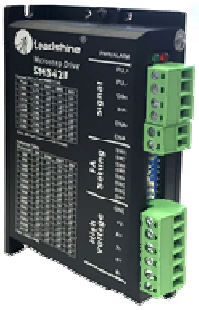
Stepper Motor Driver DM542EU



1. Features:

- Supply voltage up to +50 VDC (recommended not above 45 V due to "back EMF")
- Output current selectable in eight steps from 1.0 to 4.2 A (peak) via DIP switch
- Automatic current reduction (in idle mode) to reduce the motor heat
- Motor auto-identification and parameter auto-configuration for optimal torque from wide range motors
- „Soft-Start“ – no “Jump” when powered on
- Pulse input frequency up to 200 KHz
- Optically isolated inputs
- 16 selectable micro-step resolutions of 400 - 25.600 via DIP switches
- Suitable for 2-phase and 4-phase motors
- Protections for over-voltage and over-current

2. Description:

The DM542EU is a digital stepper drive with simple design and easy setup. By implementing Leadshine’s advanced stepper control technology, this stepper drive is able to power 2-phase and 4 phase stepper motors smoothly with optimal torque and low motor heating & noise. Its operating voltage is 20 – 50 V DC and it can output up to 4.2 A current. All the micro step and output current are done via DIP switches. Therefore, the DM542EU is an ideal choice for Applications requiring simple step & direction control of NEMA 17, 23, and 24 stepper motors.

3. Applications:

Suitable for a wide range of stepper motors of NEMA sizes 17, 23 and 24 (42 x 42 mm to 60 x 60 mm). It can be used in various kinds of machines, such as X-Y tables, engraving machines, labelling machines, laser cutters, pick-place devices, and so on. Particularly well suited for applications where low noise levels, less heat development, high speed and high precision are desired.

4. Electrical Specification:

Parameters	Min.	Typ.	Max.	Unit
Output current	1.0	-	4.2 (3.0 RMS)	A
Supply Voltage	20	24 - 48	50	V DC
Logical Signal Current	7	10	16	mA
Pulse input frequency	0	-	200	kHz
Minimal pulse width	2.5			µs
Minimal direction setup	5.0			µs
Isolation Resistance	500			MΩ

5. Further Specifications:

Parameters	Min.	Typ.	Max.
Microsteps / 1.8°	400		25600
Puls / Direction (PUL / DIR)		X	
NEMA Sizes	17		24
Motor Type Mecheltron	42BYGH-XXX		60BYGH-XXX

6. Environment:

Cooling	Natural or forced cooling	
Operating Environment	Environment	Avoid dust, oil, fog and corrosive gases
	Ambient Temperature	0 °C - 40 °C
	Humidity	40 % RH bis 90 % RH
	Operating Temperature	max. 90 ℃
Storage Temperature	-20 °C to 65 °C	

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7.DIP Switch Settings:

Dynamic Current Configuration				
Peak Current	**RMS Current**	**SW 1**	**SW 2**	**SW 3**
1,00 A	0,71 A	On	On	On
1,46 A	1,04 A	Off	On	On
1,91 A	1,36 A	On	Off	On
2,37 A	1,69 A	Off	Off	On
2,84 A	2,03 A	On	On	Off
3,31 A	2,36 A	Off	On	Off
3,76 A	2,69 A	On	Off	Off
4,20 A	3,00 A	Off	Off	Off

SW4 is used to set the percentage of the motor idle current. In the OFF position, this means that the stall current is set to 50% of the selected output current. In the ON position, this means that the stall current is set equal to the selected dynamic current. The current is automatically reduced to 50% of the selected dynamic current 0.4 seconds after the last pulse.

Micro Step Resolution Configuration					
Micro Steps	**Steps/rev. (1,8°)**	**SW 5**	**SW 6**	**SW 7**	**SW 8**
1/2	400	Off	On	On	On
1/4	800	On	Off	On	On
1/8	1600	Off	Off	On	On
1/16	3200	On	On	Off	On
1/32	6400	Off	On	Off	On
1/64	12800	On	Off	Off	On
1/128	25600	Off	Off	Off	On
1/5	1000	On	On	On	Off
1/10	2000	Off	On	On	Off
1/20	4000	On	Off	On	Off
1/25	5000	Off	Off	On	Off
1/40	8000	On	On	Off	Off
1/50	10000	Off	On	Off	Off
1/100	20000	On	Off	Off	Off
1/125	25000	Off	Off	Off	Off

8.Pin Assignment:

Pin	Details
PUL +	PUL signal: Pulse active on rising edge; 4-5V for PUL-HIGH, 0-0.5V for PUL-LOW. Minimum pulse width of 2.5µs. Add resistor to limit current at +12V or +24V input logic Voltage (1KΩ for +12V, 2kΩ for +24V). Same for DIR and ENA signals.
PUL -	
DIR +	DIR signal: This signal has low/high voltage levels representing two directions of motor rotation. Minimum direction setting time of 5µs.
DIR -	
ENA +	ENA signal: This signal is used to enable/disable the inverter. High level +5V (NPN control signal) to enable the inverter and low level to disable the inverter. By default it is Unconnected (ENABLED).
ENA -	
GND	Ground connection of the power supply.
+V	Positive connection of the power supply. Recommended supply voltage 24-48VDC
A +; A -	Connections of Motor Phase A.
B +; B -	Connections of Motor Phase B.

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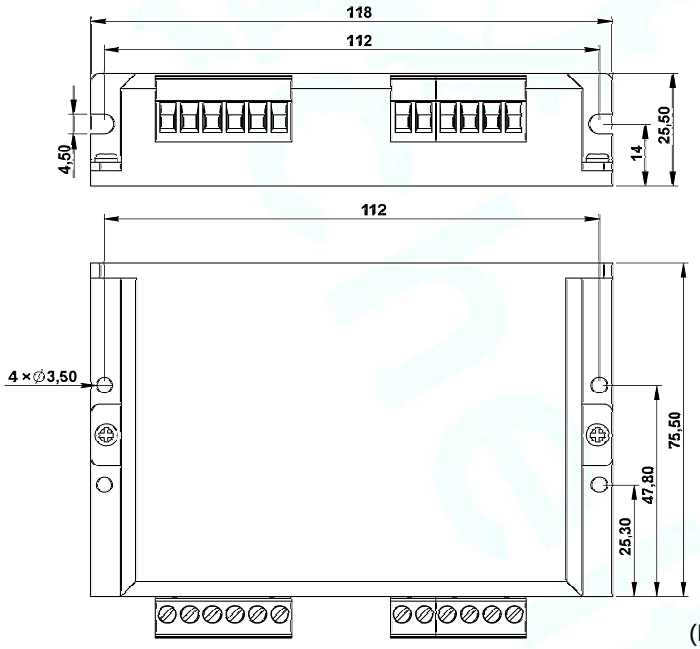
9. Protection Indication:

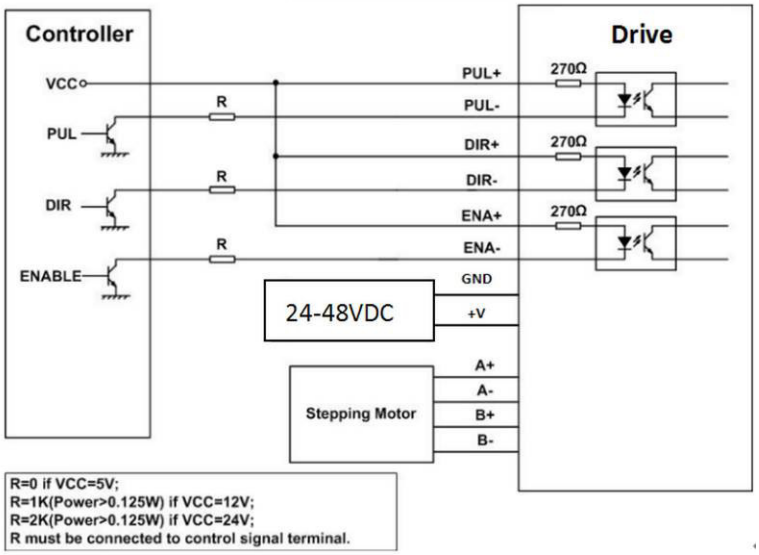
Prio.	Number Flashing	Sequence of the red LED	Description
1.	1		Overcurrent protection activated when the peak current exceeds the limit.
2.	2		Overvoltage protection activated when the
3.	3		operating voltage is higher than 60 V DC

10. Mechanical Data:



(Einheit: mm)

11. Wiring:



A complete system consists of stepper motor, stepper motor driver, power supply and controller (pulse generator). A typical connection diagram is shown in the left figure.