



Elektronikdesign  
Markus Bender

---

# operating manual



## MBIQ-P

Compatible with Shimano:

- EP801 (DU-EP801) / RS
- EP6 (DU-EP801)

As of 05/2024

|            |   |           |
|------------|---|-----------|
| <b>1</b>   | <b>important safety instructions</b> .....                  | <b>3</b>  |
| 1.1        | Signal words used.....                                      | 3         |
| 1.2        | Characters and symbols used.....                            | 4         |
| <b>2</b>   | <b>Adhere to the requirements for safe use</b> .....        | <b>5</b>  |
| 2.1        | Know the intended use.....                                  | 6         |
| 2.2        | Know and adhere to operational restrictions.....            | 6         |
| 2.2.1      | No longer use in public areas.....                          | 7         |
| 2.2.2      | Use only with protective clothing and a crash helmet.....   | 7         |
| 2.2.3      | Restrict user group.....                                    | 8         |
| 2.2.4      | Prevent misuse and abuse.....                               | 8         |
| 2.2.5      | Observe shortened maintenance and inspection intervals..... | 9         |
| 2.2.6      | Note shortened battery charging cycles.....                 | 9         |
| 2.3        | Know and comply with installation requirements .....        | 10        |
| 2.3.1      | Check and confirm strength and design requirements.....     | 10        |
| 2.3.2      | Check and confirm drive system requirements.....            | 11        |
| 2.4        | Obligation of the owner .....                               | 12        |
| 2.5        | Obligation of each user .....                               | 12        |
| <b>3</b>   | <b>Warranty and liability</b> .....                         | <b>13</b> |
| 3.1        | Personal Injury – Further Disclaimers to Consider .....     | 14        |
| 3.2        | Property Damage – Further Disclaimers to Consider .....     | 14        |
| <b>4</b>   | <b>Functional description</b> .....                         | <b>15</b> |
| <b>5</b>   | <b>Technical data and connection values</b> .....           | <b>16</b> |
| <b>6</b>   | <b>Install</b> .....  | <b>17</b> |
| 6.1        | Know installation example.....                              | 17        |
| 6.2        | Know the tools needed.....                                  | 17        |
| 6.3        | Remove engine protection cover.....                         | 18        |
| 6.4        | Check connection terminal .....                             | 19        |
| 6.5        | Plug in the tuning module .....                             | 19        |
| 6.6        | Complete installation .....                                 | 20        |
| <b>7</b>   | <b>Installation</b> .....                                   | <b>21</b> |
| <b>8th</b> | <b>Operating modes</b> .....                                | <b>22</b> |
| 8.1        | Programming the operating mode .....                        | 22        |
| 8.2        | Programming structure.....                                  | 24        |
| 8.3        | Choice of maximum support speed.....                        | 24        |
| <b>9</b>   | <b>Check before each use</b> .....                          | <b>25</b> |
| <b>10</b>  | <b>Riding the tuned Pedelec mountain bike</b> .....         | <b>26</b> |
| <b>11</b>  | <b>Dispose</b> .....  | <b>27</b> |
| <b>12</b>  | <b>EC/EU declaration of conformity</b> .....                | <b>28</b> |

## 1 important safety instructions

Use the replaceable "Tuning Module" equipment only for the purpose described in these instructions. Otherwise you will endanger yourself or damage parts of your Pedelec mountain bike.

You are putting yourself and others at risk if you install or operate the replaceable equipment incorrectly or if you do not follow the safety or warning instructions. Serious injuries or significant property damage can result.

### 1.1 Signal words used

All safety and warning information in this manual has been clearly highlighted. The following symbols and signal words were used for warnings.

#### **WARNING**

Warns you of dangers that could result in death or serious injury to people if you do not follow these instructions.

#### **CAUTION**

Warns you of dangers that could lead to minor, usually reversible injury to people if you do not follow these instructions.

#### **DANGER**

Warns you about situations that could result in property damage and malfunctions during use if you do not follow these instructions.

#### **IMPORTANT** For your safety

Indicates safety-relevant descriptions and instructions.

## 1.2 Characters and symbols used

Mandatory symbols used in these operating instructions:



refer to the manual



Use safety glasses



wearing safety gloves

Other symbols used in these operating instructions:



### Tip

Reference to useful information when dealing with interchangeable equipment.



### Cross-references

Cross-references in these operating instructions or references to other applicable documents are marked with this symbol or in italics.



### Request to make entries

This symbol is always used when the operator is asked to enter or document the results obtained in the operating instructions.

### ► Call to action

Individual calls for action, for example in safety and warning notices, are marked with this symbol.

- a) **Action step**
- b) **Action step**
- c) ...

Step-by-step instructions for action are listed in lowercase letters according to the order of actions.

### ✓ Intermediate or final result of an action or series of actions

The information makes it easier to see whether the step-by-step procedure has been successfully completed.

### ■ bullet point

indicate lists in descriptive and instructive parts of the operating instructions.

## 2 Adhere to the requirements for safe use

In order to safely use the tuning module in your Pedelec mountain bike, it is essential that you first read and understand these operating instructions completely.

### This operating manual

- informs you about the intended use,
- the installation and use requirements,
- important usage restrictions,
- Obligations of the owner and the user,
- Warranty and liability conditions and
- guides you step by step for correct installation and safe use
- warns you of potentially unsafe or dangerous situations and uses with conspicuous safety and warning notices.

### IMPORTANT

#### Know and observe all contents of the operating instructions

- ▶ Be sure to take the time and read these operating instructions carefully before you start installing the tuning module.
- ▶ Keep these operating instructions safe and yet within easy reach so that you have access to the important and safety-relevant information for use at all times, even after installation.
- ▶ Make these operating instructions available to any other person who is allowed to ride your tuned Pedelec mountain bike to read.
- ▶ Make sure that every person who is allowed to move your tuned Pedelec mountain bike has read and understood these operating instructions before any use.
- ▶ Instruct the user in the safe use of the tuned Pedelec mountain bike using these operating instructions before giving your tuned Pedelec mountain bike to other people.
- ▶ Be sure to pass on these operating instructions to the future owner if you ever want to sell the tuning module or your tuned Pedelec mountain bike.

## 2.1 Know the intended use

The tuning module shifts the switch-off threshold of the motor support of your Pedelec mountain bike.

By installing the tuning module, higher speeds can be achieved with electric motor support.

However, proper use also includes compliance with all of the following without exception

- Usage restrictions and
- Installation requirements as well as the
- Obligations of the owner and the user.

### Intended use of “interchangeable equipment”

According to the European Union product regulations, the tuning module is placed on the market as “interchangeable equipment” within the meaning of Directive 2006/42/EC for machinery, Article 2 b).

### Know meaning

The tuned Pedelec mountain bike remains even after the T has been installed tuning modules within the scope of the European Machinery Directive. If the intended use is strictly adhered to, a “non-significant change” to the “machine” can be assumed.

This means that the applicable safety requirements of the “machine” Pedelec mountain bike were checked by the manufacturer of the tuning module as part of a risk assessment and were assessed as continuing to be met even with the use of the tuning module.

### Safety and protection devices

The safety and protective devices of the Pedelec mountain bike remain untouched by installing the tuning module.

## 2.2 Know and adhere to operational restrictions

### IMPORTANT

#### Strictly adhere to usage restrictions

There are usage restrictions associated with installing the tuning module in your Pedelec mountain bike.

The “machine” bicycle with electric motor support is being changed. Although there is no increase in performance, the achievable speed of more than 25 km/h means that

- use on public roads or on public paths is no longer permitted,
- If you use it without appropriate protective clothing and a crash helmet, accident insurance companies can release you from your obligation to pay benefits after a fall that results in injuries,
- The permitted group of users must be further restricted by the owner of the vehicle, taking into account physical and mental suitability, before the Pedelec mountain bike is passed on to other people,
- The owner of the tuned Pedelec must always prevent misuse and misuse, including by other people
- Necessary maintenance and inspection intervals according to the original manufacturer's instructions and usual battery charging cycles or those specified by the manufacturer can be significantly shortened.
- Due to the operating principle, the displayed speed when driving > 25 km/h does not correspond to the actual speed. For this reason, the total mileage display on your system will not correspond to the actual distance traveled when driving beyond this. Diagnoses/calculated values based on this will follow in the same way!

## 2.2.1 No longer use in public areas

Pedelecs for use on public roads or on public paths with a permissible speed of > 25 km/h are subject to Regulation 168/2013/EU, the Vehicle Regulation, in Europe.

Additional approval requirements in non-European countries may apply.

Purchasing the tuning module does not entail any approval for operation in public areas. Therefore, participation in public traffic and driving on public roads is prohibited after installing the tuning module.

This also applies despite the "insignificant change" to the Pedelec mountain bike "machine" recognized by the tuning module manufacturer when used as intended.

### **IMPORTANT**

#### **Prevent misuse and misuse**

Due to the higher speeds with electric motor support, you lose permission to use the tuned Pedelec on public roads or on public paths without further legal approval.

## 2.2.2 Use only with protective clothing and a crash helmet

After installing the tuning module, a Pedelec mountain bike can reach speeds of up to 45 km/h supported by an electric motor.

### **! WARNING**

#### **Reduce increased risk of accidents**

Reaching such speeds increases the risk of a fall, even with appropriate strength and design of the vehicle.

Using the tuned Pedelec mountain bike without appropriate protective clothing and a crash helmet can release accident insurance companies from your obligation to pay benefits after a fall that results in injuries.

- ▶ Always wear suitable protective clothing and a crash helmet when using your tuned Pedelec mountain bike to protect yourself from the increased risk of accidents.
- ▶ Insist that every user of your tuned Pedelec mountain bike always wears appropriate protective clothing and a crash helmet while using it.

### 2.2.3 Restrict user group

After installing the tuning module, a Pedelec mountain bike can reach speeds of up to 45 km/h supported by an electric motor. Reaching such speeds can result in the permissible user group determined by the Pedelec manufacturer having to be further restricted. Such a restriction must be determined by the owner of the tuned Pedelec on his own responsibility, taking into account the physical and mental suitability of the people to whom the tuned Pedelec is provided for use.

#### **IMPORTANT**

#### **Also take into account the terrain to be driven on**

Consideration of the terrain to be driven on should also be an important factor when determining permitted users.

- ▶ Be sure to clearly state permission for use before giving it to anyone else.
- ▶ Always lock your tuned Pedelec mountain bike when you park it.

This will prevent misuse and misuse by other people.

### 2.2.4 Prevent misuse and misuse

#### **IMPORTANT**

#### **Use on public roads means misuse**

Due to the higher speeds with electric motor support, you lose permission to use the tuned Pedelec on public roads or on public paths without further legal approval.

- ▶ Only use your tuned Pedelec mountain bike on private, secured land or race tracks.
- ▶ Never drive on public paths or areas that you have not previously secured to prevent other people from entering.
- ▶ Also prevent another person from using your tuned Pedelec mountain bike on public roads or paths.
- ▶ Always lock your tuned Pedelec mountain bike when you park it.

This will prevent misuse and misuse, including by other people.

## 2.2.5 Observe shortened maintenance and inspection intervals

Due to the higher speeds with electric motor support, higher loads and forces will affect all vehicle parts.

Reaching higher speeds increases wear on all vehicle parts, especially the braking system and all parts of the drive system, even if the vehicle is of suitable strength and design.

### IMPORTANT

#### Determine and carry out shortened inspection and maintenance cycles

Shortened inspection and maintenance cycles must be determined by the owner of the tuned Pedelec on his own responsibility, taking into account the operating conditions.

- ▶ Before using your tuned Pedelec mountain bike, carry out a comprehensive inspection of the vehicle.
- ▶ Be sure to check the condition and function
  - the brakes and their functional components,
  - the vehicle frame,
  - the steering and its functional components,
  - the drive and its functional components as well
  - of the saddle and its functional components.
- ▶ Please also note all inspections not mentioned here that are required by the manufacturer of your Pedelec mountain bike before each use. This list does not replace the original operating instructions from the Pedelec manufacturer.
- ▶ Determine further inspection and maintenance cycles according to the manufacturer's instructions for your Pedelec mountain bike.
- ▶ Shorten this according to your operating conditions.
- ▶ If necessary, coordinate this with your specialist company, which will carry out the inspection and maintenance work.

This ensures that the shortened inspection and maintenance intervals are adhered to.

## 2.2.6 Note shortened battery charging cycles

The "machine" bicycle with electric motor support is being changed. Although there is no increase in performance, the achievable speed of more than 25 km/h means that the maximum possible performance is drawn from the battery regularly and over longer periods of time.

This leads to an earlier discharge of the available battery capacity than you previously knew from your Pedelec or as stated by the manufacturer of the Pedelec mountain bike in the operating instructions.

- ▶ Take this into account when planning your trips.

## 2.3 Know and comply with installation requirements

### Meet requirements for strength and design as well as for the drive system

In order to safely use the tuning module in your Pedelec mountain bike, your vehicle must also meet a few requirements.

#### City or trekking bikes cannot usually be equipped

City or trekking bikes often do not meet the requirements for strength and design or the requirements cannot be checked due to a lack of manufacturer information.

#### IMPORTANT

#### Prevent misuse and misuse

Furthermore, with tuned city or trekking bikes it cannot be assumed that they will actually only be used on private, secured properties or race tracks.

Abuse and misuse contrary to point 2.7 The intended use and restrictions mentioned above would be to be feared.

For these reasons, the installation of the tuning module is only permitted for Pedelec mountain bikes that demonstrably meet the following requirements according to their manufacturer's instructions.

### 2.3.1 Check and confirm strength and design requirements

Strength and design requirements are regulated by EN 15194 and EN ISO 4210-2 and must be confirmed as applied by the manufacturer of your Pedelec mountain bike.

#### WARNING

#### Prevent increased risks of accidents due to insufficient strength

Due to the higher speeds with electric motor support, higher loads and forces will affect all vehicle parts.

Increased risks of accidents due to parts breaking and failing parts of the entire vehicle can only be largely ruled out for vehicles that have been demonstrably designed and built in accordance with both product standards.

- ▶ Check the EC declaration of conformity from the manufacturer of your Pedelec mountain bike.
- ▶ Only insert the tuning module into your Pedelec mountain bike if the manufacturer of your Pedelec mountain bike states that the two product standards EN 15194 and EN ISO 4210-2 are applied.

This ensures that the necessary strength and design requirements are met.



#### Normative requirements met?

- ▶ Before installation, confirm the references in the EC declaration of conformity of the manufacturer of your Pedelec mountain bike:
  - The EC declaration of conformity verifiably applies to the vehicle to be equipped?
  - EN 15194 ..... mentioned in the declaration of conformity?
  - EN ISO 4210-2 ..... mentioned in the declaration of conformity?
- ✓ Only if both standards are mentioned as applied can it be assumed that the requirements for strength and design have been met.
  - ▶ Never use the tuning module in vehicles for which you cannot clearly determine these requirements and prove them using the Pedelec manufacturer's EC declaration of conformity.

### 2.3.2 Check and confirm drive system requirements

#### **DANGER** Prevent damage and malfunctions

The tuning module is tailored to specific drive systems. Use in vehicles with unsuitable drive systems will lead to malfunctions or damage to the Pedelec or the tuning module.

- ▶ Check the equipment on your Pedelec mountain bike.
- ▶ Only insert the tuning module into your Pedelec mountain bike if you can determine that your Pedelec equipment matches the drive systems listed below.

| Drive system:        | Remark:              |
|----------------------|----------------------|
| Shimano - EP801 / RS | Sales name: DU-EP801 |
| Shimano - EP6        | Sales name: DU-EP600 |



#### Requirements for the drive system and display met?

- ▶ Before installing, confirm the equipment of your Pedelec mountain bike.

The Pedelec mountain bike to be equipped is equipped with one

- equipped with the above-mentioned drive systems as well
- Equipped with the above-mentioned display type that matches the drive system?

✓ Only if you can confirm both requirements can it be assumed that the operation is functioning and safe.

- ▶ Never use the tuning module in vehicles for which you cannot clearly determine and prove both requirements.

This operating manual describes three products for use with the drive system described. The MBIQ-P module can be used regardless of the speed sensor used in the system. When it comes to sensor solutions, it is important to check in advance which type is installed.

- ▶ Use the illustrations to check which type of sensor you are using.

| Tuning: | Variant: | Picture: | Description:  |
|---------|----------|----------|---|
| MBIQ-P  | -        | -        | Module to integrate into the current path of the existing speed sensor. |

## **2.4 Obligation of the owner**

Every user must be instructed by the owner of the tuned Pedelec mountain bike using these operating instructions and informed about the special restrictions on use and increased risks due to the increased speed.

### **The owner of the tuned Pedelec mountain bike ensures that**

- all requirements for safe use
- as well as for the intended use and
- This operating manual is always available to every user.

### **The owner of the tuned Pedelec mountain bike undertakes to**

to only make the tuned Pedelec mountain bike available to people who

- have read and understood these operating instructions and
- were instructed in the safe and intended use of the tuned Pedelec mountain bike.

## **2.5 Obligation of each user**

### **Every user is obliged to**

- to read and follow these operating instructions completely
- to follow all safety and warning instructions without exception,
- to use the tuned Pedelec mountain bike only if it is in technically perfect condition and as intended, with an awareness of safety and dangers and in compliance with these operating instructions and
- If any damage or malfunctions are detected that could impair safety, they must be immediately remedied and, if necessary, repaired.

## 3 Warranty and liability

### Warranty and liability of the manufacturer of the tuning module

Warranty and liability claims are excluded by the manufacturer of the tuning module in the event of direct or indirect personal injury or property damage if they can be traced back to one or more of the following causes:

- Increased wear or breakage on components of the Pedelec mountain bike, especially on parts of the brake system and/or the drive,
- Failure to follow these operating instructions or
- Improper use of the tuning module or the Pedelec mountain bike with integrated tuning module or
- Failure to comply with the application restrictions in these operating instructions or
- Use or operation with operating conditions that do not comply with these operating instructions or
- improper installation, commissioning, maintenance or repairs that are not specified in these operating instructions or
- after unauthorized structural, hardware or software changes to the tuning module itself or to the Pedelec approved for the tuning module or its equipment.

#### IMPORTANT

**The installation and operation of the tuning module is at your own risk**

The manufacturer of the tuning module assumes no liability for damages associated with the operation or installation of the tuning module.

#### The technical and legal consequences mentioned may be incomplete

In addition to the technical and legal consequences stated in these operating instructions, further requirements may apply depending on the operating location.

- ▶ Before installing the device, find out about possible further technical and legal consequences and requirements that you must comply with when operating the tuned Pedelec mountain bike.

### Guarantee, warranty and liability by the manufacturer Pedelec mountain bikes

Due to the higher speeds with electric motor support, higher loads and forces will affect all vehicle parts.

Reaching higher speeds increases wear on all vehicle parts, especially the braking system and all parts of the drive system, even if the vehicle is of suitable strength and design.

For this reason, liability, warranty and guarantee claims against the dealer or manufacturer of the Pedelec mountain bike will expire or be severely limited when the tuning module is used.

### 3.1 Manipulation detection by the manufacturer

The manufacturer uses certain procedures to detect components on the speed sensor that are susceptible to manipulation, which can lead to so-called manipulation detections with error output.

When delivered, the MBIQ-P module is in DAMP mode with a set factor of 1.35. Adjusting the value/mode is the responsibility of the owner and may (or may not) lead to tampering detection. This is signaled by the ERROR code: E295. If this appears, the value/mode must be immediately adjusted back to the initial value.

**Attention: if error E295 is ignored several times, the entire drive unit will be blocked and error E299 will be output. This can only be reversed by the dealer!**

The manufacturer of the tuning module also assumes no liability for damages associated with the operation or installation of the tuning module.

## 3.2 Personal Injury – Further Disclaimers to Consider

After installing the tuning module, a Pedelec mountain bike can reach speeds of up to 45 km/h supported by an electric motor.

### **WARNING** Reduce increased risks of danger

Reaching such speeds increases the risk of a fall and resulting personal injury, even with appropriate strength and design of the vehicle.

Using a tuned Pedelec mountain bike without appropriate protective clothing and a crash helmet can release accident insurance companies from your obligation to pay benefits or significantly reduce them after a fall that results in injuries.

- ▶ Always wear suitable protective clothing and a crash helmet when using your tuned Pedelec mountain bike to protect yourself from the increased risk of accidents.
- ▶ Insist that every user of your tuned Pedelec mountain bike always wears suitable protective clothing and a crash helmet throughout the entire period of use.

### Monetarily reduce the risk of accidents

- ▶ Determine exactly your operating conditions and user groups to be insured.
- ▶ Take out insurance for the use of your tuned Pedelec mountain bike that corresponds to the operating conditions and user group.

How to prevent monetary risks from injuries due to falls.

## 3.3 Property Damage – Further Disclaimers to Consider

After installing the tuning module, a Pedelec mountain bike can reach speeds of up to 45 km/h supported by an electric motor.

Damage caused in connection with the operation of the tuned Pedelec may no longer be covered by private liability insurance. It is therefore advisable to take out insurance that is specifically designed for this purpose.

### **DANGER** Reduce increased liability risks

Reaching such speeds increases the risk of causing property damage.

### Monetarily reduce the risk of property damage

- ▶ Determine exactly your operating conditions and user groups to be insured.
- ▶ Take out liability insurance for the use of your tuned Pedelec mountain bike that corresponds to the operating conditions and user group.

In this way, you prevent monetary risks if other people's property is damaged while using the tuned Pedelec mountain bike.

## 4 Functional description

Once installed in Pedelec mountain bikes with a Shimano drive system, the tuning module offers the following operating modes:

A basic distinction is made between two operating modes, which are referred to below as "multiplier" and "freeze" mode.

**DAMP mode:** The speed output corresponds approximately to the speed actually driven, dampened by a set, parameterizable factor. Factory setting 1.35.

An example would be: output value = 25 km/h, actual final speed 33.75 km/h. ( $25 * 1.35 = 33.75$ )

**FREEZE mode:** The speed output corresponds approximately to the speed actually driven up to a value of <25 km/h. This value can vary depending on the system and is, for example, around 22 km/h. From higher speeds, the value always remains around this range, but always <25 km/h.

An example would be: output value = 22 km/h, actual speed 40 km/h.

### Adjustable modes are:

- Tuning permanently activated / DAMP -> delivery status (multiplier 1.35)
- Tuning according to switch-on condition / DAMP
- Tuning permanently disabled / FREEZE
- Tuning according to switch-on condition / FREEZE

As well as additional adjustable functions:

- Limiting speed "v-max" (in FREEZE mode) or multiplier (in DAMP mode) adjustable.

*(For more details see chapter 8)*



### Setting options

All settings are made via the display in combination with wheel movements on the e-bike. (see Chapter 8)  
No smartphone or notebook is required.

### Safety and protection devices

The safety and protective devices of the Pedelec mountain bike remain untouched by installing the tuning module.

### **DANGER**

**For the motors described in this manual, the Freeze operating mode is not recommended due to detection of manipulation of the motor firmware. Adjusting the multiplier is also the responsibility of the owner. Values that are too high can lead to malfunctions.**

**All speed-based assistance systems also receive the manipulated signals for processing (e.g. electronic circuit DI2). They must be adjusted accordingly. Proper functionality cannot be guaranteed across the board.**

## 5 Technical data and connection values

| measurements and weight |   |
|-------------------------|---|
| Housing dimensions:     | <ul style="list-style-type: none"> <li>• 16x14x7mm</li> </ul>     |
| Cable length:           | <ul style="list-style-type: none"> <li>• approx. 80 mm</li> </ul> |
| Weight:                 | <ul style="list-style-type: none"> <li>• approx. 5g</li> </ul>    |

| Electrical data                  |   |
|----------------------------------|---|
| Supply voltage:                  | From the ACC port of the engine, fused in the device.<br>Voltage range. 7-15V DC<br>Or "Light" mode permanently activated, without afterglow                                |
| Protection class of the housing: | IPX4 according to EN 60529  |
| Display indication               | <u>FREEZE mode:</u><br>Manipulated values from approx. 22 km/h<br>(Display remains < 25km/h up to v-max)<br><br><u>DAMP mode:</u><br>Values damped, final speed factor x.xx |

## 6 Install

### IMPORTANT

#### Before you start installation

- ▶ Confirm that you have carefully and completely read and understood all previous chapters of this operating manual before you begin installation.

This is the only way to ensure that you use the replaceable "tuning module" equipment exclusively for the purpose described in these instructions and as intended.



#### Have you read and understood all previous chapters and their sub-points?

- *1 important safety instructions*
- *2 Adhere to the requirements for safe use*
- *2.1 Know the intended use*
- *2.2 Know and adhere to operational restrictions*
- *2.3 Know and comply with installation requirements*
- *3 Warranty and liability*
- *4 Functional description*
- *5 Technical data and connection values*

- ▶ Only begin installation once you have read and understood all chapters and sub-points.

### 6.1 Know installation example

In these operating instructions, installation can only be shown using an example vehicle and its equipment.

The installation described below and all associated instructions refer to the installation example:

#### Shimano DU-EP801 RS

### 6.2 Know the tools needed

- Phillips screwdriver PZI
- Hexagon socket T10
- TL-EW300



#### Additional tools may be necessary

Depending on the vehicle model, the engine cover can also be included

- Torx or
- another Allen key.

Many covers also require the crank to be dismantled.

- In such a case, a suitable crank puller is required.

Furthermore, in models from some manufacturers, the motor can be partially integrated into the frame. There it is necessary to loosen it completely in order to access the connections (e.g. with ORBEA, ...). The manufacturer's information such as tightening torque, etc. must be observed here!

### 6.3 Remove engine protection cover

#### **WARNING** Prevent unexpected startup

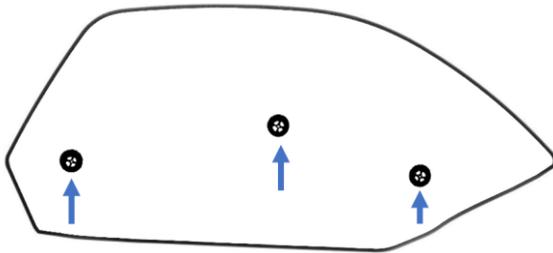
If the drive starts up unexpectedly, hands and fingers can be sheared, crushed or pulled in.

- ▶ Switch off the Pedelec mountain bike and remove the battery.

This prevents any movement supported by an electric motor.

#### Parts may have sharp edges and protective particles may spray out

- ▶ Wear protective gloves and safety glasses when removing the engine guard.



*Illustration: Engine cover screw position*

#### Remove engine protection cover

- Ensure that your Pedelec mountain bike stands firmly and securely.
  - Remove the battery.
  - Loosen the cross screws (see illustration) on the engine cover.
  - Remove the engine cover.
- ✓ The cabling is visible under the cover.

### 6.4

## 6.5 Check connection terminal

The picture shows the assignment of the connection terminal under the cover. The installation of the module is shown schematically and is explained below.

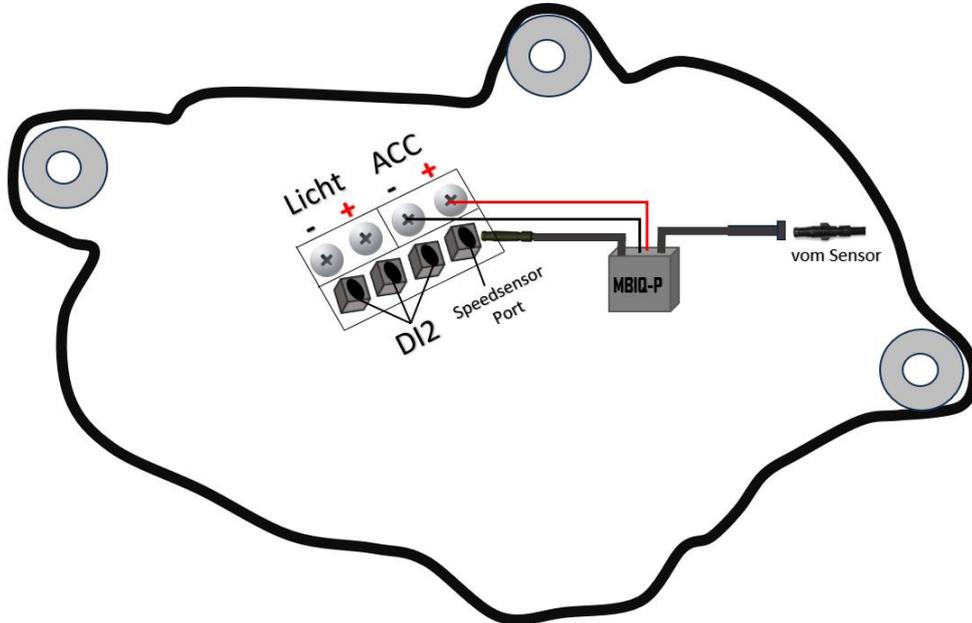


Illustration2: Connector position of the speed sensor in the connection terminal

## 6.6 Plug in the tuning module

- Using the TL-EW300 (or alternative), remove the speed sensor plug from the socket shown.
- Now plug the end of the speed sensor (with wing) into the socket of the MBIQ-P.
- The plug connection of the MBIQ-P does not have a wing, but goes into the previously used socket in the engine compartment.
- Finally, the power supply must be connected to the ACC port according to the connection diagram shown.



Illustration3: Connector fully inserted

### Check plug

- Press the plug into the socket until the wings stop and then turn it as shown so that it is secured and cannot come out.



### Properly stuck

A little pressure is required, the connectors usually click into place!

## 6.7 Complete installation

### Place the tuning module and lay the cables

- Find a suitable place to store the module.
- Place the tuning module in a suitable location.
- Lay the cables so that the motor protection cover can be reinstalled without hindrance.



#### No uniform installation location can be defined

Due to the large number of different drive systems and covers, it is not possible to define a uniform installation location.

It is often possible to place the module directly in the connection area of the motor.

It is also possible to accommodate it in the frame tube, although this usually requires removing the motor from the frame.

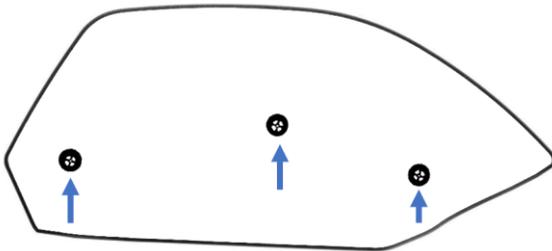


Illustration4: Engine protection cover reinstalled

### Reinstall the engine protection cover

- Reinstall the engine protection cover.
- Make sure that no cables rub against them or are even crushed.
- Screw the engine protection cover back on.

## 7 Installation

### IMPORTANT

#### Initial commissioning

Before using it for the first time, it is recommended to check that the module is functioning correctly.

- ▶ Make sure you have a secure footing
- ▶ Put the battery back into the system and start it up.
- ▶ If the rear wheel is now set in motion (without pedaling!), a speed indicator should appear on the display.



#### **If the display remains at 0.0:**

If the display remains at 0.0, the module wiring is faulty. Please check the last steps and the correct seating of the connectors. If necessary, check the voltage at the ACC port for the correct value.

**The module can only work properly if there is a speed display. Do not start a journey or attempt to program beforehand.**

**Otherwise your system will diagnose an error.**

## 8 Operating modes

You have the option to choose between four operating modes:

### 1. Permanent tuning activated

In this operating mode, the speed limit is permanently lifted. The actual speed driven no longer corresponds to the displayed speed from around 25 km/h. Manipulated values  $\leq 25$  km/h are generated for the engine firmware.

### 2. Permanent tuning disabled

No lifting of the speed limit. The actual speed traveled corresponds to the displayed speed. Support up to 25 km/h.

### 3. Tuning according to switch-on condition

To activate the tuning, the magnet must be in front of the sensor for at least 4 seconds during startup. Otherwise the tuning is deactivated. (the time approximately corresponds to the time until the display is ready to start.)

**When delivered, the device is in the mode: "Tuning permanently active"  
with the highest support speed limit.**



**Have chapters 7 successfully completed?**

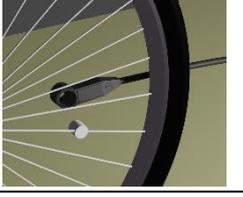
- *Speed display available when rotating.*
- ▶ Only then can the operating mode be reprogrammed if necessary.

### 8.1 Programming the operating mode

To enter programming mode, you must carry out the following procedure:

Before starting, turn off the bike and wait a moment...

|  |   |
|--|---|
| <p>Make sure the spoke magnet is at the level of the sensor before turning on the system.</p>  |  |
| <p>Then turn on the system.<br/><b>Important:</b> What counts for the rest of the process is the start of the system (e.g. LED turns on), not the complete booting of the display!</p> |  |
| <p>Leave the magnet positioned in front of the sensor for approx. 4-5 seconds.</p>   |  |

|   |   |
|---|---|
| <p>Remove the magnet from the sensor for &lt; 1 second</p>  |  |
| <p>Place the magnet in front of the sensor again. With the waiting time that follows, you determine which settings menu you will then reach.</p> <p>For more information see: Chapter 8.2</p>   |  |
| <p>If the magnet is now removed, the tuning sensor switches to programming mode.</p>  |  |
| <p>If the process has been carried out correctly, the display will now show the speed corresponding to the selection on the respective display of your bike<br/>(See overview 8.2).</p> <p>To navigate through the different parameters, it is enough to simply turn the wheel. Each revolution (moving the magnet past the sensor) jumps one point/step further.</p> <p><b>Make sure that the magnet is not in front of the sensor after the rotation!</b></p> |   |

If you do not want to save any changes, simply switch off your system; the last selected setting will then be retained.

If you would like to save a change, place the magnet in front of the sensor for at least 4 seconds.  
After saving, the display shows 0 km/h and remains in this state.

**Then restart the system; do not drive beforehand!**



#### Values displayed

What matters when setting the operating mode is not the exact value (this varies depending on the wheel circumference), but the order!

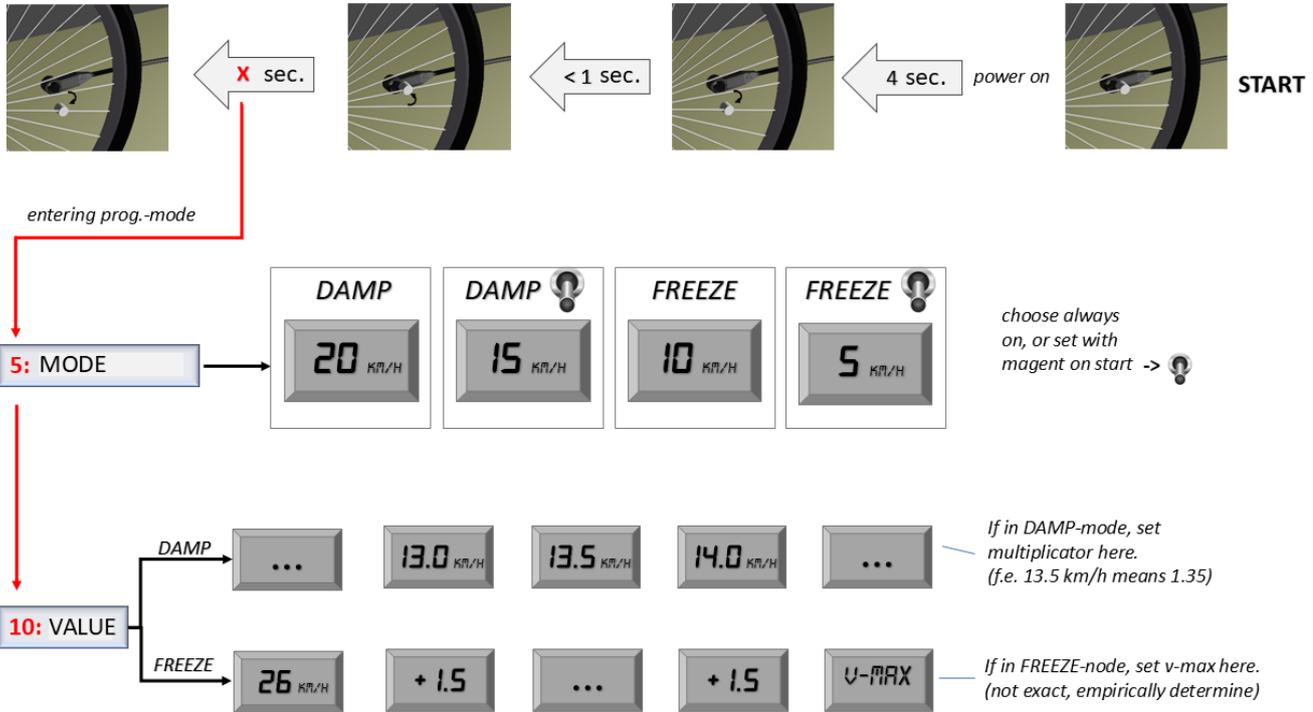


#### Systems with immobilizer

- ▶ If your system has an immobilizer using a transponder, this must be deactivated for the duration of programming.

## 8.2 Programming structure

The programming structure through which the parameters can be set is shown below:



### Choice of maximum support speed

The setting of the limit value up to which speed should be supported is carried out using the same procedure as for setting the operating mode. The values displayed correspond to the limit speed.

The tuning will run the assist up to approximately this displayed speed and increment the displayed speed.



#### If the limitation is not removed despite speed mode being activated:

In this case, the "switchable" mode may have been set in the setup. The module is only active if you hold the magnet for at least 4 seconds before starting, in front of the sensor

- ▶ In such a case, repeat the setup according to the instructions in chapter 8./these operating instructions.

## 9 Check before each use

Due to the higher speeds with electric motor support, higher loads and forces will affect all vehicle parts.

Reaching higher speeds increases wear on all vehicle parts, especially the braking system and all parts of the drive system, even if the vehicle is of suitable strength and design.

### IMPORTANT

#### Before each use

- ▶ Before using your tuned Pedelec mountain bike, carry out a comprehensive inspection of the vehicle.
- ▶ Be sure to check the condition and function
  - the brakes and their functional components,
  - the vehicle frame,
  - the steering and its functional components,
  - the drive and its functional components as well
  - of the saddle and its functional components.
- ▶ Please also note all inspections not mentioned here that are required by the manufacturer of your Pedelec mountain bike before each use. This list does not replace the original operating instructions from the Pedelec manufacturer.
- ▶ Only use your tuned Pedelec mountain bike if you can determine and confirm that it is in perfect condition.

## 10 Riding the tuned Pedelec mountain bike

In order to safely use the tuning module in your Pedelec mountain bike, it is essential that you first read and understand these operating instructions completely.

### This operating manual

- informs you about the intended use,
- important usage restrictions,
- Obligations of the owner and the user,
- Warranty and liability conditions and
- warns you of potentially unsafe or dangerous situations and uses with conspicuous safety and warning notices.

### IMPORTANT

#### Know and observe all contents of the operating instructions

- ▶ Be sure to take the time and read these operating instructions carefully before setting off with your tuned Pedelec mountain bike.
- ▶ Make these operating instructions available to any other person who is allowed to ride your tuned Pedelec mountain bike to read.
- ▶ Make sure that every person who is allowed to move your tuned Pedelec mountain bike has read and understood these operating instructions before any use.
- ▶ Instruct the user in the safe use of the tuned Pedelec mountain bike using these operating instructions before giving your tuned Pedelec mountain bike to other people.



#### It is imperative that you adhere to the intended use and usage restrictions

- ▶ It is imperative that you adhere to the intended use and the usage restrictions.
- ▶ Pay particular attention to the points
  - 2.1 Know the intended use as well as
  - 2.2 Know and adhere to operational restrictions and its sub-points of these operating instructions.

## II Dispose



### Know rules and regulations for disposal

- ▶ In any case, comply with regional and internal waste disposal regulations.
- ▶ If in doubt, ask your local waste disposal officer where you can properly dispose of electronic waste.



### Disposal instructions

- ▶ Never throw electronic components into household waste.
- ▶ Only dispose of electronic waste in designated collection containers provided by a waste disposal company or your municipality.

The device must not be disposed of with household waste. This device is marked in accordance with the European Directive 2002/96/EC on waste electrical and electronic equipment. The directive provides the framework for the EU-wide take-back and recycling of old devices. To return your old device, please use the return and collection systems available to you.

You can also return the tuning kit to your specialist dealer after use.

## 12 EC/EU declaration of conformity

in the sense of the

**EC Directive for Machinery 2006/42/EC, Annex II 1 A** for interchangeable equipment in accordance with Articles 1 b) and 2 b) as well

EU official L 157/24 from June 9, 2006

**EMC RL 2014/30/EU,**

EU official L 96/79 of February 26, 2014

**RoHS RL 2011/65/EU,**

EU official L 174/88 from July 1, 2011

As a manufacturer and under our sole responsibility, we hereby declare that the interchangeable equipment mentioned below, in its design and construction as well as in the version we have placed on the market, complies with the relevant provisions and harmonization legislation of the above-mentioned directives.

**Product name**

**Tuning module, Shimano EP801/600 compatible**

**item number**

0756892107067

**Date of Manufacture**

from 05/2024

**Interchangeable equipment exclusively for**

**Pedelec mountain bikes**

**with the standards specified in the Pedelec manufacturer's declaration of conformity**

**EN 15194EN ISO 4210-2(mountain bikes)**

**Manufacturer and address**



Elektronikdesign  
Markus Bender

Dipl.-Ing. (FH)

FS Eng. TÜV Rheinland

Markus Bender

Langgasse 20

D-35435 Wettenberg

**Documentation representative**

Markus Bender

**Applied harmonized standards, in particular:**

EN ISO 12100:2010

Risk assessment and risk reduction

EN 15194:2017

Bicycles - electric motor assisted bikes - EPAC

EN ISO 4210-2:2015

Bicycles - Safety requirements for bicycles Part 2: Requirements for city and trekking bicycles, youth bicycles, off-road bicycles (mountain bikes) and racing bikes

**Further applied regulations:**

UNECE Regulations No. 78

Brake requirements

**Place and date of issue:**

Wettenberg May 8, 2024



*Legally binding signature, Markus Bender*

