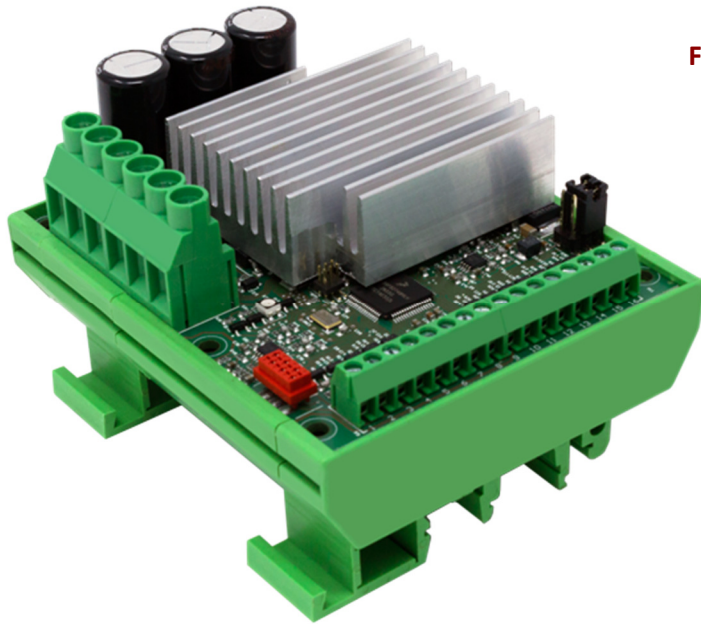


Linear Actuators

Electronic Driver for 1-2 Independent Linear Actuators or
2 Synchronized Linear Actuators 12/24 V 10-15 A



Features and Options:

- ✓ Power stage driven by pulse width modulation (PWM)
- ✓ Customizable acceleration and deceleration ramps
- ✓ Extreme precision and control for movement and brake, with arrests through limit switches
- ✓ Current and temperature limits
- ✓ Parameters editable in an easy and fast way thanks to a PC interface and through a USB/UART converter
- ✓ Control of movements in sync mode by encoder with Hall effect, allowing the setting of electronic limit switches (opening/closing)
- ✓ Compatible with a wide range of products and different applications
- ✓ High efficiency and energy saving

Drivers are low voltage for the control of one or two linear actuators with force up to 10.000 N (1.000 kg) and DC motors through MOSFET transistors with pulse width modulation (PWM).

In sync mode, the device ensures the balancing of the two linear actuators also in case of extremely different loads in terms of weight, shape, or distribution on the surface, allowing a stroke without any difference.

Technical Data

POWER SUPPLY	:	From 12 up to 48 Vdc, maximum ripple 20%
OUTPUT CURRENT	:	15 A for motor, in duty cycle S3 - 30% - 5 minutes
STAND BY POWER CONSUMPTION:	:	50 mA @ 24 V
PWM FREQUENCY	:	10 kHz
12 DIGITAL INPUTS (3 - 12 V)	:	8 for commands/limit switches, 4 for encoders (max 1 kHz), with operating logic programmable (positive/negative)
2 DIGITAL OUTPUTS NPN OPEN COLLECTOR (MAX 50 MA - 24 V)	:	One for the fault and one programmable
DIMENSIONS:	:	Without heat sink for currents up to 10 A: 86 x 72 x 30 mm (W x H x D) With heat sink for currents over 10 A: 86 x 72x 50 mm (W x H x D)

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Connections - Sync Mode:

Main Controls:

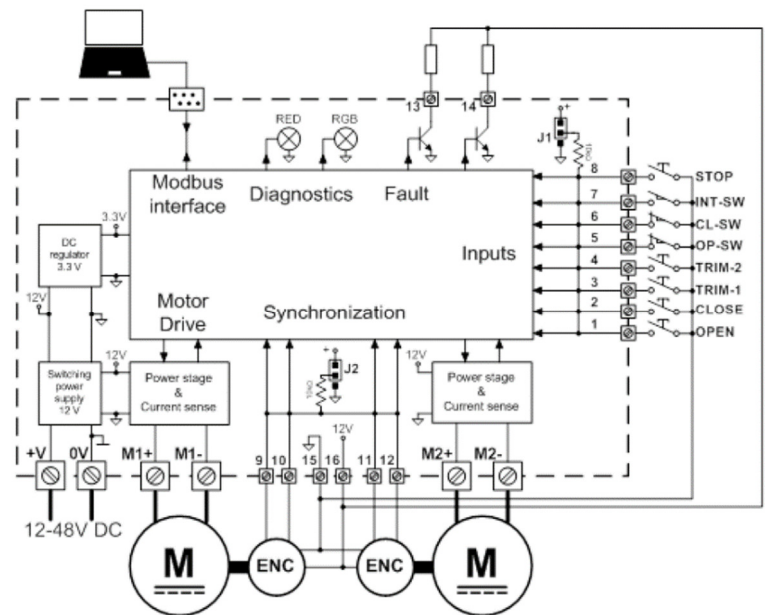
- OPEN/CLOSE: synchronous movement
- TRIM1 + OPEN/CLOSE: movement of actuator 1
- TRIM2 + OPEN/CLOSE: movement of actuator 2
- TRIM1 + TRIM2 (3 sec): homing

Signal Terminals (Vertical):

1. **OPEN:** opening command
2. **CLOSE:** closing command
3. **TRIM-1:** enabling independence for actuator 1
4. **TRIM-2:** enabling independence for actuator 2
5. **OP-SW:** opening limit switch
6. **CL-SW:** closing limit switch
7. **INT-SW:** intermediate limit switch
8. **STOP**
9. Encoder motor 1 – channel 1
10. Encoder motor 1 – channel 2
11. Encoder motor 2 – channel 1
12. Encoder motor 2 – channel 2
13. Digital output 1: FAULT
14. Digital output 2: programmable
15. GND for commands, limit switches and encoder
16. +12V for encoder supply

Power Terminals (Horizontal):

- **+V:** positive supply
- **0V:** GND
- **M1+:** actuator 1, positive supply (voltage > 0 opening)
- **M1-:** actuator 1, GND
- **M2+:** actuator 2, positive supply (voltage > 0 opening)
- **M2-:** actuator 2, GND



Homing:

The driver moves both the actuators in the same direction, according to an adjustable profile, current limiter or limit switch, depending on the configuration. It detects the connection's direction of encoders.

Trimming:

The driver moves each actuator independently, for mechanical adjustments and the first manual alignment. It is required to check that commands correspond to the direction of the movement.

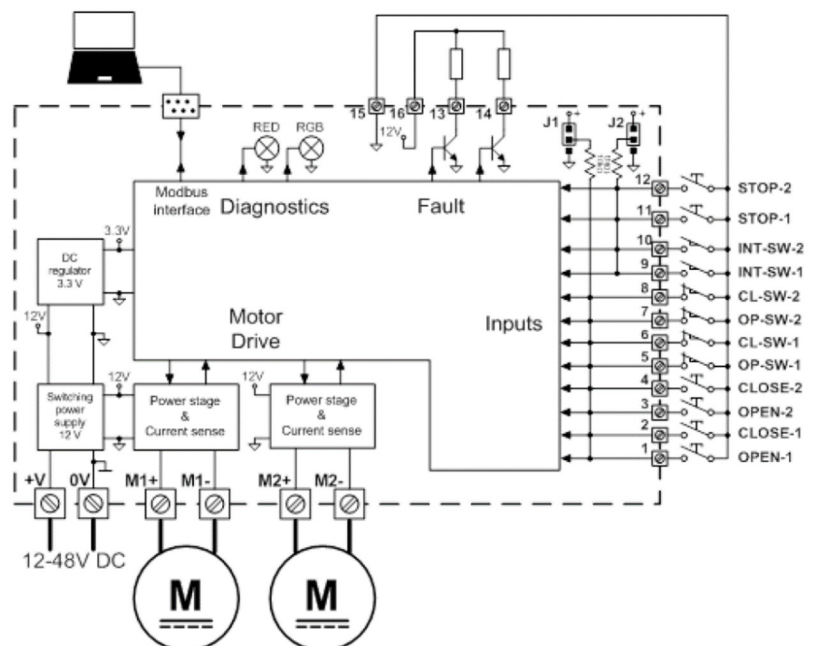
Connections - Independent Mode:

Signal Terminals (Vertical):

1. **OPEN-1:** opening command for actuator 1
2. **CLOSE-1:** closing command for actuator 1
3. **OPEN-2:** opening command for actuator 2
4. **CLOSE-2:** closing command for actuator 2
5. **OP-SW-1:** opening limit switch for actuator 1
6. **CL-SW-1:** closing limit switch for actuator 1
7. **OP-SW-2:** opening limit switch for actuator 2
8. **CL-SW-2:** closing limit switch for actuator 2
9. **INT-SW-1:** intermediate limit switch 1
10. **INT-SW-2:** intermediate limit switch 2
11. **STOP-1:** stop for actuator 1
12. **STOP-2:** stop for actuator 2
13. Digital output 1: FAULT
14. Digital output 2: programmable
15. GND for commands, limit switches and encoder
16. +12V for encoder supply

Power Terminals (Horizontal):

- **+V:** positive supply
- **0V:** GND
- **M1+:** actuator 1, positive supply (voltage > 0 opening)
- **M1-:** actuator 1, GND
- **M2+:** actuator 2, positive supply (voltage > 0 opening)
- **M2-:** actuator 2, GND



Linear Actuators

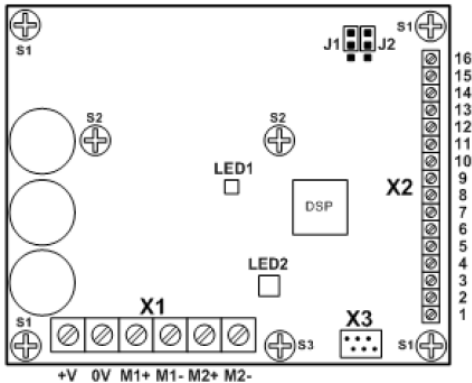
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Broad Overview:



COMPONENT:	FUNCTION:
X1	Power terminal for power supply and motor output connections
X2:1 – X2:8	Signal terminals for inputs
X2:9 – X2:12	Signal terminals for pulse inputs
X2:13	Fault output
X2:14	Configurable output
X2:15	Auxiliary voltage GND and inputs GND
X2:16	Auxiliary voltage +12 V
X3	Connector for communication with PC interface
J1	Jumper for inputs 1-8 pull-up/down configuration
J2	Jumper for inputs 9-12 pull-up/down configuration
LED1	DSP red LED
LED2	Diagnostic red/green/blue (RGB) LED

Interface:

Main Editable Parameters:

- Voltage Ramps
- Current Limits
- Sync or Independent Mode Enablement (the standard setup is in sync mode, customized pre-sets available on request)
- Homing at the start (for sync only)
- Homing with current limits or limit switches (for sync only)
- Virtual limit switches settled with encoder pulses limits (for sync only)

Values Monitorable through “Monitor” and “Statistics” sections:

- Motors current
- Applied voltage
- Temperature
- Speed
- Active commands
- Operating mode
- General information about the operating status of the driver



Using the PC interface, it is possible to:

- Consult the errors history (the driver stores each error and the time at which it occurred from the last start)
- Decide if an error must stop the operation (only advanced mode for some errors)
- Decide after how many repetitions of the same error the driver must block (only advanced mode for some errors)
- Decide the error tripping delay (only advanced mode for some errors)
- The connection and the communication between driver and PC are possible only through the USB/UART cable converter.

Ordering Key:

CODE:	NAME:	DESCRIPTION:
PF.0104	MC12/10A/S	Electronic driver for 2 synchronized linear actuators (max 10A)
PF.0106	MC12/15A/S	Electronic driver for 2 synchronized linear actuators (max 15A)
PF.0102	CAVO AZ2 CONVERT	USB/UART Cable Converter