

# Operating Manual

autonomous wheels **ezW160**

*Wired versions*

Revision A – November 2013

# ez - wheel

The Electric Wheel



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Do not use ez-Wheel products for other purposes or in other conditions than those mentioned in the technical documentation.

Read and make sure you have understood the manual before using ez-Wheel products.

Observe all the warnings and usage instructions in this manual.

Keep this manual for reference throughout the life of the product.

In the event of loss, you can obtain a copy of this manual from your dealer or from the ez-Wheel Service Department.

If the product is transferred to another owner, make sure that the manual is transferred as well.

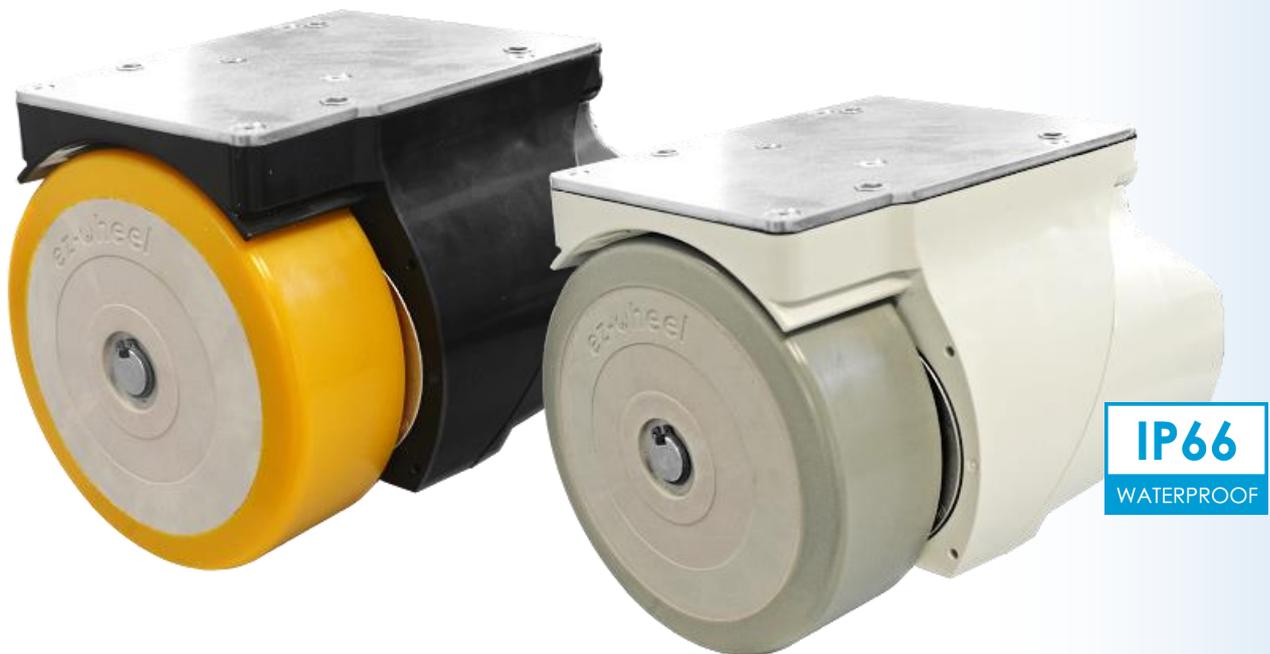
The characteristics, descriptions, and illustrations in this document are applicable at the date of publication. ez-Wheel reserves the right to make any modifications and revisions to this document. Product users obtain their own information on these modifications.

## 1. Characteristics of the ez-Wheel product

The range of autonomous wheels, **ezW160** enable powerful electric drive to be installed quickly and easily.

**ezW160** wheels are controlled by a wired interface connected directly to the back of the wheel casing. Many accessories are available for controlling the wheels in the ez-Wheel range.

This operating manual contains the instructions to be followed for installation, use and maintenance of **ezW160** wheels.



## 2. Fitting the wheel on the application

- Fix the mounting plate under the application with 4 M6 screws.

Centre distance: 102 x 105 mm  
Fitting drawings available on request

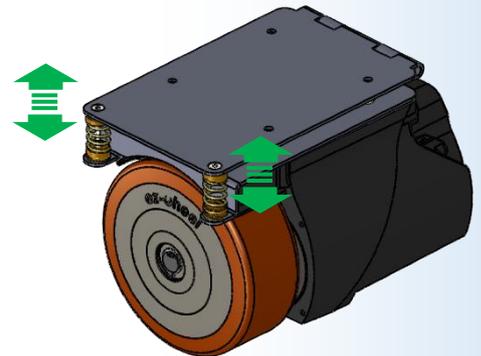
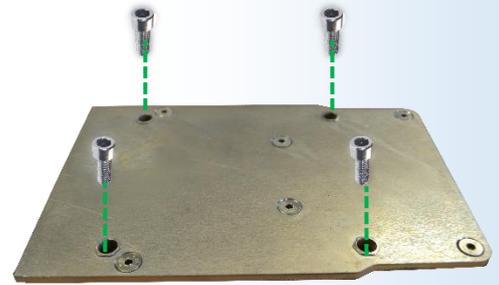
△ The tightening torque for the screws is 7 Nm; do not exceed this torque. The maximum length of the screws in the plate is 16 mm.

The wheel can be mounted as a fixture on the chassis. In this case, check the maximum load carried by the wheel.

When using as a 5<sup>th</sup> wheel or for the addition of a driving wheel on an existing machine we recommend installing the wheel with a system of suspension or shock absorbing blocks.

Contact your dealer for more information on the fitting of the ez-Wheel and the installation accessories available.

The installation of a driving wheel on a wheeled machine must be done in accordance with the Machinery Directive in force. Refer to the Declaration of Incorporation at the back of this document and make sure that the machine equipped with the wheel satisfies the directives and standards applying to it.



## 3. Opening/Closing the cable casing

### □ Removing the cable casing

- Remove the 2 screws holding the cable casing to the chassis.

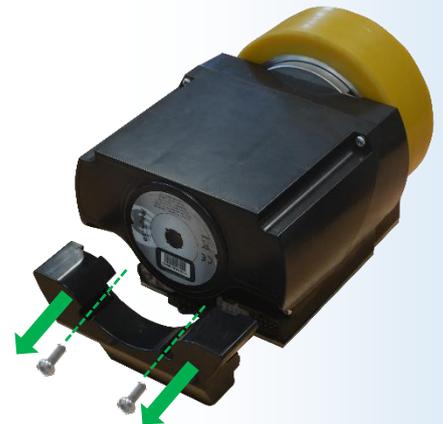
M4x12 Torx screws  
Torx screwdriver

- Remove the cable casing

### □ Cable routing

When installing or manipulating connected cables, make sure that they are positioned in the locations provided in the casing before refitting it.

Once the casing is positioned on the wheel check that all the cables are routed correctly in the cable chute between the cover and the cable casing.



□ **Refitting the cable casing**

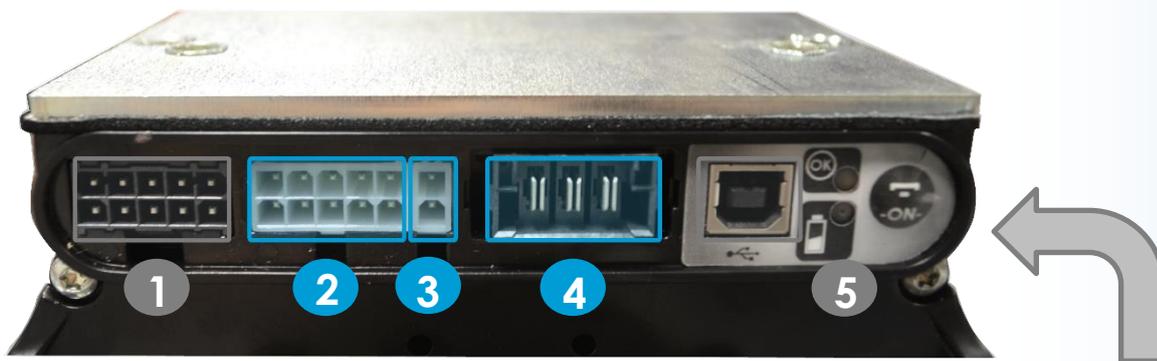
- Refit the cable casing in its original position.
- Screw up the 2 screws fully.

M4x12 Torx screws  
Torx screwdriver and extension

△ The tightening torque for the screws is 2 Nm; do not exceed this torque



#### 4. Commissioning the product



Cable / connection pairing:

All the cables with an **ezAC\_\_/160** reference connect to the Molex® 10-pin female Jr Mini-Fit connector, Cf.2 on the above illustration.

All the cables with an **ezCC\_\_/160** reference and the chargers with the **/160** suffix connect to the Molex® 2-pin female Jr Mini-Fit connector, Cf.3 on the above illustration.

1. "Other uses" connector
2. Actuator connector
3. Charging connector
4. JUMPER
5. USB port

□ **Fitting the actuator**

- Mount the actuator on the application so that its use is intuitive and ergonomic.

Via an actuator panel for rotating handle, joystick and drawbar head type actuators;

At the end of a tube for trigger type actuators.

Contact the dealer for installation drawings for the different types of actuator.



### □ Connecting the actuator

If the system does not have a starting switch, prepare an **ezACxM/160** connecting cable of the length required for the installation on the application.

- Connect the actuator to the wheel with the **ezACxM/160** adaptor cable as follows:

Molex® 6-pin Jr Mini-Fit connector on the actuator  
Molex® 10-pin Jr Mini-Fit connector on the wheel

- Check that the locking pin holds the connector.

If the system has a starting switch, prepare an **ezACxM-B/160** connecting cable of the length required for installation on the application.

- Connect the actuator and the switch to the wheel with the **ezACxM-B/160** adaptor cable as follows:

Molex® 6-pin Jr Mini-Fit connector on the actuator  
Faston terminals on the switch  
Molex® 10-pin Jr Mini-Fit connector on the wheel

- Check that the locking pin holds the connector.

If the system has a starting switch with an indicator light,

- Connect the actuator and the switch to the wheel with the **ezACxM-BD/160** adaptor cable of the length required for installation on the application as follows:

Molex® 6-pin Jr Mini-Fit connector on the actuator  
Molex® 4-pin Jr Mini-Fit connector on the switch  
Molex® 10-pin Jr Mini-Fit connector on the wheel

- Check that the locking pin holds the connector.

All mechanical drawings that could serve for the installation of the actuators are available on request.

### □ Connecting the cable: charging

If the charging system comprises an XLR remote charging socket:

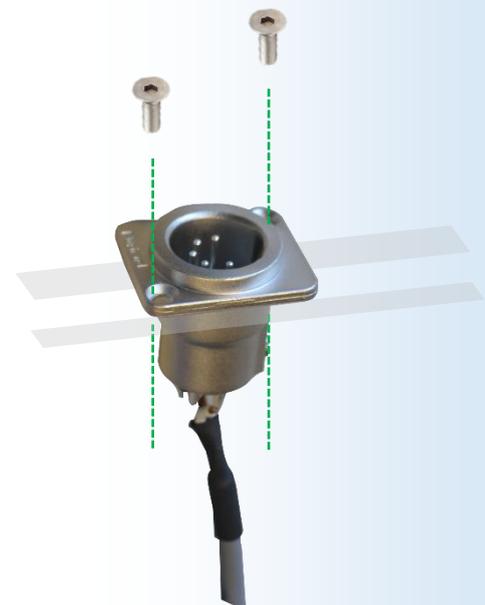
- Fix the flange-mounting XLR connector to the panel on the chassis with 2 screws.

FHC M3 screws  
Torx screwdriver

- Fix the **ezCCxM/160** charging cable on the application.



Molex® 10-pin Jr Mini-Fit connector connected to the wheel



The flange-mounting XLR connector should be positioned in such a way as to facilitate its use.

- Connect the Molex<sup>®</sup> 2-pin connector on the **ezCCxM/160** charging cable to the 2-pin female connector on the wheel.
- Check that the locking pin holds the connector.



If the charging system comprises an on-board charger (with the suffix **/160**):

- Fix the charger to the application chassis making sure that there is access to the mains cable for recharging.
- Connect the Molex<sup>®</sup> 2-pin connector from the charger to the 2-pin female connector on the wheel.

#### **Connecting the external battery**

If you have an external battery, contact the dealer for:

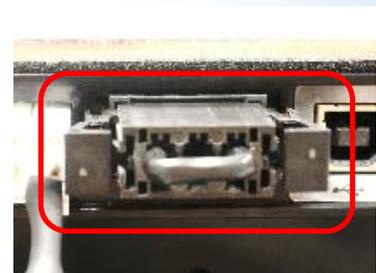
- confirmation of the batteries used
- connection of the external batteries

**△ Never connect an external battery if the wheel has an internal battery.**

#### **Connecting the JUMPER/emergency stop switch**

With a battery in the wheel:

- Check that the JUMPER is properly connected to the wheel before using.
- The JUMPER can be replaced by wiring up a remote emergency stop switch (or any other normally closed switch)



**△ Battery voltage is accessible on this connector, take care not to cause a short circuit between the metal contacts.**

In the absence of the JUMPER or a switch wired to this connector the wheel will not operate.

#### **Other connectors**

**USB socket:**

The USB socket is only used for setting the system.  
Contact the dealer for more information.

**“Other use” connectors:**

These connectors are dedicated to other uses.  
Contact the dealer for more information.

Before using for the 1<sup>st</sup> time check that the 3 main sockets: actuator, charging cable and JUMPER are connected.



## 5. First use

### □ Charging the ez-Wheel

Wheels can be charged anytime as long as a mains connection is available (if necessary several times per day). It is not necessary to wait for the battery to be discharged.

If the charging system consists of an XLR remote charger connection,

- Connect the XLR cable from the charger to the 5-pin on-board connector fitted to the application chassis.



If the charging system consists of an on-board charger (with the suffix /160),

- Connect the charger socket directly to the mains.

Use a suitable charger.

Contact the dealer for more information on chargers.

The indicator light  on the wheel should be orange and flashing.

1 to 2 hours are required to charge the wheel fully.



When the wheel is charged, the indicator light  on the wheel is green and flashing.

Refer to the paragraph entitled: "Display" for more details about the indicator lights.

When the wheel is charged, disconnect the charger by pressing the lug on its XLR connector.

To disconnect the charger connector, press in the locking lug and pull the connector.

To put the wheel back into operation, disconnect the charger and switch the wheel on by pressing the ON/OFF switch.

Only use chargers approved by ez-Wheel. For further information on charging wheels contact the dealer.

**First use of the ez-Wheel product**

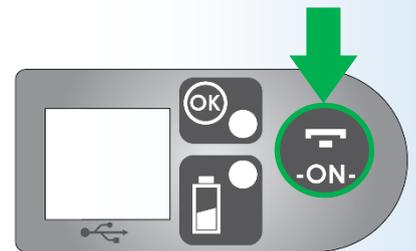
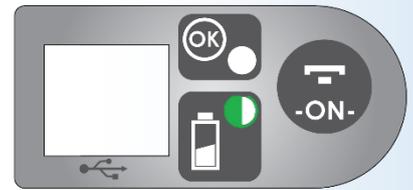
It is necessary to charge the wheels completely before using for the first time. (See: Charging the wheel)

Motor operation is controlled by the actuator accelerator.

- To switch on the wheel: Press the ON/OFF switch situated at the back of the wheel or mounted remotely.

The wheel goes into sleep mode after a few minutes without movement on the actuator to conserve battery life.

- To restart the system, press the ON/OFF switch; wake-up is immediate.



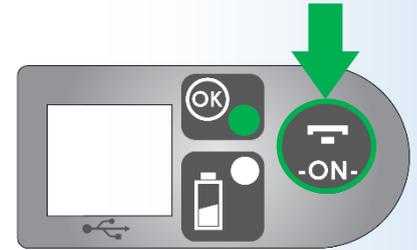
## 6. Diagnosis

- Make sure that the wheel is firmly located before switching it on.
- Check the condition of the wheel: Press the ON/OFF button on the wheel label and check that the light  is green.  
( The light indicates the level of charge of the battery. See "Display" appendix)

If the application has several wheels, repeat the operation for all the wheels.

- Press the remote switch connected to the **ezACxM-B/160** or **ezACxM-BD/160 cables**
- Check the display on the wheel, or the remote display if there is one.
- Check forward and reverse operation with the actuator.

If one of these steps does not take place as described refer to the "troubleshooting" paragraph or contact the dealer.



## 7. Precautions for use

### Wheel usage conditions

Model	ezW160I	ezW160M
IP rating	IP54	IP66
Indoor	x	x
Wet conditions	x	x
Water splashing		x
Washing with water		x

For further information refer to the conditions relating to the operating environment, or contact the dealer.

### Wheel maintenance

The wheel does not require any maintenance other than charging.

It should never be opened in any circumstances.

The wheel can be washed with a normal water hose.

Never use a high pressure cleaner.

Do not expose the connectors, the display or the labels directly to the jet. It is preferable to use a wet sponge. Do not use solvents or corrosive products.

**△ ezW160I wheel: IP54 (do not wash with water)**

**△ ezW160M wheel: IP66**



#### **Prolonged shutdown**

The wheel should be stored in a warm and dry place.  
Charge the wheel before a prolonged shutdown. Charging at least once a month is recommended.  
Do not exceed 50 days storage between charges even if the wheel is not used.  
To put the system back into use after a prolonged shutdown, see: Starting up for the first time

#### **Precautions for use relative to the wheel**

Always use a suitable charger.  
Always use an appropriate ez-Wheel actuator.  
Do not submerge the wheel.  
Do not open the parts of wheel that are not described in this manual.  
Do not expose to a heat source.  
Do not expose to fire.  
Do not insert pieces of metal into the connector.  
The product must never, in any circumstances, be modified without authorisation from ez-Wheel.  
Do not try to change the technical performance of the wheel.  
The product should not be subjected to use beyond the technical performance specified by ez-Wheel.  
Inappropriate use results in cancellation of the warranty.  
Dismantling the wheel results in cancellation of the warranty.

#### **Safety rules in relation to the batteries**

The user should never, in any circumstances, dismantle the battery packs.  
Batteries should be handled without metal or conducting tools.  
Use only batteries supplied by ez-Wheel or your dealer.  
All information and regulations concerning these batteries can be supplied on request.

#### **Incorrect use**

ez-Wheel cannot be held responsible in any circumstances for any loss caused to the user in the event of unreasonable or inadequate use of the product.



## 8. Opening/Closing the cover

Remove the cable casing as described in the paragraph entitled: "Opening/Closing the cable casing".

### □ Removing the cover

- Disconnect all the cables (charge, actuator and JUMPER)

- Unscrew the 4 M4x30 Torx screws holding the cover on the chassis.

A Torx screwdriver extension is required.

- Remove the cover

This final step gives access to the wiring connectors, the batteries and their connections.

### □ Refitting the cover

Take care not to pinch the wires when refitting the cover to the chassis. This precaution is necessary to facilitate the closing of the cover.

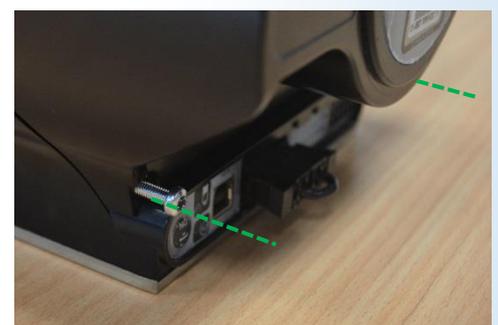
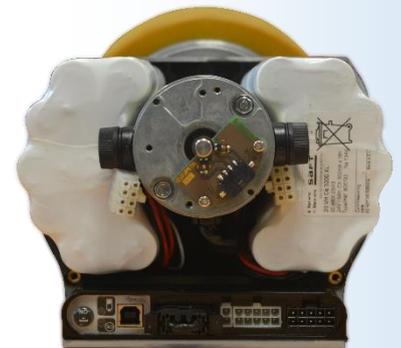
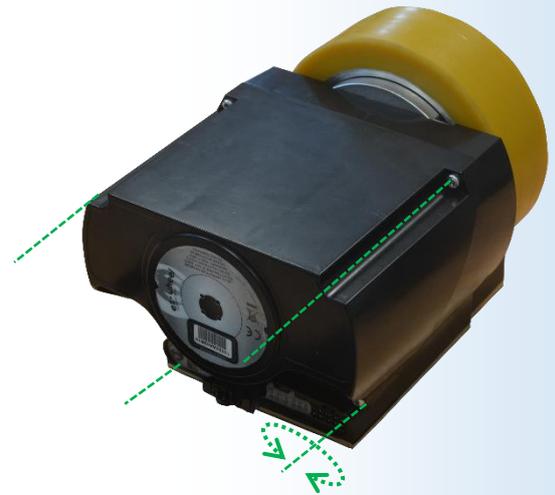
A Torx screwdriver extension is required.

Align the casing to the chassis with the centring spacers.

- Position the two screws in the spacer housings - next to the connection interface

┆ Torx M4x30 screws  
┆ Torx screwdriver and extension

- Screw the 2 Torx screws in until they touch.



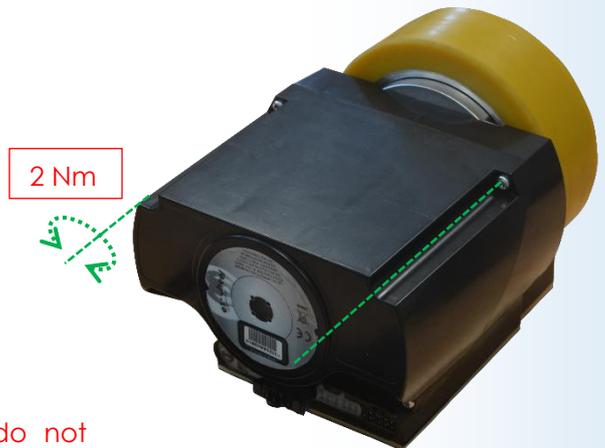
Do not tighten the screws at this stage!

- Tighten the remaining 2 screws fully.

Torx M4x30 screws  
Torx screwdriver and extension

- Tighten the first two screws fully.

△ The tightening torque for the screws is 2 Nm; do not exceed this torque.



## 9. Fitting or replacing batteries

Refer to the paragraph entitled: "Opening/Closing the cover" for the instructions for removing the cover.

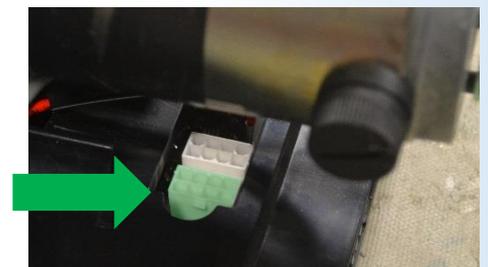
### □ Removing the battery units

- Remove the battery unit(s) from their location.

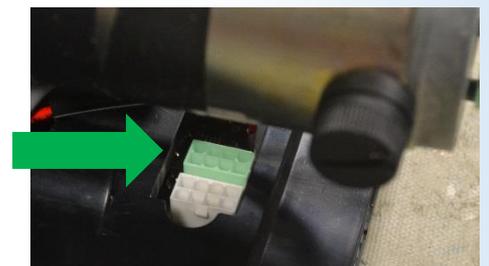


### □ Connecting up battery unit(s)

- Connect the first battery unit to the left Molex® 8-pin female connector.



- Repeat the operation on the right side for the second battery unit.



- Once the battery cables are connected replace the batteries in their initial positions.

Refer to the paragraph entitled: "Opening/Closing the cover" for instructions for refitting the cover.



## 10. Contacting your dealer's Service Department

If a product appears to be faulty, contact the dealer.

Warranty conditions are available with the general sales conditions, or from your dealer.

## 11. Troubleshooting

Only ez-Wheel personnel are authorised to have access to the parts of the wheel not described in this manual. Removing the safety labels on the top plate of the wheel results in cancellation of the warranty.

In case of malfunctioning by your product contact your dealer.

### Display

The light  on the wheel is not green:

- Charge the wheel for several hours and put the system back into operation.
- Check that no safety system is preventing operation (drawbar anti-crushing button, dead man switch, etc.)

At the connections:

- Make sure that the JUMPER is in position and check the status of the emergency stop switch.
- Check the position and the connection of the connectors.

It is possible that the wheel temperature may be too high:

- Wait 10 to 20 minutes; the system will operate normally when the wheel temperature has fallen.

The indicator light  on the wheel is flashing red:

- Put the wheel on charge for several hours.

The light  on the wheel does not flash although the charger is connected:

- Check the connections.
- Check the condition of the connector.
- Check the charger fuse, if there is one.
- Check the condition of the mains plug.

### **Wheel malfunctioning**

The appearance of the wheel seems damaged:

- Check that no part of the wheel is missing.
- Check the cover for damage.

If the product is damaged return it to your dealer (wheel + actuator).

Charging the wheel does not enable it to be used:

- Check that nothing is obstructing the charging connector.  
If necessary clean the connector carefully.

After a long period of storage, if the system does not start, leave it on charge for several hours and follow the procedure for putting the system back into use.

## **12. Product end-of-life**

When the product is at the end of its life, return it to the dealer or the ez-Wheel service Department (Information on the website).

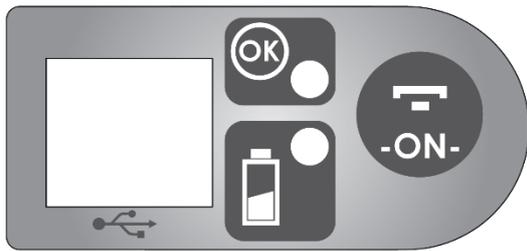
Even though it is at the end of its life, the product must be protected during transport.

Pack the equipment properly in its original packaging, or an equivalent.

If the original packaging no longer exists, place the product in a box in good condition, making sure that the equipment is perfectly wedged and close the box with adhesive tape. If more than one piece of equipment needs to be returned, group them together in a single box or group the boxes together.



### 13. Wheel display



		Green	The wheel is working.
		Flashing green/red	Fault preventing operation or flat battery

		Green	The wheel is charged.
		Orange	The wheel is at half charge (50%).
		Red	The wheel charge is below 30%
		Flashing red	The wheel is completely discharged. It is impossible to use the system. Charging is necessary.
		Flashing orange	The wheel is charging.
		Flashing green	The wheel is charged and connected to the charger.

### Declaration of Incorporation

In our quality as manufacturer, we

ez-Wheel SAS  
Rue Jean Doucet  
16470 Saint Michel  
France

declare that the ezW160 product is an incomplete machine within the meaning of the machinery directive 2006/42/EC.

This product is intended to be incorporated into an application, and cannot in any circumstances be put into operation before this application has been declared compliant to the requirements of directive 2006/42/EC.

Issued in St Michel, on 29/10/2013.

Jérôme Pénigaud, Chairman



### EC Declaration of Conformity

In our quality as manufacturer, we

ez-Wheel SAS  
Rue Jean Doucet  
16470 Saint Michel  
France



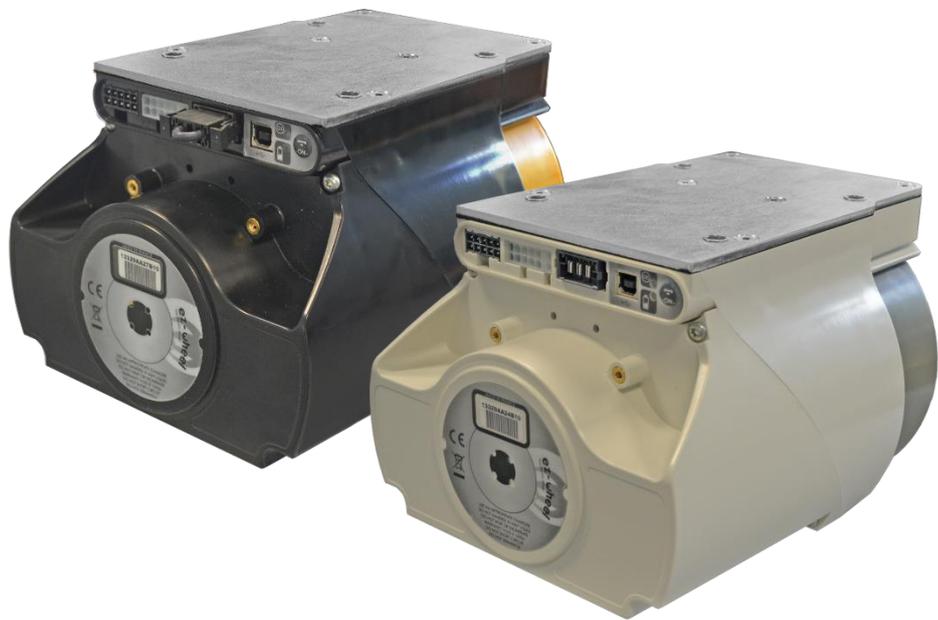
Declare that the ezW160 product complies:

with the regulatory requirements defined by the Electromagnetic Compatibility Directive 2004/108/EC

Issued in St Michel, on 29/10/2013.

Jérôme Pénigaud, Chairman





**- IMPORTANT -**  
**READ BEFORE USING**



The wheel contains a rechargeable battery of which the charge level must be maintained even in the event of non-use. Failure to maintain the battery may reduce its performance or damage it irreversibly.

**Monthly charging is recommended. Never exceed 50 days storage without charging.**

Always charge the wheel before a prolonged shutdown.  
Never leave an unused wheel totally discharged.



**The packing box and foam  
used for ez-Wheel products are recyclable.**

