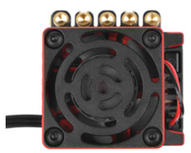
Updated 2025-01

ENGLISH*

CMM-10

ELECTRONIC SPEEDCONTROLLER



#C-53030

***Download the other languages of this manual at** https://corally.com/en/useful-links/downloads-manuals

INSTRUCTION MANUAL

INTRODUCTION

The Team Corally CMM-10 electronic speed controller for brushless motors are being fine tuned for the today's high power brushless motors. Everything can be set-up on these controllers to provide you the best functionality and performance.
The CMM-10 manufactured with the highest grade components to ensure the lowest possible internal resistance resulting in a optimized performance. This controller give the competition racer what he needs. You will experience the best controllability of your RC car, no matter you use it in a on-road or off-road car.

FEATURES

- For sensored and sensorless motors
- Manufactured with the highest grade components
- Ultra compact design
- Aluminium case for improved heat dissipation
- Waterproof power switch
- Advanced boost & turbo timing system for improved acceleration performance
- Enhanced throttle & brake control function.
- High power 4A BEC
- Powerful TC Link software to test motor timing and advise the best ESC timing setting

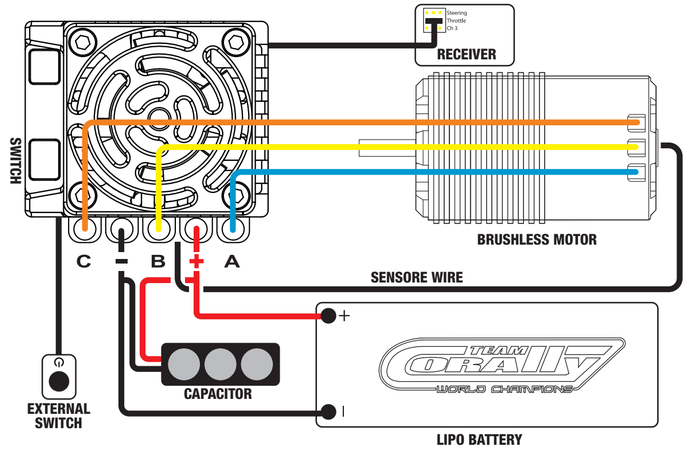
TECHNICAL SPECIFICATIONS

	CMM-10 • 220A
Cont. Current	220A
Burst Current	860A
Input Voltage	2-3S LiPo
BEC Output	6.0V,7.4V/4A (Switch BEC)
Size (LxWxH)	L38 x W31 x H30mm
Weight	54g
Firmware Upgrade	-
Waterproof	No
Applicable	1/10th On-Road/Off-Road

SAFETY NOTES

- When connecting the battery, pay attention to polarity: incorrect connection will **damage** the ESC and Battery.
- This ESC is not a toy and only suitable for users from age 14+
- Never allow water, moisture, oil or other materials to get in contact or inside the ESC, motor, or in contact with the PC Boards. It may damage the ESC completely.
- Never disassemble the ESC or modify the components on the PC board
- We strongly suggest to use the original wires and connectors supplied in the ESC packaging
- Never run the ESC without load at full throttle. This may damage the motor bearings and other parts.
- Please select carefully the location of the ESC in your car.
  Ensure the ESC is mounted in a well ventilated place and with a good airflow so that the heat can dissipate quickly.
- To avoid short circuit, please keep the ESC connectors away from any metal parts.
- Never connect a battery with reversed polarity.
- Please remove the pinion from the motor before you start the calibration and programming of this ESC.
  Please keep hands, hair, clothes away from the moving gear train.

ESC CONNECTION DIAGRAM



MOTOR WIRE CONNECTION

1. Sensored Mode :
   When using a sensored brushless motor, the A/B/C ESC wires must beconnected to the A/B/C motor connectors correspondingly and it is necessary to connect the Sensor wire to the "Sensor" socket on the ESC. Don't change the wires sequence optionally.
2. Sensorless Mode:
   When using a sensorelesss brushless motor, the A/B/C ESC wires can be connected with the motor connectors freely (without any sequence). If the motor runs in the reverse direction, please swap any 2 wire connections.

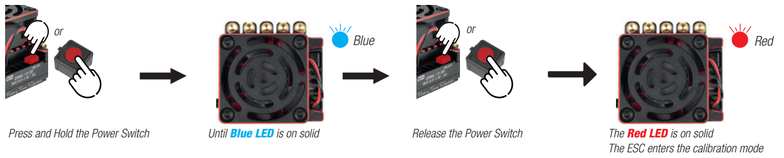
SOFTWARE FUNCTIONS AND SETTINGS

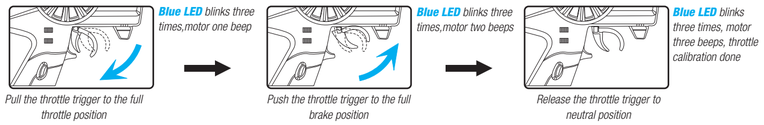
Power ON/OFF ESC

1. Press the power button then the ESC will be powered on.
2. Press and holding the power button until the all LEDs died out, then the ESC will be powered off.
   (Note: Please place the throttle trigger on the neutral position: within 10%, otherwise the ESC can not be powered off.)

THROTTLE CALIBRATION

1. Connect the ESC with the battery and receiver well, then turn on the transmitter.
2. Press and holding the power button until the blue LED is on solid, the motor have a long beep at the same time, then release the power button, the red led will be on solid, the ESC enters to the calibration mode.
3. Pull the throttle trigger to the full throttle position, the blue led blinks three times and the motor beeps once, the full throttle position is saved.
4. Push the throttle trigger to the full brake position, the blue led blinks three times and the motor beeps twice, the full brake position is saved.
5. Release the throttle trigger to the neutral position, the blue led blinks three times and the motor beeps three times, the throttle calibration is completed.
6. The ESC can support reverse throttle calibration, if the transmitter throttle set reverse (it means pull the throttle will go to 1000 throttle position/ normally is 2000, and push the throttle will go to 2000 throttle position/normally is 1000), then you do the throttle calibration the same way as usual (as above), it will not have any effects on the ESC forward and revers way even if the transmitter throttle set reverse.





LED STATUS

1. During Operation

THROTTLE POSITION	BLUE LED	RED LED
Neutral	Blinking	OFF
Full Throttle	ON	ON
Full Brake	OFF	ON

Note: When you pull the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will go faster when the throttle goes higher.

2. When some protection is activated
   The RED LED is always on solid once the power button is pressed.
   The RED LED blinks, single flash between every one second. Repeat like "▫ ▫ ▫" indicates that the voltage is abnormal.
   The RED LED blinks, double flash between every one second. Repeat like "▫▫ ▫▫ ▫▫" indicates that the temperature is abnormal.
   The RED LED blinks, single and double flash alternately between every one second. Repeat like "▫ ▫▫ ▫ ▫▫ ▫ ▫▫" indicates that both of the voltage and temperature is abnormal at the same time.
   The RED LED will not have any responds even the voltage or temperature is abnormal if not detect the signal.
   The BLUE LED blinks,double flash between every two seconds. Repeat like "▫▫ ▫▫ ▫▫" indicates that the throttle is abnormal.
   (No throttle, or the throttle is not on the neutral position)

Throttle Signal

1. The ESC can support the 450Hz maximum PPM throttle signal.
2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash:
   - The throttle trigger do not place on the neutral position when the ESC turns on.
   - Lost the throttle signal.
3. If the ESC lost throttle signal during the operation, the BLUE LED will blink double flash, and the ESC will start to work again until the throttle signal is back to normal.

Sensored & Sensorless

1. The sensored mode is activated once the ESC detected the hall sensor signal at any time.
2. The ESC will work on sensorless mode once the ESC didn't detect the hall sensor signal at any time.
3. The ESC will have a slight power drop and restored soon during the moment of sensored and sensorless mode switching.
4. The PWM driving frequency will be selected automatically by the ESC on sensorless mode, and the manual setting is invalid.
5. It is invalid to set the brake PMW frequency less than 1KHz and forced recognized as 1KHZ, if the ESC is on sensorless mode.
6. Boost and turbo functions are not available on sensorless mode.

Boost & Turbo

1. After the boost or turbo timing triggered, the RPM and current will be increased, and the battery/ESC/motor will be heating, so setting the proper timing and timing increased rate, and control the time of timing will effect the battery/ESC/motor service life.
2. The difference of the Boost and Turbo Timing:
   The Boost timing will be triggered even though you do not pull the throttle trigger to the full throttle position.
   The Turbo timing will be triggered only when you pull the throttle trigger to the full throttle position.
3. The Boost timing plus the Turbo timing is equal to the final opened timing when the throttle reaches its maximum position, and the final total timing is 60 degrees for Beast Pro 150A total timing is 15 degree). For example: If Boost timing set at 45 degree, and Turbo Timing set at 50 degree, so when the throttle reaches its maximum position, the Boost timing will be 45 degree, and Turbo Timing only can be opened at 15 degree.
4. If set the low voltage or over temperature protection, and the protection is activated, then all the timing will be closed.

Protection

1. High Voltage Protection:
   If the ESC detected the voltage too high (Higher than the esc standard voltage), when the ESC turns on, and the voltage protection was not set "OFF", then the voltage protection will be activated, and the maximum throttle output will be limited within 50%. (The high voltage protection only worked on the moment of the ESC turns on, and it will not work on the other stages even it detected the high voltage, once the high voltage protection opened, even though the voltage comes down to the normal voltage, the protection will not be relieved.)

2. Low Voltage Protection:
   If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%. (Once the low voltage protection activated, even though the voltage comes back to normal, the protection can not be relieved.)

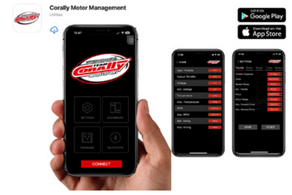
3. Thermal Protection:
   The output throttle from the ESC will be limited (not over 50%) with the thermal value you have preset. (The Thermal protection will be dismissed when the ESC temperature drop to 65°C)

4. If the voltage protection and temperature protection set off, and when the voltage and temperature become abnormal, the LED status will indicates the problems correspondingly, but will not limit the throttle output and will not close all ESC timing.

5. If the ESC detected the motor have the driving problem (like motor rotor locked or motor phase lost problem) which can cause the motor not run smoothly, and when the throttle trigger leave neutral position for a while, then the ESC driving abnormal protection will be activated, and the motor will emit special tone like beep-beep-beep (note: some motors can not beep or beep with a low sound if motor have phase loss problem), and the protection will be closed until you released the throttle trigger to neutral position for 0.2 seconds. If this problem occurs three times continuously, then you have to solve the motor driving problem first,or the protection will exist all the time.

"BLE" (Remote connection with the CORALLY APP)

1. Reset password: When the ESC turns on, press and holding the power button around 10 seconds, the ESC will restore the BLE password to default setting 0000.
2. With the CORALLY management BLE APP, you can program parameters, upgrade firmware and check the real-time data of the ESC.
3. Due to the range limit of BLE, the operational distance is around 10 meters. (If there are many metals or other strong interference signals or obstacles around will short the operational distance)
4. The BLE name can not be changed.
5. The BLE connecting will be failed during the ESC throttle calibration process.



Programmable Items

The user can program parameters at any status if the ESC turns on, and new programmed parameters will be took effect immediately, no need to restart the ESC, it means the programming parameters can be competed online, so it can provide a very intuitive feeling between the before programming and after programming. There will be some impacts on the battery/ESC/motor if you program some parameters when the motor in a high-speed rotation. For example, if you changed the motor rotation when the motor in a high-speed rotation, then the ESC will drive the motor reverse immediately, but the motor can not be reverse immediately because of its inertia, then it will cause a big current and vibration. Or when the Boost or Turbo timing opened, but you set it off when the motor in a high-speed rotation, it also will cause a big current, so we would like to recommend not programming parameters when the motor in a high-speed rotation.

REAL-TIME DATA

1. The real-time data can be read only when the ESC have the throttle signal.
2. The real-time data is just a reference data with±10% accuracy, if you want to get the more accurate real-time data, you need to use the more professional equipment.
3. The description of the real-time data items:

Number	Item	Description
1	Input Throttle	% of throttle signal that goes to esc (0-100%)
2	Output Throttle	% of throttle going out to motor (0-100%)
3	Voltage	Current battery voltage [V]
4	Min. Voltage	Minimum voltage reached since last reset [V]
5	Temperature	Current ESC temperature [deg C]
6	Max. Temperature	Maximum ESC temperature reached since last reset [deg C]
7	RPM	Current motor RPM
8	Max. RPM	Maximum motor RPM reached since last reset
9	Advanced Timing	Current timing value (include the boost and turbo timing combined)
10	Max. Timing	Maximum timing value (include the boost and turbo timing combined)

FIRMWARE UPGRADE

1. If the ESC firmware upgrade failed during the upgrading process, please restart the ESC again, and must upgrade the ESC firmware via the APP again (all the other functions are not available), the ESC will get right after the firmware upgraded successfully.
2. The Red Led will blink a faint light when the ESC in the firmware upgrade mode, and the Blue Led will blink a faint light when the ESC have data transmission.
3. Please do not turn off the ESC during the time of the ESC firmware upgrading process. (And the ESC only can be switched off after pressing the power button around 5 seconds)

PROGRAMMABLE ITEMS DESCRIPTION

1. THROTTLE

1.1. **Throttle Response:** Lower millisecond values deliver more immediate power delivery, a higher millisecond value creates a smoother power delivery and acceleration.

1.2. **Coast:** This feature is applicable only to the range of forward throttle and affects deceleration. For example, without use of this setting, if the throttle position is changed from 80% to 30% then the 30% throttle value is immediate. With coast activated, the throttle value gradually decreases from 80%, 70%, 60% and eventually resulting in 30%.

1.3 **Neutral Range:** Varies the throttle sensitivity while advancing past neutral. Lowest setting results in throttle application when just “breathing” on the trigger, conversely the highest setting results in more significant trigger movement required prior to throttle application.

1.4. **Min. Throttle:** Varies the amount of initial throttle that is applied while advancing past neutral.

1.5. **Minus:** The higher the throttle minus value, the lower the car speed.

1.6. **Minus Range:** It determines the throttle range within which the (Throttle) Minus function works. The higher the value, the wider the effective range.

1.7. **Max. Forward Force:** Sets the maximum amount of forward throttle applied when the trigger is at full throw.

1.8. **Max. Reverse Force:** Sets the maximum amount of power applied when the trigger is at full reverse.

2. BRAKE

2.1. **Brake Response:** Determines how quickly braking force begins to be applied as the trigger is moved away from neutral.

2.2. **Min. Brake Force:** Determines the initial braking force applied as the throttle trigger is moved from neutral to brake.

2.3 **Max. Brake Force:** Determines the maximum braking force applied when the throttle trigger is at full brake.

2.4. **Fwd. Drag Brake Force:** Determines the amount of braking force applied when the throttle trigger is reduced from forward to neutral.

2.5. **Fwd. Drag Brake Response:** Determines how quickly the drag brake force is applied as the throttle trigger is reduced from forward to neutral.

2.6. **Rev. Drag Brake Force:** Determines the amount of drag brake force applied as the throttle trigger is moved from full reverse to neutral.

2.7. **Rev. Drag Brake Response:** Determines how quickly the drag braking force is applied as the throttle trigger is moved from full reverse to neutral.

2.8. **PWM Frequency:** The higher the brake frequency, the smoother the braking force. The lower the brake frequency, a more powerful initial braking response is evident.

3. BOOST

4.1. **Boost Timing:** Electronically increase the timing of brushless motors for higher top speeds and acceleration

4.2. **Trigger:** Control if throttle trigger (physical position) or motor RPM is what activates the boost feature.

4.3 **Throttle Threshold:** When throttle is chosen as the boost trigger, this sets at what percentage of throttle that the boost first engages.

4.4. **RPM Threshold:** When RPM is chosen as the boost trigger, this sets the motor RPM where the boost first engages.

4.5. **Initial Angle:** Select the initial impact of the increase in throttle function at the beginning of the trigger throw

4.6. **Angle Inc Rate:** Select the rate of throttle increase during the increase in throttle trigger position.

4.7. **Angle Dec. Rate:** Select the rate of throttle decrease when trigger returns to neutral.

4. TURBO

5.1. **Turbo Timing:** Select the amount of motor timing increase when turbo is becomes active at 100% throttle.

5.2. **Angle Inc. Rate:** Select the rate in which the turbo increase occurs at full throttle. .

5.3 **Angle Dec. Rate:** Select the rate of turbo decrease when the throttle comes trigger is returned from full throttle.

5.4. **Delay:** Select the time delay of turbo feature activation once full throttle is activated.

5.5. **Delay Reload:** It determines whether or not to delay and reload when the throttle trigger/stick is moved away and quickly returned to the 100% point with the Turbo Timing activated. There are two options: Wait (reload after the turbo timing is decreased to 0), Instant (reload immediately when the throttle trigger/stick is moved away from the 100% position).

5. GENERAL

3.1. **Motor Rotation:** Most RC vehicles use motors that operate anti-clockwise (CCW); however, some rock crawlers or dual-motor trucks use CW. Use this feature to change.

3.2. **Motor Poles:** Team Corally monster trucks use 4-pole brushless motors. Most brushless motors for RC cars are either 2-pole or 4-pole.

3.3 **Running Mode:** Choose the set of operating features set to match specific vehicle needs and running conditions.

3.4. **Reverse Mode:** One shot means that after applying brakes, the throttle trigger must first be moved to neutral prior to selecting reverse. Two shots means that it must be done twice.

3.5. **Drive PWM Freq.:** The higher the drive frequency, the smoother and gentler the power delivery with decreased heat. The lower the drive frequency, the more powerful acceleration and initial response with a small penalty being reduced efficiency and increased operating temperatures.

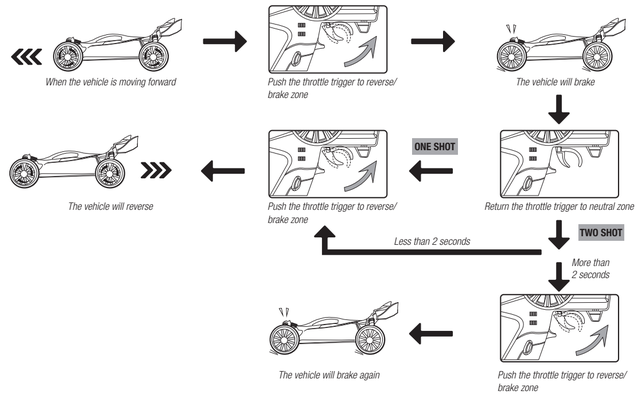
3.6. **Cut-off Voltage:** The ESC will automatically cease operation when the vehicle battery pack falls below a preset voltage. The default setting is automatic detection, but this value can easily be changed by the owner.

3.7. **Cut-off Thermal:** The ESC will automatically cease operation when the internal temperature rises above user-selectable values

3.8. **BEC Output:** Select the output of the Battery Eliminator Circuit depending on the operating voltage requirements of the servos.

3.9. **A/C Swap:** Switching the motor wires: A & C. When setting to “No”, the output wires at the ESC side must be connected to the motor in the following sequence: A-A, B-B, and C-C; when setting to “Yes”, the wiring sequence must be: A-C, B-B, C-A.

Reverse Mode: One shot & Two shot (In the Forward/Brake/Reverse Mode)



TROUBLE SHOOTING

Trouble Shooting	Possible causes	Solutions
The ESC was unable to start the status LED, the motor, and the cooling fan after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check if all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
The motor suddenly stopped or significantly reduced the output in operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the battery LVC (Low Voltage Cut off) protection. 3. The ESC entered the thermal (over-heat) protection.	1. Check all devices and try to find out all possible causes, and check the transmitter’s battery voltage. 2. The RED LED blinks, single flash between every one second. 3. The RED LED blinks, double flash between every one second.
The motor stuttered but couldn’t start.	1. Some soldering between the motor and the ESC was not good. 2. The ESC was damaged (some MOSFETs were burnt).	1. Check all soldering points, please re-solder if necessary. 2. Contact the distributor for repair or other customer services.
The car ran forward/backward slowly when the throttle trigger was at the neutral position.	1. The neutral position on the transmitter was not stable, so signals were not stable either. 2. The ESC calibration was not proper.	1. Replace your transmitter 2. Re-calibrate the throttle range or fine tune the neutral position on the transmitter.

WARRANTY AND SERVICE

If material defects or manufacturing faults should arise in a product distributed or manufactured by Team Corally, a division of JSP Group Intl BVBA, and purchased by a consumer, we Team Corally acknowledge the obligation to correct those faults or defects within the limitations described below. This manufacturers warranty is in addition to, and does not affect, the legal or contractual rights of the consumer which arise from the purchase of such products. Team Corally guarantees the consumer that its products are free from material, manufacturing, and construction faults, as determined by the general state of knowledge and technology valid at the time of manufacturing. The fault responsible for causing the damage must be proven to have been present in the product at this time. Claims for compensation arising from consequential damage or product liability will not be considered valid unless they fall under peremptory provisions of the law. If material defects or manufacturing faults should arise in a product distributed or manufactured by Team Corally in the European community (EC) and purchased by a consumer, then Team Corally undertakes to correct those defects within the limitations described below. This manufacturer’s declaration does not affect the consumer’s legal or contractual rights regarding defects arising from the purchase contract between the consumer and the dealer or reseller.

EXTEND OF THE WARRANTY

If a claim is made under warranty, we take at our discretion to repair or replace the defective goods. We will not consider supplementary claims, especially for reimbursement of costs relating to the defect (e;g. installation / removal costs) and compensation for consequent damages unless they are allowed by statute. This does not affect claims on legal regulations, especially according to the product liability law.

PROVISIONS OF THE WARRANTY

The purchaser is required to make the warranty claim in writing, and must enclose original proof of purchase (e.g. invoice, receipt, delivery note) and the appropriate warranty card. He must send the defective goods to our **local representatives or directly to Team Corally, a division of JSP Group Intl BVBA, Geelseweg 80, 2250 Olen, Belgium at his own risk and cost.**
The purchaser should state the material defect or manufacturing fault, or symptoms of the fault, as accurate as possible, so that we can check if our warranty obligation is applicable. The goods are transported from the consumer to us, and from us to the consumer, entirely at the risk and cost of the consumer.

INVALIDATION OF THE WARRANTY

The consumer cannot make a claim under warranty when the fault is affecting the use of the product arising from natural wear, competition use, or improper use (including installation) or external forces. The consumer’s adherence to the building and operating instructions relevant to the model, including the installation, operation, use of, and maintenance of, model-related components cannot be supervised by Team Corally. Therefore Team Corally is in no way liable for loss, damage, or costs resulting from improper use, or behavior in any way connected to the above described provisions. Unless otherwise required by law, Team Corally is in no way whatever liable to provide compensation for damages arising from the improper use of the model (including personal injury, death, damage to buildings, loss of turnover, loss of business, or interruption of business, or any other direct, or indirectly caused, consequential damage).

DURATION OF VALIDITY

The claim period is 24 months from the date of purchase of the product by the consumer from a dealer in the European Community (EC) counted from the date of purchase. The claim period is 12 months from the date of purchase of the product by the consumer from a dealer outside the European Community (EC) counted from the date of purchase. If a defect arises after the end of the claim period, or if evidence or documents required according to this declaration in order to make the claim valid are not presented until after this period, then the consumer forfeits any rights or claims from this declaration. The guarantee period is not prolonged by the granting of any claims within the framework of this warranty, especially in the case of repair or replacement. The guarantee period also does not restart in such cases.

WARRANTY EXPIRATION

If we do not acknowledge the validity of a claim based on this declaration within the claim period, all claims based on this declaration will expire after six months from the time of registering the claim; however this cannot occur prior to the end of the claim period.

APPLICABLE LAW

This declaration, and the claims, rights and obligations arising from it, are based exclusively on the pertinent Belgium Law, without the norms of international private law, and excluding UN retail law. Place of fulfillment for liabilities arising from this declaration is Olen, Belgium. Court of jurisdiction is Turnhout, Belgium.

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DECLARATION OF CONFORMITY

Declaration of Conformity
Team Corally CMM-10 Controller

Declaration of conformity in accordance with EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU and directive 2014/53/EU

Team Corally, a division of JSP Group Intl BVBA declares under sole responsibility that the electronic speed controller CMM-10 with reference nr C-53030 to which this declaration relate, conforms with the following harmonized standards and EU legislations;

EN 55014-1:2017
EN 55014-2:2015
EN 61000-4-2:2008
EN 61004-3:2006 + A1:2007 + A2:2010

Olen - Belgium
02 January 2024

Stefan Engelen
Ceo

WEEE: At the end of this device’s useful life, please remove all the batteries and dispose of them separately. Take electrical appliances to the local collection points for waste electrical and electronic equipment. Other components can be disposed of in domestic refuse. Thank you for your co-operation!

FCC Information

FCC Warning This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) this device must accept any interference received, including interference that may cause undesired operation.
CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

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