 4 ms 10 μs Yes Yes Yes Yes Parameterizable Yes; Parameterizable Yes; Parameterizable	· · · · · · · · · · · · · · · · · · ·	
Jitter, max. 10 μs Interrupts/diagnostics/status information Substitute values connectable Yes Alarms • Diagnostic alarm Yes; Parameterizable • Maintenance interrupt Yes; Parameterizable Diagnoses		
Interrupts/diagnostics/status information Substitute values connectable Yes Alarms • Diagnostic alarm Yes; Parameterizable • Maintenance interrupt Yes; Parameterizable Diagnoses		
Substitute values connectable Alarms Diagnostic alarm Maintenance interrupt Ves; Parameterizable Yes; Parameterizable Yes; Parameterizable		10 µs
Alarms	Interrupts/diagnostics/status information	
 Diagnostic alarm Maintenance interrupt Diagnoses Yes; Parameterizable Yes; Parameterizable 	Substitute values connectable	Yes
Maintenance interrupt Yes; Parameterizable Diagnoses	Alarms	
Diagnoses	Diagnostic alarm	Yes; Parameterizable
·	Maintenance interrupt	Yes; Parameterizable
Diagnostic information readable Yes	Diagnoses	
	Diagnostic information readable	Yes

 Monitoring the supply voltage 	Yes
— parameterizable	Yes
Wire-break	Yes
Short-circuit	Yes; Outputs to M; channel by channel
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 LED
 Channel status display 	Yes; green LED
 for channel diagnostics 	Yes; red LED
 For load voltage monitoring 	Yes; green 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 FS02
Highest safety class achievable for safety-related tripping of stan	dard modules
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
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
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	, , , , , , , , , , , , , , , , , , , ,
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	70 Hilli
	780 a
Weight, approx.	780 g
last modified:	9/22/2022 [4

last modified: 9/22/2022 [2]