AESC V4 / V6.7
CONTROLLER USER MANUAL

FOR SAFETY, PLEASE READ THIS MANUAL PRIOR TO USE.

Follow this user manual precisely to prevent potential hazards or property damage.

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS BEFORE USE. FAILURE TO COMPLY MAY RESULT IN FIRE, ELECTRIC SHOCK, SERIOUS INJURY, OR DEATH.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

1.VOLTAGE LIMIT

• Maximum Safe Input Voltage: 12S Li-ion configuration (50.4V).

• NEVER use with 13S or higher battery configurations.

• Verify motor voltage compatibility before connection.

2.REVERSE POLARITY

• Incorrect battery (+) to (–) or motor phase wiring will cause permanent damage, fire, or explosion.

• Double-check all connections before powering on.

3.REGENERATIVE BRAKING RESTRICTIONS

• Regenerative braking MUST NOT be used with switching power supplies. Battery systems SHALL have pre-configured regen current limits.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

1.HIGH SURFACE TEMPERATURE

• Controller surface should not exceed 85°C (185°F) during operation.

• Severe burn hazard: Always wear heat-resistant gloves (>93°C(200°F) rated) when handling.

• Do not touch during operation or within 10 minutes after shutdown.

2.ELECTRICAL HAZARDS

• Incorrect wiring may cause fire, electric shock, or explosion.

•Always disconnect batteries before installation/maintenance.

3.CHOKING HAZARD

• Contains small parts. Keep out of reach of children under 3 years.

4.OPERATIONAL WARNINGS

• Immediately power off if product emits unusual noise, odor, or smoke. Contact support.

• Disconnect batteries during extended non-use.

• Never modify this controller. Unauthorized alterations void warranty.

5.AGE RECOMMENDATION

Not for children under 16 years. This is not a toy.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor/moderate injury or product damage.

1.ENVIRONMENTAL REQUIREMENTS

• Dry environments ONLY. Not waterproof.

• Install in flat, stable locations away from heat sources/direct sunlight.

2.MAINTENANCE

• Clean only with dry cloth. Ensure no dust/debris accumulates on product.

• Prevent foreign substances from entering ports/vents.

3.PHYSICAL HANDLING

• Avoid drops, impacts, or bending cables.

• Keep body/clothing clear of rotating motor shafts.

OVERVIEW

• The Autoro AESC V4/V6.7 controllers deliver robust performance and high power density in a compact form factor.

• It is designed for low voltage EV applications like skateboards, bikes, scooters, robots and much more.

• These motor controllers, running on the open-source VESC software, are fully customizable and adaptable for any product with an electric motor.

• AESC V4 and AESC V6.7 are available for pre-order on website.

LED INDICATOR STATUS

• **Blue:** Device is powerd up.

• **Green Dim:** SW Running>>Software(Firmware) installed and running

• **Green Bright:** Device is driving the motor.

• **Red:** Fault code,something is wrong!Read out the fault code in VESC-Tool.

FEATURES

• Controlled by the STM32F4 microcontroller, frequency up to 168MHz.

• Sensored and sensorless FOC with auto-detection of all motor parameters.

• Brushless, brushed DC motors and IPM motors are supported.

• Robust starting torque performance in both sensorless and sensored modes.

• Support four control modes:Duty-cycle Control,Speed Control,Current Control and Position Control.

• Real-time data logging and monitoring.

• Adjustable protection against:

    ▶ Low input voltage limit.   ▶ High input voltage limit.

    ▶ High motor current limit.   ▶ High input current limit.

    ▶ High regenerative braking current limit (separate limits for motor and input).

    ▶ High ERPM limit (separate limits for each direction).

• Overtemperature protection.

• Support motor temperature detection and compatible with motor temperature sensors including: NTC 10K at 25℃, NTC 100K at 25℃, PTC 1K at 100℃, KTY83/122, etc.

• The compact controller design fits in any confined space. AESC V4 &AESC V6.7 have the same size: 55mm * 45mm * 17mm (2.17in * 1.77in * 0.67inch)

SIZE

17mm
0.67in.

55mm
2.17in.

45mm
1.77in.
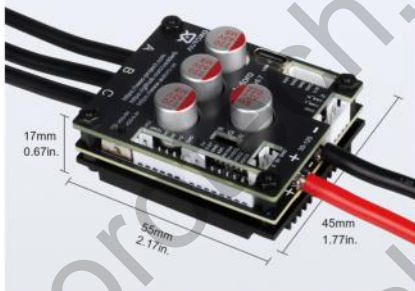
TECHNICAL SPECIFICATIONS

Model SPEC	AESC V4	AESC V6.7
Voltage	Safe for 3S~12S(12-50.4V)	
Current	50A Continuous,150A Peak	
ERPM	100,000	150,000
Motor Control Modes	BLDC square wave and FOC sine wave	
Supported Sensors	Sensorless,HALL, ABI, AS5047,AS5048A	
Control Interface Ports	USB,CAN,UART	
Input Set Support	PPM,ADC,UART	PPM,ADC,UART,NRF
Battery Wire	12AWG	
Phase Wire	12AWG	
Regenerative Capacity	Yes	
Programmable	Yes	

WHAT'S IN THE BOX?

Product Name	Qty	V4	V6.7
AESC V4 Controller Unit	1	√	-
AESC V6.7 Controller Unit	1	-	√
USB Type-C	1	√	√
HST(Heat Shrink Tubing), L=300mm	1	√	√
Male Banana Plug,φ4mm	3	√	√
Female Banana Jack,φ4mm	3	√	√
PH2.0 3-Pin to 2.54mm Pitch Dupont Header Adapter Cable, L=200mm	1	√	√
PH2.0 6-Pin Single-Ended Cable, L=150mm	1	√	√
PH2.0 7-Pin Single-Ended Cable, L=150mm	1	√	-
PH2.0 8-Pin Single-Ended Cable, L=150mm	1	-	√
XT60H-F & XT60H-M	1	√	√
User Manual	1	√	√

HARDWARE INSPECTION

Required Equipment for hardware check: Multimeter, Adjustable Switching Power Supply.

1.Pre-energization Short-circuit Check

· Procedure:

a. Set multimeter to continuity mode (audible beep) .

b.Test between: ▶ VIN+ and VIN- terminals ▶ 5V output and GND ▶3.3V output and GND

c. Pass Criteria: No continuity (resistance >1kΩ) observed between any tested terminals.

2.Current-limited Power Supply Verification

· Configure adjustable power supply parameters:

▶ Output voltage: 12 V DC

▶ Current limit: 100mA (constant current mode)

• Apply independent power to the controller module, observe LED status:

▶ Blue LED illuminates within 0.5s (power good)

▶ Green LED activates within 10s (system ready)

3.Output Voltage Validation

• Maintain power supply, measure with multimeter in DC voltage mode:

▶ 5V output to GND: Tolerance ±5% (4.75~5.25V)

▶ 3.3V output to GND: Tolerance ±5% (3.14~3.47V)

4. Hardware Inspection Completion

• Safely disconnect power supply.

• Remove all test leads.

Notes:

• Damage Inspection: Visually examine PCB for: burnt components, broken traces, swollen capacitors, report anomalies to Autoro.service@hotmail.com (attach high-res photos of damaged PCB).

• Please read all the terms & conditions before purchasing the product from Autoro for claiming warranties or making returns.

HARDWARE CONNECTION

To connect AESC to a motor via banana connectors, proceed as follows:

AESC and Female Banana Jack

| 1 | 2 | 3 |

1.Prepare components:

▶AESC three-phase wires (A/B/C)   ▶ Female Banana Jack   ▶ Heat shrink tubing

2.Solder the wires: Solder each phase wire to separate Female Banana Jack

3.Apply heat shrink tubing after solder joints cool completely:

a. Cut heat shrink tubing to appropriate length.

b. Slide tubing over solder joint and connector body.

c. Ensure complete coverage of all metal parts.

d. Heat evenly with heat gun (Approximately 130°C to 150°C) while rotating until snug.

If connection between AESC and battery using XT-60H connectors is required, proceed as follows:
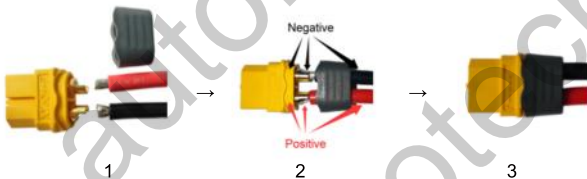
WARNING: POLARITY MUST NOT BE REVERSED.
Reversed connection will cause permanent equipment damage.

Inspection Before Soldering:
• Visually verify polarity (+/-) 3 times.
• Cross-check with user manual.

AESC and XT60H-M
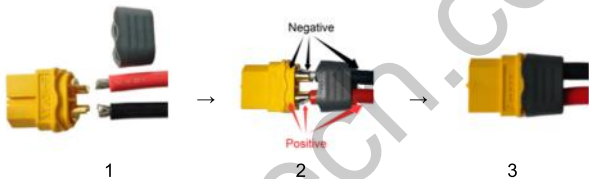

1 → 2 → 3

1.Prepare AESC and XT60H-M

2.Solder wires: ▶ Positive (+): Solder the red power wire to the side marked + on XT60H-M.
　　　　　　▶ Negative (-): Solder the black power wire to the side marked - on XT60H-M.

3.Assemble the housing: After the solder joints have completely cooled, reassemble the insulation housing onto the XT60H-M body until you hear a "click" or confirm it is fully secured.

Battery and XT60H-F

1 → 2 → 3

1.Prepare Battery and XT60H-F

2.Solder wires: ▶ Positive (+): Solder the red power wire to the side marked + on XT60H-F.

▶ Negative (-): Solder the black power wire to the side marked - on XT60H-F.

3.Assemble the housing: After the solder joints have completely cooled, reassemble the insulation housing onto the XT60H-F body until you hear a "click" or confirm it is fully secured.

XT60H-M and XT60H-F

Inspection After Soldering:

Test connections with a multimeter immediately after soldering:

• Check for short circuits.

• Confirm correct polarity.

• Connect XT60H-M and XT60H-F

GENERAL CONNECTION INSTRUCTIONS

1.Motor Phase Wiring: The initial connection order of the motor phase wires (A/B/C) to controller phase outputs (A/B/C) may be arbitrary. If the motor rotates in the wrong direction, swap any two phase wire connections or adjust motor direction setting in VESC-Tool.

2.Position Sensor Connection (If Applicable): Connect the sensor to the controller's sensor interface for motors equipped with position sensors.

3.USB Communication Setup: Use a USB Type-C cable to connect the computer to the controller.

4.Power Supply Selection: Select a power supply whose voltage is within both controller operating range and motor rated voltage range.

5.Power Connection: Connect the power supply to the controller's power interface. Critical: Verify correct polarity (+/-) before energizing.

6.LED Status Indication:

• Power-on: Blue LED illuminates immediately.

• System ready: Green LED activates within 10 seconds (initialization complete)

7.Technical Support:

• For installation,email detailed information to: Autoro.service@hotmail.com

• Preliminary response within 3 business days.

Safety Note: Due to high-capacity capacitors in the controller:

• Minor arcing / sparking during battery connection is normal.

• For enhanced safety, install an Autoro Anti-Spark Switch is recommended.

SOFTWARE SETUP

In this tutorial we will configure AESC motor controller in combination with a BLDC (Brushless Direct Current) motor.

We will run the motor in FOC (Field-Oriented Control) mode.

1. Download and Install VESC-Tool

• Download the latest stable version of VESC-Tool compatible with your operating system(Windows/macOS/Linux) from the official website: (https://vesc-project.com/vesc_tool). Run the installer and follow the on-screen instructions to complete the installation.

2. Run VESC-Tool and Connect to the controller

•Launch VESC-Tool on your computer.

•Click the "Auto Connect" button on the main interface.

•Upon successful connection, the bottom-right corner of the main interface will display: "Connected (serial) to COM3" .

3. Initial Motor Parameter Detection

• Pre-Detection Verification

► Ensure the motor is securely mounted and its rotor rotates freely.

► Keep all objects clear of the motor shaft rotation path.

► Verify motor phase wires (A/B/C) are correctly & securely connected to controller terminals.

► For sensor-equipped motors (e.g., Hall/Encoder), confirm proper connection to the sensor interface.

• Motor Configuration

► Access FOC Setup: In the VESC-Tool's main interface, click "Setup Motor FOC".

► Carefully read all warnings and instructions in the setup wizard.

► Configure parameters according to your motor specifications: Motor type (Inrunner/Outrunner), Battery Type, Battery Cells Series, Battery Capacity, Number of motor pole pairs,etc.

► Pre-Detection Checks:Verify all settings and confirm safety conditions.

► Initiate Detection: Click "RUN DETECTION" to initiate the process.

► Progress and status will display in real-time.

► The motor will emit audible beeps and begin slow rotation.

► Completion: Detection typically completes within 30–60 seconds.

• Complete Detection

► Successful Detection Output: Upon successful detection, the following parameters will be displayed:

 • Resistance (R) • Inductance (L) • Flux linkage (λ) • Sensor Status, etc.

► Rotation Direction Test:

 a.Motor Direction OK: Click "**FWD**" and "**REV**" to check motor direction → Click "**FINISH**" to complete setting if the direction is OK.

 b.Motor Rotation Reversed: Click the "**Inverted**" on to change motor direction → click "**FWD**" and "**REV**" to confirm motor direction → Click "**FINISH**" to complete setting.

Congratulations! The motor parameters have been successfully detected and configured.

For comprehensive controller configuration, refer to the official VESC Project step-by-step guide.

Official VESC Configuration Guide Link: https://vesc-project.com/node/178

Autoro Configuration Guide Link: https://github.com/Autoro-ESC/AESC

**SAFE SETTINGS AND OPERATION FOR MOTOR AND BATTERY SETTINGS
(Motor Settings Panel, General):**

WARNING: This device is intended to be used with the original Open Source Software
VESC-Tool. Usage of other software than stated voids warranty and statement of
conformance! This is a guide to set up your device within the measures of safe
operation. Stay safe! To prevent injuries,operate your motor without attached propellers,
wheels and/or moving mechanical parts when doing/changing your setup.Stay clear of
any moving parts! Motor will spin up during setup!If you are not an expert, please use
the Wizards for Setup! Additionally apply safe settings for the temperature cutoffs to
prevent over heating.

• **BLDC Mode:** Block Commution (Trapezoidal),more noise,less efficient,sometimes lesser likelihood to experience problems.

• **FOC Mode:** Sinosoidal Commutation (Sine Wave),free of noise /vibrations,more efficient,more complex.

• **Sensors:** Does your motor/setup incorporates motor sensors?Do you want to use them? (Hall,ABI,AS 5047P Sensors)

Did you check and adjust the sensor voltage (3.3V / 5V)?

• **Battery Cutoff Start:** System decreases power usage when voltage drops below defined value,e.g.3.4V per cell for LiPo (battery protection/health).

• **Battery Cutoff End:** System stops motor when voltage drops below defined value,e.g.3.1V per cell for LiPo (battery protection/health).

• **Motor Current Max:** Defines maximum allowed Amp draw for the Motor.Can your motor cope with your setting?Does anything get hot during operation?

• **Motor Current Max Brake:** Defines maximum allowed current being generated by the motor (regenerative braking). * Warning: Wrong settings may overstress your motor/generator and/or battery!Read the warnings below!

• **Absolute Maximum Current:** Max.Amp flow allowed in your electrical system(peak).

• **Battery Current Max:** Max.allowed continuous current drain according to batteries technical data sheet.Read warning below!

• **Battery Current Max Regen:** Max.current fed back into your battery pack.Check batteries data sheet to prevent dangers or battery damage.Read warnings below!

• **MOSFET Temp Cutoff Start:** System decreases power usage when temperature reaches this value, default 85℃ (185°F)

• **MOSFET Temp Cutoff End:** System stops motor operation when temperature reaches this value, default 100℃ (212°F)

• **MotorTemp Cutoff Start:** System decreases power usage when temperature reaches this value, default 85℃ (185°F). Motor Temp sensors needed for this feature.

• **Motor Temp Cutoff End:** System stops motor operation when temperature reaches this value, default 100℃ (212°F). Motor Temp sensors needed for this feature.

Please visit www.vesc-project.com/documentation for more Information.If you are unsure about any setting inform yourself or send us an email to prevent any danger. Start using values on the safe side and check if any part of your electrical system starts to heat up beyond safe limits of operation.

Warning: When using the motor as a generator(e.g. as a regenerative motor brake), your battery will be charged with the setting found in **Motor Settings >> General >> Current Tab** of VESC-Tool. The Battery Current Max Regen value will define the maximum Ampflow pushed towards your battery when the motor is operated as a generator (e.g. during regenerative braking). Make sure your battery can handle the ampflow, as defined in the settings mentioned above. The maximum battery charge currents can be found in the batteries documentation and data sheets. Never use your motor as a generator when your battery is fully charged, especially if your battery is vulnerable to catch fire or explode when overcharged. **LITHIUM BATTERIES and other types of Batteries ARE potentially DANGEROUS!**

Depending on your application you may need to include a Battery Management System(BMS) to safely operate your battery and to give you feedback, when the battery is fully charged. Stop using the motor as a generator until yourr battery is discharged enough to cope with regenerative braking again. **Never drain more Amps** than your battery and/or motor can cope with(Max rating for continuous Amp flow). Use safe settings for all parameters found in the **Motor Settings >> General >> Current Tab!**

For additional setup assistance, contact our technical support.

INTEGRATION & WIRING DIAGRAM

Integrating your controller into an electrical system:

Your motor controller is designed to be integrated into a battery powerd electrical system only! The sketch below shows how to integrate your Controller into such a system. Minimum requirements for safe operation:
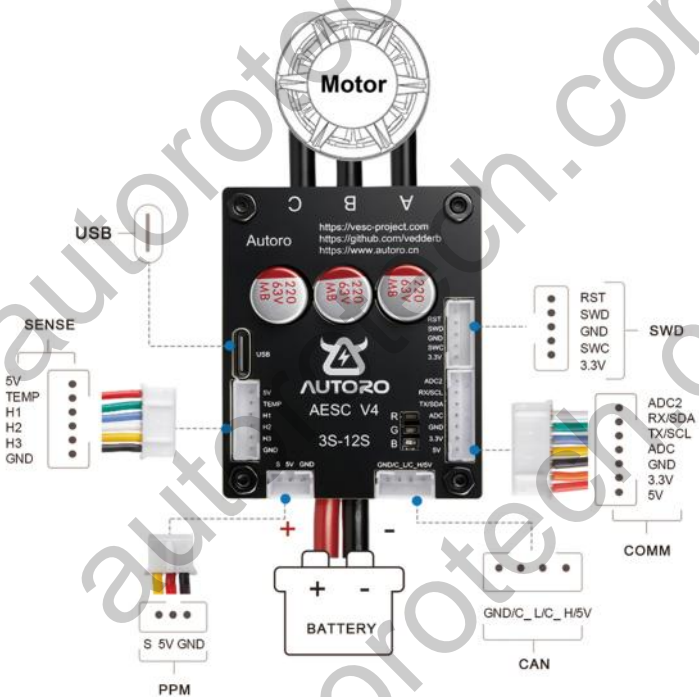
1. Integration of a safety power cut-off.

2. The integration of a FUSE, rated in accordance of your electrical system (weakest part of the system).

3. Use of a compatible input device (legal to operate, free of interference, reliable).
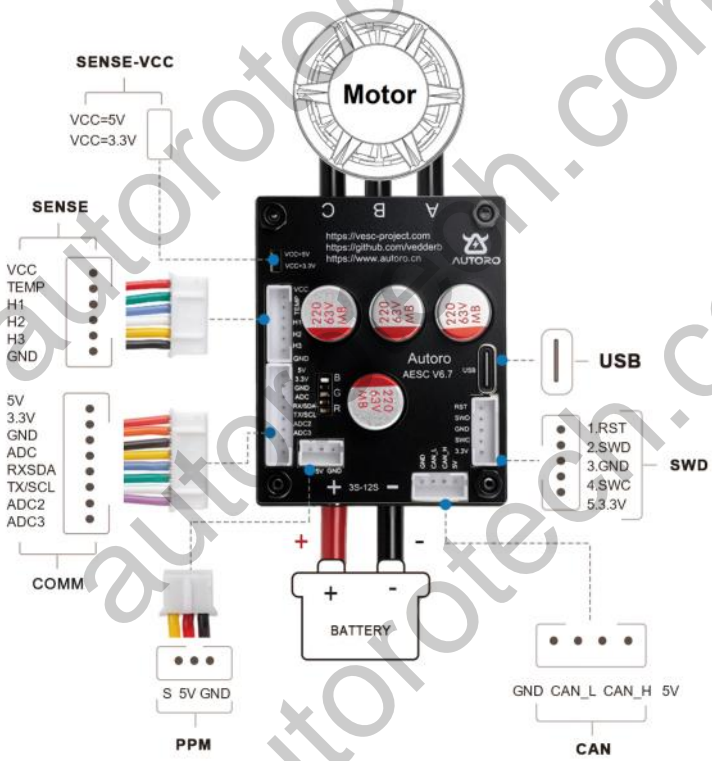
   Shown: PPM (Pulse Position Modulated) 2.4GHz receiver

4. Using safe setting for the operation in accordance with your electrical system and components involved.

5. Use a Battery Management System (BMS) if the motor is used for regenerative braking or as a generator.

6. Follow general safety measures for your device/system, as legally required. Do not operate above a voltage you can safely handle or being allowed to safely handle.

AESC V4 Wiring Diagram

Motor

USB

Autoro

https://vesc-project.com
https://github.com/vedderb
https://www.autoro.cn

220 63V M/B

220 63V M/B

220 63V M/B

USB

AESC V4
3S-12S

SENSE

5V
TEMP
H1
H2
H3
GND

5V
TEMP
H1
H2
H3
GND

RST
SWD
GND
SWC
3.3V

ADC2
RX/SCL
TX/SDA

ADC
GND
3.3V
5V

R
G
B

SWD

RST
SWD
GND
SWC
3.3V

ADC2
RX/SDA
TX/SCL

ADC
GND
3.3V
5V

COMM

S 5V GND

GND/C_L/C_H/5V

+ −

BATTERY

GND/C_L/C_H/5V

S 5V GND

PPM

CAN

AESC V6.7 Wiring Diagram

SENSE-VCC

VCC=5V
VCC=3.3V

SENSE

VCC
TEMP
H1
H2
H3
GND

5V
3.3V
GND
ADC
RXSDA
TX/SCL
ADC2
ADC3

COMM

Motor

https://vesc-project.com
https://github.com/vedderb
https://www.autoro.cn

AUTORO

Autoro
AESC V6.7

USB

1.RST
2.SWD
3.GND
4.SWC
5.3.3V

SWD

+ 3S-12S −

BATTERY

S 5V GND

PPM

GND CAN_L CAN_H 5V

CAN

Never share any connections, other than CAN H and CAN L with other controller devices. This will typically create a ground loop. Ground loops will damage your controllers. Only the battery ground may be shared. Use optocouplers instead.
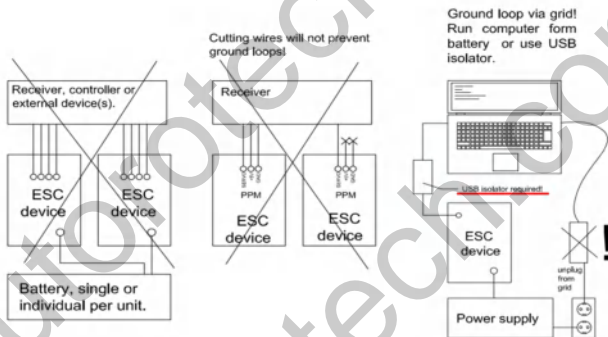
Cutting wires will not prevent ground loops!

Ground loop via grid! Run computer form battery or use USB isolator.

CONNECTORS AND SWITCHES

Your controller is equipped with USB,CAN-Bus,PPM,COMM,SWD and a SENSOR ports. The following List will give you an idea how to interconnect the device to other devices.

- **Sensors:** Sensor Port for ABI,HALL or AS5047P motor position sensors. Motor sensors allow precise and powerful rotation of the motors rotor from a random(standstill) Check and adjust the sensor voltage (3.3/5V)!
  Did you check the wiring scheme of your sensor cable?

- **NRF:** UART port for connection of NRF transceivers or other UART devices.

- **SWD:** Serial Wire Debug allows to access the STM32 Chip while running your motor controller:Diagnostics,debugging and real time data.

- **COMM**: I2C,UART and ADC Interface to allow communication with other devices,such as Microcontrollers (e.g.Arduino,Raspberry Pi)or using analogue input devices (e.g.analogue throttle)

- **PPM**: Connect input devices using Pulse-Position Modulation e.g.a 2.4GHz transceiver for controlling the motors output power and speed (Radio control).Never connect one reciever to two or more ESC controllers in an array! Permanent damage may result from Y-PPM wiring!

- **CAN**: CAN BUS for interconnection of the controller in an array. E.g.when implementing traction control in a multi drive setup or when powering up multiple motors, using multiple Controllers(master+slave 1,2,3,...).CAN-bus is also a universal bus to link the Controller to other devices also featuring CAN-Bus.ONLY connect CAN L to CAN L and CAN H to CAN H. Do not interconnect 5V and GND in a controller array! Permanent damage may result!

- **Motor A,B,C**: Connectors for three phase wired BLDC Motors(Coil A,B,C). In most ases the motor wires can be plugged in randomly.If you know your motor phases plug in the phases accordingly (Yellow=A, Blue=B, Red=C) to be displayed correctly in the VESC-Tool real time data analysis. DC-Motors use only connections A & C, B will be remained unplugged!

- **USB**: USB-Port to connect to a computer for the purpose of configuration,firmware updates and real time data analysis.

INTERFACE DEFINITIONS
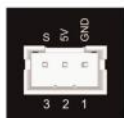
Interface Connection Diagram:

AESC V4/V6.7 SWD (Debug)
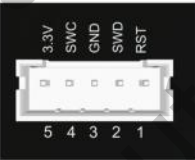
PIN No.	Silkscreen	Description
1	RST	Reset
2	SWD	Serial Wire Debug I/O
3	GND	Ground(-)
4	SWC	Serial Wire Clock
5	3.3V	3.3 Volt

AESC V4/V6.7 CAN

PIN No.	Silkscreen	Description
1	5V	5Volt
2	C_H	CAN_H
3	C_L	CAN_L
4	GND	Ground(-)

AESC V4/V6.7 PPM

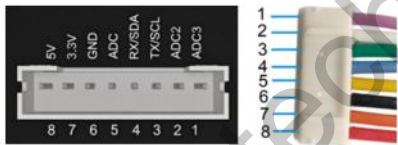| PIN No.	Wire Color	Silkscreen	Description
1	Black	GND	Ground(-)
2	Red	5V	5 Volt
3	Yellow	S	Servo Input

AESC V4 COMM
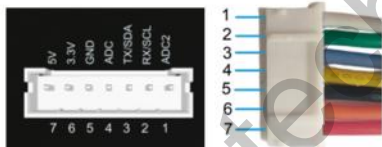
Typical Function Mapping for UART/I2C/Throttle/Brake Applications

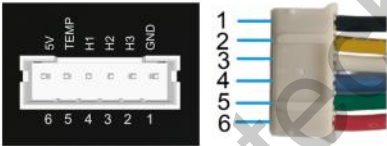| PIN No.	Wire Color	Silk screen	Description	Throttle	Brake
1	White	ADC2	ADC2_Regen Input	NC	ADC2_Regen Input
2	Green	RX/SCL	UART_RX/I2C_SCL	NC	NC
3	Blue	TX/SDA	UART_TX/I2C_SDA	NC	NC
4	Yellow	ADC	ADC1 Throttle Input	ADC1 Throttle Input	NC
5	Black	GND	Ground(-)	Ground(-)	Ground(-)
6	Orange	3.3V	3.3Volt	3.3Volt	3.3Volt
7	Red	5V	5Volt	NC	NC

AESC V6.7 COMM

Typical Function Mapping for UART/I2C/Throttle/Brake Applications

PIN No.	Wire Color	Silkscreen	Description	Throttle	Brake
1	Purple	ADC3	ADC3	NC	NC
2	White	ADC2	ADC2_Regen Input	NC	ADC2_Regen Input
3	Green	TX/SCL	UART_TX/I2C_SCL	NC	NC
4	Blue	RX/SDA	UART_RX/I2C_SDA	NC	NC
5	Yellow	ADC	ADC1 Throttle Input	ADC1 Throttle Input	NC
6	Black	GND	Ground(-)	Ground(-)	Ground(-)
7	Orange	3.3V	3.3Volt	3.3Volt	3.3Volt
8	Red	5V	5Volt	NC	NC

AESC V4 SENSE

PIN No.	Wire Color	Silkscreen	Description	Hall Sensor	ABI Encoder	AS5047 Encoder
1	Black	GND	Ground(-)	Ground(-)	Ground(-)	Ground(-)
2	Yellow	H3	Hall_3	Hall_3	I	CS
3	White	H2	Hall_2	Hall_2	B	MISO
4	Blue	H1	Hall_1	Hall_1	A	SCK
5	Green	TEMP	Motor Temperature	Motor Temperature	NC	MOSI
6	Red	5V	5Volt	5Volt	5Volt	3.3V (**Note**)

Note: The AS5047P encoder requires a 3.3V power supply. Connect it to any controller 3.3V pin or external 3.3V supply. Never use 5V. Incorrect voltage setting may result in communication issues or damage to the equipment.

AESC V6.7 SENSE
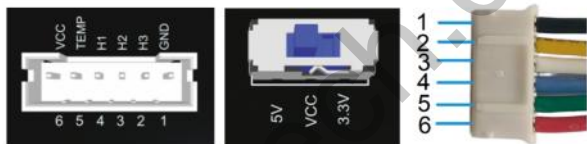
The VCC voltage for the sensor is configured using the SENSE-VCC slide switch.

When connecting different position sensors, such as Hall Sensors, ABI Encoders, or AS5047P Encoders, ensure the voltage setting corresponds to the sensor type.

Note: The AS5047P encoder requires a 3.3V power supply. Connect it to any controller 3.3V pin or external 3.3V supply. Never use 5V. Incorrect voltage setting may result in communication issues or damage to the equipment.

PIN No.	Wire Color	Silkscreen	Description	Hall Sensor	ABI Encoder	AS5047 Encoder
1	Black	GND	Ground(-)	Ground(-)	Ground(-)	Ground(-)
2	Yellow	H3	Hall_3	Hall_3	I	CS
3	White	H2	Hall_2	Hall_2	B	MISO
4	Blue	H1	Hall_1	Hall_1	A	SCK
5	Green	TEMP	Motor Temperature	Motor Temperature	NC	MOSI
6	Red	VCC	VCC	5Volt	5Volt	3.3Volt

TROUBLESHOOTING

Symptom	Possible Causes	Solution
Blue LED not lit	1.Damaged/short-circuited PCB. 2.Input voltage too low (<2S). 3.Adjustable power supply current limit set too low.	1. Cut power immediately. 2. Increase input voltage within limits(≥3S). 3. Increase the current limit setting on the adjustable power supply.
Blue LED lit, Green LED off	1.Firmware corrupted. 2. Poor contact or damaged MCU pins.	1. Reflash firmware via J-Link (SWD interface). 2. Replace ESC.
Red LED flashing Motor stops	1. Over-voltage. 2. Brake/regen current setting too high. 3. Motor overheating or ESC overheating.	1. Reduce input voltage. 2. Disable braking/regen or lower current limits. 3. a. Ensure adequate cooling (heatsink, airflow). b. Add heatsink/fan Allow motor/ESC to cool down before restarting.
Motor spins wrong direction	Incorrect Three-Phase Wiring.	a.Invert Motor Direction in VESC-Tool. b.With power de-energized and safety verified, swap any two motor phase conductors to reverse rotation.
Smoke/Burn marks on power-up	Reverse polarity input or PCB short circuit.	Cut power immediately.
VESC-Tool Connection Failure	1.USB cable not connected or Poor USB Connection. 2.Another program is using the serial port. 3.Controller system malfunction.	1.a.Verify USB cable integrity and connection. b.Reconnect: Unplug the cable, clean the metal contacts, then firmly reinsert. c.Replace cable/port: Try a different USB cable or switch to another USB port. 2.Restart all VESC-Tool instances and reboot controller. 3.Check controller indicator light status.

If issues persist, contact Autoro Technical Support:

Email: Autoro.service@hotmail.com

WARRANTY INFORMATION

1.WARRANTY COVERAGE

The Company warrants that if within a period of 30 days from date of purchase of the product, the same is found defective on account of any of its parts proving to be defective in material or workmanship, the same shall be repaired or replaced free of charge. Unauthorized alterations or repairs void warranty and may cause safety hazards.

2.WARRANTY EXCLUSIONS

The warranty does not cover:

• Damage from accidents, misuse, negligence, tampering, fire, natural disasters, or missing components/accessories.

• Physical damage including drops, impacts, liquid exposure, or burns.

• Non-compliance with inspection procedures or installation procedures per this user manual.

• Use of non-original parts or unapproved accessories.

• Unauthorized modifications or repairs.

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3. WARRANTY CLAIM PROCEDURE

Step 1: Prepare Documents:

• Valid proof of purchase (order confirmation showing product name and date)

• Legible photo of model label (located on product back/bottom/package)

• 15-second video demonstrating:

 ▸ The malfunction ▸ Visible model label ▸ Undamaged full product & condition

• Email detailed description including:

 ▸ Failure frequency ▸ Error codes (if any) ▸ Usage environment

Step 2: Submit Claim

Email: Autoro.service@hotmail.com

Attachments: All required documents + Compressed Video (≤20MB)

Email Subject Format: Warranty Claim - [Order #] - [Model #]

Processing Time: 3~7 business days

Note: Incomplete submissions may delay processing.

Step 3: Claim Resolution Process

• Valid Claim: Request received → Claim verification → Seller provides solution:

▶ Option 1: Prepaid return label; ▶ Option 2: Partial refund; ▶ Option 3: New unts shipped.

→ Buyer action required: ▶ Option 1: Return item ; ▶ Option 2: Confirm refund.

• Invalid Claim: Request received → Invalid claim/Non-manufacturing defect → Reject with reason.

4. CRITICAL NOTES

• Non-Qualifying Scenarios:

▶ Products without verifiable purchase history.

▶ Products obtained through unauthorized channels.

▶ Warranty void if model label unreadable or purchase proof mismatch.

5. RETURN SHIPPING RULES

Scenario	Cost Responsibility
Verified manufacturing defect	Seller pays
No fault found	Customer pays

6. TIME LIMITS:

▶ Warranty claims must be submitted during the valid warranty period .

▶ Returned items must be received within 15 days of the claim verification date.

CONTACT & SUPPORT

For technical support, contact: Autoro.service@hotmail.com
For business, contact:Autoro.sales@hotmail.com

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