

# Control & Monitoring Relays

## Digital Control Relay MCU-10...U



### DESCRIPTION

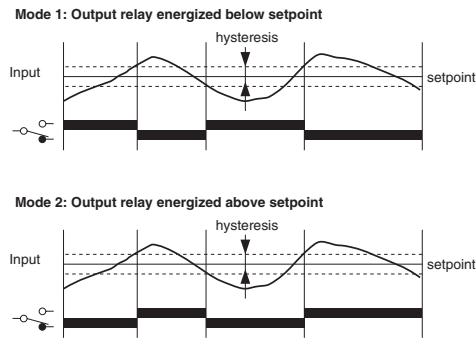
Digital control relay with 3½-digit LCD display.  
 The scaling facilities of the MCU-10...U make it ideal as a monitor or control device for normal standard process signals, e.g. 4-20mA. Any output from a transmitter can be scaled to engineering units and a unit label can be inserted on the front of the control relay. A sheet with common units is enclosed with the relay.  
 Typical applications:  
 General process instrumentation.  
 Signal monitor with read-out in engineering units.  
 3½ digit LCD display with selectable read-out of actual input and setpoint.  
 Output relay with LED indication of energized output relay.  
 Built-in power supply for direct mains supply. Galvanic isolation between input and supply.  
 Standardized housing for 11-pole plug-in or DIN rail mounting.  
 Bases for DIN rail, surface and chassis mounting are listed under Accessories for MCP-10, see page 128.

### VERSION/ORDERING CODES

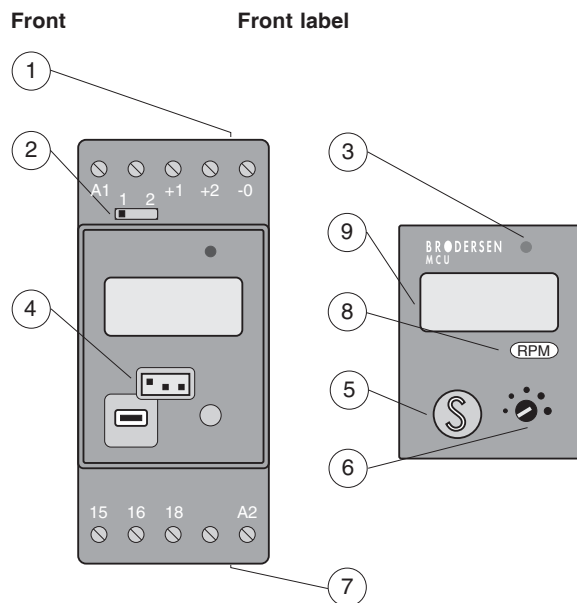
<b>Type:</b> Digital control relay.	MCU-10	MCU-10	S	1	230	U1
<b>Mounting:</b> 11-pole plug-in. DIN rail.	S D					
<b>Output relay:</b> SPDT	1					
<b>Supply voltage:</b> 12-48V DC/10-30V AC 12V AC/DC 24V AC/DC 24V AC 110/120V AC 220/240V AC 380/415V AC	G24 912 1) 924 1) 024 115 230 400					
<b>Input:</b> Standard process signals: 0-20mA DC/4-20mA DC and 0-10V DC/2-10V DC	U1					

### OPERATION

The display shows the actual input signal when the supply voltage is connected.  
 The setpoint is displayed by pressing the S button and the setpoint is adjusted on the front mounted potentiometer.  
 The output mode switch for selecting whether the output relay should be energized above or below the adjusted setpoint, see the diagrams below.  
 The red LED indicator will light up when the output relay is energized.



### FRONT



1. Input selector 2. Output mode selector 3. LED indication of energized output relay 4. Decimal point position 5. Button for setpoint read-out 6. Setpoint adjustment 7. Scale and offset adjustment 8. Unit label position 9. Display field.

## TECHNICAL DATA

### Measuring ranges:

<b>DC</b>
0-20mA/4-20mA and 0-10V/2-10V. The actual input signal is selected via a switch on the control relay.

**Measuring accuracy:** 1% of full scale  $\pm$  1 digit.

**Hysteresis:** 1% of full range.

### Input impedance:

Voltage: 1Mohm.  
Current: 50Ohm.

**Temperature drift:** Max. 0.02% per °C.

**Display:** 3½-digit LCD-type (-1999 to 1999).  
Digit height: 6.5 mm.  
Display update time: Typically 0.4 sec.

**Scale:** The scale is adjusted to the actual measuring range which is user adjustable (-1999 to 1999, max. 2000 steps).

**Decimal point:** Selectable \_ \_ \_ \_ \_

**Output relay:** SPDT (single changeover contact).  
Load ( $\cos\phi=1$ ): D1/S1: Max. 8A/240V AC  
Min. 10mA/24VDC  
Frequency: Max. 1000 operations per hour at max. load.  
Mechanical life time: Min.  $10 \times 10^6$  operations.  
Electrical life time: Min. 100.000 operations at max. load.  
Time delay: Typically 1s.

**Mounting:** S1: 11-pole plug-in.  
D1: Directly on 35 mm DIN-rail (EN50022).

**Terminals:** Max. conductor size 4 mm<sup>2</sup>.  
Screw type terminals with self-lifting clamps shrouded in accordance with VDE0106 (finger and back of hand protection).

**Supply voltage:** 12-48VDC(10.5-60V)/12-30VAC(10.5-35V).  
12V AC/DC (10-18V) <sup>1)</sup>.  
24V AC/DC (18-35V) <sup>1)</sup>.  
24V AC (22-26V).  
110/120V AC (95-135V).  
220/240V AC (195-265V).  
380/415V AC (342-418V).

**Mains frequency:** 45-66Hz.

**Consumption:** 1-3VA.

**Protection:** S1: IP40.  
D1: IP20.

**EMC:** Conforming to EN 50081-1/EN 50082-2.

**Ambient temperature:**-25-55°C.

### Isolation:

AC versions: 4kV AC according to EN 60950 class II.  
G24 version: 1kV AC

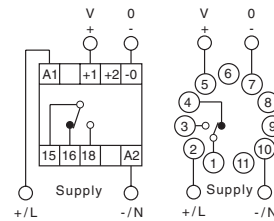
**Dimensions:** Identical to MCP-10, see page 39.

**Housing:** Black Noryl SE-1.

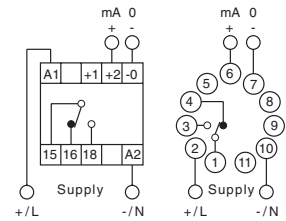
**Weight:** Typically 170 g.

## WIRING DIAGRAMS

### Voltage

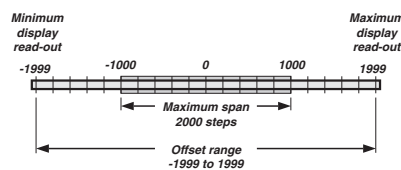


### Current



## CONFIGURATION/CALIBRATION

The control relay for standard process signals is fully user adjustable within in the scale limits -1999 to 1999 with a maximum span of 2000 steps, e.g. a scale from -1000 to 1000.



The offset is adjustable within the range -1999 to 1999 ,however, the maximum offset must be smaller than the required span:

**Max. offset ≤ Span = Max. scale - Min. scale**  
a scale e.g. 500 to 800 (  $500 \leq 300 = 800 - 500$  ) can therefore not be obtained.

Selectable decimal point position: \_ \_ \_ \_ \_  
Selectable input range:0-20mA/0-10V or 4-20mA/2-10V.  
Example: Adjust the control relay to a scale -1000 to 1000, input signal 4-20mA.

- 1) Set the switches for input, output mode and decimal point position. Mount the front label and connect the supply voltage.
- 2) Apply min. signal 4mA and adjust Offset to display read-out 0000.
- 3) Apply max. signal 20mA and adjust Scale to a display read-out 1999. Adjust **Offset** to display read-out 1000.
- 4) Apply min. signal 4mA and check display read-out is -1000. If incorrect, return to step 2 and readjust the control relay.

The control relay is now calibrated and ready to use.

## NOTES/REMARKS

- 1) There is no galvanic isolation between input and supply. External isolation should be provided to prevent damage to the controller when measuring voltage/current or a G- or other version with internal isolation should be used.