ADV-B-42-24-02
Microstep Motor Driver

User Manual

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1. Feature

- ✓ High performance, cost-effective
- ✓ Supply voltage +24VDC
- ✓ Output current up to 4.2A
- ✓ Small size and light
- ✓ Pure-sinusoidal current control technology
- ✓ Pulse input frequency up to 500 KHz
- ✓ Optically isolated Input / Output
- ✓ 16 selectable resolutions, up to 1/250 microstepping (50,000 steps/rev for 1.8 degree Stepper Motors)
- ✓ Suitable for Bipolar step motors
- ✓ Support PULSE/DIR and CW/CCW modes
- ✓ Setting parameters via isolated USB interface
- ✓ Graphic User interface available for Windows XP/Vista/7
- ✓ Over-voltage, over-current and over temperature protection
- ✓ Smooth automatic idle-current reduction
- ✓ Smooth increase of motor current after Power-On to avoid mechanical shock and reduce noise during start operation
- ✓ Smooth increase of motor current from idle-current to maximum to avoid mechanical/sound click. Time of current increasing recalculated due to motor acceleration during rotation start to produce maximum motor torque and minimum vibration.
- ✓ Extremely low noise during motor stop. During motor stop status the current control of the motor coils going to low-noise mode. In this mode no any changes of PWM Duty Cycle and extremely low noise. This feature extremely suitable for laser beam deflection system, optical and vision systems.
- ✓ Self adjustable Motor Current Control Gain to provide maximum motor torque at high speed and low noise at low speed rotation.
- ✓ Active digital damping system highly reduces vibration and avoids the motor stops due to failure of step at motor natural resonant frequencies.
- ✓ Maximum microstep resolution for any set microstep resolution. Microstep interpolation algorithms used for provide smooth motor rotation at all microstep modes.

2. Introduction

The *Advanced Equipment Step Motor Drivers* are high performance microstepping drivers based on one of the most advanced technologies in the world today. They are suitable for driving bipolar hybrid step motors. By using advanced bipolar constant-current technique, they can output more speed and power from the same motor, compared with traditional technologies such as L/R drivers. Its 3-state current control technology allows coil current to be well controlled, with relatively small current ripple and results in less motor heating.
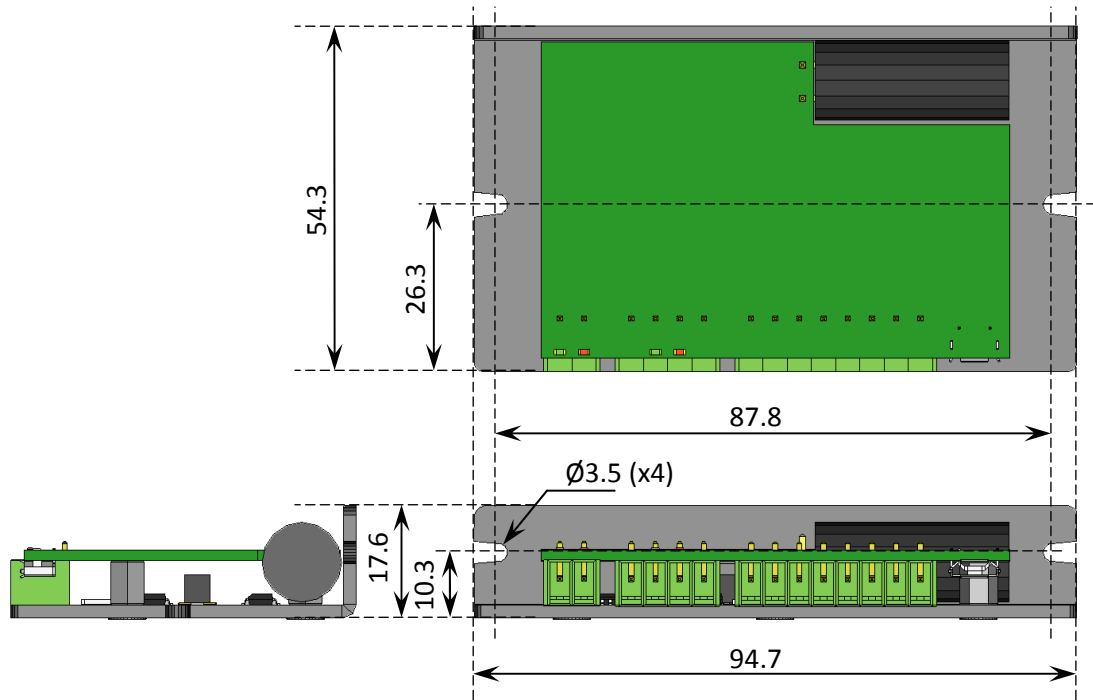
3. Applications

Suitable for a wide range of stepping motors of size Nema23 and 43 or similar, and usable for various kinds of machines, such as X-Y tables, labeling machines, laser cutters, engraving machines, and pick-and-place devices. *Advanced Equipment Step Motor Drivers* are extremely suitable for applications expected to be low noise, low vibration, high speed and high precision system.
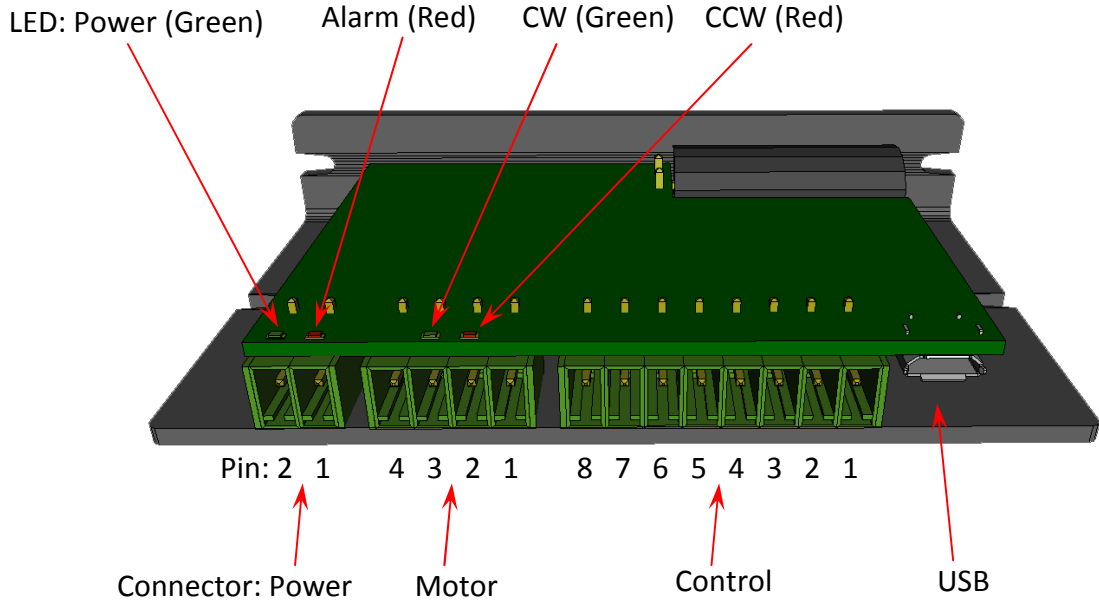
4. Specifications

4.1. Electric Specifications

Parameter	Value
Input Voltage	24VDC ±10%
Output Current	0.5 .. 4.2A
Driver Method	Bipolar PWM drive with DSP
Temperature	In use: 0..50 ^{o}C In Storage: -20..70 ^{o}C
Humidity	In use: 35..85% (Non-Condensing) In Storage: 10..90% (Non-Condensing)
Vibration Resist	0.5G
Resolution	1/2.5, 1/5, 1/8, 1/10, 1/16, 1/18, 1/20, 1/25, 1/32, 1/40, 1/50, 1/100, 1/125, 1/180, 1/200, 1/250 (Default 1/50)
Control method	1 pulse (Pulse / Direction) / 2 pulse (CW / CCW)
Control Max Frequency	500 kHz (Duty 50%)
Alarm Function	Over-Current (motor coil short circuit), Over-Heat, Power Supply Over/Under-Voltage, Motor disconnection, Motor Over Regenerative Voltage
LED Display	Power Status(Green), Alarm Status(Red), Motor direction CW(Green) / CCW(Red)
STOP Current	10% ~ 100% Be activated after 0.5 second after motor stop (Default 50%)
Rotational Direction	Normal / Inverse
Input Signals	Motor Free / Alarm Reset (Photocoupler Input)
Output Signals	Alarm (Photocoupler Output)
Set parameters	Via build-in high voltage isolated USB port

4.2. Mechanical Specifications [mm]

54.3

26.3

87.8

Ø3.5 (x4)

17.6

10.3

94.7

5. Pin / LED Assignment and Description

LED: Power (Green)   Alarm (Red)   CW (Green)   CCW (Red)

Pin: 2 1   4 3 2 1   8 7 6 5 4 3 2 1

Connector: Power   Motor   Control   USB

5.1. Connector Description

Power Connector

Pin	Description	Remark
1	+24V	
2	Ground	

Motor Connector

Pin	Description	Remark
1	A	
2	/A	
3	B	
4	/B	

Control Connector

Pin	Description	Remark
1	CW+ / Pulse+	
2	CW- / Pulse-	
3	CCW+ / Dir+	
4	CCW- / Dir-	
5	Alarm Reset/Disable +	
6	Alarm Reset/Disable -	
7	Alarm +	
8	Alarm -	

USB Connector

Standard High Voltage isolated micro-USB type B connector.

5.2. LED Assignment

Power / Alarm LED

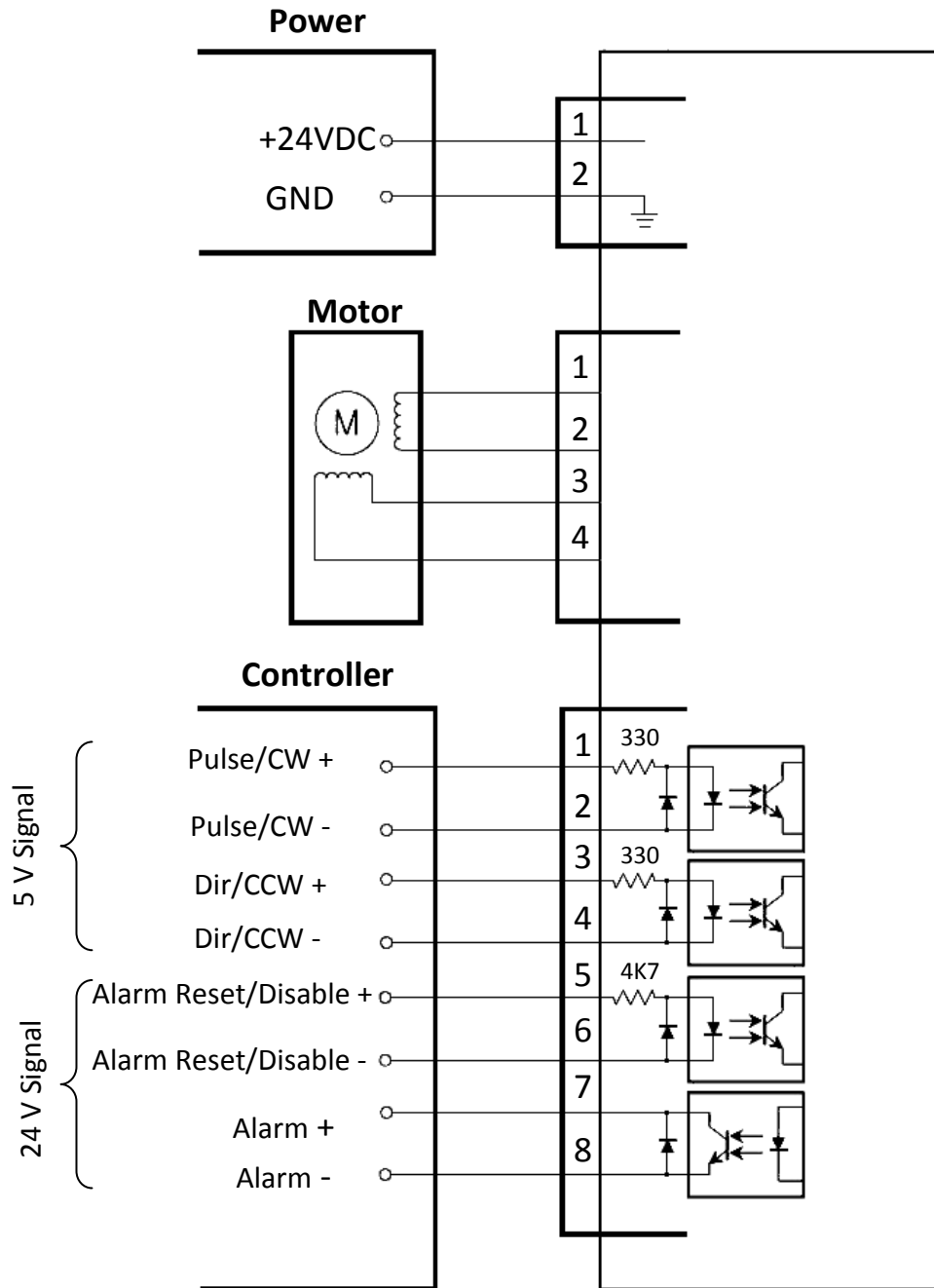| LED Mode	Meaning
Green	Normal operation
Green Flashing	Motor disable
Red Flashing	Alarm (Number of flashes shows error number: Refer Table 1)

Table 1. Driver error description

Error Number	Error Description
2	Motor Connection Error
3	Over Current
4	Over Temperature
5	Over Regenerative Voltage
6	Power Supply Voltage Error
7	EEPROM CRC Error
8	Internal Driver Error
9	Over Speed
10	Motor Voltage Error

CW / CCW LED

LED Mode	Meaning
Green	Motor rotate at CW direction
Red	Motor rotate at CCW direction
No light	Motor Stop

6. Typical Connections

Power

+24VDC

GND

| 1 |
| 2 |

Motor

M

| 1 |
| 2 |
| 3 |
| 4 |

Controller

5 V Signal

Pulse/CW +

Pulse/CW –

Dir/CCW +

Dir/CCW –

24 V Signal

Alarm Reset/Disable +

Alarm Reset/Disable –

Alarm +

Alarm –

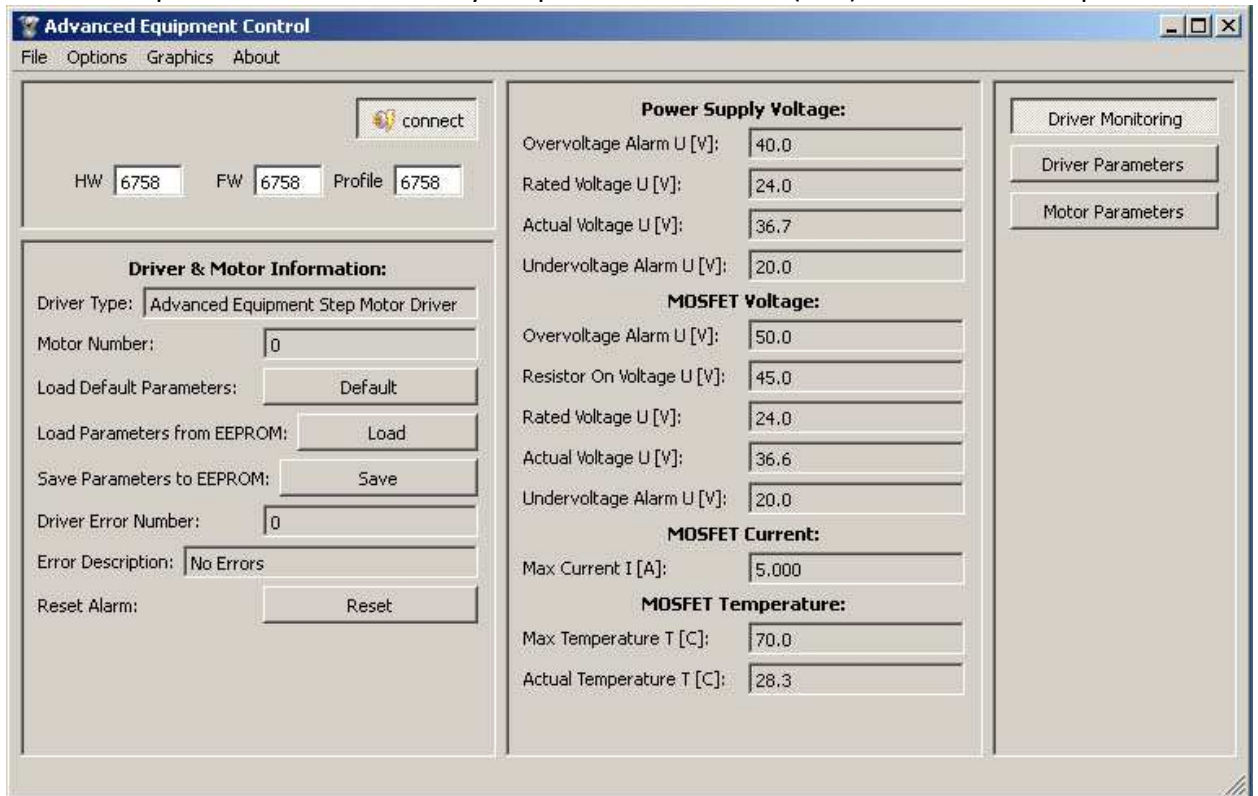| 1 | 330 |
2	
3	330
4	
5	4K7
6	
7	
8	

7. Graphic User Interface
7.1. Overview

All parameters can be set by Graphic User Interface (GUI) via isolated USB port.

7.2. Installation

1. Download latest version from website http://www.adv-driver.com/
2. Run Install Program
3. Follow the on-screen instructions to complete the process

After install run the program and connect to device. For Additional information refers to GUI reference manual.