DATASHEET - EASY-E4-DC-12TC1P



Control relays, Expandable, networkable (Ethernet), 24 V DC, Digital: 8, of which can be used as analog: 4, Quantity of outputs: Transistor: 4, Push-in terminals

Powering Business Worldwide

Part no. EASY-E4-DC-12TC1P
Catalog No. 197506

Delivery program

Basic function			easyE4 base device
Description			Electronic control relay Rated operating voltage 24V DC 8 digital inputs for 24 VDC of these, 4 inputs can also be used as analog inputs and 4 inputs as fast counters 4 transistor outputs for 24 VDC with display Real-time clock with Ethernet interface Expandable with the easyE4 series of digital input/output expansions with easy-E4-CONNECT1 connector (Item Y7-197225) Expandable with communications modules EASY-COM-... Push in terminals
Inputs			
Digital			8
of which can be used as analog			4
Outputs			
Quantity of outputs			Transistor: 4
Additional features			
Real time clock			#
Display & keypad			#
Expansions			Expandable networkable (Ethernet)
Supply voltage			24 V DC
Software			EASYSOFT-SWLIC/easySoft 7
Connection type			Push-in terminals

Technical data

General

Standards			EN 61000-6-2 EN 61000-6-3 IEC 60068-2-6 IEC 60068-2-27 IEC 60068-2-30 IEC/EN 61131-2 EN 61010 EN 50178
Approvals			
Approvals			cULus
certificate			CE
shipping classification			DNV GL
			DNV·GL
Dimensions (W x H x D)		mm	71.5 x 90 x 58
Weight		kg	0.162
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories)
Connection type			Push-in terminals
Ethernet			
Connections			RJ45 plug, 8-pin
Cable			CAT5

Terminal capacities

Push-in terminals			
Solid		mm^2	0.2 - 2.5
flexible		mm^2	0.2 - 2.5
Solid or flexible conductor, with ferrule		mm^2	0,25 - 1,5
Solid or stranded		AWG	24 - 14
Standard screwdriver		mm	0.4 x 2.5
Stripping length		mm	8

Display

Display - Type			Monochrome
Lines x characters			6 x 16

Climatic environmental conditions

Operating ambient temperature		°C	-25 to 55, cold as per IEC 60068-2-1, heat as per IEC 60068-2-2
Condensation			Take appropriate measures to prevent condensation
LCD display (clearly legible)		°C	0 - 55
Storage	ϑ	°C	-40 - +70
relative humidity		%	in accordance with IEC 60068-2-30, IEC 60068-2-78 5 - 95
Air pressure (operation)		hPa	795 - 1080

Ambient conditions, mechanical

Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Vibrations		Hz	In accordance with IEC 60068-2-6 constant amplitude 0.15 mm: 10 - 57 constant acceleration 2 g: 57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Impacts	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3
Mounting position			Vertical or horizontal

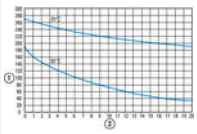
Electromagnetic compatibility (EMC)

Overvoltage category/pollution degree			III/2
Electrostatic discharge (ESD)			
applied standard			nach IEC/EN 61000-4-2
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI) to IEC EN 61000-4-3		V/m	0.08 - 1.0 GHz: 10 1.4 - 2 GHz: 3 2.0 - 2.7 GHz: 1
Radio interference suppression			EN 61000-6-3 Class B
Burst		kV	according to IEC/EN 61000-4-4 Supply cables: 2 Signal cables: 2
power pulses (Surge)			according to IEC/EN 61000-4-5 0.5 kV (supply cables, symmetrical) 1 kV (supply cables, asymmetrical)
Immunity to line-conducted interference to (IEC/EN 61000-4-6)		V	10

Insulation resistance

Clearance in air and creepage distances			nach EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201
Insulation resistance			per EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201

Back-up of real-time clock

Back-up of real-time clock			
			① Backup time (hours) with fully charged double layer capacitor ② Service life (years)
Accuracy of the real-time clock		s/day	typ. ± 2 (± 0.2 h/Year)
			depending on ambient air temperature fluctuations of up to ± 5 s/day (± 0.5 h/year) are possible

Repetition accuracy of timing relays

Accuracy of timing relays (of values)		%	± 0.02
Resolution			

Range “S”		ms	5
Range “M:S”		s	1
Range “H:M”		min	1

Power supply

Rated operational voltage	U_e	V	24 DC (-15/+20%)
Permissible range	U_e		20.4 - 28.8 V DC
Residual ripple		%	≦ 5
Protection against polarity reversal			yes
Input current			max. 80 mA at Ue
Voltage dips		ms	≤ 10
Fuse		A	≧ 1A (T)
Power loss	P	W	Normally 2
Heat dissipation at 24 V DC		W	2

Digital inputs 24 V DC

Number			8
Inputs can be used as analog inputs			4 (I5, I6, I7, I8)
Status Display			LCD-Display
Potential isolation			from power supply: no to the memory card: no to Ethernet: yes between inputs: no from the outputs: yes to expansion devices: yes
Rated operational voltage	U_e	V DC	24
Input voltage		V DC	Signal 0: ≦ 5 (I1 - I8) Condition 1: ≧ 15 (I1 - I8)
Input current at signal 1		mA	3.3 (I1 – I4) 1.8 (I5 – I8)
Deceleration time		ms	20 (0 -> 1/1 -> 0, Debounce ON) type 0.015 (0 -> 1/1 -> 0, Debounce OFF)
Cable length		m	100 (unshielded)
Frequency counter			
Number			4 (I1, I2, I3, I4)
Counter frequency		kHz	≦ 5
Pulse shape			Square
Pulse pause ratio			1:1
Cable length		m	≦ 20 (screened)
Incremental counter			
Number of counter inputs			2 (I1 + I2, I3 + I4)
Value range			-2147483648 to +2147483647
Counter frequency		kHz	≦ 5
Pulse shape			Square
Signal offset			90°
Pulse pause ratio			1:1
Cable length		m	≦ 20 (screened)
Rapid counter inputs			
Number			4 (I1, I2, I3, I4)
Value range			-2147483648 to +2147483647
Counter frequency		kHz	≦ 10
Pulse shape			Square
Pulse pause ratio			1:1
Cable length		m	≦ 20 (screened)

Analog inputs

Number			4 (I5, I6, I7, I8)
Potential isolation			from power supply: no to the memory card: no to Ethernet: yes between inputs: no from the outputs: yes to expansion devices: yes
Input type			DC voltage

Signal range			0-10 V DC
Resolution			12 Bit (value 0 - 4095)
Input impedance		kΩ	13.3
Accuracy of actual value			
two devices from series		%	± 3 , ± 0.12 V
Within a single device		%	± 2, ± 0.12 V
Conversion time, analog/digital		ms	each CPU cycle
Input current		mA	< 1
Cable length		m	≦ 30, screened

Transistor outputs

Number			4
Rated operational voltage	U_e	V DC	24
Permissible range	U_e		20.4 - 28.8 V DC
Residual ripple		%	5
Supply current		mA	Norm./max. 15
Protection against polarity reversal			Yes (Caution: A short circuit will occur if a supply voltage of the wrong polarity is applied to the outputs.)
Potential isolation			from power supply: yes to the memory card: yes to Ethernet: yes From the inputs: yes to control buttons: yes between the outputs: no to expansion devices: yes
Rated operational current at signal „1" DC per channel	I_e	A	Max. 0.5
Residual current on 0 signal per channel		mA	< 0.005
Max. output voltage		V	1 (at status 0 per channel) $U = U_e$ - 1 V (signal 1 at I_e = 0.5 A)
Short-circuit protection			yes, electronic (Q1 - Q4)
Short-circuit tripping current for R_a ≦ 10 mΩ		A	0.7 ≦ I_e ≦ 1.7 per output depending on number of active channels and their load
Total short-circuit current		A	6.8
Thermal cutout			Yes
Max. operating frequency with constant resistive load		Operations/h	abhängig von der Zykluszeit des Basisgeräts und bei Erweiterungsgeräten auch von deren Übertragungszeit
Parallel connection of outputs			
With resistive load, inductive load with external suppressor circuit, combination within a group			Group 1: Q1 to Q4
Number of outputs	max.		4
Max. total current		A	2
Output status indication			LCD-display
Inductive load to EN 60947-5-1			
Without external suppressor circuit			
DC-13, $T_{0.95}$ = 72 ms, R = 48 Ω, L = 1.15 H			
Utilization factor		g	0.25
Duty factor		% DF	100
$T_{0.95}$ = 15 ms, R = 48 Ω, L = 0.24 H			
Utilization factor		g	0.25
Duty factor		% DF	100
With external suppressor circuit			
Utilization factor		g	1
Duty factor		% DF	100
Max. switching frequency, max. duty factor		Operations	Depending on the suppressor circuit

Ethernet

Data transfer rate		Mbit/s	10/100
Connections			RJ45 plug, 8-pin
Cable			CAT5

Design verification as per IEC/EN 61439

Technical data for design verification			

Static heat dissipation, non-current-dependent	P_{vs}	W	2
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	55
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures			Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat			Meets the product standard's requirements.
10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects			Meets the product standard's requirements.
10.2.4 Resistance to ultra-violet (UV) radiation			Meets the product standard's requirements.
10.2.5 Lifting			Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 Mechanical impact			Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 Inscriptions			Meets the product standard's requirements.
10.3 Degree of protection of ASSEMBLIES			Meets the product standard's requirements.
10.4 Clearances and creepage distances			Meets the product standard's requirements.
10.5 Protection against electric shock			Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation of switching devices and components			Does not apply, since the entire switchgear needs to be evaluated.
10.7 Internal electrical circuits and connections			Is the panel builder's responsibility.
10.8 Connections for external conductors			Is the panel builder's responsibility.
10.9 Insulation properties			
10.9.2 Power-frequency electric strength			Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage			Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material			Is the panel builder's responsibility.
10.10 Temperature rise			The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating			Is the panel builder's responsibility.
10.12 Electromagnetic compatibility			Is the panel builder's responsibility.
10.13 Mechanical function			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Technical data ETIM 7.0

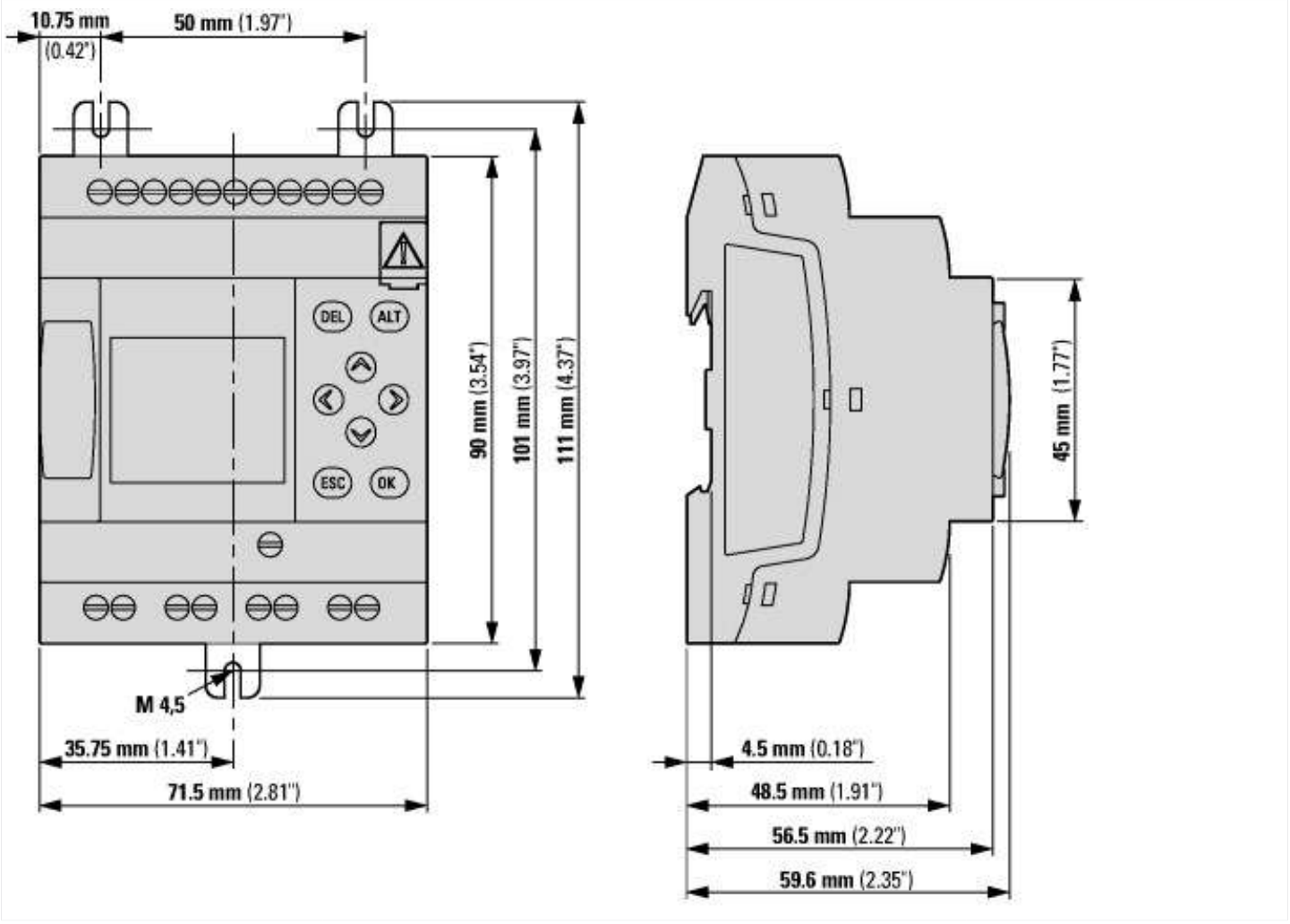
PLC's (EG000024) / Logic module (EC001417)			
Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / Logic module (ecl@ss10.0.1-27-24-22-16 [AKE539014])			
Supply voltage AC 50 Hz		V	0 - 0
Supply voltage AC 60 Hz		V	0 - 0
Supply voltage DC		V	20.4 - 28.8
Voltage type of supply voltage			DC
Switching current		A	0.5
Number of analogue inputs			0
Number of analogue outputs			0
Number of digital inputs			8
Number of digital outputs			4
With relay output			No
Number of HW-interfaces industrial Ethernet			1
Number of interfaces PROFINET			0
Number of HW-interfaces RS-232			0
Number of HW-interfaces RS-422			0
Number of HW-interfaces RS-485			0
Number of HW-interfaces serial TTY			0
Number of HW-interfaces USB			0
Number of HW-interfaces parallel			0
Number of HW-interfaces Wireless			0
Number of HW-interfaces other			1
With optical interface			No
Supporting protocol for TCP/IP			Yes

Supporting protocol for PROFIBUS		No
Supporting protocol for CAN		No
Supporting protocol for INTERBUS		No
Supporting protocol for ASI		No
Supporting protocol for KNX		No
Supporting protocol for MODBUS		Yes
Supporting protocol for Data-Highway		No
Supporting protocol for DeviceNet		No
Supporting protocol for SUCONET		No
Supporting protocol for LON		No
Supporting protocol for PROFINET IO		No
Supporting protocol for PROFINET CBA		No
Supporting protocol for SERCOS		No
Supporting protocol for Foundation Fieldbus		No
Supporting protocol for EtherNet/IP		No
Supporting protocol for AS-Interface Safety at Work		No
Supporting protocol for DeviceNet Safety		No
Supporting protocol for INTERBUS-Safety		No
Supporting protocol for PROFIsafe		No
Supporting protocol for SafetyBUS p		No
Supporting protocol for other bus systems		No
Radio standard Bluetooth		No
Radio standard WLAN 802.11		No
Radio standard GPRS		No
Radio standard GSM		No
Radio standard UMTS		No
IO link master		No
Redundancy		No
With display		Yes
Degree of protection (IP)		IP20
Basic device		Yes
Expandable		Yes
Expansion device		No
With timer		Yes
Rail mounting possible		Yes
Wall mounting/direct mounting		Yes
Front build in possible		Yes
Rack-assembly possible		No
Suitable for safety functions		No
Category according to EN 954-1		None
SIL according to IEC 61508		None
Performance level acc. EN ISO 13849-1		None
Appendant operation agent (Ex ia)		No
Appendant operation agent (Ex ib)		No
Explosion safety category for gas		None
Explosion safety category for dust		None
Width	mm	71.5
Height	mm	90
Depth	mm	58

Approvals

UL File No.		E205091
UL Category Control No.		NRAQ/7
North America Certification		UL listed
Degree of Protection		IEC: IP20, UL/CSA Type: -

Dimensions



Additional product information (links)

f1=1454&f2=1174&f3=1755;Download Software easySoft V7	http://applications.eaton.eu/sdlc?LX=11&amp
Product overview (WEB)	http://www.eaton.eu/easyE4

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