



Hex ezCAN

Accessory manager for CAN-bus-equipped motorcycles

User manual

Edition 1.1
April 2020
Hex ezCAN Configuration Tool

1 TABLE OF CONTENTS

1	TABLE OF CONTENTS	2
2	WHAT CAN THE EZCAN DO?	3
3	INSTALLING FOR LIFE	5
3.1	Calculating power consumption.....	5
3.2	Generic installation	7
3.3	Before you wire your accessories.....	8
3.3.1	Connecting 2-wire accessories	9
3.3.2	Connecting 3-wire LED lights.....	10
3.4	Connecting power wiring	11
3.5	ezCAN registration.....	13
3.5.1	Registering the ezCAN.....	13
3.5.2	Re-registering the ezCAN	14
3.5.3	Manual registration.....	14
4	EZCAN VIDEO TUTORIALS.....	15
4.1	ezCAN installation instructions	15
4.2	ezCAN configuration instructions	15
5	HOW TO CONTROL YOUR EZCAN	16
5.1	BMW Motorrad with Multi-Controller.....	16
5.2	BMW Motorrad without Multi-Controller.....	17
5.3	Harley-Davidson	18
5.4	KTM	18
5.4.1	Switching <i>Aux 1</i> and <i>Aux 2</i> lights independently.....	19
5.4.2	If no hardware light switch is installed.....	20
5.4.3	If the Hex UP-DOWN switch is installed	20
5.4.4	If a single-button switch is installed	21
5.5	All other ezCAN functions.....	22
6	IF SOMETHING GOES WRONG	25
6.1	What do the Status LED colours mean?	25
6.2	Using the ezCAN <i>Diagnostics</i> window	26
7	SPECIFICATIONS	30
8	NOTICES AND COPYRIGHT	31

2 WHAT CAN THE EZCAN DO?

Congratulations on your purchase of a Hex ezCAN! We wish you many years of trouble-free service and exciting riding. We aim to boost the rideability and usability of your motorcycle, and the safety, comfort and pleasure of your riding experience. The only practical limit to what ezCAN can do for you is your imagination!

The ezCAN is an accessory manager for CAN-bus equipped motorcycles, ATVs and other vehicles. It connects directly to the battery, sidestepping the electrical power restriction issues of the latest motorcycles. It continuously monitors the data transmitted on the CAN-bus (a small selection of the monitored data includes engine speed, vehicle speed, status of brake lights and brake pedals/levers, horn status, gear position, throttle position, headlight and switch status, and turn signal status). The ezCAN uses these messages to control the individually configured accessories connected to its power outputs.

The ezCAN has four highly configurable multi-purpose power outputs. The four outputs have identical power-supply capability, and are colour-coded **Red, Blue, Yellow** and **White** (below).



The **White** output is also capable of functioning as a LIN (Local Interconnect Network) bus for future expandability.

The Hex ezCAN is capable of powering any 12-volt electrical accessory with a current draw of up to 25 Amps*. In practice, ezCAN can power all electrical accessories used in modern motorcycling. This includes (but is not limited to):

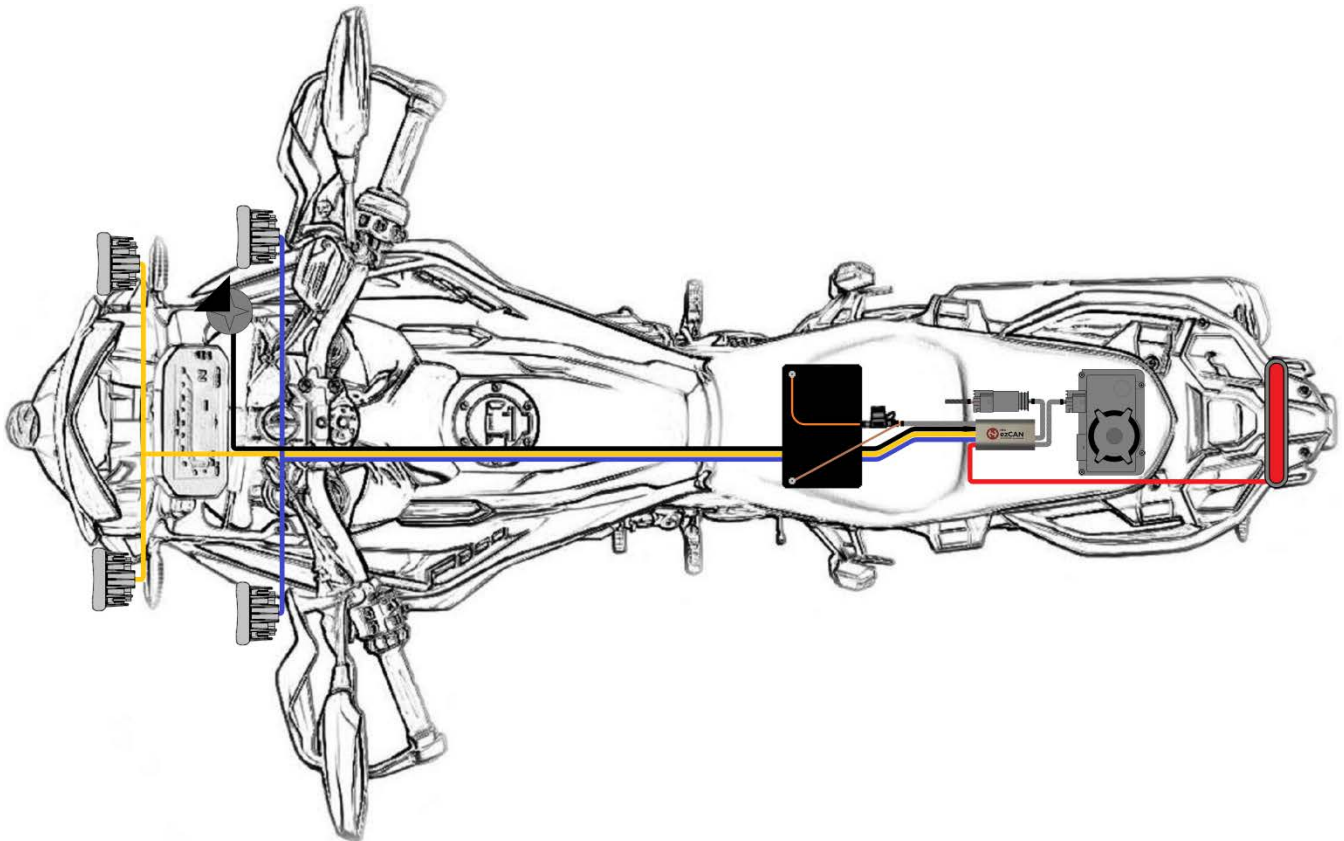
- One or more sets of high-powered auxiliary front LED lights.
- Auxiliary rear running lights and brake lights.
- High-powered air horns.
- Auxiliary front daytime running lights/turn signals.
- Combined rear run/brake/turn signals.
- Marker lights.

* For a full description of the ezCAN's functional specifications, see [SPECIFICATIONS](#).

- Heated gear.
- Action cameras.
- Switched 12V outlets supplying power to mobile phones, satellite-navigation devices, and so on.

You are not limited to a specific role per power circuit: any 12V accessory of any type can be assigned to any power circuit.

The possibilities are so broad that we recommend you devote some thought to function and configuration. One common installation scenario includes a circuit powering two front spotlights (blue circuit, below), another circuit powering two more front spotlights (yellow circuit, below), a circuit powering an auxiliary rear light (red circuit, below), and a circuit powering a high-power accessory horn (white circuit below, shown in black for clarity).



But you are not confined to this layout. ezCAN customers have created truly imaginative scenarios, all of which have enhanced their personal riding experience.

3 INSTALLING FOR LIFE

To install your ezCAN in a way that ensures optimum, trouble-free performance in all conditions, you must:

1. **Protect the main body from damage.** Where you install the silver body of the ezCAN depends on what space is available. Install the ezCAN's main body where it is protected from crushing, impacts and vibration. Although the ezCAN is highly water resistant, try not to expose it to excessive water spray from the wheels, or from high-pressure cleaning equipment.
2. **Ensure easy diagnostics.** With the ezCAN installed and secured, make sure you have easy access to the Status LED and the ezCAN's main fuse.
3. **Mount the main body securely.** If you use the Velcro strips supplied with the kit, first clean the silver body and your planned mounting point with methyl alcohol. Otherwise, secure the main body to a frame tube or other solid component using medium-sized zip ties.
4. **Protect the wiring.** When routing the ezCAN wiring to the battery, CAN-bus connector, accessory power points and other connections, run the wiring next to existing wiring, under body panels, and behind frame tubes. Make sure all wiring is kept well clear of moving components (such as fork stanchions, steering triple clamps and swingarms), and is not in danger of being cut or abraded.
5. **Secure the wiring.** Securely fasten all ezCAN and accessory wiring to frame tubes or non-moving components with zip ties. Do not over-tighten the zip ties.

For specific instructions on where and how to install ezCAN on BMW, Harley-Davidson and KTM motorcycles, [click here](#).

3.1 Calculating power consumption



WARNING

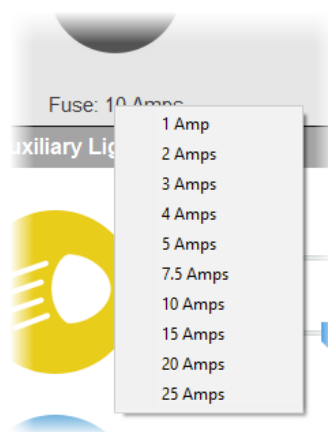
Make sure that all amperage cut-off limits are set correctly. If this is not done, current overload conditions could damage your accessories or cause electrical fires.

You must correctly set the cut-off amperage limit for each ezCAN power circuit you use. Setting these limits too high will make them ineffective, possibly causing dangerous over-current conditions. Setting the limits too low may trip power circuits for no good reason (this is known as *nuisance tripping*).

The ezCAN features software amperage limits that act in the same way as normal fuses. These ‘software fuses’ are based on the *accumulated energy principle*. This means they take the severity of an over-current condition into account, and act accordingly. In practice, this means they will not trip in the first fraction of a second in which an amperage limit has been exceeded but will act upon the energy of the event. This means that ezCAN can intelligently handle small current spikes without nuisance tripping.

If a circuit draws more than the amount of current you specify, the ezCAN cuts the power supply to that circuit. To reset a ‘tripped’ circuit, cycle the ignition (switch the motorcycle’s ignition switch OFF, then switch it back ON).

Any of the software fuses can be set at to a trip point between 1 and 25 Amps (below).



Calculate the safe cut-off amperage limit for each power circuit by doing the steps that follow:

1. Find out how much *continuous current* (in Amps) your accessory uses at full power (value **X**).
2. Calculate the *total amperage limit* (value **I**) for the circuit by adding a 30% margin to value **X**, using this formula:

$$I = (X + 30\%)$$

**TIP**

For larger electrical loads, it may be advisable to use a lower margin.

If you are using a margin lower than 30%, and a power circuit disables repeatedly, increase the margin.

3. Assign the closest software fuse setting above value **I** to the circuit, using the procedure [shown here](#).
 - As a typical example, you might want to connect a Run/Brake light with a maximum current draw of 1.8 Amps to a power circuit. Adding 30% to this yields 2.34 Amps.

This means the 3 Amp setting must be chosen to protect the circuit.

If you do not know the Amperage draw of the accessory:

1. Find out the maximum amount of power (in Watts) the accessory uses at full power (value **P**).
2. If a single output circuit must power two or more accessories (such as auxiliary lights), calculate the total value of **P** by adding the total wattage of the accessories together.
3. Calculate the *nominal amperage* (value **Y**) for the circuit by dividing value **P** by the twelve volts of the motorcycle's electrical system (value **V**), using this formula:

$$Y = \frac{P}{V}$$

4. Calculate the *total amperage limit* (value **I**) for the circuit by adding a 30% margin to value **Y**, using this formula:

$$I = (Y + 30\%)$$

- As a typical example, you might want to connect two auxiliary front lights consuming 40 Watts each to the power circuit, in parallel. The calculation for this would be:

$$I = \left(\frac{(40 + 40)}{12} \right) + 30\% = 8.7 \text{ Amps}$$

Adding 30% to 6.67 Amps yields 8.67 Amps. This means the 10 Amp setting must be chosen to protect the circuit.



IMPORTANT

The ezCAN has a 30 Amp inline fuse.

The combined maximum current limit for all four power circuits must not exceed 30 Amps. The main fuse may blow if the ezCAN draws more than this amount of current.

It is recommended that you keep the combined maximum current limit under 25 Amps.

To learn how to enter value **I** for each power circuit using the ezCAN configuration software, [click here](#).

3.2 Generic installation



CAUTION

Follow the installation sequence in this section carefully, and do not skip any steps.

Your ezCAN is a precision component, and must be fitted with care and attention. The installation sequence in this section is designed to make

installation easy, and to prevent fault codes being logged by any of the motorcycle's control units.

1. Switch the motorcycle's ignition OFF.
2. Remove the negative terminal (–) from the motorcycle's battery.
3. Remove the positive terminal (+) from the motorcycle's battery.
4. Connect the ezCAN to the correct CAN-bus connections:
 - On 2013-onward liquid-cooled BMW R-series models, connect the ezCAN to the tyre-pressure monitoring module or blanking plug, and the corresponding module connector.
 - On all other BMW models, connect the ezCAN to the anti-theft alarm module or blanking plug, and the corresponding module connector.
 - On all Harley-Davidson and KTM models, connect the ezCAN to the motorcycle's diagnostic connector.
5. Connect the orange ezCAN power cable to the battery's positive terminal (+).
6. Connect the brown ezCAN power cable to the battery's negative terminal (–). Always reconnect the negative terminal last.
7. Configure your ezCAN [as shown here](#).
8. Connect your accessories to the ezCAN power circuits as shown in the sub-sections below. Pay attention to the output circuit colours, making sure you configure the output circuits to power the correct accessories.
9. Switch the motorcycle's ignition ON.
10. Test that each accessory is working as expected. Fine-tune the cut-off amperage limit for each power circuit, as needed.

3.3 Before you wire your accessories...



IMPORTANT

Not all accessories use red cables for 12V+, or brown cables for Ground. If you do not know what one or more wires on your accessory are for, ask the manufacturer for the accessory's *pinouts* (terminal assignments).

The ezCAN kit includes four 3-wire stub connectors, four 2-wire stub connectors, and two blanking plugs. Use the blanking plugs to cover all power output plugs you will not be using.

The power output plug shown below is a typical female output plug found on the ezCAN. Each ezCAN power circuit has three wires:

- **A solid red, blue, yellow or white wire** (right terminal, below). This is the 12V+ wire.

- **A wire of the same colour as the solid-coloured wire, with white or black tracer** (left terminal, below). This is the pulse-width modulation (PWM) control wire. It is used for controlling light intensity if the accessory is a three-wire light.
- **A black wire** (upper terminal, below). This is the Ground or negative return wire.



Note the position of each terminal (the *pinouts*). The following sub-sections will use this information to show you how to connect specific accessories.



TIP

On the *White* power circuit, the PWM control wire also serves as the Local Interconnect Network (LIN-bus) channel.

In future, this channel will be used for expansion, and to accommodate intelligent accessories.

It is important that you pay close attention when connecting your accessories to the ezCAN's output circuits. Use the ezCAN power circuits and stub connectors as shown in the following sub-sections.

3.3.1 Connecting 2-wire accessories

If the accessory you are installing only has two wires, read this section. If you are installing accessory LED lights that have three wires, refer to [Connecting 3-wire LED lights](#).

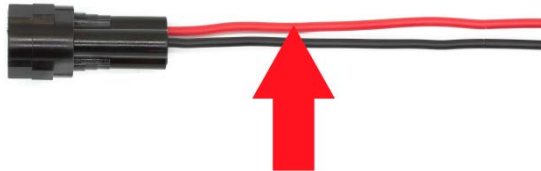
Most accessories have two wires: a 12V supply wire, and a second wire for Ground return. Some typical examples are:

- 12-volt power for accessories (GPS, phones, action cameras, and so on)
- High-power LED lights featuring two-wire connections
- Run/Brake/Turn lights
- Auxiliary brake lights
- Daytime Running Lights (DRLs) and marker lights

- Air horns
- Heated gear

Join the wiring of a two-wire accessory to an ezCAN two-wire stub connector by doing the steps that follow:

1. Connect the accessory's 12V+ cable to the **solid-coloured red, blue, yellow or white** wire on the stub connector (below).



2. Connect the accessory's Ground cable to the **black wire** on the stub connector (below).



3. If the accessory is a two-wire LED light, switch OFF **Three-Wire Dimming Mode** in the correct **Auxiliary Lights** section of the ezCAN configuration software (below).



IMPORTANT

If **Three-Wire Dimming Mode** is not switched OFF for two-wire lights, the lights will remain at full brightness regardless of their brightness setting.

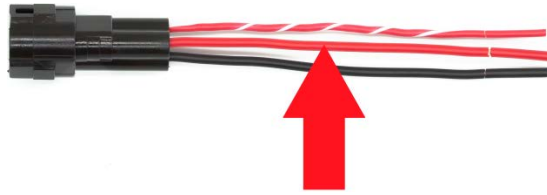
3.3.2 Connecting 3-wire LED lights

If you are installing accessory LED lights that have three wires, read this section. If the accessory you are installing only has two wires, refer to [Connecting 2-wire accessories](#).

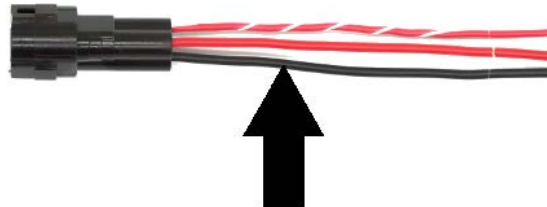
In addition to Power and Ground, some LED lights have a third wire that is used to control the light's brightness. This is done using a low-power Pulse Width Modulation (PWM) control signal.

Join the wiring of a three-wire LED light to a three-wire ezCAN stub connector by doing the steps that follow:

1. Connect the auxiliary light's 12V+ wire to the **solid-coloured red, blue, yellow or white** wire on the stub connector (below).



2. Connect the auxiliary light's Ground wire to the **black wire** on the stub connector (below).



3. Connect the auxiliary light's PWM/brightness control wire to the **dual-coloured wire** on the ezCAN stub connector (below).



4. Switch ON **Three-Wire Dimming Mode** in the correct **Auxiliary Lights** section of the ezCAN configuration software (below).



IMPORTANT

If **Three-Wire Dimming Mode** is not switched ON for three-wire lights, the lights may flicker or 'stutter' when their brightness is adjusted, or their brightness adjustment may 'jump' between the low and high settings.

3.4 Connecting power wiring

When connecting accessories to the ezCAN stub connectors, we suggest you use one of the following methods:

- It is strongly recommended that you use *solder seal wire connectors*. This is a special configuration of heat-shrink tubing with a watertight seal on both ends and a low-temperature solder ring in the middle. Typical examples are shown below.



- If you cannot obtain solder seal wire connectors, use traditional soldered joints (below).



Each soldered joint must be covered with a generous section of heat-shrink tubing (below). Insulation tape is not recommended.



TIP

Some types of heat-shrink tubing have an interior coating of adhesive. This type of tubing is preferred, as it improves water resistance.

When connecting the power wiring of an accessory to an ezCAN stub connector, do the steps that follow:

1. Install the ezCAN and all accessories on the motorcycle.
2. Measure the length of each planned power circuit wiring run.
3. If needed, extend stub connectors by adding more wiring between each terminal of the accessory. Alternatively, consider using the ezCAN Extension Kit (unassembled view below left, assembled view below right).



To purchase an ezCAN Extension Kit from the Hex Innovate online store, [click here](#).

**WARNING**

If an accessory connects to a power outlet (for example, a Hella plug), make sure the accessory's power cord cannot interfere with control of the motorcycle, and cannot entangle you when you get onto and off of the motorcycle.

3.5 ezCAN registration

**IMPORTANT**

Registration brings these essential benefits:

- Support and warranty cover are enabled for your ezCAN.
- You will also have access to the latest device firmware updates.
- You can choose to stay informed of the latest software functionality. ezCAN functionality is continually upgraded, and the ability to control intelligent accessories is part of future planning.

Note that ezCAN product support is only available to registered users.

The registration procedure allows ezCAN owners to access the full benefit of ezCAN ownership.

3.5.1 Registering the ezCAN

To register your ezCAN, follow these steps:

1. Connect your computer to the internet.
2. Remove the rubber plug covering the ezCAN's Micro-USB port.
3. Connect the ezCAN to your computer.
4. Launch the ezCAN Configuration Tool from your computer.
 - If this is not the first time your ezCAN is connected to the internet, the ezCAN configuration software will be shown.
 - If this is the first time your ezCAN is connected to the internet, the **ezCAN Registration** dialogue will be shown.
5. If the **ezCAN Registration** dialogue is shown, follow the prompts.
 - Your browser will show the **Hex ezCAN Registration** form.
6. Enter all needed information, including a valid E-mail address.
7. Click the **Submit** button.
 - A verification E-mail will be sent to your E-mail address.



IMPORTANT

It may take several minutes to receive the verification E-mail. If you do not receive the verification E-mail after this time, check your E-mail account's anti-spam settings and Spam folder. The verification E-mail has the following delivery address and subject line:

From: noreply-signup@hexcode.co.za

- *Subject: ezCAN Registration*

If you have not received the verification E-mail after one hour, contact support@hexezcan.com for help.

8. Click the verification link in the body of the E-mail.
 - Registration is now complete, and support and warranty cover are active for your ezCAN.

3.5.2 Re-registering the ezCAN

If you need to change your ezCAN registration details, or if you have purchased a used ezCAN and want to register it in your name, do the steps that follow:

1. Click the Extra Settings button in the upper right corner of the ezCAN configuration software (below).



2. Click the **About** option in the drop-down menu.
 - The ezCAN *Version details* dialogue will be shown.
3. Click the **Update Registration Details** button.
 - The **ezCAN Registration** dialogue will be shown.
4. Complete the **ezCAN Registration** dialogue as shown in [Registering the ezCAN](#).

3.5.3 Manual registration

If for any reason you cannot register using the **ezCAN Registration** dialogue, register manually by going to <https://ezcanupdate.hex.co.za/ezcan/registration> and filling in your details.

4 EZCAN VIDEO TUTORIALS

A number of video tutorials are available for every ezCAN-related topic. To see relevant video tutorials, click the links below.

More videos are added on a regular basis. Please visit www.hexezcan.com to see the newest additions.

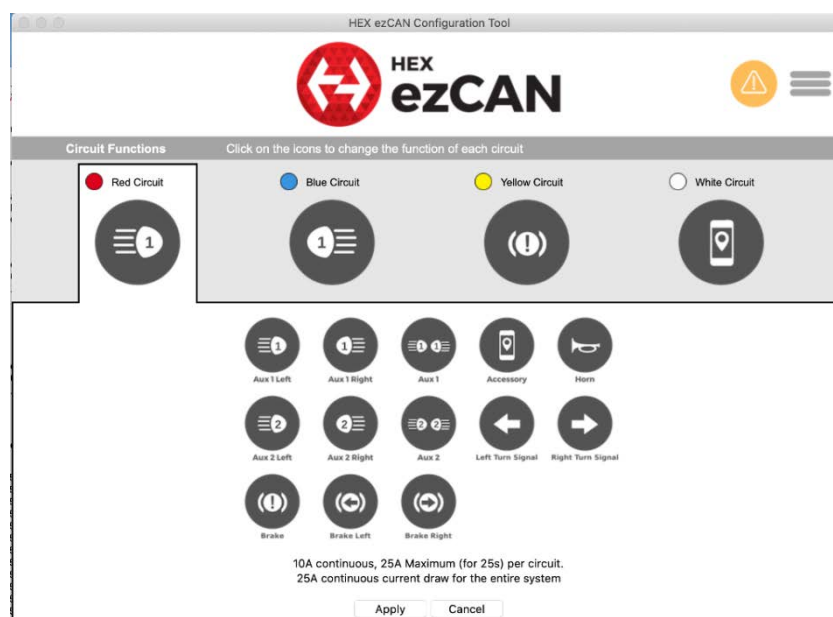
4.1 ezCAN installation instructions

The ezCAN installation video tutorials all give specific, easy-to-follow instructions for the relevant motorcycle.

- For installation on compatible BMW motorcycles, [click here](#).
- For installation on compatible Harley-Davidson motorcycles, [click here](#).
- For installation on compatible KTM motorcycles, [click here](#).

4.2 ezCAN configuration instructions

You will see the view below when you click the configuration icon for any power output circuit.



You can assign any of the configuration options above to each of the power output circuits.

Some software configuration instructions may differ, depending on whether you are setting up an ezCAN for a BMW, Harley-Davidson or KTM motorcycle.

Configuration instructions are available for all compatible motorcycles. To learn how to configure your ezCAN, [click here](#).

5 HOW TO CONTROL YOUR EZCAN

Some aspects of ezCAN operation differ, depending on whether the ezCAN is installed on a BMW, Harley-Davidson or KTM. This section shows all rider actions needed to switch on, adjust and switch off all functions on all compatible motorcycles.



IMPORTANT

Note that the ezCAN may need to be configured before it works exactly the way you want it to.

For detailed instructions on how to configure the ezCAN using the ezCAN configuration software, [click here](#).

Some rider actions may give different results, depending on how the ezCAN is configured. To learn how to configure your ezCAN using the Configuration Software, see [ezCAN configuration instructions](#).

In all cases, the motorcycle's ignition switch must be ON.



WARNING

For safety reasons, it is strongly recommended that you stop the motorcycle and select *Neutral* before switching on, adjusting or switching off auxiliary front lights.

On KTMs without optional Hex light switches, it is not technically possible to adjust auxiliary front lights, or switch them ON or OFF, while the motorcycle is moving.

5.1 BMW Motorrad with Multi-Controller

Switching on and adjusting Aux 1 lights only	<ol style="list-style-type: none"> 1. Hold the Multi-Controller LEFT until the Aux 1 lights flash twice. <ul style="list-style-type: none"> • The Aux 1 lights are now in brightness-adjustment mode. 2. Rotate the Multi-Controller UP to increase light brightness by 10% per click (to a maximum of 100%), or DOWN to decrease brightness by 10% per click (to a minimum of 0%). 3. Exit brightness-adjustment mode by not operating the Multi-Controller for more than 5 seconds.
Switching on and adjusting Aux 2 lights only	<ol style="list-style-type: none"> 1. Hold the Multi-Controller RIGHT until the Aux 2 lights flash twice. <ul style="list-style-type: none"> • The Aux 2 lights are now in brightness-adjustment mode. 2. Rotate the Multi-Controller UP to increase light brightness by 10% per click (to a maximum of 100%), or DOWN to decrease brightness by 10% per click (to a minimum of 0%). 3. Exit brightness-adjustment mode by not operating the Multi-Controller for more than 5 seconds.

Switching off Aux 1 lights only	Press and hold the turn-signal cancel button for more than 3 seconds.
Switching off Aux 2 lights only	Press and release the turn-signal cancel button rapidly three times.
Switching off all front and rear auxiliary lights	Press and hold the turn-signal cancel button for more than 5 seconds.

5.2 BMW Motorrad without Multi-Controller

Switching on and adjusting Aux 1 lights only	<ol style="list-style-type: none"> 1. Press and hold the left switchgear INFO button until all auxiliary front lights flash twice. <ul style="list-style-type: none"> • The auxiliary front lights are now in brightness-adjustment mode. 2. Release the INFO button. 3. Briefly press and release the INFO button to adjust light brightness. <ul style="list-style-type: none"> • Each press will brighten the Aux 1 lights by 10% to a maximum of 100%, then roll brightness through to 0% (OFF). • You can repeat this cycle as many times as you need. 4. Exit brightness-adjustment mode by not operating the INFO button for more than 5 seconds.
Switching on and adjusting Aux 2 lights only	<ol style="list-style-type: none"> 1. Press and hold the left switchgear INFO button until all auxiliary front lights flash twice. <ul style="list-style-type: none"> • The auxiliary front lights are now in brightness-adjustment mode. 2. Release the INFO button. 3. Pull in and hold the clutch lever. 4. Briefly press and release the INFO button to adjust light brightness. <ul style="list-style-type: none"> • Each press will brighten the Aux 2 lights by 10% to a maximum of 100%, then roll brightness through to 0% (OFF). • You can repeat this cycle as many times as you need. 5. Release the clutch lever. 6. Exit brightness-adjustment mode by not operating the INFO button for more than 5 seconds.
Switching off Aux 1 lights only	Press and hold the left switchgear INFO button for more than 7 seconds.
Switching off Aux 2 lights only	<ol style="list-style-type: none"> 1. Pull in and hold the clutch lever. 2. Press and hold the left switchgear INFO button for more than 7 seconds.
Switching off all front and rear auxiliary lights	Press and hold the left switchgear INFO button for more than 10 seconds.

5.3 Harley-Davidson

Switching on and adjusting Aux 1 lights only	<ol style="list-style-type: none"> 1. Press and hold the left switchgear TRIP or trigger button until all auxiliary front lights flash twice. <ul style="list-style-type: none"> • The auxiliary front lights are now in brightness-adjustment mode. 2. Release the TRIP or trigger button. 3. Briefly press and release the TRIP or trigger button to adjust light brightness. <ul style="list-style-type: none"> • Each press will brighten the Aux 1 lights by 10% to a maximum of 100%, then roll brightness through to 0% (OFF). • You can repeat this cycle as many times as you need. 4. Exit brightness-adjustment mode by not operating the TRIP or trigger button for more than 5 seconds.
Switching on and adjusting Aux 2 lights only	<ol style="list-style-type: none"> 1. Press and hold the left switchgear TRIP or trigger button until all auxiliary front lights flash twice. <ul style="list-style-type: none"> • The auxiliary front lights are now in brightness-adjustment mode. 2. Release the TRIP or trigger button. 3. Pull in and hold the clutch lever. 4. Briefly press and release the TRIP or trigger button to adjust light brightness. <ul style="list-style-type: none"> • Each press will brighten the Aux 2 lights by 10% to a maximum of 100%, then roll brightness through to 0% (OFF). • You can repeat this cycle as many times as you need. 5. Release the clutch lever. 6. Exit brightness-adjustment mode by not operating the TRIP or trigger button for more than 5 seconds.
Switching off Aux 1 lights only	Press and hold the left switchgear TRIP or trigger button for more than 7 seconds.
Switching off Aux 2 lights only	<ol style="list-style-type: none"> 1. Pull in and hold the clutch lever. 2. Press and hold the left switchgear TRIP or trigger button for more than 7 seconds.
Switching off all front and rear auxiliary lights	Press and hold the left switchgear TRIP or trigger button for more than 10 seconds.

5.4 KTM

Operation of the ezCAN for KTM varies slightly, depending on whether an auxiliary light control switch is or is not installed, and if a switch is installed, the type of switch.

This section describes the three possible scenarios:

- To operate front auxiliary lights if no accessory switch is installed, see [If no hardware light switch is installed](#).
- To operate front auxiliary lights if a Hex UP-DOWN switch is installed, see [If the Hex UP-DOWN switch is installed](#).

- To operate front auxiliary lights if a single-button switch is installed, see [If a single-button switch is installed](#).

5.4.1 Switching Aux 1 and Aux 2 lights independently

Without a Hex UP-DOWN button installed (thus single button or no button), only the Aux 1 circuit can be switched on and off. The ezCAN Configuration Tool contains a KTM-specific feature that allows you to switch the Aux 2 circuit simultaneously with the Aux 1 circuit. (In other words, the on/off condition of the Aux 2 circuit mimics that of the Aux 1 circuit).

This feature is used if:

- A single-button auxiliary light switch is installed (in other words, the on/off condition and brightness can only be controlled for the Aux 1 circuit), or
- No accessory light switch is installed (in other words, the on/off condition and brightness can only be controlled for the Aux 1 circuit, and only using the motorcycle's DRL menu).

If the Hex UP-DOWN switch is installed, this feature is not used. The Hex UP-DOWN switch is used to independently switch Aux 1 *and* Aux 2 light circuits on and off, and individually control the brightness for each circuit.

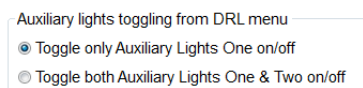
To choose whether the Aux 2 lights switch on or off, based on how the Aux 1 lights are commanded, follow the steps below:

1. Click the drop-down menu button in the upper right corner of the **Auxiliary Lights One** or **Auxiliary Lights Two** sections (below).



2. Click the **Extra Settings** option.

- The auxiliary lights Extra Settings menu will be shown. Look for the following section:



3. To control the on/off function of the Aux 1 lights *only*, click the **Toggle only Auxiliary Lights One on/off** radio button.
4. To control the on/off function of the Aux 1 lights *and* Aux 2 lights (in other words, to make the Aux 2 lights mirror the on/off condition of the Aux 1 lights), click the **Toggle both Auxiliary Lights One & Two on/off** radio button.
5. Click **OK**.

5.4.2 If no hardware light switch is installed

If a hardware auxiliary light switch is *not* installed, use the motorcycle's DRL function to switch the auxiliary lights ON or OFF by doing the steps that follow:

1. Navigate to the **DRL** option in your KTM's instrument display **Settings** menu.
2. Toggle the DRL function twice. You can use either of the following sequences:
 - ON → OFF → ON → OFF → ON
 - OFF → ON → OFF → ON → OFF

Switching the auxiliary lights on or off	<ol style="list-style-type: none"> 1. Stop the motorcycle. 2. Navigate to the DRL option in the KTM instrument display's Settings menu. 3. Toggle the DRL function twice.
Adjusting Aux 1 or Aux 2 light brightness	This can only be done using the Auxiliary Lights sections of the ezCAN configuration software.

5.4.3 If the Hex UP-DOWN switch is installed

The Hex UP-DOWN switch is available as an accessory from Hex Innovate. To purchase a Hex UP-DOWN switch, [click here](#).

The Hex UP-DOWN switch option is enabled in the Aux Lights Extra Settings menu:

To configure the ezCAN to accept control input from a Hex UP-DOWN switch, do the steps that follow:

1. Click the drop-down menu button in the upper right corner of the **Auxiliary Lights One** or **Auxiliary Lights Two** sections (below).



2. Click the **Extra Settings** option.
 - The auxiliary lights Extra Settings menu will be shown.
3. Configure the ezCAN to accept control input from the Hex UP-DOWN switch by selecting the **Dual button switch** option.

Select auxiliary switch type if installed:

Single button switch

Dual button switch

4. Click **OK**.

Switching the Aux 1 lights on and off	Briefly press and release the UP button to toggle the Aux 1 lights on or off.
Adjusting Aux 1 lights only	<ol style="list-style-type: none"> Press and hold the UP button until the Aux 1 lights flash twice. <ul style="list-style-type: none"> The Aux 1 lights are now in brightness-adjustment mode. Briefly press and release the UP button to increase Aux 1 light brightness by 10% per press (to a maximum of 100%), or the DOWN button to decrease brightness by 10% per press (to a minimum of 0%). Exit brightness-adjustment mode by not operating the switch for more than 5 seconds.
Switching the Aux 2 lights on and off	Briefly press and release the DOWN button to toggle the Aux 1 lights on or off.
Adjusting Aux 2 lights only	<ol style="list-style-type: none"> Press and hold the DOWN button until the Aux 2 lights flash twice. <ul style="list-style-type: none"> The Aux 2 lights are now in brightness-adjustment mode. Briefly press and release the UP button to increase Aux 2 light brightness by 10% per press (to a maximum of 100%), or the DOWN button to decrease brightness by 10% per press (to a minimum of 0%). Exit brightness-adjustment mode by not operating the switch for more than 5 seconds.

5.4.4 If a single-button switch is installed

In context of ezCAN for KTM, a *single-button switch* is any off-the-shelf normally open (push-to-make) switch.

To configure the ezCAN to accept control input from a single-button switch, do the steps that follow:

- Click the drop-down menu button in the upper right corner of the **Auxiliary Lights One** or **Auxiliary Lights Two** sections (below).




- Click the **Extra Settings** option.
 - The auxiliary lights Extra Settings menu will be shown.
- Configure the ezCAN to accept control input from the single-button switch by selecting the **Single button switch** option.

Select auxiliary switch type if installed:

- Single button switch
 Dual button switch

- Click **OK**.

The single-button option controls the on/off function and brightness of the Aux 1 circuit only. To choose whether the Aux 2 lights switch on or off based on how the Aux 1 lights are commanded, see [Switching Aux 1 and Aux 2 lights independently](#).

Switching all Aux 1 and optionally also Aux 2 lights on or off	<p>Briefly press and release the single-button switch.</p> <ul style="list-style-type: none"> The Aux 1 and optionally also Aux 2 lights will be switched on or off according to the settings specified in the auxiliary lights Extra Settings menu.
Adjusting the Aux 1 lights	<ol style="list-style-type: none"> Press and hold the single-button switch until the Aux 1 lights flash twice. <ul style="list-style-type: none"> The Aux 1 lights are now in brightness-adjustment mode. Release the single-button switch. Briefly press and release the single-button switch to adjust light brightness. <ul style="list-style-type: none"> Each press will brighten the Aux 1 lights by 10% to a maximum of 100%, then roll brightness through to 0% (OFF). You can repeat this cycle as many times as you need. Exit brightness-adjustment mode by not operating the single-button switch for more than 5 seconds. <div data-bbox="676 792 1299 1025" style="background-color: #f0f0f0; padding: 10px; margin-top: 10px;">  <p>NOTE</p> <p>The brightness of Aux 2 lights cannot be adjusted using a single-button switch.</p> <p>If you want to adjust the brightness of Aux 1 <i>and</i> Aux 2 lights, we recommend using a Hex UP-DOWN switch instead.</p> </div>

5.5 All other ezCAN functions



IMPORTANT

Note that the ezCAN may need to be configured before it works exactly the way you want it to.

For detailed instructions on how to configure the ezCAN using the ezCAN configuration software, [click here](#).

No 'special' rider actions are needed to operate all other ezCAN functions.

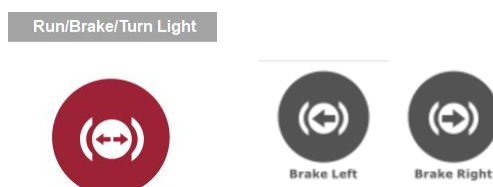
- Depending on configuration, an **auxiliary rear/brake light** will be active as a running light whenever the ignition switch is ON, and be active as a brake light whenever the brakes are used. To use this feature, set one or more power circuits to power auxiliary rear/brake lights. The **Auxiliary Brake Light** section of the ezCAN configuration software (below) will be shown.

Auxiliary Brake Light



- Depending on configuration, a **run/brake/turn light** will be active as a running light (in other words, at a lower brightness than brake

light brightness) whenever the ignition switch is ON, active as a brake light whenever the brakes are used, and be active as a turn signal whenever the turn signal for the correct side is switched on. To use this feature, set one or more power circuits to power left or right run/brake/turn lights. The **Run/Brake/Turn Light** section of the ezCAN configuration software will be shown (below, left). This section of the software is associated with the **Brake Left** and **Brake Right** circuit configuration options (below, right).

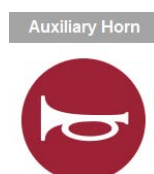


- A 12-volt accessory circuit will supply full battery voltage whenever the ignition switch is ON. To use this feature, set one or more power circuits to power an accessory circuit. The **Accessory / Ignition Supply** section of the ezCAN configuration software (below) will be shown.

This function also has a configurable delay time-out that will keep the output ON for the configured time after the motorcycle's ignition has been switched OFF.



- A horn circuit will supply full battery voltage to all accessory horns whenever the ignition switch is ON and the motorcycle's Horn button is pressed. To use this feature, set one or more power circuits to power an accessory horn. The **Auxiliary Horn** section of the ezCAN configuration software (below) will be shown.



- Depending on its configuration, an **auxiliary turn signal** will be active as a running light or marker light whenever the ignition switch is ON, active as a turn signal whenever the turn signal for that side is switched on, and active as an auxiliary hazard light whenever the hazard lights are switched on. To use this feature, set one or more power circuits to power auxiliary left or right turn

signals. The **Turn Signals** section of the ezCAN configuration software will be shown (below, left). This section of the software is associated with the **Left Turn Signal** and **Right Turn Signal** circuit configuration options (below, right).

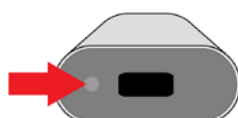


6 IF SOMETHING GOES WRONG


In the unlikely event that something goes wrong with your ezCAN or accessory installation, follow the guidelines in this section to get things working again.

6.1 What do the Status LED colours mean?

Switch the motorcycle's ignition switch ON. Check the Status LED on the end of the ezCAN (below).



The Status LED light codes have the following meanings:

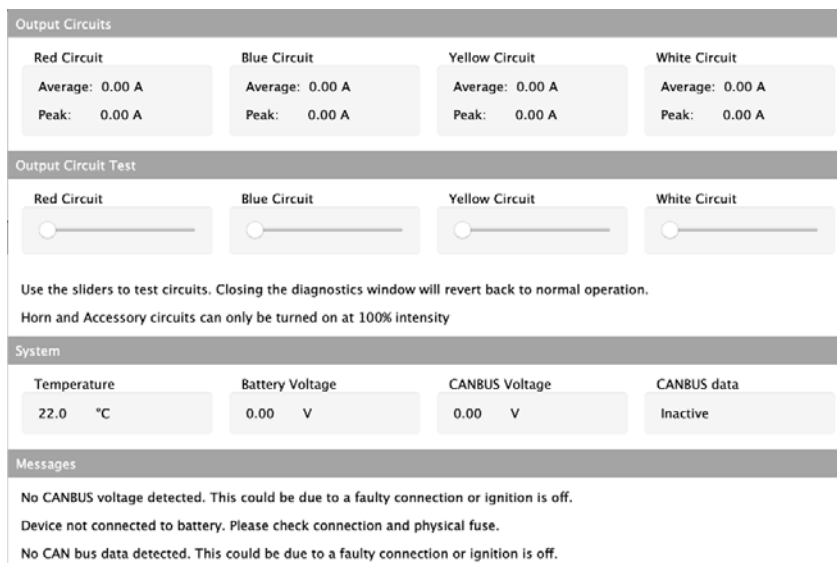
Status LED codes	
LED code	Meaning
Constant green:	The ezCAN is operating normally.
Green 'blip' every two seconds:	The ezCAN is in Sleep Mode. It will switch on the next time the motorcycle's ignition is switched on.
Quick flashing green while connected to computer by USB:	The ezCAN is downloading and installing a firmware update.  CAUTION Do not disconnect the ezCAN from your computer until the firmware installation is complete.
Quick flashing orange:	CAN-bus data that the ezCAN needs is missing or incorrect, or there is a configuration error. <ol style="list-style-type: none"> 1. Reset the ezCAN by switching the ignition OFF, then ON. 2. If the LED does not show constant green, connect the ezCAN to your computer and run the configuration software. 3. Navigate to the ezCAN Diagnostics window. 4. Note the CAN-bus data value in the System section. This value should be <i>Active</i>. If the value is <i>Inactive</i>, make sure the ezCAN is securely connected to the correct CAN-bus connector on the motorcycle. 5. If the problem persists, contact Hex support by sending an E-mail to support@hexezCAN.com.
Quick flashing red:	One or more of the electronic output fuses have been 'tripped'. This may be due to a current overload, or incorrectly set current limits. Refer to the <i>One or more power output circuits have stopped working</i> section of the ezCAN fault diagnosis table in this section.

Constant red:	<p>The ezCAN reset unexpectedly.</p> <ol style="list-style-type: none"> 1. Connect the ezCAN to your computer and run the configuration software. <ul style="list-style-type: none"> • The ezCAN will attempt to complete a self-recovery. 2. If self-recovery is unsuccessful, contact Hex support by sending an E-mail to support@hexezCAN.com.
Solid green with quick flashing orange:	<p>The ezCAN's application firmware is corrupt.</p> <ol style="list-style-type: none"> 1. Connect the ezCAN to your computer and run the configuration software. 2. You should see a firmware update or firmware recovery dialogue. Follow the prompts to completion. 3. If a firmware dialogue is not shown, contact Hex support by sending an E-mail to support@hexezCAN.com.
Solid orange:	<p>The ezCAN has an internal error.</p> <ol style="list-style-type: none"> 1. Connect the ezCAN to your computer and run the configuration software. <ul style="list-style-type: none"> • The ezCAN will attempt to complete a self-recovery. 2. If self-recovery is unsuccessful, contact Hex support by sending an E-mail to support@hexezCAN.com.

6.2 Using the ezCAN *Diagnostics* window

If you cannot isolate the problem using the table above:

1. Connect the ezCAN to your computer.
2. Launch the ezCAN software.
3. Turn on the motorcycle's ignition switch.
4. Navigate to the *Diagnostics* window (below) by clicking on the warning triangle in the upper right corner of the ezCAN Configuration Tool, or by clicking the *Diagnostics* option in the Configuration Tool's main menu.



The screenshot shows the 'Diagnostics' window with the following sections:

- Output Circuits:** Four panels for Red, Blue, Yellow, and White circuits, each showing Average: 0.00 A and Peak: 0.00 A.
- Output Circuit Test:** Four sliders for Red, Blue, Yellow, and White circuits.
- System:**
 - Temperature: 22.0 °C
 - Battery Voltage: 0.00 V
 - CANBUS Voltage: 0.00 V
 - CANBUS data: Inactive
- Messages:**
 - No CANBUS voltage detected. This could be due to a faulty connection or ignition is off.
 - Device not connected to battery. Please check connection and physical fuse.
 - No CAN bus data detected. This could be due to a faulty connection or ignition is off.

5. The *Diagnostics* window is partitioned into four sections:

- **Output Circuits:** This section shows the real-time Average current and Peak current for each power circuit since the ignition was last switched ON.
- **Output Circuit Test:** This section overrides the standard ezCAN control inputs, and allows you to control the Pulse Width Modulation for each circuit. This section can be used to test the functional state of the ezCAN, its software configuration, the state of the output wiring, and the accessories connected to the power output circuits.



NOTES

Horn and Accessory/Ignition outputs can only be switched ON and OFF.




If an auxiliary light is configured as a 2-wire light, the current to the 12V+ power terminal (solid coloured wire) will be modulated.



If an auxiliary light is configured as a 3-wire light, the current to the PWM/brightness terminal (coloured wire with white or black tracer) will be modulated.

- **System:** This section shows various real-time data, internal to the ezCAN
- **Messages:** This section shows messages, hints and recommendations given the current status of the ezCAN.

6. Refer to the **ezCAN fault diagnosis** table below.

ezCAN fault diagnosis	
Symptom	Solution
One or more power output circuits have stopped working.	<ol style="list-style-type: none"> 1. Reset the ezCAN's software fuses by turning the ignition switch OFF, then ON. 2. If a power circuit disables repeatedly: <ol style="list-style-type: none"> i. Check whether the ezCAN Status LED is flashing red, or if an OVERLOAD! warning is given for the power circuit in the ezCAN Diagnostics window. If this happens, a circuit has deactivated ('tripped'). This may be due to a current overload or incorrectly set current limits. ii. Make sure the cut-off amperage limit for the circuit has not been set too low. If needed, re-calculate the accessory's power consumption as shown in Calculating power consumption, and select the correct power cut-off value for the circuit. iii. Check the ezCAN and accessory wiring for physical damage that might be causing a short circuit. Properly repair and insulate all breaks in the wiring. Reposition and re-secure affected wiring so it cannot be damaged again.

<p>An accessory isn't working, but the Diagnostics window isn't showing an overload for that circuit.</p>	<ol style="list-style-type: none"> 1. Make sure all power circuit plugs are securely connected. 2. Open the ezCAN Diagnostics window. 3. Under Output Circuit Test, click-and-drag the slider for the affected circuit. <ul style="list-style-type: none"> • The accessory connected to the circuit should respond accordingly. 4. If the accessory does not respond, check that the software configuration for the circuit is correct. 5. If the accessory still does not respond, connect it to another ezCAN power circuit and repeat steps 3 and 4 above.
<p>The ezCAN software interface is showing a green message notification (below).</p> 	<p>The combined maximum current limit for the four power circuits totals more than 30A.</p> <div style="background-color: #e0e0e0; padding: 10px; border: 1px solid #ccc;">  <p>IMPORTANT</p> <p>If all power outputs are not operated simultaneously, this could be regarded as an acceptable condition.</p> <p>However, note that the main fuse may blow if the ezCAN draws more than 30A.</p> </div> <p>View the average and peak current draw for each power circuit since the ignition switch was last turned on in the Output Circuits section of the ezCAN Diagnostics window. This may help if you need to fine-tune the fuse trip limits.</p> <ol style="list-style-type: none"> 1. Re-calculate the maximum current draw for all circuits as shown in Calculating power consumption. If needed, reduce the fuse trip limit on one or more circuits.
<p>The ezCAN software interface is showing an orange message notification (below).</p> 	<ul style="list-style-type: none"> • The ezCAN may not be connected to battery power. • The motorcycle's battery voltage may be too low. • The motorcycle's CAN bus voltage may be too low. • CAN data may be missing, or is not being detected. <p>Check the following items:</p> <ul style="list-style-type: none"> • Make sure the motorcycle's ignition switch is ON. • Check the Messages section of the ezCAN Diagnostics window. For some models, if you see a message that data is not being received, make sure that the motorcycle's kill switch is in the RUN position. • Make sure the ezCAN is receiving an acceptable battery voltage. If your motorcycle does not have a voltmeter, check the Battery Voltage value in the System section of the ezCAN Diagnostics window. This value should be more than 11 volts with the ignition switch ON and engine OFF, and approximately 14 volts with the engine running. • Check the CAN-bus data value in the System section of the ezCAN Diagnostics window. The value should be <i>Active</i>. If the value is <i>Inactive</i>, make sure the ezCAN is securely connected to the correct CAN-bus connector on the motorcycle. • Make sure the ezCAN's battery connections are secure. • Make sure the ezCAN main fuse is not blown. • If the ezCAN main fuse is blown, check for short circuits along the ezCAN wiring and accessory wiring. Replace the main fuse only with one of the same type and 30 Amp rating.

<p>The ezCAN software interface is showing a red message notification (below).</p> 	<p>The USB connection between the ezCAN and computer has been interrupted. If you are doing configuration or diagnostics, make sure the USB cable is securely connected to the computer and the ezCAN.</p>
<p>The standard horn works, but the accessory horn does not (some BMW Motorrad models with a horn input harness, and all KTM models).</p>	<ol style="list-style-type: none"> 1. Check the Horn Input Voltage value in the System section of the ezCAN Diagnostics window. 2. If the motorcycle's Horn button is not being pressed, the value should be 0.00V. 3. Press the motorcycle's Horn button. <ul style="list-style-type: none"> • The value should now be approximately the same as the Battery Voltage value. • If the Horn Input Voltage value remains 0.00V when the button is pressed, check that the ezCAN's green horn input harness is not disconnected, and that there are no breaks in the horn harness wiring. • If the Horn Input Voltage value is approximately the same as the Battery Voltage value when the Horn button is pressed, but the accessory horn does not work, check the ezCAN's accessory horn power output circuit wiring for breaks or short circuits.
<p>Front auxiliary lights flicker or 'stutter' when their brightness is adjusted, or their brightness adjustment seems to 'jump' between low and high.</p>	<ol style="list-style-type: none"> 1. Connect the ezCAN to your computer and run the configuration software. 2. In the relevant Auxiliary Lights One/Two section, check that the correct Three-Wire Dimming Mode setting is being used. This setting must be ON for three-wire auxiliary lights, and OFF for two-wire auxiliary lights. <div data-bbox="644 1182 1299 1442" style="background-color: #f0f0f0; padding: 10px;">  <p>NOTE</p> <p>Some lower-quality 2-wire LED lights perform poorly when their supply voltage is pulse-width modulated.</p> <p>It is recommended that you use only high-quality LED lights, or LED lights that are known to perform well.</p> </div>

7 SPECIFICATIONS

Generation II hardware specifications	
Physical size	76mm x 30mm x 16mm
Voltage supply	6V to 18V
System fuse rating	30A, automotive mini blade fuse
Maximum continuous current	30A (25A recommended)
Current consumption (operating)	25mA (typical)
Current consumption (sleep)	750uA (typical) 1mA (max)
Number of output circuits	Four, each with switched 12V power, Ground and PWM / brightness control wire
Output circuit current	10A per circuit (continuous) 25A (max) for 25 seconds
Output circuit fusing	Electronic fuses, configurable from 1A to 25A
Output circuit 3rd wire (PWM control)	40mA (short circuit current)
<i>Measurement ranges:</i>	
Output current	0 to 72A
CAN-bus voltage	0 to 22V
Horn input	0 to 22V
Switch input	0 to 3.3V
Internal thermal protection	90°C (maximum internal temperature)
Transient protection	As per UN ECE Regulation 10, Revision 5
CAN connectivity	1x CAN 2.0B
USB connectivity	USB V2.0 full speed, micro B-type connector
LIN connectivity	Configurable LIN master (White power circuit)
Water and dust protection	Sealed unit. Waterproof USB connector with dust cover and sealed connectors

Product	Type approval number
Generation I 2-wire devices	No approval
Generation I 3-wire devices	No approval
Generation I 3-wire devices*	E11*10R05/01*10262*00
Generation II devices*	E11*10R05/00*10443*00
Generation II devices*	E11*10R05/00*10443*01



*: The E type approval number is shown on the bar-coded label affixed to the ezCAN main body (above).

8 NOTICES AND COPYRIGHT

© HEX Innovate (UK) Ltd, 2020. All rights reserved in perpetuity.

This manual and the software described in it must not, in whole or in part, be reproduced, translated or reduced to any machine-readable form without the prior written consent of Hex Innovate (UK) Ltd. Reproduction, distribution, utilisation and/or communication of this document, or any part thereof, without express authorisation is strictly prohibited. Offenders will be held liable for payment of damages.

All rights (including intellectual property rights) flowing from, incidental to or contained in this document irrevocably rest with Hex Innovate (UK) Ltd. unless otherwise agreed in writing.

ezCAN is a registered trademark of Hex Innovate (UK) Ltd. All other trademarks and/or registered trademarks described in this document are the property of their respective owners.

Hex Innovate (UK) Ltd. provides no warranty with regard to this manual, software or other information contained herein, and hereby expressly disclaims any implied warranties of merchantability or fitness for any particular purpose with regard to this manual, the software or such other information. In no event shall Hex Innovate (UK) Ltd. be held liable for any incidental, consequential or special damages, whether based on tort, contract or otherwise, arising out of or in connection with this manual, the software or other information contained herein, or use thereof.

Hex Innovate (UK) Ltd. has a policy of continuous product improvement, and specifications and features may change without notice. Hex Innovate (UK) Ltd reserves the right to make any modification to this manual or the information contained herein, at any time, and without notice. The software described herein may also be governed by the terms of a separate end-user license agreement.