



## Optimization possibilities for Shimano STePS systems with the *eMax* products

### Legal notice

Using this software, the legally regulated speed limit for the motor support of a bicycle with Shimano STePS drive unit could be increased.

Using this software could invalidate the official approval and homologation for road service and warranty of the bicycle.

A bike modified with this software may only be used on closed or private terrain if some settings have been changed.

No liability is accepted for any damage to objects and / or people that may occur now or in the future through the use of the ***eMax*** - software.

The user of this software acts knowingly and responsibly!

# Inhaltsverzeichnis

---

1. History of document .....	3
2. Supported Shimano STePS drive units .....	4
3. Connection possibilities with the bicycle .....	5
3.1 <i>Wireless connection via Bluetooth and smartphone</i> .....	5
3.2 <i>Wired connection via PCE interface</i> .....	5
4. Optimizing possibilities on DU-EP800 .....	6
4.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	6
4.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	7
5. Optimizing possibilities on DU-E8000 starting with motor firmware 4.5.1 .....	8
5.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	8
5.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	9
6. Optimizing possibilities on DU-E8000 with motor firmware 4.2.7 – 4.3.2 .....	10
6.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	10
6.2 <i>Using the Windows based eMax - program (version 3.9R)</i> .....	11
7. Optimizing possibilities on DU-E7000 .....	12
7.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	12
7.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	13
8. Optimizing possibilities on DU-E61X0 (DU-E6100, DU-E6110, DU-E6180) .....	14
8.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	14
8.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	15
9. Optimizing possibilities on DU-E60X2 (DU-E6002, DU-E6012) .....	16
9.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	16
9.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	17
10. Optimizing possibilities on DU-E60XX (DU-E6001, DU-E6010, DU-E6050) .....	18
10.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	18
10.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	19
11. Optimizing possibilities on DU-E50X0 (DU-E5000, DU-E5080, DU-E5080-H) .....	20
11.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	20
11.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	21
12. Optimizing possibilities on DU-EP801 (EP801) & DU-EP600 (EP6) .....	22
12.1 <i>Using the Bluetooth based eMaxMobileApp (version 1.73)</i> .....	22
12.2 <i>Using the Windows based miniMax - program (version 2.50)</i> .....	23
13. Additional hints to the optimizing possibilities .....	24
13.1 <i>Hints to the USA - modification</i> .....	24
13.2 <i>Hints to the wheel circumference modification</i> .....	24
13.3 <i>Hints on using the E-Tube software from Shimano</i> .....	25
13.4 <i>Updating motor firmware respectively downgrading motor firmware</i> .....	25

## 1. History of document

Version	Date	Author	Comment
1.0	23.04.2021	M. Schlegel	initial version of English document
1.1	24.04.2021	M. Schlegel	DU-E50X0, DU-E60X2, DU-E60XX added
1.2	25.04.2021	M. Schlegel	minor changes to EP8 settings
1.3	28.04.2021	M. Schlegel	corrections to DU-E8000 settings
1.4	10.05.2021	M. Schlegel	minor additional comments
1.5	11.05.2021	M. Schlegel	correction of link
1.6	24.05.2021	M. Schlegel	correction of link to SC-EM800
1.7	03.06.2021	M. Schlegel	add on for new EP8 firmware 4.1.5, <i>eMaxMobileApp</i> 1.44 & <i>miniMax</i> 2.16
1.8	01.07.2021	M. Schlegel	corrections related to <i>miniMax</i>
1.9	07.09.2021	M. Schlegel	add on for new EP8 firmware 4.1.6, DUE50X0 firmware 4.4.5, <i>eMaxMobileApp</i> 1.45 & <i>miniMax</i> 2.17
1.A	26.11.2021	M. Schlegel	add on for new EP8 firmware 4.1.7, <i>eMaxMobileApp</i> 1.47 & <i>miniMax</i> 2.19
1.B	24.12.2021	M. Schlegel	add on for new EP8 firmware 4.1.8, <i>eMaxMobileApp</i> 1.48 & <i>miniMax</i> 2.20
1.C	07.01.2022	M. Schlegel	correction of enumeration of sequences and content list
1.D	16.03.2022	M. Schlegel	add on for new DU-E61X0 & DU-E7000 firmware 4.7.4, add on for new DU-E80X0 firmware 4.9.3, <i>eMaxMobileApp</i> 1.50 & <i>miniMax</i> 2.21
1.E	29.03.2022	M. Schlegel	add on for new DU-E50X0 firmware 4.4.7 <i>eMaxMobileApp</i> 1.51 & <i>miniMax</i> 2.22
1.F	30.03.2022	M. Schlegel	correction in chapter 6.1
1.G	19.05.2022	M. Schlegel	correction for DU-E50X0
1.H	11.07.2022	M. Schlegel	correction for DU-E60XX
1.I	19.07.2022	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.54
1.J	26.09.2022	M. Schlegel	correction for EP8 motor firmware 4.0.2
1.K	03.10.2022	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.55 & <i>miniMax</i> 2.24
1.L	04.10.2022	M. Schlegel	add on for <i>miniMax</i> 2.25
1.M	18.10.2022	M. Schlegel	add on for <i>miniMax</i> 2.28 & <i>eMaxMobileApp</i> 1.56
1.N	18.10.2022	M. Schlegel	add on for new DU-E50X0 firmware 4.4.8, add on for new DU-E61X0 & DU-E7000 firmware 4.7.5, add on for new DU-E80X0 firmware 4.9.4, add on for new EP8 firmware 4.1.9, add on for <i>miniMax</i> 2.29 & <i>eMaxMobileApp</i> 1.57
1.O	28.10.2022	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.58
1.P	03.02.2023	M. Schlegel	correction on DU-E50X0 Bluetooth possibilities
1.Q	26.02.2023	M. Schlegel	add on for <i>miniMax</i> 2.30 & <i>eMaxMobileApp</i> 1.59
1.R	02.03.2023	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.61 (there is no version 1.60)
1.S	21.03.2023	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.62
1.T	31.03.2023	M. Schlegel	add on for new DU-E50X0 firmware 4.4.9, add on for new DU-E61X0 & DU-E7000 firmware 4.7.6, add on for new EP8 firmware 4.1.10, add on for <i>miniMax</i> 2.31 & <i>eMaxMobileApp</i> 1.63
1.U	02.04.2023	M. Schlegel	correction on reduction of max. motor support speed
1.V	24.04.2023	M. Schlegel	add on for DU-E6100-CRG
1.W	30.05.2023	M. Schlegel	add on for SC-EN500
1.X	13.08.2023	M. Schlegel	correction of min. version on DU-E7000 and DU-E61X0
1.Y	09.10.2023	M. Schlegel	add on for new DU-E50X0 firmware 4.4.10, add on for new DU-E61X0 & DU-E7000 firmware 4.7.7, add on for new DU-E80X0 firmware 4.9.5, add on for new EP8 firmware 4.1.11, integration of EP801 & EP600 firmware 4.1.1 add on for <i>miniMax</i> 2.40 & <i>eMaxMobileApp</i> 1.69
1.Z	23.10.2023	M. Schlegel	add on for <i>eMaxMobileApp</i> 1.70
2.0	04.11.2023	M. Schlegel	correction on calculations in chapter 13
2.1	06.11.2023	M. Schlegel	add on for <i>miniMax</i> 2.41
2.2	04.12.2023	M. Schlegel	add on for <i>miniMax</i> 2.42
2.3	02.02.2024	M. Schlegel	add on for <i>miniMax</i> 2.43 configuration changes for gear mode settings possible with PCE interface for EP801 and EP6
2.4	04.02.2024	M. Schlegel	Add on for new EP801 & EP600 firmware 4.2.0 add on for <i>miniMax</i> 2.44 & <i>eMaxMobileApp</i> 1.71
2.5	26.02.2024	M. Schlegel	Add on for EP801 & EP6
2.6	26.03.2024	M. Schlegel	Add on for new EP801 & EP600 firmware 4.2.1 add on for <i>miniMax</i> 2.45 & <i>eMaxMobileApp</i> 1.72
2.7	15.04.2024	M. Schlegel	Add on for new EP801 & EP600 firmware 4.2.2 add on for <i>miniMax</i> 2.46 & <i>eMaxMobileApp</i> 1.73
2.8	20.04.2024	M. Schlegel	Add on for <i>miniMax</i> 2.50

## 2. Supported Shimano STePS drive units

Using **eMax** products it is possible to optimize a bike equipped with Shimano STePS components without having to make any mechanical or electronic changes to the bike!

The following Shimano STePS drive units are supported by the **eMax** optimization products:

[DU-E50X0](#) ([DU-E5000](#), DU-E5080 & DU-E5080-H)

[DU-E60X2](#) ([DU-E6002](#) & [DU-E6012](#))

[DU-E60XX](#) ([DU-E6001](#), [DU-E6010](#) & [DU-E6050](#))

[DU-E61X0](#) ([DU-E6100](#), DU-E6100-CGR, [DU-E6110](#) & DU-E6180)

[DU-E7000](#)

[DU-E80X0](#) ([DU-E8000](#) & DU-E8080)

[DU-EP800](#) (EP800, EP800-CRG & EP800-RS)

[DU-EP801](#) (EP801, EP801-CRG & EP801-RS)

[DU-EP600](#) (EP600, EP600-CRG & EP600-RS)

### 3. Connection possibilities with the bicycle

In general, there are 2 different ways to optimize a bike equipped with Shimano STePS components with the **eMax** products.

#### 3.1 *Wireless connection via Bluetooth and smartphone*

Every bicycle equipped with a Bluetooth-capable bike display from Shimano can be optimized with a modern Bluetooth-capable smartphone (or tablet) with the iOS (Apple) or Android (Google) operating system using our **eMaxMobileApp** (see [here](#)).

Compared to the wired version (see below), this wireless solution offers the advantage of simple mobile use and requires no additional components other than a smartphone.

The following Shimano display types are Bluetooth capable and can therefore establish a wireless connection with **eMaxMobileApp**:

[SC-E6100](#)

[SC-E7000](#)

[SC-E8000](#)

[SC-EM800](#)

[EW-EN100](#)

[SW-EN600-L](#)

The following display types are not Bluetooth-capable and can therefore not be used with **eMaxMobileApp**: [SC-EN500](#), [SC-E5000](#), [SC-E5003](#), [SC-E6010](#). However, these display types can be exchanged for a Bluetooth-enabled display relatively easily. Also using the **wired** connection, described in the next chapter is possible with these display types.

#### 3.2 *Wired connection via PCE interface*

Every Shimano STePS-based bike can be optimized with a Windows-based PC and an [SM-PCE1](#) or [SM-PCE02](#) interface from Shimano with our Windows-based **eMax** software (**eMax**, **miniMax**, **freeMax**, see [here](#)).

This wire based solution usually offers additional options compared to the Bluetooth variant (see above) and can also be used with the latest motor firmware versions.

Please note that the new EP8 system may require an additional [EW-AD305](#) adapter and an additional [EW-SD300](#) cable to connect the PCE interface to the STePS system. Especially if the bike is fitted with an SC-EN500, SC-E5003 or SC-EM800 display type with the new smaller receptacles, these additional accessories are necessary.

The new packaging of the SM-PCE02 interface now already includes an additional cable with the smaller SD300 plug. So please take care of the offer description when ordering such an interface.

## 4. Optimizing possibilities on DU-EP800

### 4.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.0.2	motor firmware 4.1.1 – 4.1.11
changing destination (*1) (*3)	✓	✗
changing wheel circumference (*1) (*4)	✓	✗
activation / deactivation of light output on drive unit (*2)	✓	✗
changing remaining light time(*2)	✓	✗
reduction of max. motor support speed (*1)	✓	✓
selection of profile (1/2) (*2)	✓	✓
changing of profile values incl. torque up to 85Nm (*2)	✓	✓
changing of max. peak power up to 500W (*2)	✗	✓
changing of range for max. torque (*2) (*5)	✗	✓
changing of chainring size (*2)	✓	✓
changing smallest rear sprocket (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*5) The range for the max. torque is only relevant for the E-Tube-Project software of Shimano. Even when the torque range is limited, you could program max. torque values of up to 85Nm in both EP8 profiles.

**Note:** The downgrade to motor firmware 4.0.2 could easily be done via also via Bluetooth, see [here](#).

**Take care:** Please don't downgrade the EP8 special version EP8-CRG (this version is used mainly for cargo bikes and is clearly indicated by the „**CARGO**“ – signature on the left side of the motor cover) to motor firmware 4.0.2!

## 4.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.0.2	motor firmware 4.1.1 – 4.1.11
changing destination (*1) (*3)	✓	✓
changing wheel circumference (*1) (*4)	✓	✓
activation / deactivation of light output on drive unit (*2)	✓	✓
changing remaining light time(*2)	✓	✓
reduction of max. motor support speed (*1)	✓	✓
selection of profile (1/2) (*2)	✓	✓
changing of profile values incl. torque up to 85Nm (*2)	✓	✓
changing of max. peak power up to 500W (*2)	✗	✓
changing of range for max. torque (*2) (*5)	✗	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*5) The range for the max. torque is only relevant for the E-Tube-Project software of Shimano. Even when the torque range is limited, you could program max. torque values of up to 85Nm in both EP8 profiles.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

**Take care:** Please don't downgrade the EP8 special version EP8-CRG (this version is used mainly for cargo bikes and is clearly indicated by the „CARGO“ – signature on the left side of the motor cover) to motor firmware 4.0.2!

## 5. Optimizing possibilities on DU-E8000 starting with motor firmware 4.5.1

### 5.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.5.1 – 4.8.0	motor firmware 4.9.0 – 4.9.5
changing destination (*1) (*3)	✓	✗
changing wheel circumference (*1) (*4)	✓	✗
changing remaining light time(*2)	✓	✗
activation / deactivation of light output on drive unit (*2)	✓	✓
changing of max. peak power up to 500W (*2) (*5)	✓	✓
changing max. torque up to 70Nm (*2) (*6)	✓	✓
changing max. assist ratio up to 300% (*2)	✓	✓
changing of chainring size (*2)	✓	✓
changing smallest rear sprocket (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2) (*7)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*5) With motor firmware 4.5.1 – 4.6.1, **eMaxMobileApp** and a bike related licence key it is possible to increase the max. peak power up to 550W (instead of 500W).

(\*6) With motor firmware 4.5.1 – 4.6.1, **eMaxMobileApp** and a bike related licence key it is possible to increase the max. torque up to 75Nm (instead of 70Nm).

(\*7) Works with motor firmware version 4.7.0 and above.

**Note:** The downgrade to motor firmware 4.8.0 could easily be done via also via Bluetooth, see [here](#).



## 5.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.5.1 – 4.8.0	motor firmware 4.9.0 – 4.9.5
changing destination (*1) (*3)	✓	✓
changing wheel circumference (*1) (*4)	✓	✓
changing remaining light time(*2)	✓	✓
activation / deactivation of light output on drive unit (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2) (*5)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*5) Works with motor firmware version 4.7.0 and above.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

## 6. Optimizing possibilities on DU-E8000 with motor firmware 4.2.7 – 4.3.2

### 6.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.2.7 – 4.3.2
changing max. motor support speed up to 60km/h separately for the modes Eco, Trail & Boost with correct indication of all values on the bike display (*1)	✓
changing wheel circumference (*1)	✓
changing remaining light time(*2)	✓
activation / deactivation of light output on drive unit (*2)	✓
changing max. peak power up to 500W (*2) (*3)	✓
changing max. torque up to 70Nm (*2) (*4)	✓
changing max. assist ratio up to 500% (*2)	✓
changing of chainring size (*2)	✓
changing smallest rear sprocket (*2)	✓
changing motor mounting angle (*2)	✓
changing gear mode settings (*2)	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With a bike related licence key it is possible to increase the max. peak power up to 550W (instead of 500W).

(\*4) With a bike related licence key it is possible to increase the max. torque up to 75Nm (instead of 70Nm).

**Note:** The downgrade to motor firmware 4.3.2 could easily be done via also via Bluetooth, see [here](#).

Take care: The downgrade to motor firmware 4.3.2 is only possible in combination with a SC-E6010 or SC-E8000 display!

A SC-E6100, SC-E7000 or EW-EN100 display only works with at motor firmware starting with version 4.5.1, see also [here](#)!

A SC-E5000 or SC-E5003 display only works with at motor firmware starting with version 4.8.0, see also [here](#)!

A downgrade to motor firmware 4.3.2 with the new Shimano – battery types [BT-E8016](#) / [BT-E8035](#) / [BT-E8035-L](#) / [BT-E8036](#) currently is not possible! These battery types depending on their own firmware version mostly only work in combination with a motor firmware starting with version 4.8.0, see also [here](#)!

## 6.2 Using the Windows based eMax - program (version 3.9R)

	motor firmware 4.2.7 – 4.3.2
changing max. motor support speed up to 60km/h separately for the modes Eco, Trail & Boost with correct indication of all values on the bike display (*1)	✓
changing wheel circumference (*1)	✓
changing remaining light time(*2)	✓
activation / deactivation of light output on drive unit (*2)	✓
changing motor mounting angle (*2)	✓
changing gear mode settings (*2)	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

**Note:** The downgrade to motor firmware 4.3.2 could easily be done via PCE – interface and also via Bluetooth, see [here](#).

Take care: The downgrade to motor firmware 4.3.2 is only possible in combination with a SC-E6010 or SC-E8000 display!

A SC-E6100, SC-E7000 or EW-EN100 display only works with at motor firmware starting with version 4.5.1, see also [here](#)!

A SC-E5000 or SC-E5003 display only works with at motor firmware starting with version 4.8.0, see also [here](#)!

A downgrade to motor firmware 4.3.2 with the new Shimano – battery types [BT-E8016](#) / [BT-E8035](#) / [BT-E8035-L](#) / [BT-E8036](#) currently is not possible! These battery types only work with at motor firmware starting with version 4.8.0, see also [here](#)!

## 7. Optimizing possibilities on DU-E7000

### 7.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.4.0 – 4.5.0	motor firmware 4.6.0 – 4.7.7
changing destination (*1) (*3)	✓	✗
changing wheel circumference (*1) (*4)	✓	✗
changing remaining light time(*2)	✓	✗
activation / deactivation of light output on drive unit (*2)	✓	✓
changing of max. peak power up to 500W (*2)	✓	✓
changing max. torque up to 60Nm (*2)	✓	✓
changing max. assist ratio (*2)	✓	✓
changing of chainring size (*2)	✓	✓
changing smallest rear sprocket (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** The downgrade to motor firmware 4.5.0 could easily be done via also via Bluetooth, see [here](#).

## 7.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.4.0 – 4.5.0	motor firmware 4.6.0 – 4.7.7
changing destination (*1) (*3)	✓	✓
changing wheel circumference (*1) (*4)	✓	✓
changing remaining light time(*2)	✓	✓
activation / deactivation of light output on drive unit (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

## 8. Optimizing possibilities on DU-E61X0 (DU-E6100, DU-E6110, DU-E6180)

### 8.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.4.0 – 4.5.0	motor firmware 4.6.0 – 4.7.7
changing destination (*1) (*3)	✓	✗
changing wheel circumference (*1) (*4)	✓	✗
changing remaining light time(*2)	✓	✗
activation / deactivation of light output on drive unit (*2)	✓	✓
changing of chainring size (*2)	✓	✓
changing smallest rear sprocket (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** The downgrade to motor firmware 4.5.0 could easily be done via also via Bluetooth, see [here](#).

**Take care:** Please don't downgrade the DU-E6100 special version DU-E6100-**CRG** (this version is used mainly for cargo bikes and is clearly indicated by the „**CARGO**“ – signature on the left side of the motor cover) to motor firmware 4.5.0!

## 8.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.4.0 – 4.5.0	motor firmware 4.6.0 – 4.7.7
changing destination (*1) (*3)	✓	✓
changing wheel circumference (*1) (*4)	✓	✓
changing remaining light time(*2)	✓	✓
activation / deactivation of light output on drive unit (*2)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓
display speed adjustment (+/-5%) (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

**Take care:** Please don't downgrade the DU-E6100 special version DU-E6100-CRG (this version is used mainly for cargo bikes and is clearly indicated by the „**CARGO**“ – signature on the left side of the motor cover) to motor firmware 4.5.0!

## 9. Optimizing possibilities on DU-E60X2 (DU-E6002, DU-E6012)

### 9.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 3.4.0
changing destination (*1) (*3)	✓
changing wheel circumference (*1) (*4)	✓
changing motor mounting angle (*2)	✓
changing gear mode settings (*2)	✓

(\*1) A license key that matches the bike is required to perform this function.


(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.



## 9.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 3.4.0
changing destination (*1) (*3)	
changing wheel circumference (*1) (*4)	
changing motor mounting angle (*2)	
changing gear mode settings (*2)	

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.




(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

## 10. Optimizing possibilities on DU-E60XX (DU-E6001, DU-E6010, DU-E6050)




### 10.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 3.4.7
changing wheel circumference (*1)	
changing motor mounting angle (*2)	
changing gear mode settings (*2)	

(\*1) A license key that matches the bike is required to perform this function. This option offers motor support up to approx. 45 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*2) This function could be used already in the license-free version.

## 10.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 3.4.7
changing wheel circumference (*1)	
changing motor mounting angle (*2)	
changing gear mode settings (*2)	

(\*1) A license key that matches the bike is required to perform this function. This option offers motor support up to approx. 45 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

(\*2) This function could be used already in the license-free version.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

## 11. Optimizing possibilities on DU-E50X0 (DU-E5000, DU-E5080, DU-E5080-H)

### 11.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.2.1 – 4.3.0	motor firmware 4.4.2 – 4.4.10
changing destination (*1) (*3)	✓	✗
changing wheel circumference (*1) (*4)	✓	✗
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.

(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** The downgrade to motor firmware 4.2.1 could easily be done via also via Bluetooth, see [here](#).

## 11.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.2.1 – 4.3.0	motor firmware 4.4.2 – 4.4.10
changing destination (*1) (*3)	✓	✓
changing wheel circumference (*1) (*4)	✓	✓
changing motor mounting angle (*2)	✓	✓
changing gear mode settings (*2)	✓	✓

(\*1) A license key that matches the bike is required to perform this function.

(\*2) This function could be used already in the license-free version.








(\*3) With this possibility the USA mode could be activated which offers motor support speed up to 32 km/h with correct values on the bike display.

(\*4) In combination with an activated USA mode, this option offers motor support up to approx. 55 km/h, but the values for speed and distance on the bike display will be no more correct and correspond to approx. half of the displayed value.

**Note:** For using the *miniMax* program a Windows based computer and a PCE1 or PCE02 interface are required.

## 12. Optimizing possibilities on DU-EP801 (EP801) & DU-EP600 (EP6)

### 12.1 Using the Bluetooth based eMaxMobileApp (version 1.73)

	motor firmware 4.0.0 – 4.2.2
changing destination	
changing wheel circumference	
reduction of max. motor support speed (*1)	
changing of max. peak power up to 600W (EP801) or 500W (EP6) (*2) (*5)	
changing of range for max. torque (*2) (*5)	
changing motor mounting angle (*2)	
display speed adjustment (+/-5%) (*2)	

(\*1) A license key that matches the bike is required to perform this function.

Via personal service of us (e.g. via remote-control session of the Windows computer to which the bike is connected via cable bound SM-PCE02 interface) we can increase max. motor support speed up to 50km/h with correct indication of all values on the bike display.









Starting with **miniMax** 2.50 the optimization of the bike can be done also solely with **miniMax** (without any remote-control session), see [this document](#).

Please contact us via [email](#) if you are interested.

(\*2) This function could be used already in the license-free version.

(\*5) After you have changed max. peak power and/or the range for max. torque with **eMaxMobileApp** you can change the settings for **BASIC** - mode (Eco, Trail, Boost) or **FineTune** - mode with the Shimano E-Tube-Project software (Bluetooth based app of Windows based program).

## 12.2 Using the Windows based miniMax - program (version 2.50)

	motor firmware 4.0.0 – 4.2.2
changing destination	
changing wheel circumference (*8)	
reduction of max. motor support speed (*1)	
changing of max. peak power up to 600W (EP801) or 500W (EP6) (*2) (*5)	
changing of range for max. torque (*2) (*5)	
changing motor mounting angle (*2)	
display speed adjustment (+/-5%) (*2)	
changing gear mode settings (*2)	

(\*1) A license key that matches the bike is required to perform this function.

Via personal service of us (e.g. via remote control session of the Windows computer to which the bike is connected via cable bound SM-PCE02 interface) we can increase max. motor support speed up to 50km/h with correct indication of all values on the bike display.

Please contact us via [email](#) if you are interested.

(\*2) This function could be used already in the license-free version.

(\*5) After you have changed max. peak power and/or the range for max. torque with **eMaxMobileApp** you can change the settings for **BASIC** - mode (Eco, Trail, Boost) or **FineTune** - mode with the Shimano E-Tube-Project software (Bluetooth based app of Windows based program).

(\*8) An EP801 / EP6 drive unit allows changing wheel circumference just 3 times. Please contact us via [email](#) if you are interested.

## 13. Additional hints to the optimizing possibilities

### 13.1 Hints to the USA - modification

In US – mode (**with correct wheel circumference**) the motor will support up to exactly 32km/h (20mph) but will reduce power drastically at approx. 30,5km/h (19mph). This is to avoid a hard stop of the motor at 32km/h (20mph).

If you want to get full motor support up to 32km/h (20mph) and correct values on your bike display as well then you can do the following 2 step “trick”:

- Use **eMaxMobileApp** (or the Windows based **miniMax** program) to **increase** the display speed adjustment to its max. possible value of **+5%**.
- Use **eMaxMobileApp** (or the Windows based **miniMax** program) to **decrease** the wheel circumference value by **5%** of the real circumference value. So, if your correct wheel circumference is e.g. 2300mm, then program a value of 2190mm (2300mm / 1,05) to your bike.

After this 2-step process, your motor will support with full power to 32km/h (20mph) and then support with lower power to approx. 33,5km/h (21mph) and above this speed there will be no more motor support.

**Note:** Independently of an activated USA – mode you can select the shown units (km/h and km or mph and miles) via display menu.

### 13.2 Hints to the wheel circumference modification

Via wheel circumference modification, the max. motor support speed can also be increased, but the values for speed and distance are no longer shown correctly on the display afterwards.

If the wheel circumference modification is activated, the bike will always limit the speed at the shown bike display speed of 25 km/h (for "EU" country setting) or 32 km/h (for "US" country setting). The speed actually driven by the bicycle at this speed shown on the bicycle display can, however, be significantly higher by reducing the wheel circumference.

The formula for the maximum speed of the motor support which actually can be achieved by modifying the wheel circumference is as follows:

**Actual speed = displayed speed \* actual wheel circumference / programmed wheel circumference**

#### Example 1:

Actual wheel circumference: **2250mm**

Programmed wheel circumference: **1800mm**

Speed shown on the bike display (e.g. „EU“ – mode activated): **25km/h**

⇒ Actual speed of bike: 25km/h \* 2250mm / 1800mm = **31km/h**

#### Example 2:

Actual wheel circumference: **2300mm**

Programmed wheel circumference: **1300mm**

Speed shown on the bike display (e.g. „USA“ – mode activated): **32km/h**

⇒ Actual speed of bike: 32km/h \* 2300mm / 1300mm = **57km/h**

**Note:** The minimum programmable wheel circumference is 1300mm for all STePS drive units.



### 13.3 Hints on using the E-Tube software from Shimano

It is generally possible to continue using the E-Tube software (Bluetooth-based app or Windows-based program, see [here](#)) on the bike even after using the **eMax** products. You should only ensure that you do not accidentally update to a new firmware version that may have no or limited optimization options.

If individual motor performance setting values have been selected with **eMaxMobileApp** or **miniMax** and these values are to be changed later with the E-Tube software (for whatever reason), it is recommended that you first program the default values with **eMaxMobileApp** or **miniMax**. These default values of the E-Tube system can be programmed with the indicated default buttons, otherwise a warning message can be displayed in E-Tube that the read-in values are unknown.

### 13.4 Updating motor firmware respectively downgrading motor firmware

It is strongly recommended to reprogram all settings previously changed with the **eMax** products to the original settings **before** updating the motor firmware or before downgrading the motor firmware (see [here](#)). In addition, before updating the motor firmware, it should be checked whether and which optimization options are available with the new firmware version. You can find helpful information on this on the [eMax website](#) and especially in the [news section](#).

#### **Note:**

A one-time bought and bike related licence key could be used as often and as long as you want with all of our programs and apps (**eMax**, **miniMax**, **eMaxMobileApp**) and is valid also for future versions of our programs and apps.

So you can change the type of modification whenever you want later on too, or for sure you can also reset all modifications.