

FAIRINO



Connection Guide | Fairino Control Box



Please read this guide carefully before making any connections to the control box.



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SCAN TO READ

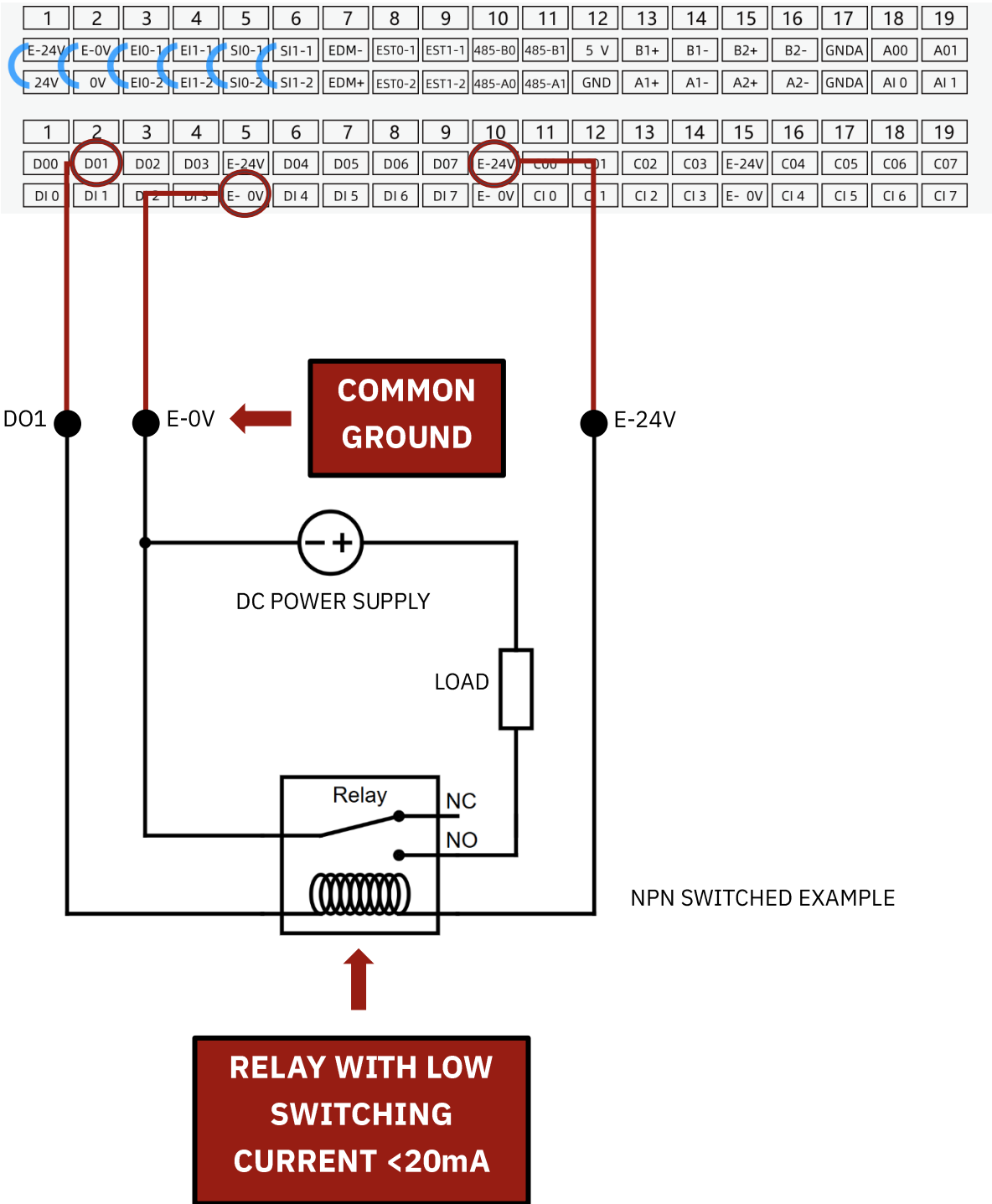
1. Common Ground
Ensure that if an additional power supply is introduced anywhere else in the system that the ground of the control box is properly connected to the ground of the additional power supply. A missing common ground can lead to control box failure.

2. External Power Supply
Do not connect an external power supply to provide 24V power to this control box. Ensure that E-24V and E-0V remain connected to 24V and 0V using the default blue wires. If the use of an external power supply is required, please contact support before proceeding. 

3. Output Load Limitations
Do not connect high-power loads directly to the digital or configurable outputs. Each output is limited to a maximum current of 60 mA. Use interface relays or solid state relays with a low switching current (<20 mA) in order to switch big loads. 

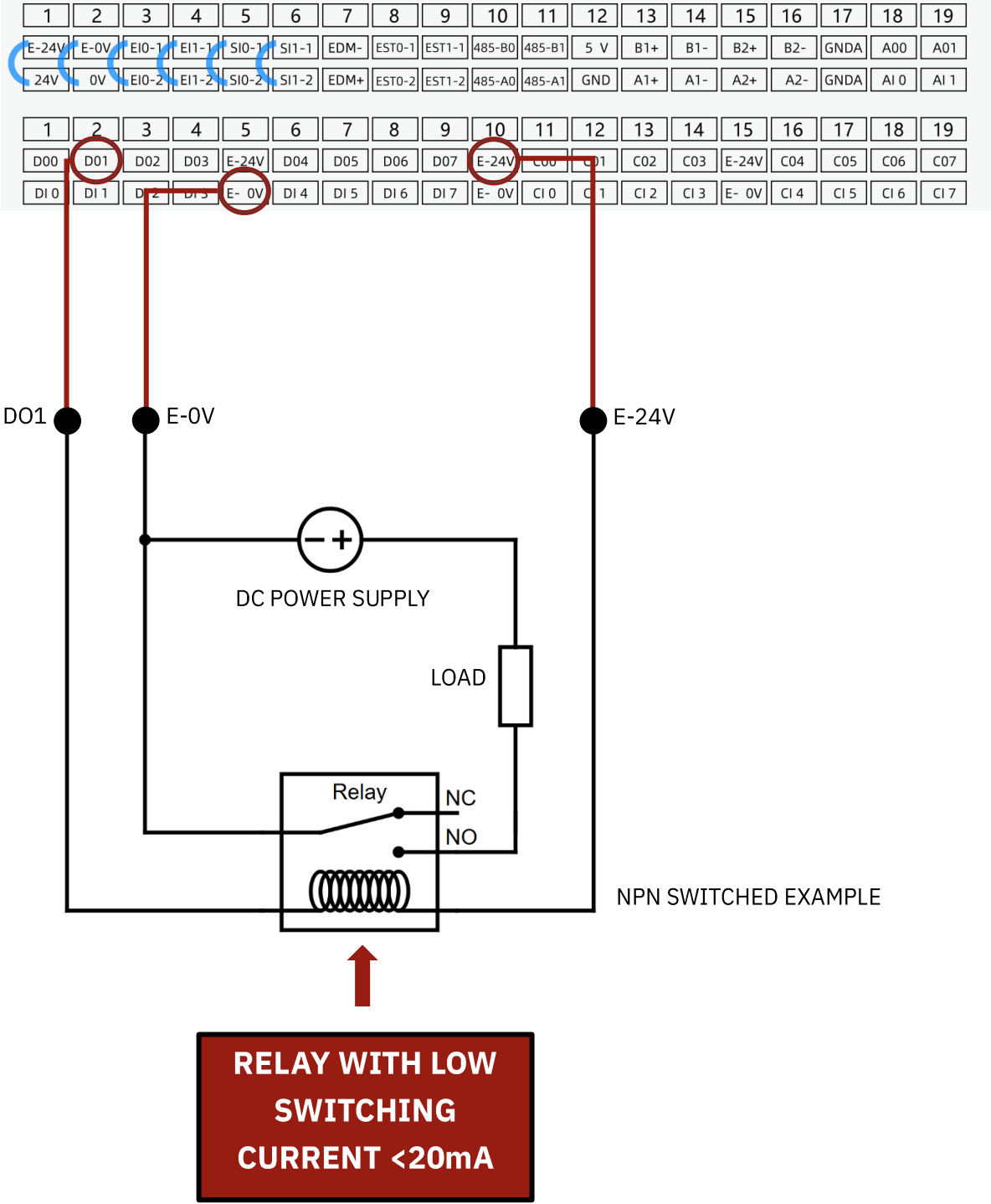
1.1 Common Ground

Ensure that if an additional power supply is introduced anywhere else in the system that the ground of the control box is properly connected to the ground of the additional power supply. A missing common ground can lead to control box failure.



1.3 Output Load Limitations

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Suitable Relay Example:

The relay selected should have a switching current of less than 20 mA. Such relays are typically referred to as interface relays or solid-state relays. Alternatively, digital outputs can be electrically isolated using optocouplers.

It is important to note that some relays require a relatively high switching current, which may exceed 60 mA. Therefore, always consult the relay's datasheet to verify its switching (input) current.

In the example below, the relay has a switching/input current of 9 mA. Since this is well below the recommended maximum of 20 mA, it is a suitable choice for the application.

Datasheet Interface Relay:

Coil side

Nominal input voltage U_N	24 V DC
Input voltage range	18.5 V DC ... 33.6 V DC (20 °C)
Nominal voltage (plugged-in electromechanical relay)	24 V DC
Drive and function	monostable
Drive (polarity)	polarized
Typical input current at U_N	9 mA
Typical response time	5 ms
Typical release time	8 ms
Protective circuit	Reverse polarity protection; Polarity protection diode Freewheeling diode; Freewheeling diode
Operating voltage display	Yellow LED



1.4 NPN to PNP

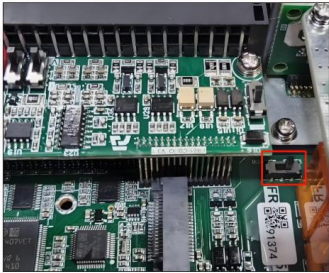
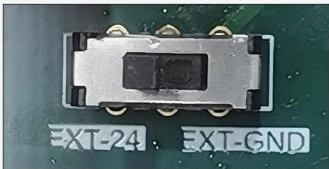
The following cobot models and control boxes can be switched from NPN to PNP mode:

- FR20 Control Box
- FR30 Control Box

Other models, such as the FR3, FR5, FR10, and FR16, do not currently support switching between NPN and PNP modes. For these models, an external NPN-to-PNP converter must be used when connecting a PNP device.



For the FR20 and FR30 models, the control box can be configured to PNP mode by opening the controller and adjusting the DIP switch position as shown in the image below.

	DIP Switch Position	DIP Switch Physical Position
NPN Input	EX-24V	
PNP Input	EX-0V	

WARNING: BEFORE OPENING THE CONTROL BOX, ENSURE THAT THE AC POWER CABLE IS DISCONNECTED AND REMAINS UNPLUGGED FOR AT LEAST 2 MINUTES. THIS PROCEDURE MUST ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL.