Training Guide

EASY 412-DC-... EASY 618-AC-RC
EASY 412-AC-... EASY 620-DC-TC
Control Relay
Caution!

Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.
- Ensure that the device cannot be accidentally restarted.
- Verify isolation from the supply.
- Earth and short circuit.
- Cover or enclose neighbouring units that are live.
- Follow the engineering instructions (AWA) of the device concerned.
- Only suitably qualified personnel may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference do not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.
- Ensure a reliable electrical isolation of the low voltage for the 24 volt supply. Only use power supply units complying with IEC 60 364-4-41 or HD 384.4.41 S2.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.
- Emergency stop devices complying with IEC/EN 60 204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause uncontrolled operation or restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.
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1 “easy” Control Relay

Safety information

Danger of injury due to electric shock!
The electrical installation and commissioning work must only be carried out by suitably qualified personnel.

- Do not work on the device when the power is switched on.
- Observe the relevant safety regulations:
  - Switch off the power
  - Make sure that the device cannot be switched on again inadvertently
  - Check to make sure that no dangerous voltages are present before working on the device
  - Cover up any neighbouring equipment which carries dangerous voltages

Simply “easy”

Clever switching and controlling

“easy” is a compact, user-friendly and low-cost control relay for simple control applications. Applications range from building and domestic automation to machine and plant control. “easy” has built-in user-friendly operating elements and an LCD display.

Just connect up “easy” and draw your circuit diagram on the display by pressing the buttons on the device. “easy” works with make contacts, break contacts, and relays.
Enter your circuit diagram in “easy” just like you sketched it on paper. “easy” has basic and advanced functions for relays, time switches and contactors, and lots more, too. You can make changes to your circuit just by pressing the buttons on the device. Time consuming rewiring is not necessary.

Applications everywhere
Building and domestic automation, controllers for lighting, doors, window shutters...
Control ventilators, rotating doors, greenhouses, exterior lighting, window controllers, shop display lighting control...
Create controllers for temperature, ventilation and brightness levels...
Control machines and plant, presses, conveyor belts, oscillating conveyors, sorters, pumps...

Additional functions
With the help of the additional 600 units - EASY 620-DC-TC, EASY 618-AC-RC - as well as the expansion of the 400 range with EASY 412-DC-TC, EASY 412-DC-TCX and EASY 412-AC-RCX, additional I/O and functions are now available, such as retentive counters, timing relays, markers and eight user-definable display texts.
The individual features of each control relay are described below.
Overview of “easy”

a  Power supply
b  Inputs
c  Buttons
d  Socket for memory card or PC interface cable
e  Output terminals
f  LCD display

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“easy” Control Relay

Mounting “easy”

Mounting on top-hat rail
Hook “easy” to the top edge of the top-hat rail and hinge into place while pressing down slightly as shown by the arrows.

“easy” will clip into place and will be secured by the built-in spring mechanism without needing screws.

Mounting on a mounting plate
“easy” can be screwed to a mounting plate with the three device feet (available as an optional accessory).

Connecting “easy” Overview

<table>
<thead>
<tr>
<th>EASY...</th>
<th>412-DC-R...</th>
<th>412-DC-TC</th>
<th>412 AC-R...</th>
<th>618-AC-RC</th>
<th>620-DC-TC</th>
</tr>
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<tbody>
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<td>Connecting outputs</td>
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<td>Page 8</td>
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<td>Page 10</td>
<td>Page 10</td>
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</tbody>
</table>

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Inputs EASY 412-DC-...

Inputs EASY 412-AC-...
"easy" Control Relay

Outputs EASY 412-AC----, EASY 412-DC-R...

Outputs EASY 412-DC-T...

Suppressor circuit

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Connecting “easy”

**Inputs EASY 620-DC-TC**

- **Input 24 V**
- **Input 115/230 V**

**Inputs EASY 618-AC-RC**

- **Input 115/230 V**
- **Input 115 V**
- **Input 230 V**

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Outputs EASY 618-AC-RC

Outputs EASY 620-DC-TC

Suppressor circuit

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“easy” operating principle

“easy” operating buttons

DEL: Delete object in the circuit diagram
ALT: Special functions in the circuit diagram
Cursor buttons:  Move cursor,
                 Select menu item,
                 Choose contact numbers, values, time etc.
OK: Next menu level, store your entry
ESC: Last menu level, cancel your entry

Moving through menus and choosing values

Show system menu
Go to next menu level
Select menu item
Store your entry
Return to last menu level
Cancel your entry since the last OK

Change menu item
Change value
Change position

P button function (if enabled):
<  Input P1,
>  Input P3,
^  Input P2
v  Input P4
## "easy" Control Relay

**EASY 412-...status display**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>I12345678</th>
<th>MO</th>
<th>Weekday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I...</td>
<td>MO</td>
<td>Time</td>
</tr>
<tr>
<td>Output</td>
<td>01234</td>
<td>RUN</td>
<td>RUN/STOP mode</td>
</tr>
<tr>
<td>terminals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **On** / **Off**

**Status display**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>1...5...8...</th>
<th>RE IMP</th>
<th>Debounce/P buttons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day, time</td>
<td>MO 02:00</td>
<td>ST</td>
<td>Stop mode</td>
</tr>
<tr>
<td>Output</td>
<td>.E...B...</td>
<td>RUN</td>
<td>Mode</td>
</tr>
<tr>
<td>terminals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1, 2, 5, 8 On/ . Off

**Menu display**

- Current choice blinks in the "easy" menu

<table>
<thead>
<tr>
<th>PROGRAM...</th>
<th>PASSWORD...</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAM...</td>
<td>PROGRAM...</td>
</tr>
<tr>
<td>PARAMETER</td>
<td>PARAMETER</td>
</tr>
<tr>
<td>SET CLOCK..</td>
<td>SET CLOCK..</td>
</tr>
</tbody>
</table>

Main menu with and without password option

---

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Cursor display

The cursor blinks alternately:

- Full blinking cursor /: Move cursor with \( < > \), in circuit diagram also with \( ^\wedge \_\wedge \).

- Value \( M/M \):
  - Change position with \( < > \)
  - Change values with \( ^\wedge \_\wedge \)

Blinking values/menus are shown grey in this manual.

Circuit diagram menu

![Circuit diagram diagram]

Connections

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“easy” Control Relay

Circuit diagram symbols

- P — Cursor button as input
- I — Contact for input
- Q — Contact for output
- M — Contact for marker relay
- T — Contact for timer relay
- C — Contact for counter relay
- G — Contact for time switch
- A — Analog comparator contact
- D — Contact for text marker relay
- : — Contact for jump relay
- R — Reserve contact for relay
- S — Contact for marker relay

Coil field

--- 1st circuit connection
--- 2nd circuit connection
--- 3rd circuit connection
... 41st circuit connection
... 121st circuit connection

1 Only EASY 618/620

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“easy” operating principle

Menu structure

Main menu without optional password protection

- **PROGRAM**
  - DELETE PROG
  - CARD...

- **Parameter set**
  - SET CLOCK
  - SUMMER TIME

- **EASY - CARD**
  - CARD-> EASY
  - DELETE CARD

- **RUN**
  - PROGRAM...
  - SET CLOCK...

- **STOP**
  - PROGRAM DELETE PROG CARD...
  - DELETE ?
  - REPLACE ?

- **Circuit diagram menu**
  - Parameter display
  - Display for clock setting

- **STOP:** Circuit diagram menu
  - Power flow display
  - Parameters

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“easy” Control Relay

Main menu with password protection

System menu EASY 412..., operating system V 1.0

The menu functions are described in the User Guide AWB 2528-1304 GB.

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“easy” operating principle

System menu EASY 412-..., operating system from V 1.2, EASY 618-AC-RC, EASY 620-DC-TC

The menu functions are described in the User Guide AWB 2528-1304 GB.

1 Only EASY 6/...
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2 Drawing a Circuit with “easy”

Operation of “easy”          Buttons for drawing circuit diagrams

Delete circuit connection, contact, relay or empty line in the circuit diagram
Toggle between break and make contact
Connect contacts and relays
Add circuit connections
Change value
   Move cursor up and down
Change position
   Move cursor to left and right
Assign P buttons:
   Input P1,    Input P2
   Input P3,    Input P4
Undo settings from previous OK
Exit current display
Change, add contact/relay
Save setting
Setting the menu language

Switching on “easy” for the first time

Choose menu language

- Choose language with the cursor keys
  - GB English
  - D German
  - F French
  - E Spanish
  - I Italian

EASY 600 also supports the following languages:

- Portuguese
- Dutch
- Swedish
- Polish
- Turkish

- Confirm with OK.

“easy” then shows the status display

```
EASY 412-...
EASY 6-
```

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Setting the time

A clock is only provided in “easy” models with the type designation “...-C”.

Switch to the Set Clock menu

Setting week days and time

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Choose “easy” operating mode

The two “easy” operating modes are RUN or STOP.

RUN: “easy” processes the circuit diagram.

STOP: Draw the circuit diagram.

The alternating RUN/STOP menu shows either RUN or STOP as follows:

STOP mode active: RUN is shown

RUN mode active: STOP is shown

Selectable startup behaviour

With EASY 412-... units using operating system V 1.2, EASY 618-... and EASY 620-... it is possible to select the operating mode to be activated when the power supply is switched:

- Startup in “RUN” mode
- or
- Startup in “STOP” mode

Retentive actual values

With EASY 412-DC-... using operating system V 1.2, EASY 620-DC-TC and EASY 618-AC-RC it is possible to save the actual values of markers and counters, also in the event of a power failure.
**“easy” circuit diagram elements**

**EASY 412-DC-...**
- 4 marker relays (markers)
- 1 timing relay
- 1 counter

**EASY 620-DC-TC, EASY 618-AC-RC**
- 12 marker relays (markers), text display
- 2 timing relays
- 4 counters

For further information see AWB 2528-1304 GB.

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### Contacts

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<tr>
<th>Contact type</th>
<th>Make contact</th>
<th>Break contact</th>
<th>EASY 412</th>
<th>EASY 6...</th>
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</thead>
<tbody>
<tr>
<td>&quot;easy&quot; input terminal</td>
<td>I</td>
<td>I</td>
<td>I1...I8</td>
<td>I1...I12</td>
</tr>
<tr>
<td>P button contact (cursor keys)</td>
<td>P</td>
<td>P</td>
<td>P1...P4</td>
<td>P1...P4</td>
</tr>
<tr>
<td>&quot;easy&quot; output relay contact</td>
<td>G</td>
<td>G</td>
<td>G1...G4</td>
<td>G1...G8</td>
</tr>
<tr>
<td>Marker relay contact</td>
<td>M</td>
<td>M</td>
<td>M1...M16</td>
<td>M1...M16</td>
</tr>
<tr>
<td>Counter relay contact</td>
<td>C</td>
<td>C</td>
<td>C1...C8</td>
<td>C1...C8</td>
</tr>
<tr>
<td>Timing relay contact</td>
<td>T</td>
<td>T</td>
<td>T1...T8</td>
<td>T1...T8</td>
</tr>
<tr>
<td>Time switch contact</td>
<td>S</td>
<td>S</td>
<td>S1...S4</td>
<td>S1...S4</td>
</tr>
<tr>
<td>Analog comparator contact</td>
<td>A</td>
<td>A</td>
<td>A1...A8</td>
<td>A1...A8</td>
</tr>
<tr>
<td>Text display contact</td>
<td>D</td>
<td>D</td>
<td>D1...D8</td>
<td>D1...D8</td>
</tr>
<tr>
<td>Jump contact</td>
<td>:</td>
<td>:</td>
<td>:1...:8</td>
<td>:1...:8</td>
</tr>
<tr>
<td>Marker relay contact</td>
<td>S</td>
<td>S</td>
<td>S1...S8</td>
<td>S1...S8</td>
</tr>
<tr>
<td>Reserve</td>
<td>R</td>
<td>R</td>
<td>R1...R16</td>
<td>R1...R16</td>
</tr>
<tr>
<td>Short-circuit detection</td>
<td>I</td>
<td>I</td>
<td>I1&amp;</td>
<td>I1&amp;</td>
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<th>&quot;easy&quot; symbol</th>
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<th>EASY 6...</th>
<th>Coil function</th>
<th>Param eter</th>
</tr>
</thead>
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<tr>
<td>&quot;easy&quot; input terminal</td>
<td>I</td>
<td>I1...I8</td>
<td>I1...I12</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>P button contact (cursor keys)</td>
<td>P</td>
<td>P1...P4</td>
<td>P1...P4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&quot;easy&quot; output relay contact</td>
<td>Q</td>
<td>Q1...Q4</td>
<td>Q1...Q8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Marker relay contact</td>
<td>M</td>
<td>M1...M16</td>
<td>M1...M16</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Counter relay contact</td>
<td>C</td>
<td>C1...C8</td>
<td>C1...C8</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Timing relay contact</td>
<td>T</td>
<td>T1...T8</td>
<td>T1...T8</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Time switch contact</td>
<td>B</td>
<td>B1...B4</td>
<td>B1...B4</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Analog comparator relay</td>
<td>A</td>
<td>A1...A8</td>
<td>A1...A8</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Text display contact</td>
<td>D</td>
<td>–</td>
<td>D1...D8</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Jump contact</td>
<td>:</td>
<td>–</td>
<td>:1...:8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Marker relay contact</td>
<td>S</td>
<td>–</td>
<td>S1...S8</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Reserve</td>
<td>R</td>
<td>–</td>
<td>R1...R8</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Short-circuit detection EASY...-DC-T...</td>
<td>I</td>
<td>I16</td>
<td>I15, I16</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

## Retentive relays

<table>
<thead>
<tr>
<th>Relay type</th>
<th>&quot;easy&quot; symbol</th>
<th>EASY 412</th>
<th>EASY 6...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker relay contact</td>
<td>M</td>
<td>M1...M16</td>
<td>M1...M16</td>
</tr>
<tr>
<td>Counter relay contact</td>
<td>C</td>
<td>C8</td>
<td>C5, C6, C7, C8</td>
</tr>
<tr>
<td>Timing relay contact</td>
<td>T</td>
<td>T8</td>
<td>T1, T8</td>
</tr>
<tr>
<td>Text display contact</td>
<td>D</td>
<td>–</td>
<td>D1...D8</td>
</tr>
</tbody>
</table>
Basic relays with contactor function

Impulse relay

Latch relay

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Drawing a Circuit with “easy”

Example: creating a circuit diagram

Interconnecting contacts and relays

Conventional circuit

“easy” circuit diagram

Connecting up “easy”
Connect S1 to “easy” input terminal I1
Connect S2 to “easy” input I2
Connect load H1 to “easy” output Q1

“easy” circuit diagram

I1-I2----€Q1

Start Status display

1...5...8.....
RE I P
MO 02:00 ST
2...5...8 RUN

PROGRAM...
RUN
PROGRAM
DELETE PROG

Insert contact “I1”

Circuit diagram display

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Example: creating a circuit diagram

Insert contact “I2”

Insert contact “I2”

Draw connection between contact and relay coil

Draw connection between contact and relay coil

Choose relay coil “Q1”

Choose relay coil “Q1”

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Drawing a Circuit with "easy"

**Change operating mode**

"easy" circuit diagram

I1-I2----€Q1

PROGRAM
DELETE PROG
PROGRAM...
RUN
PF
SE
PROGRAM...
RUN
PARAMETER
SET CLOCK..,

"easy" now in RUN mode

**Test circuit diagram**

PROGRAM...
PROGRAM...
PARAMETER
SET CLOCK..

PROGRAM...
STOP
PARAMETER
SET CLOCK..

Power flow display

I1-I2----€Q1

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In the next example, a timing relay will be added to the circuit.

Status display is activated.
Choose STOP mode:

- PROGRAM...
- RUN
- PARAMETER
- SET CLOCK...
### Function relay types

<table>
<thead>
<tr>
<th>Circuit diagram symbol</th>
<th>Function relay type</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Timing relay with on delay with and without random switching" /></td>
<td>Timing relay with on delay with and without random switching</td>
</tr>
<tr>
<td><img src="image2" alt="Timing relay, off-delayed with and without random switching" /></td>
<td>Timing relay, off-delayed with and without random switching</td>
</tr>
<tr>
<td><img src="image3" alt="Timing relay, single pulse" /></td>
<td>Timing relay, single pulse</td>
</tr>
<tr>
<td><img src="image4" alt="Timing relay, flashing" /></td>
<td>Timing relay, flashing</td>
</tr>
<tr>
<td><img src="image5" alt="Counter relay, up/down counter" /></td>
<td>Counter relay, up/down counter</td>
</tr>
<tr>
<td><img src="image6" alt="Time switch, weekday/time" /></td>
<td>Time switch, weekday/time (only in “easy” models with clock)</td>
</tr>
<tr>
<td><img src="image7" alt="Analog comparator relay" /></td>
<td>Analog comparator relay (only in “easy” models for 24 V DC)</td>
</tr>
</tbody>
</table>

### Timing relay

**Timing relay with on delay, with and without random switching**

![Timing relay with on delay, with and without random switching diagram](image8)
Function relay types

Timing relay, off-delayed, with and without random switching

With random switching, the relay contact switches randomly at any time up to the specified time value (shown shaded in figure).

Timing relay, single pulse
Timing relay, flashing

Flash frequency = \( \frac{1}{2 \times \text{Setpoint}} \)

Parameter display for timing relays

<table>
<thead>
<tr>
<th>Switch function</th>
<th>Curr. time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time units</td>
<td>Setpoint</td>
</tr>
<tr>
<td>Trigger (connected)</td>
<td>Relay no.</td>
</tr>
<tr>
<td>Reset (not connected)</td>
<td>Parameter display (access)</td>
</tr>
</tbody>
</table>
Counter relay

CT  on
DR  on
RES on

C on

Setpoint = 6

Parameter display for counter relays

Setpoint  —— Curr. value
Opt. direction (connected)  —— Setpoint
Opt. counter (connected)  —— Relay no.
Reset (not connected)  —— Parameter display (access)

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Time switch

Example: Time switch "Ø1" switches on Mondays to Fridays between 6:30 and 9:00 and between 17:00 and 22:30.

Parameter display for time switches
Analog comparator

Available functions:

I7 ≥ I8, I7 ≤ I8
I7 ≥ Setpoint, I7 ≤ Setpoint
I8 ≥ Setpoint, I8 ≤ Setpoint

The analog comparator can compare voltages from 0 V to 10 V (setpoints “0.0” to “10.0”).

Analog signals of sensors typically fluctuate by several millivolts. For stable set and reset switching the setpoints should differ by at least 0.2 V (switching hysteresis). Do not use any relay with contactor or impulse relay coil functions.

Parameter displays for analog comparators

Compare inputs “I7” and “I8”

Compare input “I7” or “I8” with program setpoint
Text display (Marker)

The markers can be used to display eight freely definable texts. Each text block can display up to 48 characters from the easy display character set (ASCII + easy special characters). If the coil of a marker is “1”, the text entered via EASY-SOFT V 2.0 will be displayed. If several text markers are “1”, the next text is displayed every 4 seconds. When text marker D1 is “1” it stays displayed (fault indication).

Press OK to switch to the menus at any time.

Current values or parameters of function relays can be displayed in lines 2 and 3.

Examples:

Fault signals

Reminder!
PUMP 1
MOTOR
MALFUNCTION

Time with text display

THE TIME IS
14:42

Showing scaled analog values

EXTERNAL TEMPERATURE
020.0°C
HEAT!

Display current value and parameter of timing relay

TIMING RELAY 1
SETP99.00 S
ACTV 42.00 S

Display counter value

QUANTITY
ACTV 0042
PCS
SETP0100
Example: using a function relay

Conventional circuit

“easy” circuit diagram

“easy” switches H1 with 10 seconds delay.

I1-I2----CM1
M1--------TT1
T1--------CO1

Select marker relay

Start Circuit from first example

Position cursor on “Q”

Select marker relay contact and connect to new

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Drawing a Circuit with “easy”

output relay

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Example: using a function relay

Select Trigger relay for time

Insert timing relay contact

Select parameter access

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Drawing a Circuit with “easy”

Set “10 seconds”

Connect timing relay contact to new output relay

Switch “easy” to RUN to test circuit diagram.

Test the circuit as shown for the first example.

To display and access the parameters for the timing relay and change the time value:

In RUN mode, position the cursor in the circuit diagram on the “T” of “T1” and press OK.
### Basic circuits

#### Significance of logic values

- **"0"**: Make contact open, break contact closed, relay coil not energised
- **"1"**: Make contact closed, break contact open, relay coil energised

#### Negation (NOR)

<table>
<thead>
<tr>
<th>I1</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Permanent contact

<table>
<thead>
<tr>
<th>---</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Impulse relay

<table>
<thead>
<tr>
<th>I1</th>
<th>State</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Series connection (AND)

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
**Parallel connection (OR)**

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Changeover circuit (XOR)**

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Latchning circuit**

<table>
<thead>
<tr>
<th>I1</th>
<th>I2</th>
<th>Contact Q1</th>
<th>Coil Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Alternatively:

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3 “easy” Interface Socket

The “easy” interface socket, which is hidden beneath a protective cap, lets you plug in the optional “easy” memory card or connect “easy” to a PC using the optional PC interface cable and the EASY-SOFT software. You can then copy your circuit diagrams to and from the PC and/or memory card. In addition you can draw and test your circuit diagrams on the PC before transferring them to “easy”.

Memory card
Memory cards are available as the optional accessory “easy-M-.K”. Each memory card can store a single “easy” circuit diagram.

Information stored on the memory card is “non-volatile” (the information is not lost when the power is switched off), and thus you can use the card to make a backup copy of your circuit diagram and/or to transfer it to another “easy” device.

Each memory card stores:

- the circuit diagram
- all parameter settings of the circuit diagram
- system settings
“easy” Interface Socket

Loading or storing the circuit diagram
You can only transfer the circuit diagram from “easy” to the card or vice versa in STOP mode.

“EASY->CARD”: Transfer circuit diagram and parameter settings from “easy” memory to the card,
“CARD->EASY”: Transfer circuit diagram and parameter settings from the card to “easy” memory,
“DELETE CARD”: Delete the contents of the card.

Available memory cards
EASY-M-8K memory card for EASY 412-...
EASY-M-16K memory card for EASY 618/620-...

EASY-SOFT
EASY-SOFT is an optional PC program with which you can create, store, test (simulate) and manage “easy” circuit diagrams. You can then transfer the circuit diagrams from the PC to “easy” or vice versa using a special PC interface cable.

You should only transfer the circuit diagrams using the special PC interface cable, which is available as the optional accessory “easy-PC-CAB”.

To test your circuit diagram in the “easy” device itself, transfer it from the PC to “easy” and choose RUN mode by pressing the appropriate buttons.

The EASY-SOFT software also includes extensive online Help.

To use the online Help, start EASY-SOFT and choose Contents in the Help menu. Context sensitive help is also available choose a menu item with the mouse and press F1 while keeping the mouse button pressed.

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## Technical Data

### Technical data

<table>
<thead>
<tr>
<th>Weight</th>
<th>200 g, 300 g (EASY 600)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature, (operation)</td>
<td>–25 to 55 °C</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 20</td>
</tr>
<tr>
<td>Emitted interference, interference immunity</td>
<td>EN 55011, EN 55 022, Class B</td>
</tr>
<tr>
<td>Standards and regulations Approvals</td>
<td>EN 50 178 UL, CSA</td>
</tr>
</tbody>
</table>

### “easy” models

<table>
<thead>
<tr>
<th>Power supply</th>
<th>EASY 412-DC-...</th>
<th>EASY 412-AC-...</th>
<th>EASY 618-...</th>
<th>EASY 620-...</th>
</tr>
</thead>
<tbody>
<tr>
<td>...R</td>
<td>...RC</td>
<td>...TC</td>
<td>...TCX</td>
<td>...R</td>
</tr>
<tr>
<td>24 V DC power feed</td>
<td>115, 230, 240 V AC</td>
<td>100, 115, 120, 230, 240 V AC</td>
<td>24 V DC power feed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital inputs</th>
<th>8 digital inputs, 2 of them also usable for analog signals</th>
<th>8</th>
<th>8</th>
<th>12</th>
<th>12 digital inputs, 2 of them also usable for analog signals</th>
</tr>
</thead>
</table>

| Relay outputs | 4 | 4 | – | – | 4 | 4 | 4 | 6 | – |
| Transistor outputs | – | – | 4 | 4 | – | – | – | – | 8 |
| LCD display | ✓ | ✓ | ✓ | – | ✓ | ✓ | – | ✓ | ✓ |
| Operating buttons | ✓ | ✓ | ✓ | – | ✓ | ✓ | – | ✓ | ✓ |
| Time switch | – | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ | ✓ |
| Text display | – | – | – | – | – | – | – | – | ✓ |
| Retentive actual values | From version V 1.2 | – | – | – | ✓ | ✓ |

### Accessories

| Software | EASY-SOFT, Version 2.0, for Windows 95/98, Windows NT |
| Accessory | EASY-PC-CAB with interface electronic circuit |
| Memory card | EASY-M-8K | EASY-M-16K |

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Technical Data

<table>
<thead>
<tr>
<th>Input/output simulator</th>
<th>EASY 412-DC-...</th>
<th>EASY 412-AC-...</th>
<th>EASY 618-...</th>
<th>EASY 620-...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>...R</td>
<td>...RC</td>
<td>...TC</td>
<td>...TCX</td>
</tr>
</tbody>
</table>

Mounting feet
- ZB 4-101-GF1: For EASY 412-... 3 feet min. 3

Documentation

### Dimensions EASY 412-...

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“easy” models

Dimensions EASY 618-..., EASY 620

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