VBCore DC motor Driver 15A v1.2

Power IN
9-50V
XT30 compatible

I2C4 voltage select solder jumper
switch 3.3 or 5V for I2C4 connector

CURRENT SHUNT RESISTOR

MOTOR CONNECTORS

+ −

A B

VOLTRO.COM
DC-15A 1.2

STM32G474 RE
v1.3

USR
TERM
RST

G 5V 3V
ON
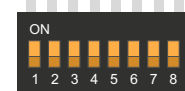1 2 3 4 5 6 7 8
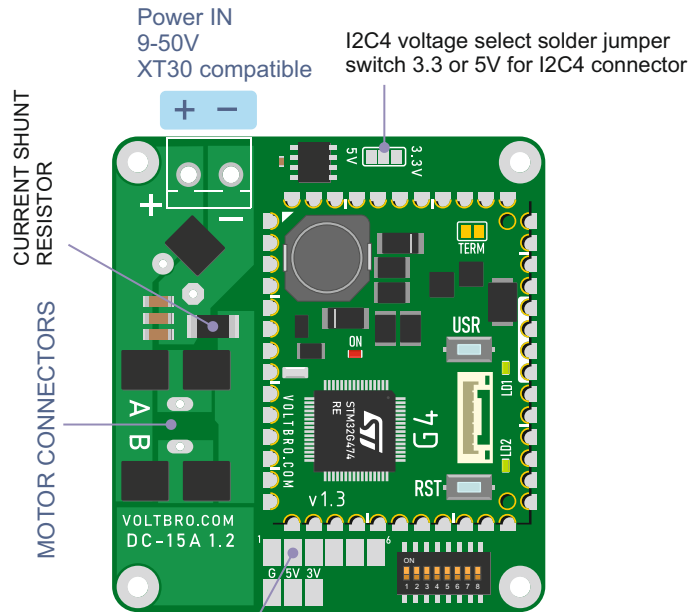
Solder pads
Use common pins with user switch (1-6 inputs)
NOTE: put switches off in case of using solder pads

I2C4_SDA
I2C4_SCL
GPIO
PB0
PC6
PB7
GND
3.3 / 5V
5 4 3 2 1

GND		1
5V		2
SPI3_MISO	PC11	3
SPI3_MOSI	PC12	4
SPI3_SCK	PC10	5
SPI3_NSS	PA15	6
SPI3_NSS2	PB4	7

SPI3

GND		1
5V		2
TIM8_CH1	PB6	3
TIM8_CH2	PC7	4
TIM8_ETR	PA0	5
NC	NC	6

TIM8

I2C4

ALLEGRO
A4955

GND
CANL
CANH
←CAN→

GND
CANL
CANH
1 2 3

GND
CANL
CANH
1 2 3

A
GND
TIM8_CH2 PC7
CH2
CH1
5V
B
6 5 4 3 2 1

B A
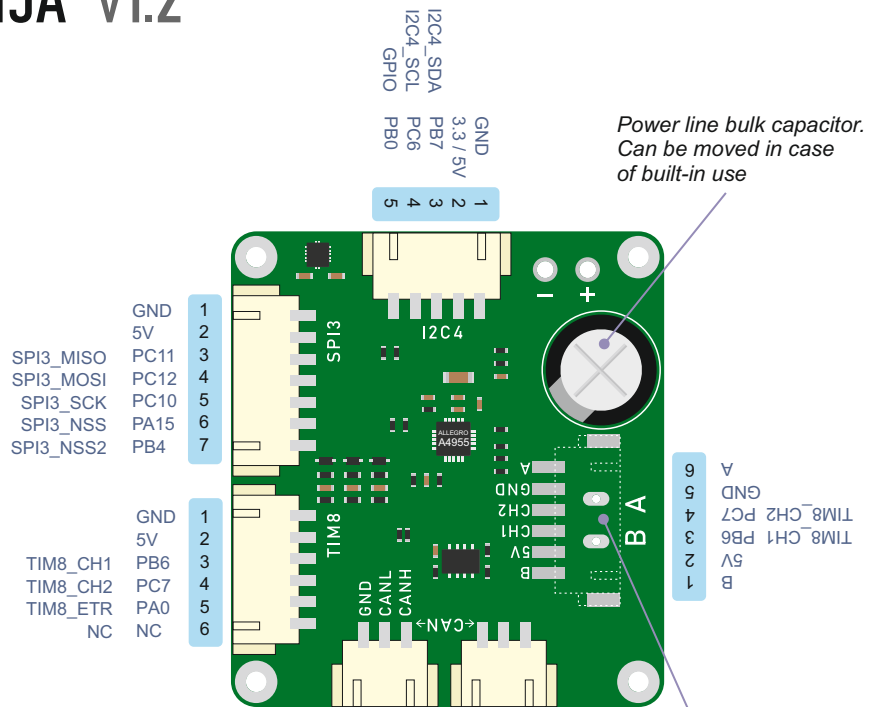
TIM8 for quadrature encoder
AB 2-Channel / ABZ 3-Channel

Power line bulk capacitor.
Can be moved in case
of built-in use

− +

Alternate motor connector,
6 pin, SMT, pitch 2.5mm
Attention! *Encoder pins
same as left connector.
AB pins same as motor out.*

Driver
Allegro A4955, 50 V
Full-Bridge PWM Gate Driver
designed for control of DC motors

Controll	PIN	Notes
SLEEPn	PB3	
IN1	PA8	TIM1_CH1
IN2	PA9	TIM1_CH2
AIOUT	PC1	
VREF	PA4	1:2 divider
FAULT	PB5	
RC		R_{RC}= 47K, C_{RC} = 1n
ISET		R_{ISET}= 47K
SENSE		R_{SENSE}= 0,01

EEPROM
256K
AT24C256C

Controll	PIN	I2C
A0	GND	
A1	GND	
A2	GND	
SCL	PC6	I2C4_SCL
SDA	PB7	I2C4_SDA

Voltage controll
Resistive voltage divider 16:1

Controll	PIN	ADC
V input	PC0	ADC12_IN6

Current shunt resistor
Connected to A4955 driver

Size	Default
1206	R_{SENSE} 0.01 Ohm

NOTES:
1. SPI3 connector connected to controller via level shifters
2. Hall sensors connectors connected to controller via filter
3. I2C4 SCL and SDA lines pulled up - **DON'T USE** internal pull-up
4. I2C4 line (including EEPROM) is powered through solder bridge

User siwtch
8 pin, ON == HIGH

ON
1 2 3 4 5 6 7 8

PB10 PB11 PB12 PB13 PB14 PB15 PC8 PC9

VBCore DC motor Driver v1.2

VIN: 9-50V
MAX CURRENT: 15A
MCU: VB32G4 (STM32G474RE)
DRIVER: ALLEGRO A4955
SPI interface
ABZ encoder interface
I2C interface
Current control
I2C EEPROM
CAN / CAN-FD
Dimensions: 51x56mm
Mount holes: 45x50mm D2.5 mm

VBCores
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research and development