

EU-4S

CE Approved:
MD, EMC, LVD

Category 3/4, EN 954-1

(Estimated category by 2-channel operation)

- Precise time delay 0-60 sec.
- 2 NO safety outputs
- 2 NO signal outputs
- Status indication with LED
- Adjustable time delay
- 22,5 mm slimline relay

Function:

Relay used for increasing the number of contacts and for the load of contacts of the existing safety relay. The relay is especially suitable for CNC/servo applications. EU-4S must be connected to 1 basic element / safety relay.

Technical facilities regarding safety requirements:

- Forced contacts
- Doubling of output contacts (33-34 and 43-44)
- Internal redundancy
- Safe time function

Approvals:



● Approved UL-Rating: Pilot Duty, C300

User's advantages:

- 2 NO safety outputs (delayed 0-60 sec.)
- 1 NO signal output (delayed 0-60 sec.)
- 1 NO signal output
- Contact load: AC 5 A / DC 4 A
- EU-4S is controlled by 2 independent μ -processors, which results in a precise time function
- Optional time delay on the safety outputs between 0-60 sec.
- Optional time delay on one signal output between 0-100% of the time delay on the safety outputs
- LED indication of the power supply, output status and possible errors in the internal circuit of the relay
- Supply voltage: 24 VDC \pm 10%
- 22,5 mm housing for space-saving DIN rail mounting
- Complies with MD, EMC, LVD (98/37/EC, 92/31/EEC and 73/23/EEC)
- Design is based on the European Standard, EN 60204-1

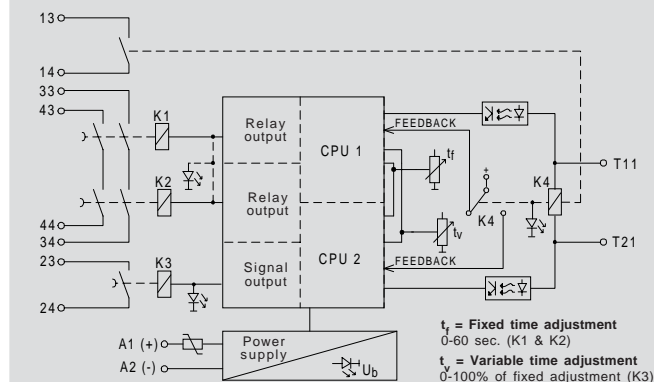
Status table, LED's

LED U _b	Interpretation
ON (green) OFF	Supply OK Supply not connected, or bad connection
Red	Internal error

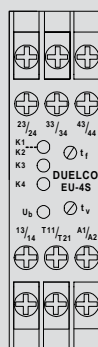
LED K1/K2	LED K3	LED K4	Interpretation
OFF ON ON OFF OFF	OFF ON ON OFF OFF	OFF ON OFF ON	Relay K1, K2, K3 and K4 are deactivated Relay K1, K2, K3 and K4 are activated = Status OK, awaiting deactivation Delay time relay K1, K2 and K3 are activated Delay time for relays K1, K2 and K3 are deactivated The signal relay K4 has been activated before the preset time delay for relay K1/K2 and K3 has run out. It is necessary to deactivate K4 again before a renewed activation of the relay outputs can take place Signal relay K3/K4 is deactivated and the safety relays K1/K2 are active
ON	OFF	OFF	

➔ Technical specifications and physical dimensions, see page 44-45

Block diagram:



Front layout EU-4S: Terminal description:



- A1:** Power supply (+)
- A2:** Power supply (-)
- T11:** + Input from emergency stop relay
- T21:** - Input from emergency stop relay
- 13-14:** NO output contact (signal)
- 23-24:** Delayed output contact (signal)
- 33-34:** Delayed NO output contact (safety)
- 43-44:** Delayed NO output contact (safety)

Order information

Article name	Article no.
EU-4S 0-10s, 24 V DC	42261244
EU-4S 0-60s, 24 V DC	42251244

Note:

A special version with a delay according to your needs can be delivered. Contact your local distributor or Duelco for further information.

Operation description and connection examples

The power supply should be applied to the terminals A1(+) / A2(-), and the LED, U_b will illuminate green. A safety control relay must be connected through a fuse to terminal T11(24 VDC) and T21(0 V). If any internal error occurs in the EU-4S unit, the LED U_b will indicate this with a red colour, and the unit can not activate the time controlled output contacts of EU-4S. The input signal T11/T21 controls K4 directly, which means that the signal output 13-14 always follows the input signal.

If power is applied, and the emergency stop relay is not active, all the output contacts of EU-4S are open. If no failure is detected, the EU-4S is ready to be activated.

When the emergency stop relay is activated, the EU-4S activates. The output contacts of EU-4S close and the LEDs K1/K2, K3 and K4 illuminate green. EU-4S must be activated for min. 400 ms before a deactivation is possible. Otherwise the CPUs of EU-4S will go into error mode.

If the emergency stop relay is deactivated, the output contact 13-14 will open immediately and LED K4 turns off. After a time delay, determined by the presetting of t_v, the output contact 23-24 opens and LED K3 turns off.

After a fixed time delay, determined by the presettings of t_f, the two output contacts 33-34 and 43-44 open and the LED K1/K2 turns off. EU-4S is now ready to be reactivated if no failure is detected.

Note: EU-4S does not have feedback terminals which can be connected to the reset / feedback input of the emergency stop relay. This means that the extension contact block does not form part of the safety circuit, when EU-4S is used with other emergency stop relays than Duelco NST-4. NST-4 combined with EU-4S, constitutes a complete safety circuit.

Warning: If the supply voltage is interrupted, all of the outputs on the extension

block are disconnected. This is also possible by voltage dropout!

Adjustment of the potentiometers (fig. 6)

This figure shows the 2 potentiometers for fixed time adjust t_f and variable time adjust t_v respectively.

Adjustment for t_f

It is possible to select a delay time for the 2 safety relays K1 and K2 between 0 - 60 sec., depending on the specific application. With a screwdriver it is possible to increase the fixed time by turning the potentiometer clockwise.

Adjustment for t_v

It is possible to select a time delay for the signalling relay K3 between 0 - 100% of the selected time for fixed time adjustment, depending on the specific application. With a screwdriver it is possible to increase the variable time by turning the potentiometer clockwise.

*Function diagram by normal operation (fig. 4):

This diagram illustrates, that subsequent start pulses do not have any influence on the function of EU-4S, as long as EU-4S has not ended its first time sequence.

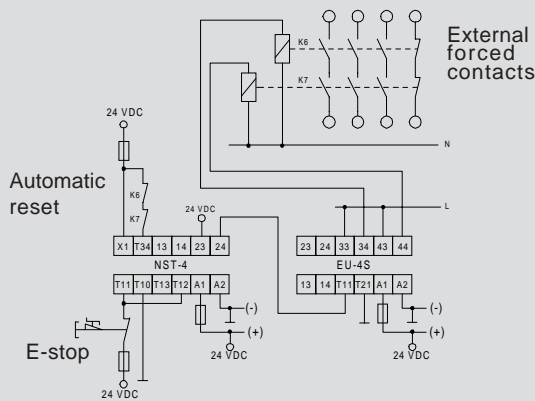
**Function diagram by unusual operation (fig. 5):

In this case the emergency stop relay is reactivated, before the EU-4S has run through its timer period. Before a new reactivation is possible, the emergency stop must be deactivated and activated again.

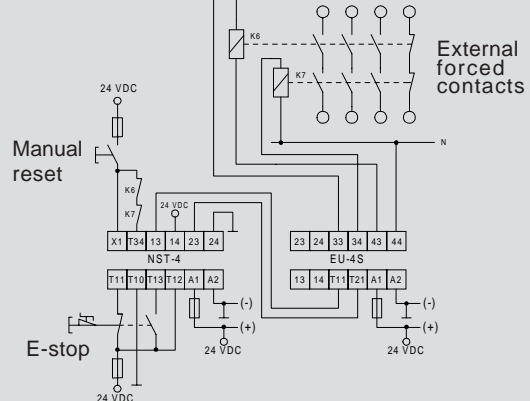
Note: Whether 1- or 2-channel operation of the extension block is used depends alone on the extent of safety the system must provide.

Note: The extension block **must** be connected to a safety relay as it does not itself comply with any safety requirements!

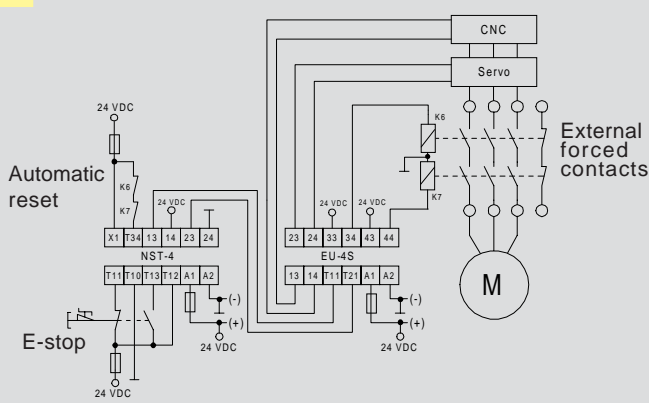
1 1-channel operation



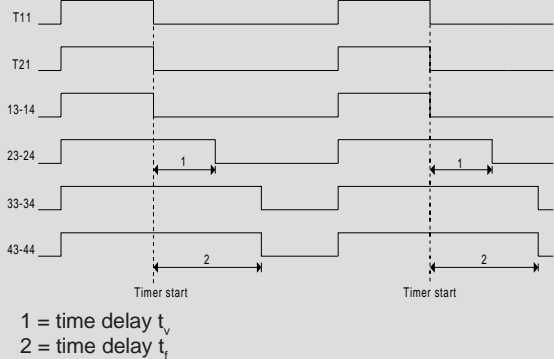
2 2-channel operation



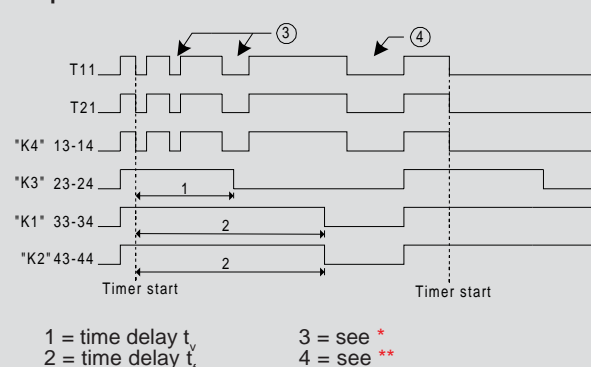
3 Connection of CNC / Servo



4 Function diagram with one start pulse



5 Function diagram with several successive start pulses



6 Adjustment of the potentiometers (see "Adjustment of the potentiometers")

