DATASHEET - EASY-E4-DC-12TC1

Control relays easyE4 with display (expandable, Ethernet), 24 V DC, Inputs Digital: 8, of which can be used as analog: 4, screw terminal

Powering Business Worldwide

Part no.	**EASY-E4-DC-12TC1**
	197213
EL Number (Norway)	**4500548**

General specifications

Product name	Eaton Moeller® series EASY Control relay
Part no.	EASY-E4-DC-12TC1
EAN	4015081939466
Product Length/Depth	58 millimetre
Product height	90 millimetre
Product width	72 millimetre
Product weight	0.2 kilogram
Certifications	IEC/EN 61000-6-2 IEC 60068-2-6 IEC 60068-2-27 IEC/EN 61000-6-3 CULus per UL 61010 CSA-C22.2 No. 61010 EN 61010 IEC 60068-2-30 IEC/EN 61000-4-2 IEC/EN 61131-2 EN 50178 UL File No.: E205091 DNV GL UL Category Control No.: NRAQ, NRAQ7 CE UL Listed UL hazardous location division 2 UL hazardous location class I UL hazardous location group A (acetylene) UL hazardous location group D (propane) UL hazardous location group B (hydrogen) UL hazardous location group C (ethylene)
Product Tradename	EASY
Product Type	Control relay
Product Sub Type	None
Catalog Notes	Accuracy of the real-time clock depending on ambient air temperature - fluctuations of up to ± 5 s/day (± 0.5 h/year) are possible

Features & Functions

Features	Parallel connection of transistor outputs with resistive load, inductive load with external suppressor circuit, combination within a group - Group 1: Q1 to Q4 Networkable (Ethernet) Expandable Display indication of 6 lines x 16 characters
Fitted with:	Keypad Display Real time clock Timer
Functions	Thermal cutout
Indication	LCD-display used as Output status indication of Transistor outputs LCD-display used as status indication of Digital inputs 24 V DC

General information

Degree of protection	IP20
Display temperature - min	0 °C
Display temperature - max	55 °C
Display type	Monochrome
Duty factor	100 % (Inductive load to EN 60947-5-1, With external suppressor circuit) 100 % (Inductive load to EN 60947-5-1, Without external suppressor circuit, T0.95 = 15 ms, R = 48 Ω, L = 0.24 H) 100 % (Inductive load to EN 60947-5-1, Without external suppressor circuit, DC-13, T0.95 = 72 ms, R = 48 Ω, L = 1.15 H)
Frequency counter	Cable length: ≤ 20 m (screened, Digital inputs 24 V DC) Number: 4 (I1, I2, I3, I4 - Digital inputs 24 V DC) Pulse pause ratio: 1:1 (Digital inputs 24 V DC) Pulse shape: Square (digital inputs 24 V DC)

	Counter frequency: 5 kHz (Digital inputs 24 V DC)
Insulation resistance	According to EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201
Mounting method	Screw fixing using fixing brackets ZB4-101-GF1 (accessories) Top-hat rail fixing (according to IEC/EN 60715, 35 mm) Front build in possible Wall mounting/direct mounting Rail mounting possible
Operating frequency	Dependent on the cycle time of the basic device Dependent on the cycle- and transmission-time of the expansion devices Depending on the suppressor circuit (Inductive load to EN 60947-5-1, With external suppressor circuit, Max. switching frequency, max. duty factor)
Overvoltage category	III
Pollution degree	2
Product category	Control relays easyE4
Protocol	TCP/IP MODBUS
Residual current	0.1 mA (on signal "1" per channel)
Residual ripple	5 % (transistor outputs) ≤ 5 %
Resolution	1 min (Range H:M) 1 s (Range M:S) 12 Bit (value 0 - 4095, Analog inputs) 5 ms (Range S)
Software	EASYSOFT-SWLIC/easySoft7
Type	easyE4 base device
Used with	easyE4
Voltage type	DC

Ambient conditions, mechanical

Drop and topple	50 mm Drop height, Drop to IEC/EN 60068-2-31
Height of fall (IEC/EN 60068-2-32) - max	0.3 m
Mounting position	Vertical Horizontal
Shock resistance	15 g, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 11 ms, 18 Impacts
Vibration resistance	10 - 57 Hz, 0.15 mm constant amplitude 57 - 150 Hz, 2 g constant acceleration According to IEC/EN 60068-2-6

Climatic environmental conditions

Air pressure	795 - 1080 hPa (operation)
Ambient operating temperature - min	-25 °C
Ambient operating temperature - max	55 °C
Ambient storage temperature - min	-40 °C
Ambient storage temperature - max	70 °C
Environmental conditions	Condensation: prevent with appropriate measures Clearance in air and creepage distances according to EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201
Relative humidity	5 - 95 % (IEC 60068-2-30, IEC 60068-2-78)

Electro magnetic compatibility

Air discharge	8 kV
Burst impulse	According to IEC/EN 61000-4-4 2 kV, Supply cable 2 kV, Signal cable
Contact discharge	6 kV
Electromagnetic fields	3 V/m at 1.4 - 2 GHz (according to IEC EN 61000-4-3) 10 V/m at 0.8 - 1.0 GHz (according to IEC EN 61000-4-3) 1 V/m at 2.0 - 2.7 GHz (according to IEC EN 61000-4-3)
Immunity to line-conducted interference	10 V (according to IEC/EN 61000-4-6)
Radio interference class	Class B (EN 61000-6-3)
Surge rating	0.5 kV, Supply cables, symmetrical, power pulses (Surge), EMC According to IEC/EN 61000-4-5, power pulses (Surge), EMC 1 kV, Supply cables, asymmetrical, power pulses (Surge), EMC
Voltage dips	20 ms ≤ 10 ms, Bridging voltage dips

Terminal capacities

Terminal capacity	0.2 - 4 mm^2 (AWG 22 - 12), solid 0.2 - 2.5 mm^2 (22 - 12 AWG), flexible with ferrule

Screwdriver size	3.5 x 0.8 mm, Terminal screw
Tightening torque	0.6 Nm, Screw terminals
Electrical rating	
Conventional thermal current ith of auxiliary contacts (1-pole, open)	0.5 A
Heat dissipation	3.4 W (at 24 V DC)
Inrush current	12.5 A (for 6 ms)
Power consumption	2 W
Power loss	2 W
Rated operational current (Ie)	Max. 0.5 A at signal „1" DC per channel
Rated operational voltage	24 V DC (-15 %/+ 20 % - power supply) 24 V DC (transistor outputs) 20.4 - 28.8 V DC (Transistor outputs) 24 V DC (digital inputs) 20.4 - 28.8 V DC
Supply current	24/44 mA, Normally/max., On 1 signal, Transistor outputs 18/32 mA, Normally/max., On 0 signal, Transistor outputs
Supply voltage at AC, 50 Hz - min	0 V AC
Supply voltage at AC, 50 Hz - max	0 V AC
Supply voltage at DC - min	20.4 V DC
Supply voltage at DC - max	28.8 V DC
Short-circuit rating	
Short-circuit current	6.8 A, Transistor outputs
Short-circuit protection	≥ 1A (T), Fuse, Power supply Yes, electronic (Q1 - Q4), Transistor outputs
Short-circuit tripping current	0.7 ≤ Ie ≤ 1.7 per output, For Ra ≤ 10 mΩ, Depending on number of active channels and their load, Transistor outputs
Communication	
Connection type	Screw terminal Ethernet: RJ45 plug, 8-pole
Data transfer rate	10/100 MBit/s
Cable	
Cable length	≤ 30 m, screened, Analog inputs 100 m, unscreened, Digital inputs 24 V DC
Cable type	CAT5
Input/Output	
Accuracy	± 2 %, (I7, I8) ± 0.12 V, of actual value, within a single device (Analog Inputs) ± 3 %, of actual value, two easy devices (Analog Inputs) ± 2 s/day, Real-time clock to inputs (± 0.2 h/Year) ± 1 %, Repetition accuracy of timing relays (of values)
Conversions	Each CPU cycle, Analog inputs
Delay time	0.015 ms typ., Digital inputs 24 V DC (I1 - I8), Delay time from 1 to 0, Debounce OFF 20 ms typ., Digital inputs 24 V DC (I1 - I8), Delay time from 1 to 0, Debounce ON 0.015 ms typ., Digital inputs 24 V DC (I1 - I8), Delay time from 0 to 1, Debounce OFF 20 ms typ., Digital inputs 24 V DC (I1 - I8), Delay time from 0 to 1, Debounce ON
Incremental counter	Pulse pause ratio: 1:1 Pulse shape: Square Value range: -2147483648 to +2147483647 Number of counter inputs: 2 (I1 + I2, I3 + I4) Signal offset: 90° Counter frequency: ≤ 5 kHz
Incremental encoder	Cable length: ≤ 20 m (screened)
Input	Voltage (DC)
Input current	1 mA (Analog inputs) 3.3 mA (I1 - I4, at 24 V DC, at signal 1) 2.2 mA (I5 - I8, at 24 V DC, at signal 1) 80 mA
Input impedance	13.3 kΩ
Input voltage	Status 0: ≤ 15 V DC (I1 - I4, Digital inputs, 24 V DC) Status 0: ≤ 8 V DC (I5 - I8, Digital inputs, 24 V DC) Status 1: ≥ 15 V DC (I1 - I4, Digital inputs, 24 V DC) Signal 0: ≤ 5 V DC (I1 - I8, Digital inputs, 24 V DC)
Lamp load	Max. 3 W (without Rv per channel)
Number of inputs (analog)	0 4
Number of inputs (digital)	8
Number of outputs (analog)	0

Number of outputs (digital)	4
Output	Parallel connection of max. 4 Transistor outputs 2 A, Max. total current, Outputs 4 Transistor Outputs Voltage Current
Output voltage	U = U# - 1 V (signal 1 at I# = 0.5 A, transistor outputs) Max. 2.5 V (at status 0 per channel, transistor outputs)
Rapid counter inputs	1:1 (Pulse pause ratio) 10 kHz, Counter frequency ≤ 20 m (cable length, screened) -2147483648 - 2147483647 (value range) Square (pulse shape) Number: 4 (I1, I2, I3, I4 - Digital inputs 24 V DC)
Signal range	0 - 10 V DC, Analog inputs
Utilization factor	0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, DC-13, T0.95 = 72 ms, R = 48 Ω, L = 1.15 H) 0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, T0.95 = 15 ms, R = 48 Ω, L = 0.24 H) 1 (Inductive load to EN 60947-5-1, With external suppressor circuit)

Safety

Explosion safety category for gas	None
Potential isolation	Between Transistor outputs and Ethernet: yes Between Digital inputs 24 V DC and Ethernet: yes Between Transistor outputs and control buttons: yes Between Transistor outputs and Power supply: yes Between Analog inputs and Outputs: yes Between Transistor outputs and expansion devices: yes Between Digital inputs 24 V DC and expansion devices: yes Between Analog inputs and expansion devices: yes Between Digital inputs 24 V DC: no Between Transistor outputs and Inputs: yes Between Transistor outputs: no Between Digital inputs 24 V DC and Power supply: no Between Analog inputs: no Between Analog inputs and Memory card: no Between Transistor outputs and Memory card: yes Between Digital inputs 24 V DC and Outputs: yes Between Analog inputs and Ethernet: yes Between Digital inputs 24 V DC and Memory card: no Between Analog inputs and Power supply: no
Protection against polarity reversal	For transistor outputs (Caution: A short circuit will result if 0 V/earth is applied to the outputs in the event that the supply voltage is connected to the wrong poles) Yes, for supply voltage (Siemens MPI optional)
Explosion safety category for dust	None

Design verification

Equipment heat dissipation, current-dependent Pvid	0 W
Heat dissipation capacity Pdiss	0 W
Heat dissipation per pole, current-dependent Pvid	0 W
Rated operational current for specified heat dissipation (In)	0 A
Static heat dissipation, non-current-dependent Pvs	2 W
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 Resist. of insul. mat. to abnormal heat/fire by internal elect. 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.
10.9.2 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 9.0

Programmable logic controllers PLC (EG000024) / Logic module (EC001417)		
Electric engineering, automation, process control engineering / Control, Process Control System (PCS) / Programmable logic control (SPS) / Logic module (ecl@ss13-27-24-22-16 [AKE539019])		
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 (supply voltage)		DC
Switching current	A	0.5
Power consumption	W	2
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		0
With optical interface		No
Supporting protocol for EtherCAT		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 time switch clock		Yes
Rail mounting possible		Yes
Wall mounting/direct mounting		Yes
Front built-in possible		Yes
Rack-assembly possible		No
Suitable for safety functions		No
SIL according to IEC 61508		None
Performance level according to 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
Certified for UL hazardous location class I		Yes
Certified for UL hazardous location class II		No
Certified for UL hazardous location class III		No
Certified for UL hazardous location division 1		No
Certified for UL hazardous location division 2		Yes
Certified for UL hazardous location group A (acetylene)		Yes
Certified for UL hazardous location group B (hydrogen)		No
Certified for UL hazardous location group C (ethylene)		Yes
Certified for UL hazardous location group D (propane)		Yes
Certified for UL hazardous location group E (metal dusts)		No
Certified for UL hazardous location group F (carbonaceous dusts)		No
Certified for UL hazardous location group G (non-conductive dusts)		No
Width	mm	72
Height	mm	90
Depth	mm	58