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1 Foreword

INFORMATION

Date of last update: 2025-09-24

- ► Please read this document carefully before using the product and observe the safety notices.
- ► Instruct the user in the safe use of the product.
- ► Please contact the manufacturer if you have questions about the product or in case of problems.
- ► Report each serious incident related to the product to the manufacturer and to the relevant authority in your country. This is particularly important when there is a decline in the health state.
- ► Please keep this document for your records.

INFORMATION

- ► New information regarding product safety and product recalls as well as the declaration of conformity can be obtained at ccc@ottobock.com or from the manufacturer's service department (visit www.ottobock.com for addresses).
- ► You can request this document as a PDF file at ccc@ottobock.com or from the manufacturer's service department. The PDF file can also be displayed in a larger size.

Initial adjustments to the product were made according to the order form. Nevertheless, fine adjustments and settings may have to be made depending on the medical situation or the user's requirements.

These instructions for use provide the information necessary for adjusting the settings. This work should be closely coordinated with the user.

Please note the following:

- The instructions for use (qualified personnel) are intended only for qualified personnel and remain with them.
- The product has been adapted to the needs of the user. We recommend checking the product settings **once per year** to ensure that the product provides optimal treatment over the long term. Especially in the case of users with a changing anatomy (such as body dimensions or weight), an adjustment at least **once every six months** is recommended.
- The manufacturer reserves the right to make technical changes to the model described in these instructions for use.

2 Intended use

2.1 Indications for use

For additional information about the indications for use, see the instructions for use (user).

The operational safety of the product can only be ensured in case of intended use in accordance with the information contained in these instructions for use (qualified personnel) and in the instructions for use (user). The user is ultimately responsible for accident-free operation.

2.2 Indications, contraindications, side effects

For more information on indications and contraindications as well as possible side effects when using the product, see the instructions for use (user).

2.3 Qualification

The tasks described below may only be carried out by qualified personnel. All manufacturer specifications and all applicable legal provisions must be complied with. Please contact the manufacturer's service department for further information (see for addresses www.ottobock.com).

2.4 Lifetime

Expected lifetime: **8 years**

The design, manufacturing and requirements for the intended use of the product are based on the expected lifetime. These also include the requirements for maintenance, ensuring effectiveness and the safety of the product.

- Regular maintenance is important. It increases safety and ensures the the product reaches its intended lifetime.
- Inspect and maintain this product **at least once a year** according to the manufacturer's specifications (maintenance plan).
  To achieve the expected lifetime of 8 years, annual inspection of the product by qualified personnel is mandatory in accordance with the maintenance plan in the service manual.

3 Safety

3.1 Explanation of warning symbols

⚠ WARNING	Warning regarding possible serious risks of accident or injury.
⚠ CAUTION	Warning regarding possible risks of accident or injury.
NOTICE	Warning regarding possible technical damage.

3.2 General safety instructions

WARNING! Risk of severe injuries

- ► Ensure that body parts, such as the hands or head, are never in the danger zone during adjustments.
- ► Perform the adjustments with assistance from a helper.
- ► Due to the design, please note that there are pinching and shear points in the area between the seat bottom and chassis of the power wheelchair. No body parts, such as hands or feet, may be in the danger zone while the power seat options are being adjusted.
- ► Severing cables or unintentionally disconnecting plug connections while driving can cause an emergency stop of the wheelchair. This can lead to dangerous situations in road traffic. Take note of the cables attached to the product with cable ties during all installation work. Be careful not to damage cables if you need to remove cable ties for assembly work. Carefully use suitable side-cutting pliers to cut cable ties to pieces if necessary.
- ► Improper cable installation can lead to a loss of cable insulation and consequently to short circuits and even fires. Always install the cables and plug connections so they cannot be damaged and cannot disconnect. Leave an appropriate cable loop on moveable components so they can move without tension. Only use suitable fasteners (such as cable ties). Also use cable ties to secure the plug connections to the product so they cannot be disconnected unintentionally.
- ► Please note that modified parameter settings lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable driving characteristics and cause an accident.
- ► The parameter settings of the control device may only be changed by qualified personnel. The product manufacturer and the control device manufacturer are not liable in case of damage caused by parameter settings that were incorrectly configured or not adjusted properly according to the user's abilities.
- ► The user has to test the driving characteristics of the product each time after parameter settings are changed. Supervise this process.

CAUTION! Risk of injury and risk of product damage

- ► When carrying out work, use only tools that are suitable for the conditions at the workplace and for which safety and the protection of health are assured when used as intended. Observe the specifications in the section "Required tools".
- ► Some parts of the power wheelchair, such as the batteries, frame, seat and motors, are very heavy. Ensure ergonomically correct lifting of these parts. Use sufficiently large hoisting devices or perform this work with assistance from a helper.
- ► If it is necessary to work underneath raised parts or equipment, make sure they are secured by suitable means so that they cannot come loose, shift or fall down.
- ► When using lifting platforms, ensure that the power wheelchair is centred on the platform and that no parts protrude into the danger zone.
- ► Verify that the anti-tipper has been installed and adjusted correctly so that the user cannot tip over due to installation or adjustment errors.

NOTICE! Danger of product damage and restricted functionality

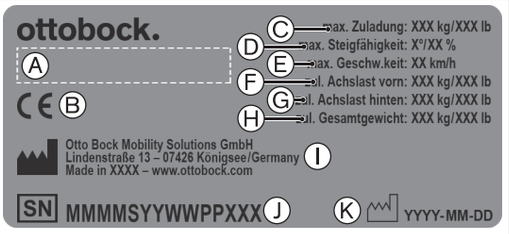
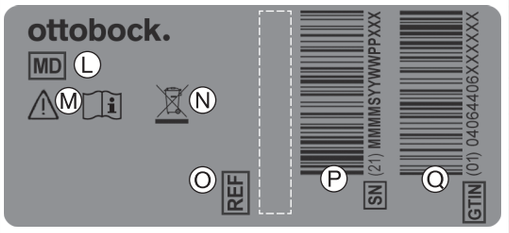
- ► Switch off the control device of the product and deactivate the main fuse for all adjustment work. Functional tests of the electrical components are excepted from this rule.
- ► Before work is carried out on the seat, ensure that the padding is adequately protected against mechanical, chemical and thermal damage.

3.3 Further information

The serial number required for enquiries and ordering spare parts and accessories is found on the nameplate. For explanations of the nameplate, see the section "Nameplate" (see page 7).

3.4 Nameplate

The nameplates are found on the mobility base.

Label		Meaning
	**A**	Reference material no. Name of the product
	B	CE marking
	C	Maximum load (see section “Technical data”)
	D	Maximum climbing ability (see section “Technical data”)
	E	Maximum speed (see section “Technical data”)
	F	Allowable axle load, front
	G	Allowable axle load, rear
	H	Allowable overall weight
	I	Manufacturer information/address
	J	Serial number[1)]
	K	Manufacturing date[2)]
	**L**	Symbol for medical device
	M	**WARNING!** Read the instructions for use before using the product. Observe important safety-related information (e.g. warnings, precautions).
	N	Symbol for separate collection of electrical and electronic devices. Components of the power wheelchair and batteries may not be disposed of in household waste.
	O	Manufacturer’s reference number for the product variant
	P	Serial number (PI)[3),1)]
	Q	Global Trade Item Number (DI)[4)]

[1)] MMMM = model/model variant; S = speed code; YY = year of manufacture; WW = week of manufacture; PP = production site; XXX = sequential production number

[2)] YYYY = year of manufacture; MM = month of manufacture; DD = day of manufacture

[3)] UDI-PI to GS1 standard; UDI = Unique Device Identifier, PI = Production Identifier

[4)] UDI-DI to GS1 standard; UDI = Unique Device Identifier, DI = Device Identifier

See the instructions for use (user) for additional warning labels.

4 Delivery

4.1 Scope of delivery

- Fitted power wheelchair with main components
- Options (depending on equipment)
- Battery charger (depending on order)
- Instructions for use (qualified personnel), instructions for use (user)
- Instructions for use for accessories (depending on equipment)

4.2 Accessories

The functionality and operation of the accessories are described in more detail in the instructions for use (user) or in separate instructions for use for the accessories.

All of the available accessories are listed on the order form.

Please note that retrofitting options further reduces the maximum load capacity (user weight + luggage).

The maximum load capacity (see print on the nameplate; see page 7) is thereby respectively reduced by the weight of the retrofitted options.

This may result in a change in stability. Therefore, the qualified personnel must ensure that the modified maximum load (user weight + luggage) in combination with the seat height, seat depth, motor speed and chassis is also an approved variant. Please contact the manufacturer for further information.

4.3 Storage

All information in the instructions for use (user) must be observed for storage and safekeeping of the product during extended breaks in use.

When the main fuse is deactivated, the control device is disconnected from the batteries. The electric buffer memory of the control device can supply the internal clock with power for approx. 12 h. If the control device is disconnected from the batteries for a longer period, the internal clock stops, e.g. during prolonged storage with the main fuse deactivated. When the product is used again, the system time has to be reset, e.g. with the help of the ECON adjustment software (see page 28).

5 Establishing functionality

5.1 Inserting the batteries

⚠ WARNING

Exposed pinch points and instability when replacing batteries

Pinching, crushing of limbs (e.g. fingers), tipping of the power wheelchair due to lack of caution when folding up the seat

- ► Before replacing the battery, adjust the back support and leg support to vertical positions to reduce shear forces.
- ► To safely fold up the seat up, grasp the seat frame. Never use the leg supports themselves for folding up, as they do not offer a secure grip.
- ► After folding up the seat, shake it to verify that it is firmly fixed in place. A seat that is not firmly fixed in place could fall back to its starting position and result in severe crushing injuries.

⚠ CAUTION

Short circuit of the battery

Burns due to incorrect battery installation, damage to the electrical/electronic components

- ► Deactivate the main fuse before performing any work on the battery.
- ► Use only insulated tools to perform maintenance work on the battery.
- ► Ensure correct polarity when you connect the battery cables. Connect the black cable to the negative terminal and the red cable to the positive terminal.

⚠ CAUTION

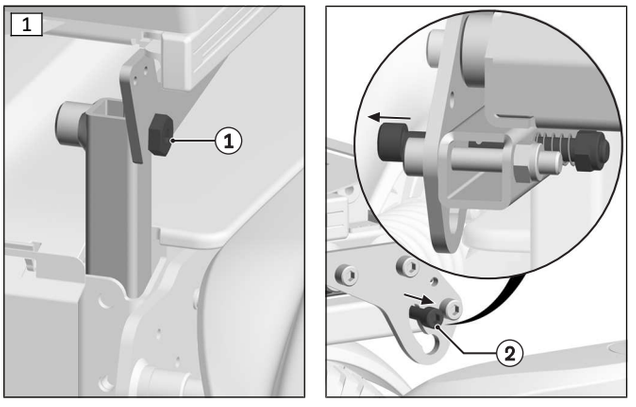
Wearing unsuitable work clothing

Chemical burns due to insufficient protection

- ► Wear suitable work clothing (for example, gloves and protective goggles) when working on the batteries.

The power wheelchair is usually delivered with the batteries installed.

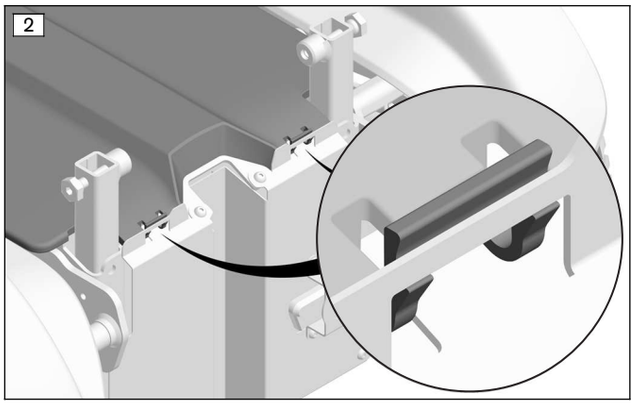
If required, batteries which have been delivered separately can be installed as follows:



Folding up the seat

1) Adjust the back support and leg support to a vertical position (90°).
2) Loosen the mounting screws on the front side of the seat and unscrew them approx. **10 mm** (see fig. 1, item 1).
3) Slightly lift the seat out of the front locking device.
4) Fold the seat up and back until it engages firmly.

In order to be able to fold the seat down again, the seat has to be held securely and then the seat locking bolt pulled (see fig. 1, item 2).



Inserting the batteries

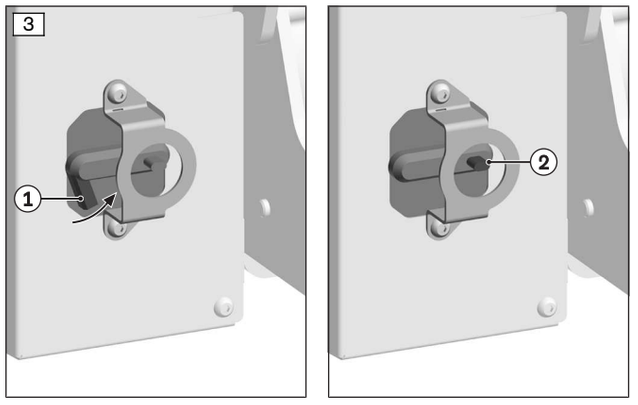
1) Loosen the closures of the battery cover (see fig. 2) and lift the battery cover up to take it off.
2) Correctly position the batteries and set them in the battery tray.
3) Connect and firmly screw in the battery cables. Observe the connection diagram in the battery cover.
   NOTICE! Make sure the polarity is correct and avoid pinch points.
4) Put on the battery cover, push it down and let the latches engage (see fig. 2).
5) Loosen the seat locking bolt (see fig. 1, item 2).
6) Fold the seat down until the front locking device engages.
7) Tighten the mounting screws on the front side of the seat (see fig. 1, item 1).

5.2 Activating the main fuse

The main fuse has to be activated before the product can be switched on.

The automatic circuit breaker is located under the seat on the front of the chassis.

When the main fuse is deactivated, the control device is disconnected from the batteries. The electric buffer memory of the control device can supply the internal clock with power for approx. 12 h. If the control device is disconnected from the batteries for a longer period, the internal clock stops, e.g. during prolonged storage with the main fuse deactivated. When the product is used again, the system time has to be reset, e.g. with the help of the ECON adjustment software (see page 28).



Activating the circuit breaker

► Close the reset lever, which is at an angle (see fig. 3, item 1).

→ The reset lever engages and the circuit breaker is activated.

Deactivating the circuit breaker

► Press the pushbutton until the reset lever flips up at an angle (see fig. 3, item 2).

→ The circuit breaker is deactivated.

5.3 Charging the batteries

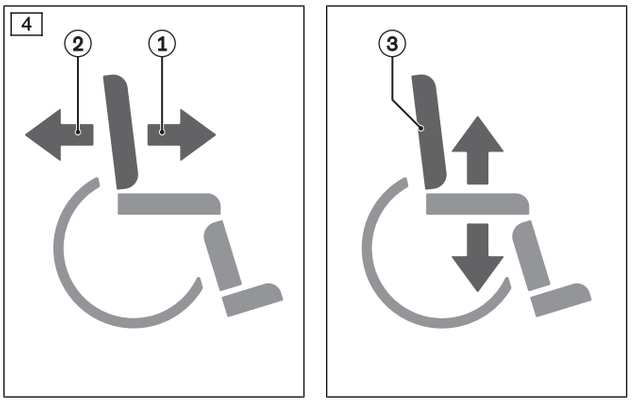
See the power wheelchair instructions for use (user) for all information regarding the charging process.

The power wheelchair must be handed over to the user with fully charged batteries.

5.4 Establishing the driving position

The product is delivered in a packaging position in order to reduce its outer dimensions for packaging or transportation in a motor vehicle. For this purpose, the length adjustment of the back support was set to the minimum (fully retracted). The back support angle has been adjusted so that the outermost, highest point of the back support is as low as possible, but does not project beyond the seat and the mobility base.

The qualified personnel must move the power wheelchair to its starting position (driving position) during unpacking.



Establishing the driving position

1) Switch on the control device.
2) Move the back support angle fully forward (see fig. 4, item 1).
   → The length adjustment synchronises again with the back support angle.
3) Move the back support angle back again and check the functionality of the automatic length adjustment (see fig. 4, item 2).
4) Switch through the remaining seat functions and make sure that the length adjustment of the back support is not adjustable separately.
   → The length adjustment (see fig. 4, item 3) should **not** be available to the user as an independent seat function. The length adjustment is only moved together with the back support angle.
   → If length adjustment can be selected separately, hide this seat function again (see page 50).

Reestablishing packaging position

For transport to the customer, the packaging position can be reestablished to reduce the transportation size (see page 50). The ECON adjustment software must be used for this purpose.

Before the product is handed over to the customer, the driving position always has to be established and the seat function of the packaging position removed from the seat menu.

6 Settings

6.1 Prerequisites

⚠ WARNING

Faulty settings

Tipping over, falling or malposition of the user due to incorrect adjustments

- ► Adjustment and installation work may be carried out only by qualified personnel.
- ► Only the adjustments described in these instructions for use may be carried out.
- ► Settings may be changed only within the allowable adjustment ranges; otherwise, the stability of the product may be impaired (see this section and the “Technical data” section). If you have any questions, contact the manufacturer’s service department (see www.ottobock.com for addresses).
- ► When changing the seat settings (e.g. adjusting the seat height or seat depth), the parameter settings – including the driving parameters – may also need to be changed in the control device, depending on the user.
- ► Unless expressly described, you may not change any settings with a person sitting in the product.
- ► Before testing changes to settings, firmly tighten all screw connections. Perform the test with the seated user only in the presence of an assistant. Secure the user against falling out.
- ► Check for safe function before delivering the product.

⚠ CAUTION

Unsecured screw connections

Pinching, crushing, tipping over, falling of user due to assembly errors

- ► Always firmly re-tighten the mounting screws and nuts after changing settings. Observe the specified torques in doing so.
- ► Any time you loosen a screw connection with thread lock, replace it with a new screw connection with thread lock or secure the old screw connection with medium strength thread locker (e.g. Loctite 241).
- ► Always replace self-locking screws and nuts with new self-locking screws and nuts after disassembly.

Adjustments should be checked in the presence of the user together with an assistant. The user should be sitting upright in the power wheelchair while adjustments are being made.

The tools required for adjustments and maintenance tasks as well as the torque values for screw connections are listed in the section "Appendices" (see page 66).

6.2 Adjusting the APS seat

6.2.1 Adjusting the head support

The head support or head/neck support must be mounted on the head/neck support mounting kit and then adjusted. Every time the settings are changed, it must be ensured that the mounting kit cannot collide with back support components. After each change to the setting, the back support angle adjustment and automatic length adjustment must be checked throughout the entire travel range.

Detailed information regarding installation and adjustment options can be found in the enclosed instructions for use.

6.2.2 Adjusting the forearm supports

⚠ CAUTION

Reaching into the swivel region

Pinching or crushing of limbs (e.g. fingers) due to lack of caution in danger zones

► Do not reach into the swivel region.

The height and depth of the armrests can be adapted to the requirements of the user.

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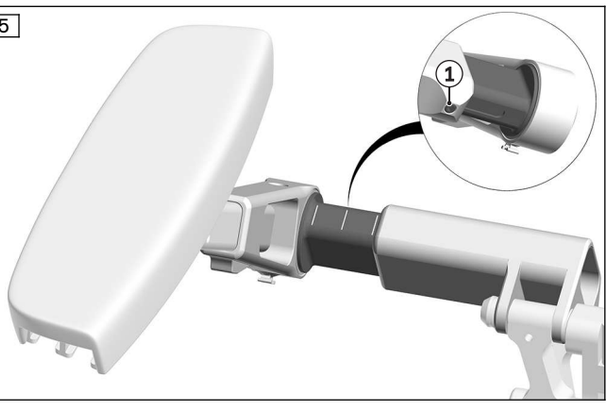
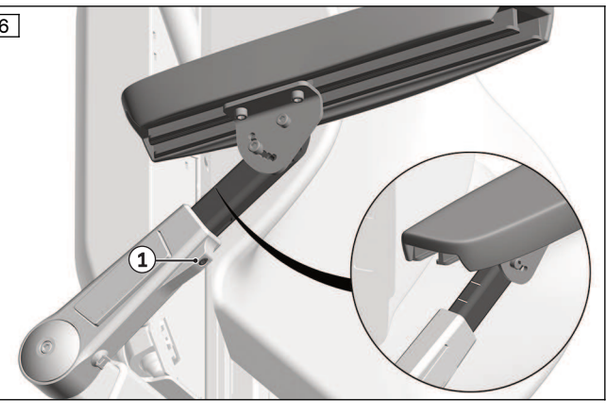


Adjusting the arm support width

The arm support width must be adjusted so that there is a distance of at least **10 mm** between the arm support and the seat cushion when the arm support is folded down.

1) Loosen each set screw on the underside of the arm support bracket (see fig. 5; item 1).
2) Adjust the width of the arm support holder. Use the scale as a guide in order to achieve a symmetrical setting on the left and right.
3) Retighten the set screw.

6



Adjusting the depth of the arm support

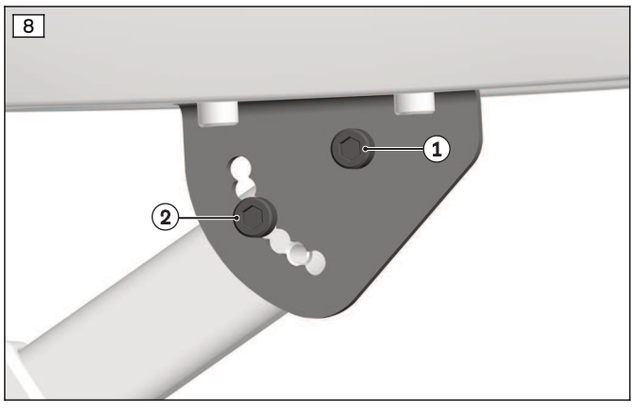
The arm support can be adjusted to the user's forearm length by adjusting the forearm support (see fig. 9). The depth can also be adjusted by adjusting the arm pad bracket.

1) Loosen each set screw on the underside of the arm support (see fig. 6, item 1).
2) Pull out or slide in the arm pad bracket. Use the scale as a guide.
3) Firmly tighten the set screw on both arm supports (see fig. 6, item 1).
   INFORMATION: To adjust the arm support angle, see the sections that follow.

Adjusting the arm support angle

Adaptations to the needs of the user are made by adjusting the angle stop.

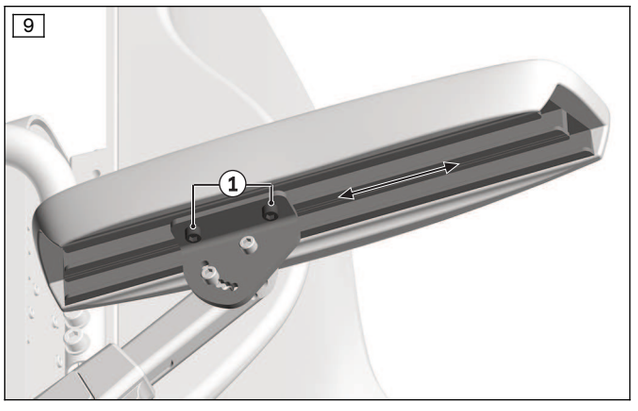
1) Loosen the set screw on both arm supports (see fig. 7, item 1).
2) Adjust the stop as desired.
3) Firmly tighten the set screw on both arm supports (see fig. 7, item 1).



Adjusting the angle of the forearm support

Adaptations to the needs of the user are made with the angle adjuster.

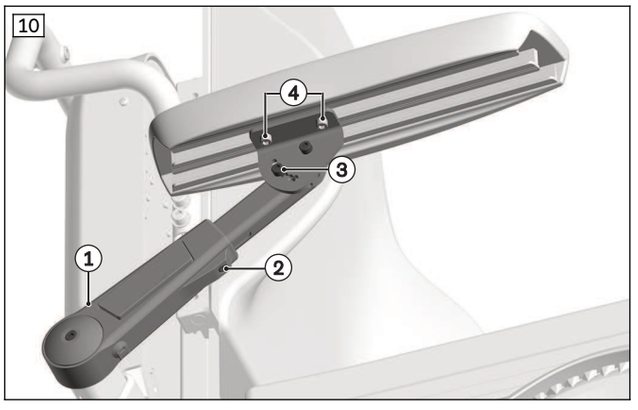
1) Loosen the upper hexagon socket screw on the angle adjuster (see fig. 8, item 1).
2) Loosen and remove the lower hexagon socket screw on the angle adjuster (see fig. 8, item 2).
3) Adjust the angle as desired.
4) **Only if necessary:** reposition the lower hexagon socket screw to the other bore hole in order to make use of intermediate points.
5) Firmly re-tighten the two hexagon socket screws.



Adjusting the depth of the forearm supports

In addition to the arm support depth adjustment described above, the forearm support itself can also be adapted to the user's forearm length.

1) Loosen the two hexagon socket screws on the underside of the forearm support (see fig. 9, item 1).
2) Move the forearm support with the control panel holder or replacement tube forward or back to the desired position.
3) Firmly re-tighten the two hexagon socket screws.



Adjusting the height of the arm support

The arm support height is adjusted to the upper arm length of the user by combining the arm support depth and arm support angle settings and by adjusting the arm support angle (see fig. 10, items 1 – 4).

6.2.3 Adjusting the seat depth

⚠ CAUTION

Exceeding the allowable adjustment ranges

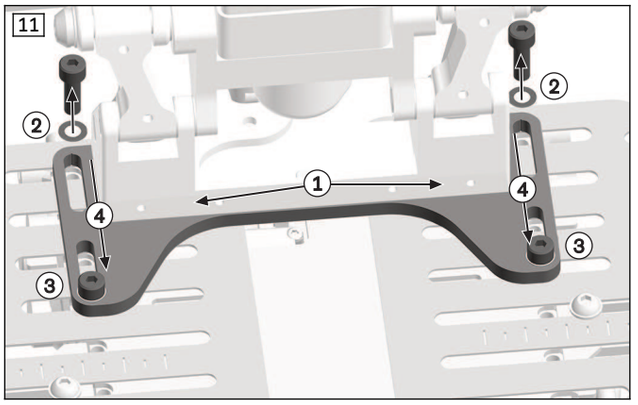
Instability and tipping of the wheelchair due to improper settings

- ► Please note that the seat depth, seat height and wheelchair features affect stability. Depending on the maximum user weight, the seat depth and seat height may only be adjusted in certain areas.
- ► Only make minor changes to the factory settings. Note the permissible adjustment ranges in the service manual for the wheelchair, particularly if the seat depth is reduced or the seat height is increased.
- ► Verify tipping resistance after any changes to the settings. During the test drive, pay particular attention to ensuring that the wheelchair is driving in a stable way, braking securely and does not rock.

INFORMATION

- ► The seat depth is measured from the front edge of the seat plate to the vertical surface of the back support bracket (see fig. 11, item 1). Subtract **40 mm** for the back support pad from the measured value. The back support angle must be **90°** (vertical position of the back support).
- ► In order to ensure the driving characteristics and stability, a driving test should be performed after changing the seat depth.
- ► Always check the driving characteristics after adjusting the seat depth. If the driving characteristics have deteriorated, contact the manufacturer immediately.

Subject to the previously provided information, the seat depth can be adjusted by gradually repositioning the back support forward or backward.



Repositioning the back support

1) Move the back support to a fully vertical position and fold up the arm support.
2) **INFORMATION: Repositioning the back support forward is described in the information below. If the back support is to be repositioned backward, the adjustment process begins by loosening and removing each of the front hexagon socket screws.**
   Loosen and remove each of the rear hexagon socket screws on the base plate of the back support bracket (see fig. 11, item 2).
3) Loosen each of the front hexagon socket screws on the base plate of the back support bracket (see fig. 11, item 3).
4) Reposition the back support forward symmetrically in the slotted holes (see fig. 11, item 4).
5) Lightly secure the base plate of the back support bracket in the new position with the hexagon socket screws removed at the rear.
6) Repeat this process step by step until the back support reaches the desired position.
   INFORMATION: The hexagon socket screws must be inserted on the outer edges of the slotted holes prior to final tightening.
   INFORMATION: For the largest/smallest adjustable seat depth (560 mm; 300 mm), the hexagon socket screws must be inserted in the slotted holes on the inner side at the edge of the seat plate, otherwise the screws will be suspended in the air.
7) Tighten the hexagon socket screws to **25 Nm**.

6.2.4 Adjusting the seat width

INFORMATION

The seat width is measured between the outer sides of the two seat side profiles.

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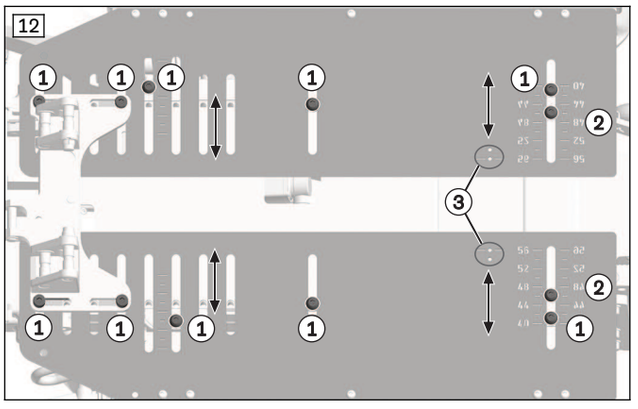

Adjusting the seat width

1) Slightly loosen the 6 hexagon socket screws on each of the seat plates (see fig. 12, item 1).
2) Adjust the seat width evenly on both sides. To do this, follow the matrix in the seat plates (see fig. 12, item 2/3). Do not tilt the seat plates while pushing.
   INFORMATION: Explanation of the adjustment matrix on the seat plate (see fig. 12, item 2/3): the two points symbolise the screws; the lines show the end points to be used on the matrix. In the example, the inner screw in each case points to the short line between 44 and 48. A seat width of 46 is set.
3) Firmly tighten all hexagon socket screws:
   → Oval head screws (seat plate attachment): **10 Nm**
   → Cap screws (back support attachment): **25 Nm**

6.2.5 Setting the pre-tilt

The product is equipped with a power seat tilt. The pre-tilt can only be set via the control device parameters. The ECON adjustment software (see page 19) must be used for this purpose.

To set the pre-tilt, an offset for the seat tilt can be set in the parameters. It allows you to shift the zero point of the seat tilt and set a pre-tilt of **up to 5°**.

6.2.6 Adjusting the back support width

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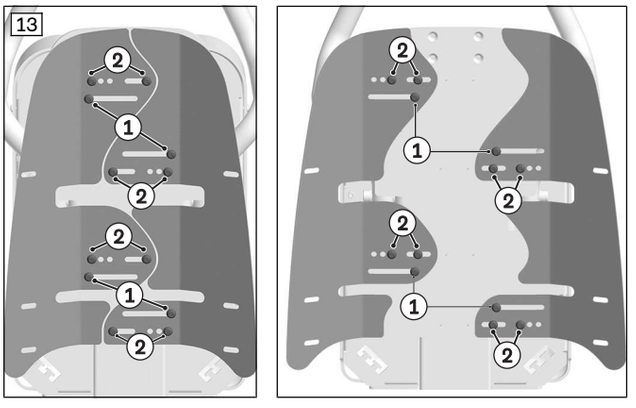


Adjusting the back support width

1) Slightly loosen the hexagon socket screws on the wide slotted holes on each back plate (see fig. 13, item 1).
2) Loosen and remove the hexagon socket screws in the narrow slotted holes and bores on each back plate (see fig. 13, item 2).
3) Adjust the width of the back plates symmetrically along the wide slotted holes on both sides (see fig. 13, item 1).
4) Reinsert the removed hexagon socket screws (see fig. 13, item 2).
5) Firmly retighten all hexagon socket screws to a **maximum of 3 Nm**.

6.2.7 Adjusting the leg supports

⚠ CAUTION

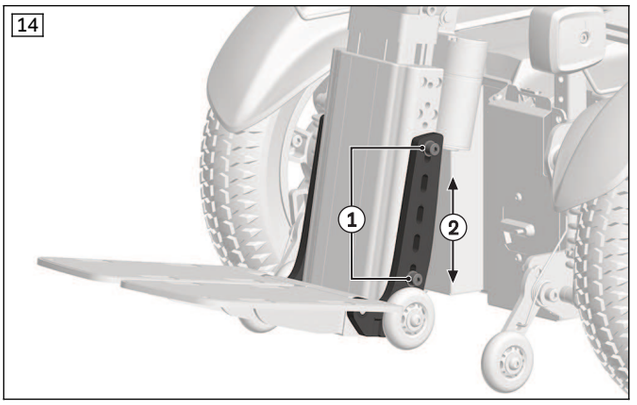
Improper adjustment of the leg support and foot plate

Risk of injuries due to uncontrolled driving behaviour, damage to the product

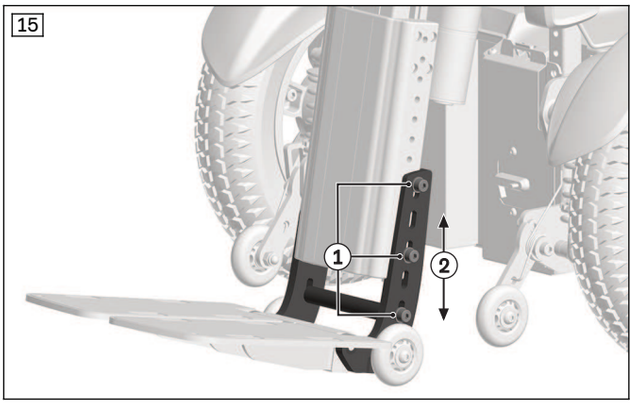
- ► Make sure that the leg support does not come into contact with uneven road surfaces while driving.
- ► Make sure that the clearance between the foot plate and ground is sufficient even under load.
- ► Make sure that the leg support and foot plate cannot come into contact with parts of the wheelchair even under load.

The height of the foot plate (adjusting the lower leg length), the angle of the foot plate, the calf pad and the knee pad can be adapted to the needs of the user.

14

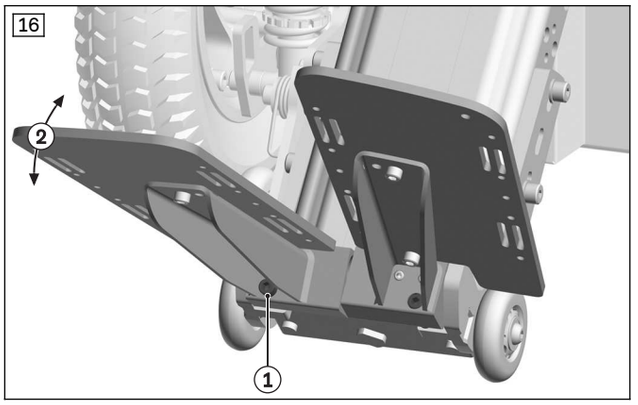


15



Adjusting the lower leg length

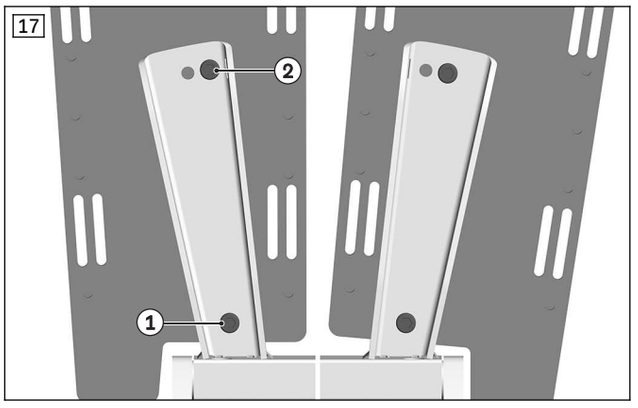
1) **Optional:** Set the power seat tilt to **0°** and the seat height adjustment to **0 mm**.
2) Adjust the leg support to the angle that the user prefers for driving (**70° to 90°** between the leg support and seat).
3) **Short variant:** Loosen the hexagon socket screws on the left and right sides of the perforated plates of the height adjustment (see fig. 14, item 1).
   Long variant: Loosen the hexagon socket screws on the left and right sides of the perforated plates of the height adjustment and the connecting piece (see fig. 15, item 1).
4) Slide the perforated plates in the slotted holes to the desired position (see fig. 14, item 2); see fig. 15, item 2).
   CAUTION! Observe the distance to the floor. The underside of the foot plates must be at least 50 mm from the floor when under load.
5) **If necessary:** Remove the hexagon socket screws (see fig. 14, item 1; see fig. 15, item 1) and move the perforated plates to the desired position. Tighten the hexagon socket screws on the perforated plate again.
   Long variant: Install the connection piece as well.
   CAUTION! Observe the distance to the floor. The underside of the foot plates must be at least 50 mm from the floor when under load.
6) Tighten all hexagon socket screws to **15 Nm**.
7) Make sure that the leg support does not touch the ground when adjusting the leg support angle.
   → Use the combined power seat function to move the leg support (leg support angle with length adjustment). Only actuate the input device carefully and stop the movement in good time before there is a risk of collision.
   → If the leg support touches the floor, calibrate the control device to the new distance to the floor (see page 44).
8) **Optional:** Check the pre-programmed seat positions with the seat tilted forwards (anterior positions, letter “A”) and adjust them to the new lower leg length.
   → Always save position **A2** again (Programmable seat positions (memory function)). It is designed so that the rollers of the foot plate slightly touch the floor to facilitate getting in and out of the wheelchair.
   → Check positions **A3** and **A5** and save them again if necessary. The leg support must not collide with the chassis or the floor when driving from driving position M1. When approaching the positions, stop the movement in good time before there is a risk of collision. If a collision is imminent, save positions **A3** and **A5** again (Programmable seat positions (memory function)).



Adjusting the foot plate angle

The angle of the foot plates can be changed by **±5°** by adjusting the set screws above the stops.

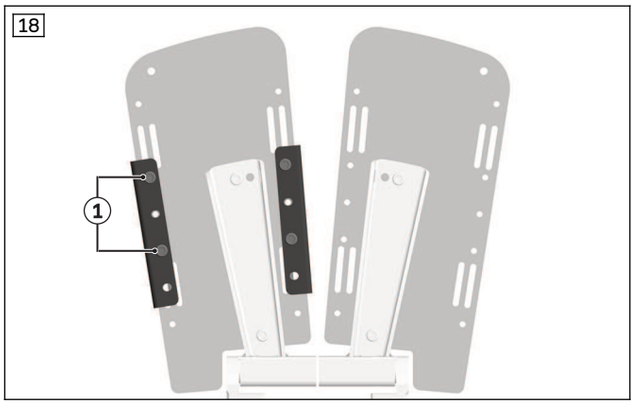
1) Fold the foot plates up so it is easier to work under them.
2) On each foot plate, turn the set screw further in or out above the stop (see fig. 16, item 1).
3) Set the set screw so that the foot plate reaches the desired angle after being folded down (see fig. 16, item 2).



Adjusting the exterior rotation of the foot plate

The exterior rotation of the foot plate can be set to 2 positions.

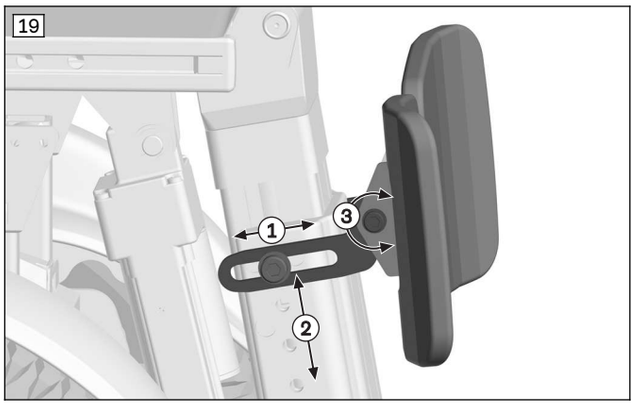
1) Fold the foot plates up so it is easier to work under them.
2) Loosen the lower hexagon socket screw on the foot plate bracket (see fig. 17, item 1).
3) Loosen and remove the upper hexagon socket screw on the foot plate bracket (see fig. 17, item 2).
4) Turn the foot plate slightly inwards or outwards and secure it with the hexagon socket screw in one of the holes.
5) Tighten the hexagon socket screws to a **maximum of 5 Nm**.



Optional: Adjusting the lateral foot guide

The depth position of the foot guide can be adjusted on the long foot plate.

1) Fold the foot plates up so it is easier to work under them.
2) Loosen the hexagon socket screws on the foot guide and remove the foot guide (see fig. 18, item 1).
3) Install the foot guide in the existing holes on the foot plate using at least 2 hexagon socket screws (see fig. 18, item 1). Always use the outer holes for assembly.
4) Tighten the hexagon socket screws to a **maximum of 5 Nm**.



Optional: Adjusting the calf pad

The height, depth and angle of the calf pad can be adjusted.

1) **Depth adjustment:** Loosen the hexagon socket screw on the calf pad adjuster and adjust the depth (see fig. 19, item 1).
2) **Height adjustment:** Loosen and remove the hexagon socket screw on the calf pad adjuster. Adjust the height of the calf pads and reinstall them (see fig. 19, item 2).
3) **Angle adjustment:** Loosen the hexagon socket screw for the angle adjustment and set the desired angle of the calf pad (see fig. 19, item 3).

4) Tighten the hexagon socket screws as follows:
   → Item 1⁄2: **15 Nm**.
   → Item 3: **5 Nm**.

6.2.8 Adjusting the lateral supports for the thigh

The position of the lateral support can be adapted to the requirements of the user in several axes.
Detailed information regarding use, maintenance and repair can be found in the included instructions for use.

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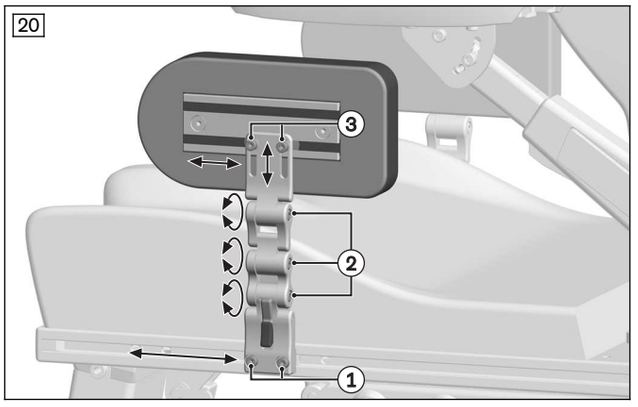

Adjusting the holder position

1) Loosen the hexagon socket screws on the holder (see fig. 20,item 1).
2) Slide the holder to the desired position.
3) Retighten the hexagon socket screws (see fig. 20, item 1).

Adjusting the position of the lateral support

1) Slightly loosen the hexagon socket screws on the joints of the holder (see fig. 20, item 2).
2) Set the desired angle.
3) Retighten the hexagon socket screws (see fig. 20, item 2).
4) **If necessary:** Slightly loosen the hexagon socket screws on the pad (see fig. 20, item 3).
5) Slide the pad to the desired position.
6) Firmly retighten the hexagon socket screws but do not over-tighten them (see fig. 20, item 3).

6.3 Adjusting the control modules

6.3.1 Adjusting the position of the hand module

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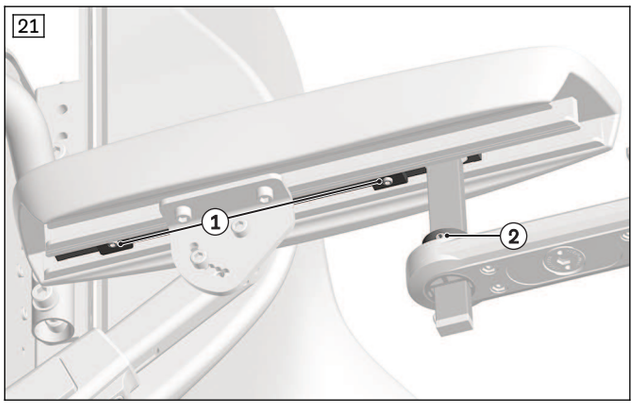

Adjusting the depth of the hand module

1) Loosen the set screws on the bottom of the forearm support (see fig. 21, item 1).
2) Slide the rectangular tube forwards or backwards with the hand module.
   INFORMATION: If the rectangular tube is too long, it can be shortened.
3) Tighten the set screws on the bottom of the forearm support.

Adjusting the height of the hand module

1) Loosen the set screw on the height adjustment (see fig. 21, item 2).
2) Adjust the height.
3) Tighten the set screw on the height adjustment.

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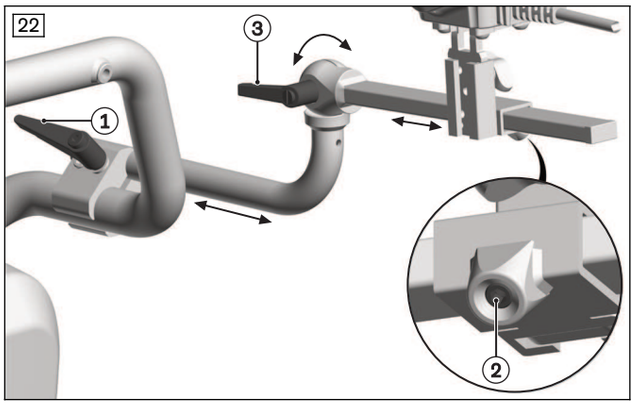


Adjusting the depth of the holder on the back support

1) Release the clamping lever on the back support (see fig. 22, item1).
2) Slide the holder forwards or backwards.
3) Close the clamping lever again.
   NOTICE! Make sure components do not collide (such as the clamping lever and back cover) when the back support angle and the automatic length adjustment are adjusted.
4) **If necessary:** Loosen the set screw on the module adapter (see fig. 22, item 2).

5) Slide the module on the holder forwards or backwards.
6) Tighten the set screw on the module adapter.

Adjusting the angle of the holder

1) Release the clamping lever on the rotation joint (see fig. 22, item 3).
2) Set the angle.
3) Close the clamping lever again.

6.3.2 Changing the installation side of control modules

The hand module or other control modules are installed on the ordered side as standard. They can also be mounted on the other side of the wheelchair later on if the user so desires. As with the position adjustment, the holder can be loosened for this purpose and removed together with the control module.

1) Switch the control device off.
2) Note the original cable routing of the control module along the wheelchair.
3) Loosen the holder of the control module in the original installation location and attach it on the other side in the same manner.
4) Install and attach the cables on the other side in the same way as they were installed at the factory.
5) Switch on the control device and perform a functional test.

6.4 Adjusting the belt length

6.4.1 Safety instructions

⚠ CAUTION

Incorrect approach to the adjustment process

Injuries, malpositions, user discomfort due to adjustment errors

- ► The qualified personnel is responsible for the individual positioning and fitting of the belt system.
- ► Adjusting the belt system too tightly may lead to unnecessary pain or user discomfort.
- ► Adjusting the belt system too loosely can cause the user to slide into a dangerous position. In addition, the fastening snaps could open unintentionally if they slide against hard parts of clothing (e.g. buttons).

⚠ CAUTION

Lack of instruction

Injuries, malpositions, illness of the user due to incorrect information

- ► The qualified personnel is responsible for making sure that the user and/or attendant/nursing staff has understood the proper adjustment, use, maintenance and care of the belt system.
- ► In particular, ensure that the user and/or attendant/care staff knows how to quickly loosen and open the product to avoid delays in case of emergency.

6.4.2 Adjusting the lap belt

Notes on the correct positioning of the user in the seat/seating system and on adjusting and applying the lap belt are found in the instructions for use (user) for this power wheelchair.

7 Adjusting control device parameters

7.1 Programming the product

⚠ WARNING

Incorrect configuration of the control device

Falling, tipping over, collision due to incorrect parameter settings

- ► Please note that modified parameter settings lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable driving characteristics and cause an accident.
- ► Note that modified power seat function settings may lead to collisions or impairment of user comfort.
- ► The parameter settings of the control device may only be changed by qualified personnel. The manufacturer of the product and the control device manufacturer are not liable in case of damage caused by parameter settings that were incorrectly configured or not adjusted properly according to the user's abilities.
- ► The user must test the driving characteristics of the product under the supervision of the qualified personnel each time after parameter settings are changed.

INFORMATION

Information on operation and troubleshooting of the wheelchair control unit can be found in the instructions for use (user).

- If necessary, the pre-programmed wheelchair control device can be adapted to the user's specific needs.
- The ECON adjustment software must be used in order to adjust the control device parameters (see the next section).
- Further information on possible parameter settings can be found in the document "Manual enAble® X1 – Power Wheelchair Control System" from Curtis, the control device manufacturer. It can be requested from Ottobock Service (see for addresses www.ottobock.com).

Special features during programming

The following special features of the control device must be observed during programming and adjustment:

- All digital input commands (e.g. keystrokes) are debounced with a time of **40 ms**. This means that an input command must be available for at least this debounce time so that it can be detected by the control device and processed further. Shorter input commands are ignored by the control device. The pre-set debounce time cannot be changed by the qualified personnel.
- Certain changes to the settings only take effect if the control device is restarted with the [on/off] button. This applies in particular to the calibration functions of the actuators and changes to restrictions in the seat configuration.

7.2 Programming accessories

7.2.1 General

INFORMATION

- ► Ottobock training is required to use the ECON adjustment software. Here you will learn how to use the adjustment software.
- ► Participation in a training course is also required in order to obtain the software for installation on the device you are using.
- ► You also need an account on the internet platform www.myottobock.com in order to log into the adjustment software.

The ECON adjustment software enables programming of the wheelchair control device. The following variants of the adjustment software are offered:

- ECON-W – version for Windows PC
- ECON-I – version for iOS devices

The installation, connecting the ECON software to the power wheelchair and the menu functions of the software are explained below.

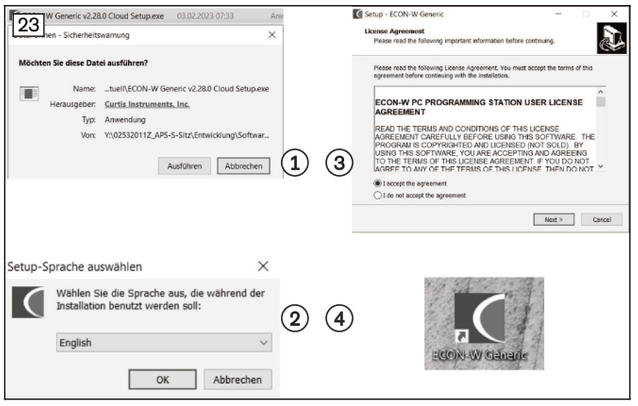
Further information regarding programming can be found in the document "Manual enAble® X1 – Power Wheelchair Control System" from Curtis, the control device manufacturer. It can be requested from Ottobock Service (see for addresses www.ottobock.com).

7.2.2 ECON software: Installing and connecting to a device

INFORMATION

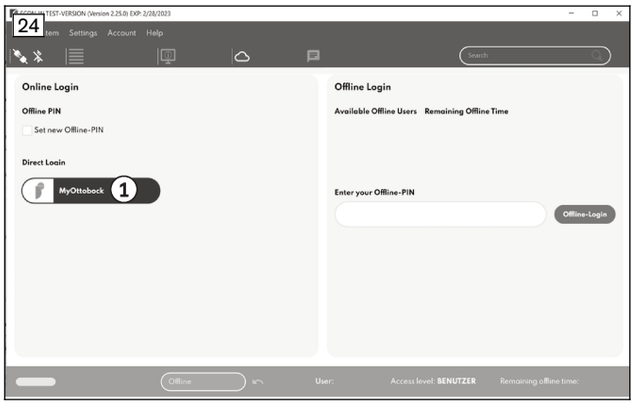
The ECON software must be installed on the PC with administrator rights.

The following steps are required to start the ECON programming software (PC example):



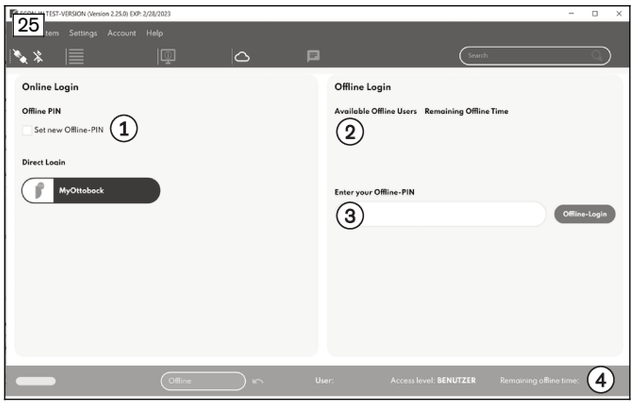
Installing the ECON software

1) Download the “ECON…Setup.exe” software to the device you are using (e.g. a PC).
2) Install the ECON software on the device in the usual way:
   → Click on the “ECON…Setup.exe” software (see fig. 23, item 1).
   → Select the setup language (see fig. 23, item 2).
   → Accept the licence agreement (see fig. 23, item 3).
   → Select the default destination folder and start menu folder.
   → Click “Install”.



ECON online login

1) Start the ECON software (see fig. 23, item 4).
2) Click “MyOttobock” (see fig. 24, item 1) and log in (not illustrated).
3) Click OK to confirm the login in the ECON software. The software is ready to use.
   INFORMATION: If the ECON software is not used online for 30 days, access must be confirmed again under “MyOttobock”.
4) Connect the software to the power wheelchair via Bluetooth or cable: see the corresponding section below.



Using ECON offline

1) Start the ECON software (see fig. 23, item 4).
2) Tick “Set new Offline-PIN” (see fig. 25, item 1).
3) Enter the 4-digit offline PIN you have selected in the fields that open.
4) Click “MyOttobock” to save the offline PIN and log in.
5) Close and open the ECON software again.
6) Tick the offline login option (see fig. 25, item 2).
7) Enter the offline PIN and confirm with “Offline login” (see fig. 25, item 3). The software is ready to use.
   INFORMATION: The offline PIN timer must be reset every 30 days. This requires logging into “MyOttobock”. The remaining time is displayed next to the offline PIN and at the bottom right when you log in (see fig. 25, item 4).
8) Connect the software to the power wheelchair via Bluetooth or cable: see below.

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Connecting the power wheelchair to the ECON software via cable

1) Start the ECON software: see above.
2) Insert the ECON-W USB adapter into the XLR charging/programming port on the side of the hand module (see fig. 26, item 1).
3) Plug the ECON-W USB adapter into the USB port on the PC (not illustrated).
   INFORMATION: The drivers for the adapter are automatically installed.
4) In the function bar of the ECON software, click on the menu item “Connect with CAN” (see fig. 26, item 2).
5) The connection is established. Programming with the ECON software is now possible.

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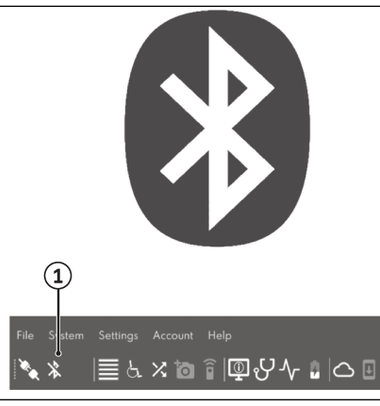


Connecting the power wheelchair to the ECON software via Bluetooth

1) Start the ECON software: see above.
2) In the hand module or LCD module, go to “Bluetooth” in the adjustment functions area (see the table below).
3) Follow the next steps in the table below.
4) In the function bar of the ECON software, click on the menu item “Connect with Bluetooth” (see fig. 27, item 1).
5) The connection is established. Programming with the ECON software is now possible.

Bluetooth link between wheelchair control device and PC

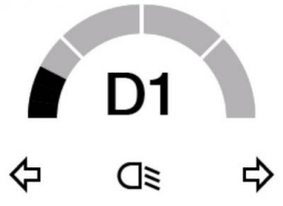
In order for a PC/mobile phone to establish the Bluetooth connection to the wheelchair control device, the Bluetooth function must first be activated on the wheelchair control device (see below).

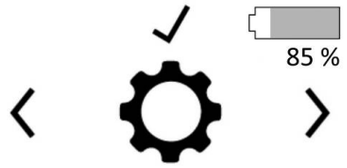
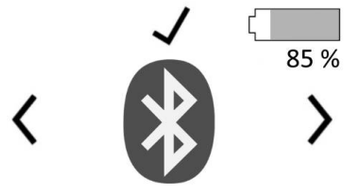
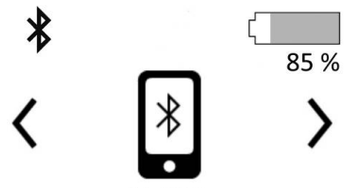
Following this, the Bluetooth function must be activated on the PC/mobile phone (see below).

During the pairing process, the Bluetooth ID with the suffix Chair-XXXX appears on the separate input device (see below).

As soon as the pairing has been established once, the PC or mobile phone will find the wheelchair control device the next time while the Bluetooth function is activated.

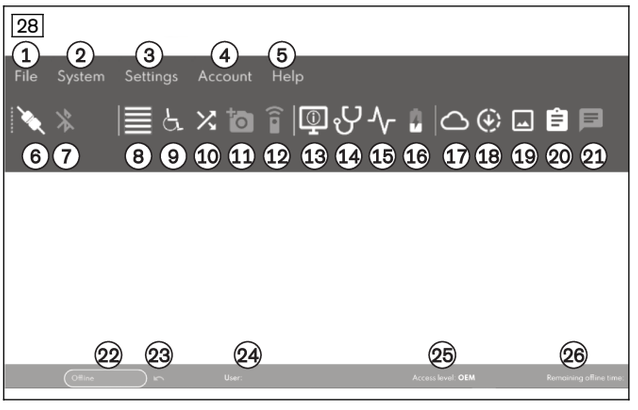
Bluetooth pairing between hand module and PC/mobile phone for the first time

Display	Action[1]	Effect
	**Variant 1 (home screen):** joystick/input device left	Switches to the “Auxiliary” section
	**Variant 2:** press [Mode] button multiple times	Switches to the “Auxiliary” section

Display	Action[1]	Effect
	Joystick/input device to left/right	Switches to the “Bluetooth” sub-function
	Joystick/input device forwards	When the tick appears above the Bluetooth symbol, Bluetooth is activated on the wheelchair control device. Accesses pairing function 1 in the “Bluetooth Pairing” section
	Before the joystick is moved again, Bluetooth pairing must be started on the separate device (PC/mobile phone): 1) For the exact Bluetooth pairing procedure, search for “Pairing a Bluetooth device in Windows/…Android/…iOS” online. 2) Carry out the pairing process step by step. 3) During the pairing process, the Bluetooth ID will appear on the separate device (PC/mobile phone) followed by Chair-XXXX: confirm the pairing on the separate device.	A PIN is displayed on the hand module as soon as the initial pairing is confirmed on the separate device. **Notice:** If pairing has already taken place, instead of a PIN, a screen will appear for the user to accept the connection (not shown).
	Forwards: confirms PIN Backwards: cancels the process **Notice:** If pairing has already taken place, the connection will be accepted here (not shown).	**Note:** Once the Bluetooth PIN is confirmed, the hand module and separate device are paired. Programming with the ECON software is now possible.

[1] The direction of movement of the joystick/input device can be adjusted by qualified personnel.

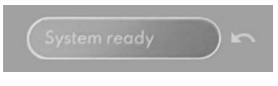
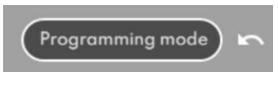
7.2.3 ECON software: menu structure

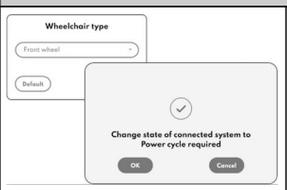


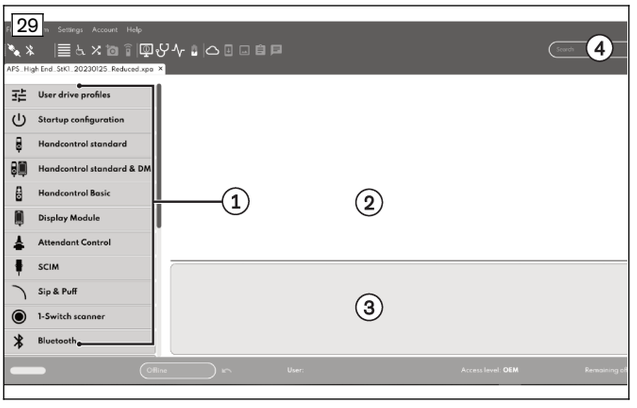
ECON software – start menu

The following overview provides a rough guide to the ECON software interface. Details are provided in the training information/instructions from the manufacturer Ottobock.

Depending on the permissions of the logged in user and product features, not all functions may be available. For further information on the scope of functions, contact the manufacturer’s service department.

	Function
①	**”File”:** opening parameter files from the PC, saving parameter files on the PC, exporting parameter files, background information on records, closing the software
②	**”System”:** Selecting the connection type of the adjustment software to the wheelchair control device, loading the XPA data into the control device (according to access level or higher), setting the system time **“System configuration”**: loading factory settings, saving/loading own parameter sets
③	**”Settings”:** setting the language of the software interface, setting the XPA language, enabling the display of all parameters, enabling online updates, enabling firmware updates, enabling patch mode
④	**”Account”:** renewing the login, calling up the account details, setting the access level (e.g. ”User”, ”Dealer”, ”OEM”)
⑤	**”Help”:** starting the web update of the software, information about the version type and version number
⑥	Establishing a connection to the power wheelchair – a cable connection between the hand module and the device with ECON software is required
⑦	Establishing a connection to the power wheelchair via Bluetooth – an established Bluetooth connection is required (pairing)
⑧	Parameter settings – displaying the list of parameters (see fig. 29, item 1)
⑨	Accessing seat configuration settings
⑩	Calling up push-button module settings and “Mapped I/O” (assignment of functions to digital inputs)
⑪	Photo album
⑫	Infrared control
⑬	Overview of the installed devices for the ICON control device (device list)
⑭	Displaying the error list (continuous) and displaying current error messages
⑮	Calling up monitoring functions of individual hardware components of the ICON control device and connected external control devices
⑯	Displaying battery statistics
⑰	Accessing the Curtis cloud website (not relevant)
⑱	Updating the firmware of the control device and the ECON adjustment software
⑲	Remote display of the LCD screen of the hand module or LCD module
⑳	Calling up the log of changes made
㉑	”Remote Chat”
㉒	Status display of the software (e.g. ”Offline”, “System ready”, “Programming mode”, “Powercycle required”)
㉒		**”Offline” (not connected)** (grey background) Software is not connected to the control device, data cannot be saved in the control device
		**”System ready”** (grey background) Normal mode, parameter changes are saved directly in the control device, wheelchair is operational
		**”Programming mode”** (green background) Appears when saving changes to the ICON push-button module, when changes are made to the inputs/outputs of the control modules and when changes are made to the seat configuration Press in the window to save or discard. The wheelchair is locked. The display changes from “System ready” to “Programming mode” when saving.
		**”Power cycle required”** (yellow background) Appears when parameters of the wheelchair hardware are saved (e.g. motor parameters, chassis type); control device switches off during saving; data is transferred to the control device; restart of the control device required

	Function	
㉒		To save or discard, press “OK” or “Cancel” in the window (see illustration on the left). The display changes from “System ready” to “Power cycle required” when saving.
㉓	Button for switching from “Programming mode” to “System ready” mode	
㉔	Displaying the user name of the logged-in user	
㉕	Displaying the set access level (e.g. “Dealer”, “OEM”)	
㉖	Displaying the remaining time during which an “Offline Login” is possible (a new login via myOttobock resets the timer)	



ECON software – configuring parameters

The following overview briefly presents the adjustable sets of parameters in the ECON software (see also the table below).

Detailed content is provided in the training information/instructions from the manufacturer, Ottobock.

	Function
①	Adjustable parameter groups (see next table) By default, only the parameter groups of the components that are actually installed in the system are displayed. If required, all parameter groups can also be displayed via the “Settings” menu. The “Show all parameters” parameter is used for this purpose.
②	Field for parameters; display of adjustable parameters
③	When the parameters from item 1 are clicked on, background information on all adjustable parameters is displayed on the field with a grey background
④	Search box for searching for entries under item 1

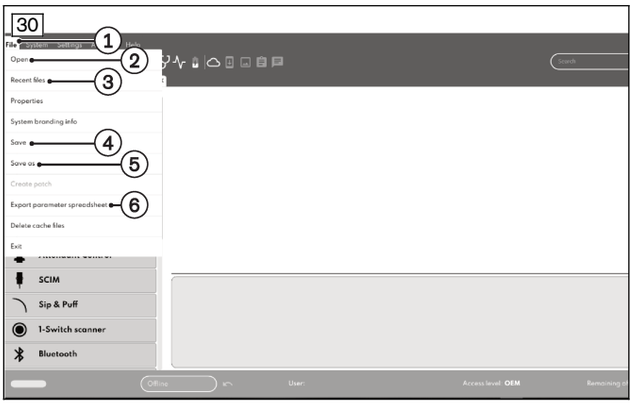
Adjustable parameter groups (see fig. 29, item 1)

Parameter group	Function
”User drive profiles”	Basic settings for the 4 possible driving profiles (Drive 1, Drive 2, etc.) with the respective speeds and acceleration for forward motion and rotation. In addition, settings for profile displays (symbols, name or number) and activation of latch driving mode (“Latch Driving”).
”Startup configuration”	Settings for the basic startup behaviour. Which input device should be selected when the control device is switched on (e.g. hand module, special control module). This can be done, for example, by specifying the standard input device and start menu after switching on.
”Handcontrol standard”	All settings that affect the standard hand module (HCS) (including joystick adjustments, button setup [Softkey 1–3], settings for the button [Change softkey functions], settings for “Auto Shutoff” and the functions of the jacks).
”Handcontrol standard & DM”	Similar to the previous menu. However, it is only active if a standard hand module and an LCD module (display module = DM) are connected to the system at the same time. In this case, there are additional adjustment options regarding the LCD module and its button assignment.
”Handcontrol basic”	Similar to the two previous menus. Settings that affect the Hand Module Basic (HCB) are easier to deal with because the hand module has an LED display rather than an LCD dis-

Parameter group	Function
	play, for example. In addition, there are no [Softkey 1–3] / [Change softkey functions] buttons.
”Display module”	Menu is only active if there is only one LCD module in the system. The menu contains the same parameters as the “Handcontrol standard & DM” menu. The “Handcontrol standard & DM” menu is more detailed, since the hand module can also be configured there.
”Secondary adaptive joystick”	For settings that affect the separate “Secondary Adaptive Joystick”. Similar to the Basic hand module (HCB), but this joystick is even simpler and has, for example, even fewer LED displays than the Basic hand module. Normally used in parallel with the special control device in combination with the LCD module.
“Attendant Control” (Be)	For attendant control settings. In principle, the hardware is identical to the “Secondary Adaptive Joystick”. However, both can be adjusted separately, as you may want to connect both joysticks in the system. In principle, it is only possible to switch between two drive profiles and make simple seat adjustments.
”SCIM”	For settings on the ICON AID adapter (SCIM) special control module, the interface for special control devices. The module is required for connecting special joysticks to a Sub-D interface (Movis joystick, mini joystick, etc.). In principle, however, buttons (Piko buttons) can also be connected to the Sub-D interface (with additional adapters).
”Sip & Puff”	For specific settings of the sip and puff control, e.g. puff pressure settings, sip and puff directions, etc.
”1-Switch scanner”	Adjustment of the 1-button control / 1-switch scanner and its specific settings such as scan rate and scan sequence, etc.
“Bluetooth”	Configuration of the Bluetooth pairing and Bluetooth communication.
”Infrared”	Configuration of infrared communication including activation of learning mode.
”Seat”	Settings for the seat memory functions. The operating time counter for the seat functions can also be reset here.
”Environmental Control Module”	Settings for the ICON output module (ECM). This has 5 relay outputs that can be combined in up to 10 functions.
”Reminder”	Reminder triggers can be configured here (e.g. distance travelled, system days or individual user reminders).
“System”	Various adjustments to the hardware parameters of the wheelchair as a system. These include characteristics of the mobility base, motors and battery charger, for example. In addition, the dealer information can be saved here.
“Display”	Adjustment of the information shown on the hand module, LCD module and push-button module (language, brightness, units of measurement etc.). In addition, the meters for the operating time and the distance can be reset here.
“Audio”	Setting for the horn, signal beeps and navigation beeps. Navigation beeps and individual signal beeps can also be activated or deactivated here. Adjustments to the volume and frequency are also possible.
“Light”	Settings for the configuration of the lighting (operating voltage, frequency, etc.).
”Error history”	Option for deleting the error memory.

7.2.4 Saving a parameter set on the PC

The current parameter set of the control device must be saved on the end device used (e.g. PC), stating the serial number, before parameters are changed. After programming is complete, the changed parameter set also has to be saved. The stored parameter sets must be stored in a safe place by the qualified personnel.



ECON software – saving/loading a parameter set on the PC

A parameter set contains the settings/configurations of the control electronics and the parameters and restrictions of the integrated wheelchair hardware (e.g. battery, mobility base, actuators).

The parameter set also contains the error and change memory. The device list is also saved along with it.

A parameter set can be saved on the PC as a backup copy in *.xpa format.

When a parameter set is loaded to the wheelchair control device, the existing settings/configurations are overwritten.

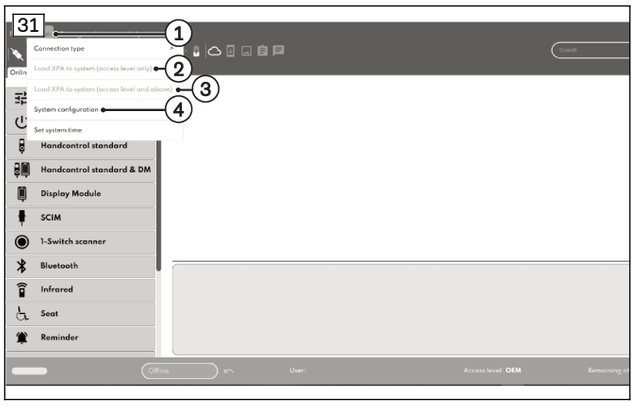
Note: It is possible to select which parameters are to be transmitted. The error memory, change memory and device list are not transmitted.

Saving the parameter set under the file name “CurtisX1_parameters_report.xlsx” creates an overview of all set parameters.

	Description	Function
①	”File”	Opening the submenu
②	”Open”	Opening the file tree for loading the stored parameter files (*.xpa format)
③	”Recent Files”	Displaying the most recently retrieved parameter files (*.xpa format)
④	”Save”	Saving the parameter file that has just been edited (*.xpa format)
⑤	”Save as”	Saving a newly edited parameter file under a new name (*.xpa format)
⑥	”Export parameter spreadsheet”	Saving a parameter overview under the file name “CurtisX1_parameters_report.xlsx”, which contains all set parameters

7.2.5 Saving a parameter set on a control device

If necessary, a complete parameter set can be transferred back to the control device. The following notes and restrictions must be observed.



ECON software – saving a parameter set on a control device

Under the “System” menu item, the parameter set can be transferred from the PC to the control device in *.xpa format. After selecting the tab in the *.xpa file opened on the PC, all system parameters/settings can be individually or completely loaded to the control device.

Various options are available for transferring the parameter set.

	Description	Function
①	“System”	Opening the submenu
②	”Load XPA to system (access level only)“	Uploading the *.xpa file from the PC to the control device Parameters that belong to your own access level (e.g. “Dealer”, “OEM”) are uploaded during this process.
③	”Load XPA to system (access level and above)“	Uploading the *.xpa file from the PC to the control device The parameters of all access levels are uploaded, even those that cannot be seen in a restricted access level.

	Description	Function
④	"System configuration"	Loading factory settings or saving the current configuration; saving parameter sets from the computer to the system memory Different states are then stored in the resulting table, which can be restored later.

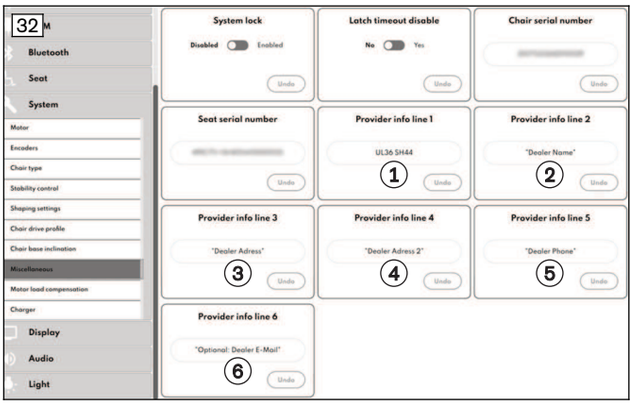
Saving a parameter set (*.xpa file) on the control device is called "cloning". A distinction is made between clonable and non-clonable parameters. Only those parameters that are classified as cloneable are transmitted to the control device from the parameter set.

Non-clonable parameters are e.g. general product information or product-specific calibration values and cannot be transferred to the control device as a parameter set. These parameters can only be changed directly in the online system.

Groups of non-clonable parameters	Parameter examples	Explanation
General product information	Chair/seat serial number* Provider information line 1–6*	The serial numbers and contact information are product-specific and are not changed using parameter sets.
Calibration values	Motor resistance calibrated Actuator ID Status Start/stop* position Travel time extend/retract* Tilt/elevate low/up position* AFP articulation low/up position*	The calibration values for the individual drives and actuators are changed via calibration functions and not via parameter sets.
Memory functions	Actuator 1–8 position* Actuator 1–8 ID* Anterior tilt allowed	The positions of the actuators are saved individually for the individual memory functions and are not changed using parameter sets.

* For a better overview, several similar parameter examples have been combined in one row.

7.2.6 Entering dealer information



Provide dealer information to the control device

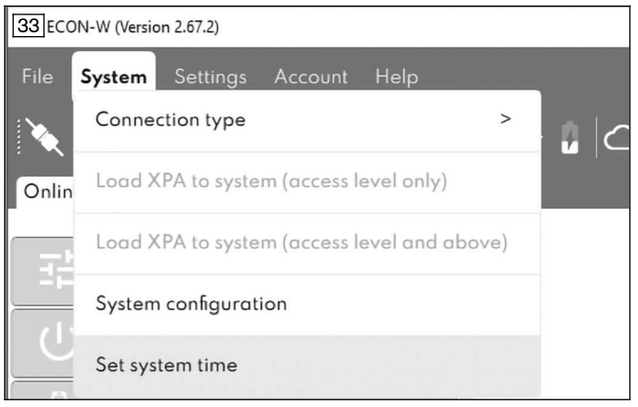
Before handing over the product, the qualified personnel must enter their own contact details and important information on the product configuration in the control device. The following fields are available for these entries in the parameter group **"System" > "Miscellaneous"**:

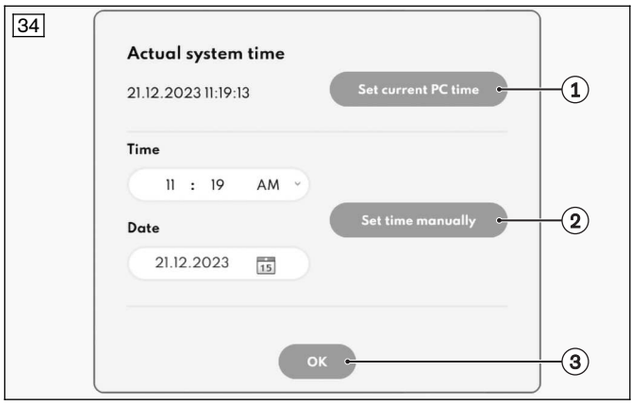
	Description	Function
①	Provider info line 1 (dealer information line 1)	Entering information on the seat geometry (lower leg length and seat height setting, e.g. "UL36 SH44")
②	Provider info line 2 (dealer information line 2)	Entering the name of the specialist dealer
③	Provider info line 3 (dealer information line 3)	Entering the address of the specialist dealer I
④	Provider info line 4 (dealer information line 4)	Entering the address of specialist dealer II
⑤	Provider info line 5 (dealer information line 5)	Entering the telephone number of the specialist dealer

	Description	Function
⑥	Provider info line 6 (dealer information line 6)	Entering the e-mail address of the specialist dealer

7.2.7 Setting the system time

The system time of the control device can be set using the adjustment software. This is particularly necessary if the control device was disconnected from the batteries for an extended period of time, for example during extended storage with the main fuse deactivated.





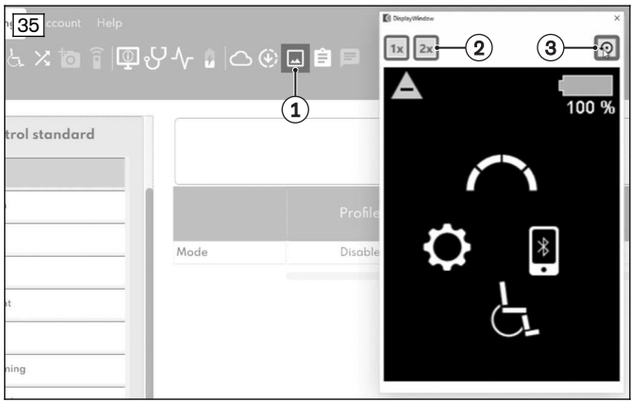
Setting the system time using the ECON adjustment software

1) Connect the ECON adjustment software to the wheelchair control device (via cable or Bluetooth).
2) Open the following menu in the adjustment software:
   → "System" > "Set system time"
3) Set the system time as needed:
   → Press the "Set current PC time" button (1) to transfer the current time of the end device.
   → Press the "Set time manually" button (2) to apply the user-defined time.
   → You can exit the function with the "OK" (3) button.

7.2.8 Auxiliary functions of the adjustment software

The following functions may help in programming the control device or troubleshooting.

7.2.8.1 Remote display



If necessary, the current display of the hand module or an optional LCD module can be displayed directly in the ECON software. This function is particularly useful when accessing the control device remotely.

The illustration shows the display of an LCD module as an example.

	Function
①	This button opens the remote display window.
②	These buttons change the size of the remote display:

	Function
	• **1x:** normal size • **2x:** double size
③	When accessing the control remotely, this button updates the remote display. This button is not relevant if you are connected directly to the controller.

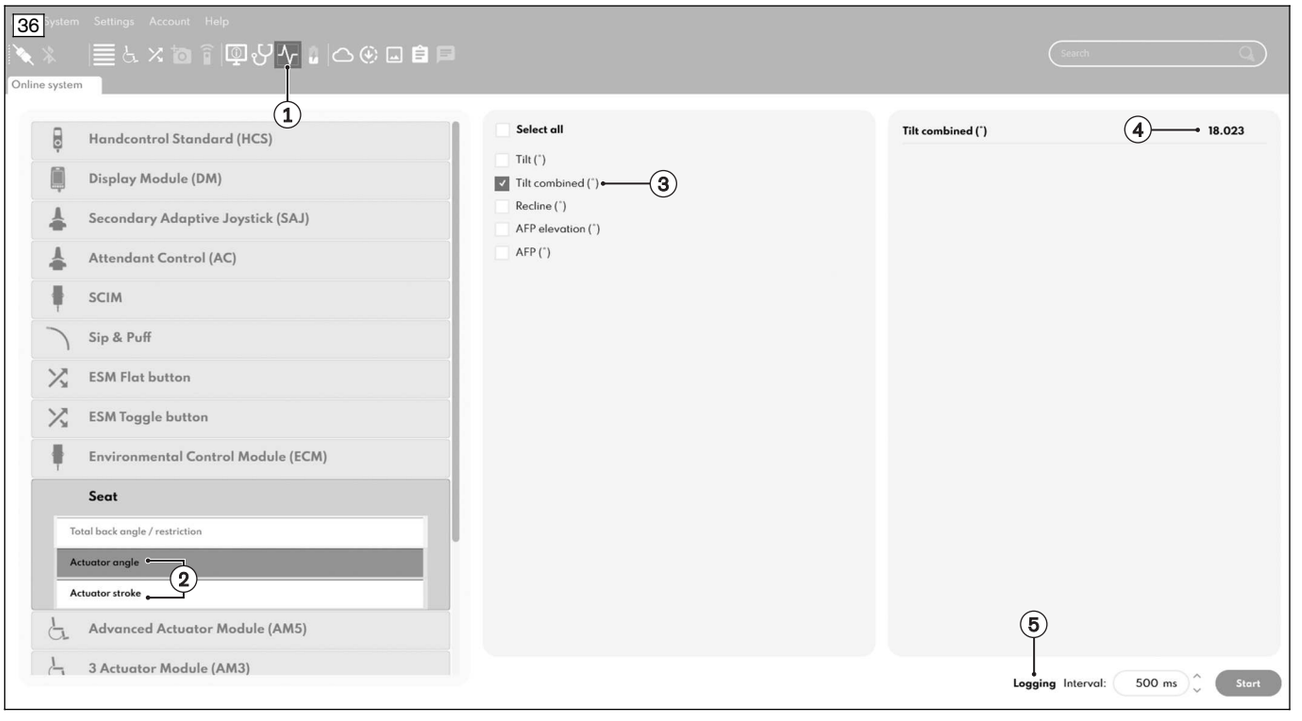
7.2.8.2 Monitoring of actuators, sensors and input signals

If necessary, all sensor values processed by the control unit can be displayed in the ECON software. These include, for example:

- Position of the actuators (adjustment motors), sensors and input devices
- Input signals (e.g. button pressing, joystick deflection…)
- Additional sensor values (e.g. motor current, battery current, battery voltage, …)

The monitoring functions are particularly useful when setting memory positions, troubleshooting or calibration.

Operation of the monitoring functions using the example of seat actuators



	Function
①	This button opens the monitoring functions window.
②	Various monitoring devices are available for the seat actuators, e.g.: • **”Actuator angle”**: display of angle values (e.g. seat tilt) • **”Actuator stroke”**: displays distance values (e.g. seat height adjustment)
③	Use these checkboxes to select the values to be monitored.
④	The selected values appear in this area and are continuously updated.
⑤	If required, the selected values can be logged in tabular form. In this area you can select the interval in which the values are recorded. With the “Start” button the location for the log can be selected and the recording can be started.

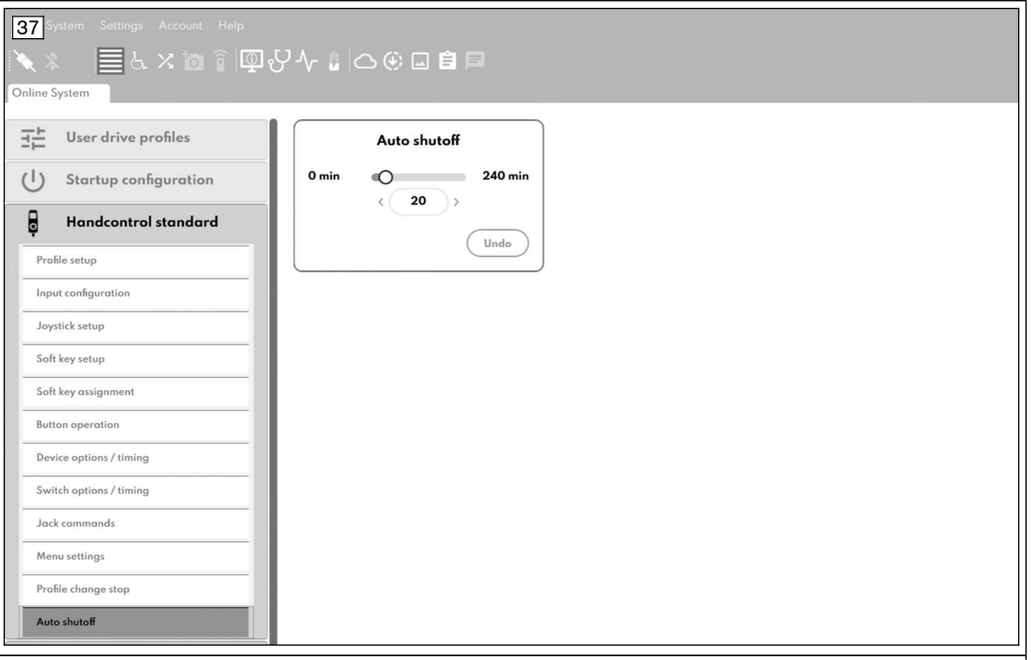
7.3 General parameters

INFORMATION

The following parameters have the same function for a hand module or an LCD module and are found in the parameter group for the respective module. The following images are for example only. By default, only the parameter groups of the components that are actually installed in the system are displayed.

Depending on the product's features, the hand module and LCD module may also be installed together. The described parameters are then in the combined parameter group "Handcontrol standard & DM" (hand module & LCD module).

7.3.1 Setting the automatic switch-off time

Menu	**Parameter settings > Handcontrol standard / Display Module / Handcontrol standard & DM > Auto shutoff**
Screenshot	
Settings	The **"Auto shutoff"** parameter specifies the time that must elapse before the control is shut down after the last input command. This parameter can be used to conserve the capacity of the batteries. A switch-on command by the user causes the control device to be restarted. The automatic shutoff can be deactivated by setting the parameter to "0".

7.3.2 Activating or deactivating signal tones

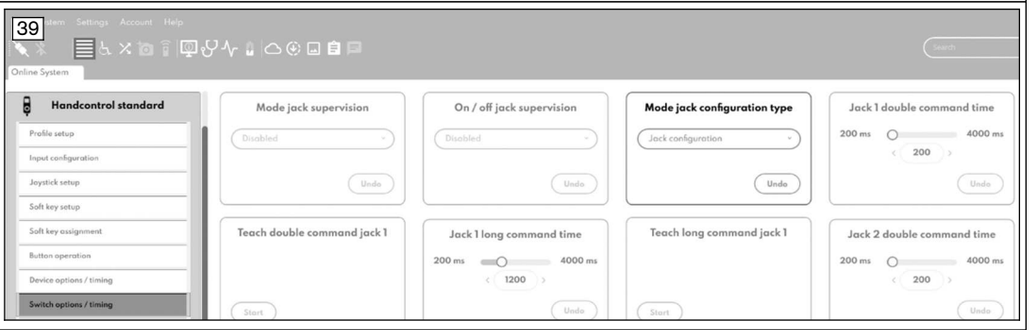
Menu	**Parameter setting > Audio > Beep**

Screenshot	
Settings	The beeps of the control device can be activated or deactivated, e.g. for: • Navigation • Timer runout • Configured reminders • Reaching memory positions • Driving in reverse

7.3.3 Configuring jacks

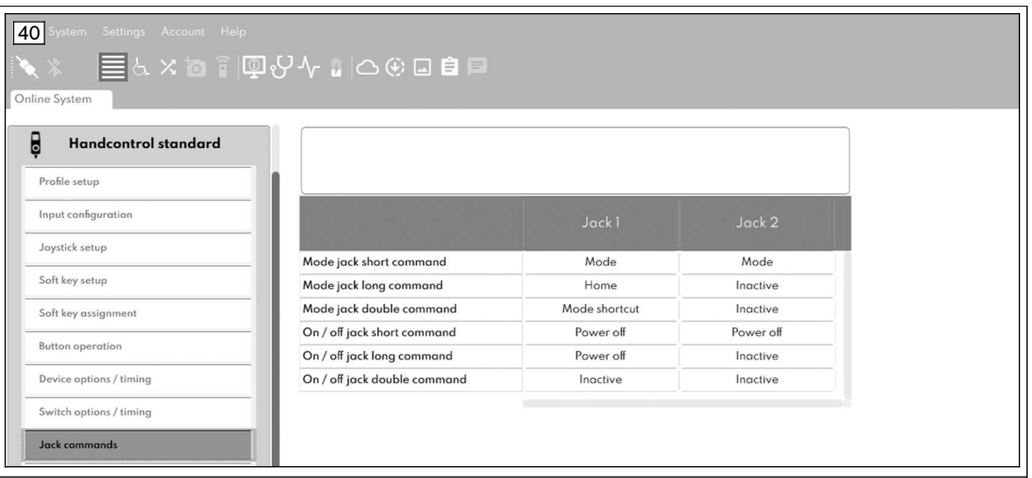
7.3.3.1 Short, long and double commands for external keys

Prerequisite for configuration of the “Mode” jack

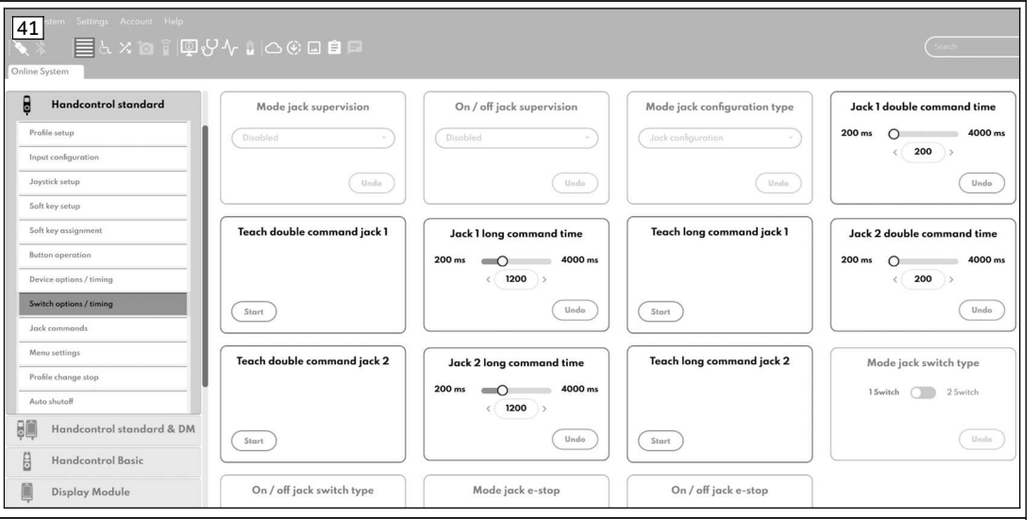
Menu	**Parameter settings > Handcontrol standard / Display Module / Handcontrol standard & DM > Switch options/timing**
Screenshot	
Settings	To configure the “Mode” jack for an external button, the **“Mode jack configuration type”** parameter must be set to **“Jack configuration”**.

Assigning functions for short, long and double commands

Menu	**Parameter settings > Handcontrol standard/Display Module / Handcontrol standard & DM > Jack commands**

Screenshot	
Settings	Three different functions can each be assigned to the two channels of the jacks. The input signals are differentiated by the number and duration of activation (short, long or double command). The following functions are available: • **Mode:** switching between driving profiles, seat menu, settings • **Mode shortcut:** switching between driving, seat menu, settings (without switching through individual driving profiles) • **Power off:** switching off (only available on the jack for the [On/Off] button) • **Home:** switches to the home screen • **Enter lock:** drive-away lock

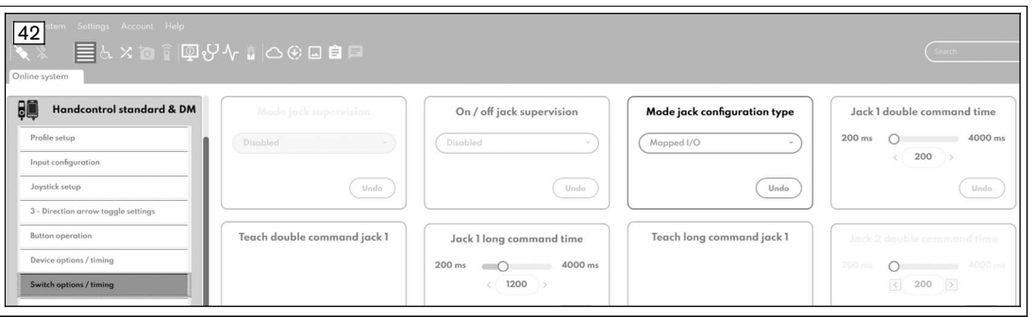
Adjusting times for long and double commands

Menu	**Parameter settings > Handcontrol standard / Display Module / Handcontrol standard & DM > Switch options/timing**
Screenshot	
Settings	The times for double commands (“double command”) and long commands (“long command”) can be entered separately for the 2 channels or taught (“teach”). The specified times apply per channel (Jack 1 or 2) but for both jacks equally.

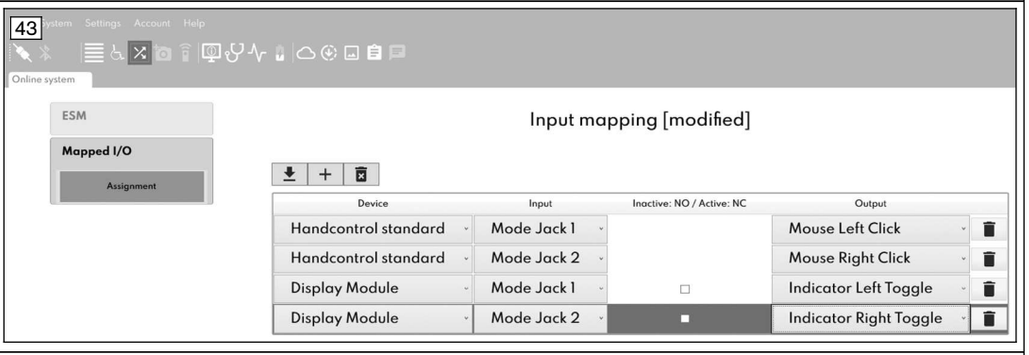
7.3.3.2 Mapped I/O

Prerequisite for configuration of the “Mode” jack

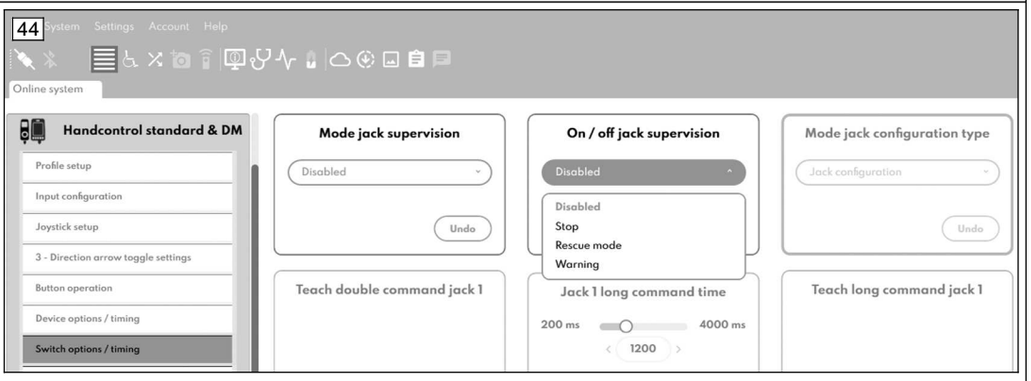
Menu	**Parameter settings > Handcontrol standard / Display Module / Handcontrol standard & DM > Switch options/timing**

Screenshot	
Settings	The 2 channels of the “Mode” jack can be used as inputs for Mapped I/O. For this purpose, the parameter **“Mode jack configuration type”** must be set to“ **Mapped I/O”**.

Configuring mapped I/O

Menu	**Support for illustrated I/O > Mapped I/O > Assignment**
Screenshot	
Settings	The channels Jack 1 and Jack 2 of the “Mode” jack can be used as input for Mapped I/O and then configured accordingly there. Example according to screenshot: • Mouse functions (left/right) via hand module inputs • Direction indicator (left/right) via inputs on the LCD module.

7.3.3.3 Monitoring the jacks

Menu	**Parameter settings > Handcontrol standard / Display Module / Handcontrol standard & DM > Switch options/timing**
Screenshot	
Settings	The two jacks for the [Mode] button and the [On/Off] button can be monitored. This feature is disabled by default. • **”Disabled”:** No actions are taken when the plug is disconnected. • **”Stop”:** When the plug is disconnected, the wheelchair comes into a soft hold and the display shows the following warning: “(device) mode plug disconnected” or “(device) on/off plug disconnected”. It is not possible to drive until the plug is connected again.

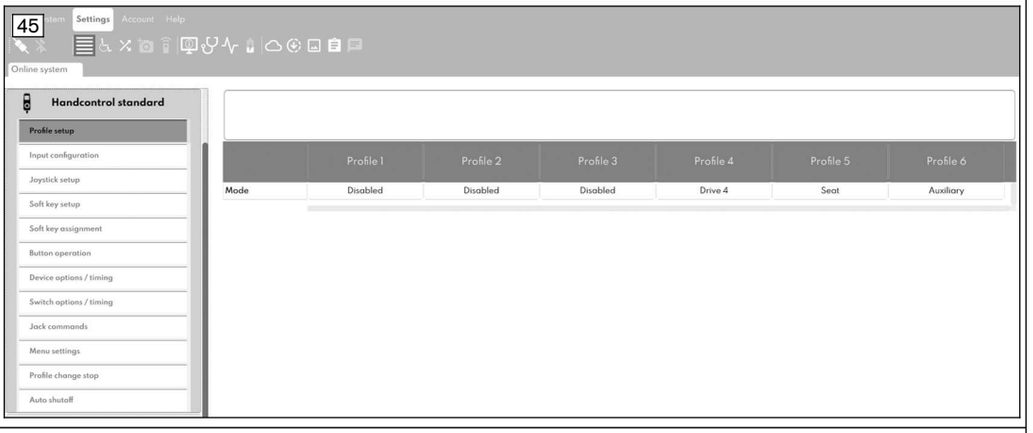
	• **”Rescue Mode”:** When the plug is disconnected, rescue mode of the wheelchair is activated and the display shows the following warning: “(device) mode plug disconnected” or “(device) on/off plug disconnected”. The wheelchair can resume driving at normal speed as soon as the plug is reconnected. • **”Warning”:** When the plug is disconnected, the wheelchair continues driving at normal speed and the display shows the following warning: “(device) mode plug disconnected” or “(device) on/off plug disconnected”.

7.4 ICON hand module or tray module

7.4.1 Adapting the driving characteristics

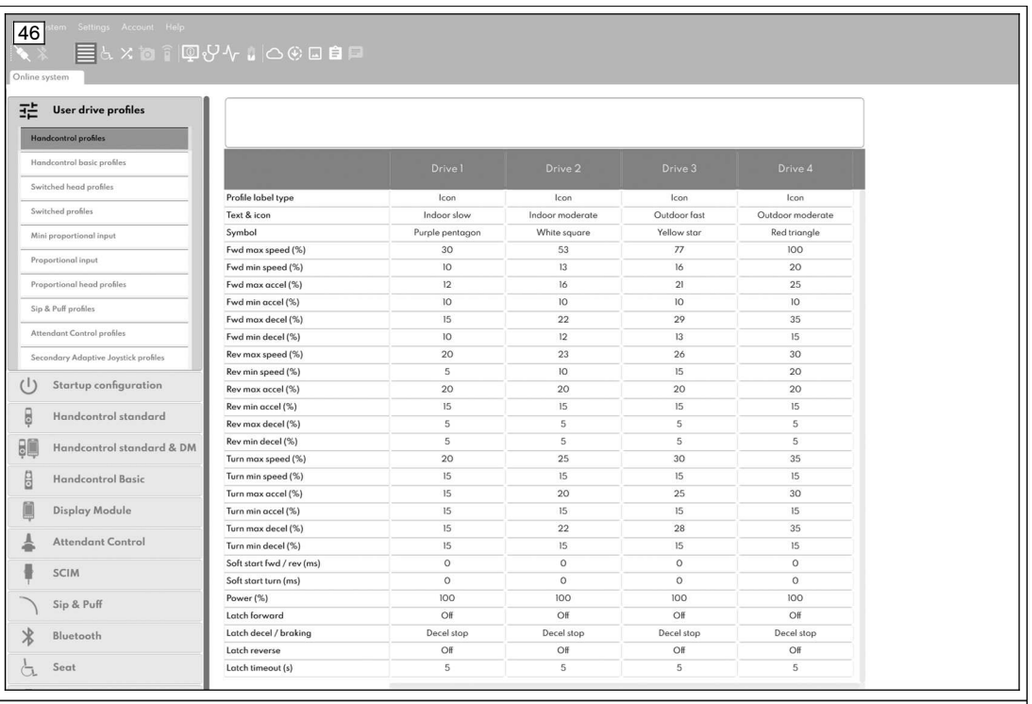
7.4.1.1 Changing driving parameters

Activating or deactivating driving profiles

Menu	**Parameter settings > Handcontrol standard > Profile setup**
Screenshot	
Settings	Up to four driving profiles are available for each category of input devices, which can be individually adjusted. Only the 4th driving profile is activated by default. The other 3 driving profiles can be added as desired. If a tray module is being installed or retrofitted, the **“Charging Detection”** parameter must be set to **“Disabled”**.

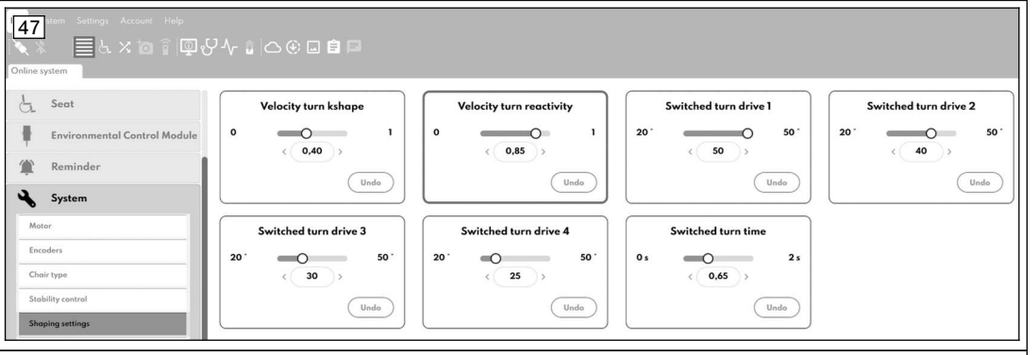
Adapting driving profiles

Menu	**Parameter setting > User drive profiles > Hand control profiles**

Screenshot	
Settings	The following adjustment procedure is recommended: • Adjustment of the acceleration values **in increments of 5 %** in the respective driving profile from the standing position (forward, reverse, turn acceleration) • Adjustment of the deceleration values **in 5 % increments** in the respective driving profile (brake values) while driving (forward, reverse, turning deceleration)

	Drive 1	Drive 2	Drive 3	Drive 4
Profile label type	Icon	Icon	Icon	Icon
Text & icon	Indoor slow	Indoor moderate	Outdoor fast	Outdoor moderate
Symbol	Purple pentagon	White square	Yellow star	Red triangle
Fwd max speed (%)	30	53	77	100
Fwd min speed (%)	10	13	16	20
Fwd max accel (%)	12	16	21	25
Fwd min accel (%)	10	10	10	10
Fwd max decel (%)	15	22	29	35
Fwd min decel (%)	10	12	13	15
Rev max speed (%)	20	23	26	30
Rev min speed (%)	5	10	15	20
Rev max accel (%)	20	20	20	20
Rev min accel (%)	15	15	15	15
Rev max decel (%)	5	5	5	5
Rev min decel (%)	5	5	5	5
Turn max speed (%)	20	25	30	35
Turn min speed (%)	15	15	15	15
Turn max accel (%)	15	20	25	30
Turn min accel (%)	15	15	15	15
Turn max decel (%)	15	22	28	35
Turn min decel (%)	15	15	15	15
Soft start fwd / rev (ms)	0	0	0	0
Soft start turn (ms)	0	0	0	0
Power (%)	100	100	100	100
Latch forward	Off	Off	Off	Off
Latch decel / braking	Decel stop	Decel stop	Decel stop	Decel stop
Latch reverse	Off	Off	Off	Off
Latch timeout (s)	5	5	5	5

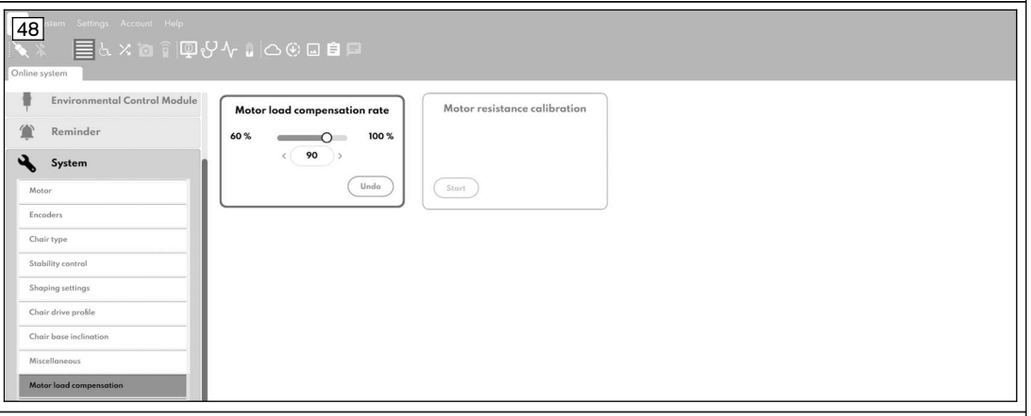
Adjusting parameters for negotiating curves

Menu	**Parameter settings > System > Shaping settings**
Screenshot	
Settings	The parameters for cornering can also be adjusted. To do so, run through a slalom course if possible and adjust the parameters**in increments of 2 %**: • **”Velocity turn kshape”:** This parameter defines the maximum reduction that reduces the speed of the wheelchair on curves. The maximum value 1 corresponds to a factor of 0.5 of the possible driving speed in the direction defined by the “curve speed angle”. Away from this direction, but within the “curve velocity sector”, the reduction runs towards zero. The parameters for the curve speed angle and the sector are pre-set at the factory and can only be adjusted by the manufacturer. • **”Curve speed reactivity”:** This parameter increases the wheelchair’s reactivity to curve commands at higher speeds. The maximum effect is reached when the value 1 is set. The value 0 has no effect. The setting depends on the wheelchair type and the user weight.

Adjusting motor load compensation rate

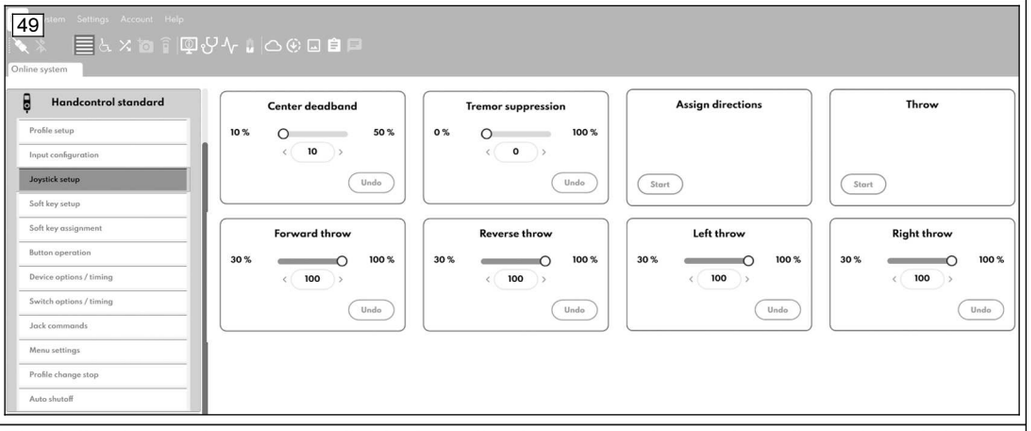
INFORMATION

This setting has a major influence on the wheelchair's driving style. Only change this setting carefully and in small increments (**maximum 2 %**). Make sure you have set the User drive profiles before changing this parameter to achieve the desired driving experience.

Menu	**Parameter settings > System > Motor load compensation**
Screenshot	
Settings	The motor load compensation rate is another way to adjust the wheelchair reactivity. The **"Motor load compensation rate"** parameter selects the percentage of motor load compensation that is applied to the control loop. A reduction of the default value reduces driving response and results in a reduction in curb and incline driving performance. Both scenarios have to be tested after adjusting the parameter.

7.4.2 Adjusting joystick settings

7.4.2.1 Adjusting center deadband, tremor suppression and movement

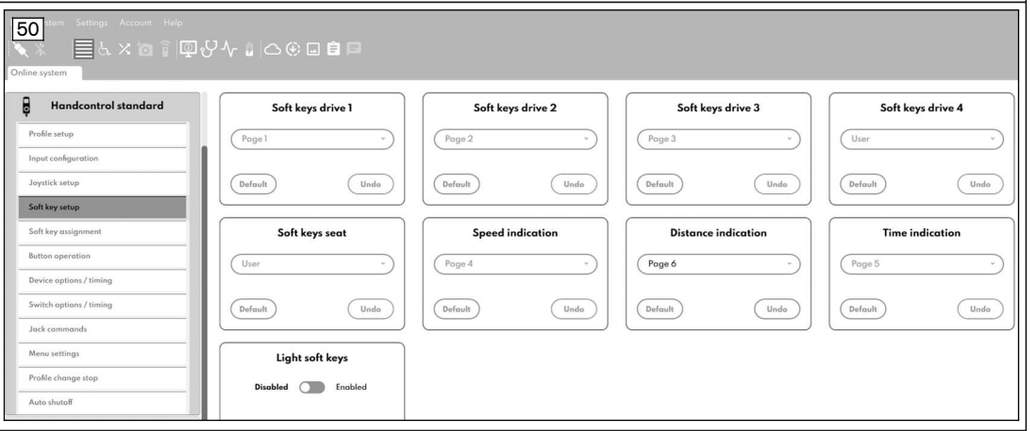
Menu	**Parameter settings > Handcontrol standard > Joystick setup**
Screenshot	
Settings	The following options are available for adjusting the setting and configuration of the joystick: • **"Center deadband":** Specifies how far the input device must be deflected from the center for a command to be recognized by the control. The value corresponds to the diameter of a circle around the center. No driving or menu command is generated as long as the input device is within this circle. Increasing the Center deadband value may be helpful for a user with severe hand tremor. • **"Tremor suppression":** the setting suppresses tremors on the proportional input device. The value can be set from 0 % (no tremor suppression) to 100 % (maximum tremor suppression). If a shortcut is used to operate the control device (e.g. if 3-direction operation is configured for a device), the tremor suppression value should **not beset higher than 90 %**, as shortcuts are otherwise ignored.

	• **“Assign directions”:** this routine can be used to teach the direction of the joystick. • **“Throw”:** The movement of the joystick can be taught using this routine.

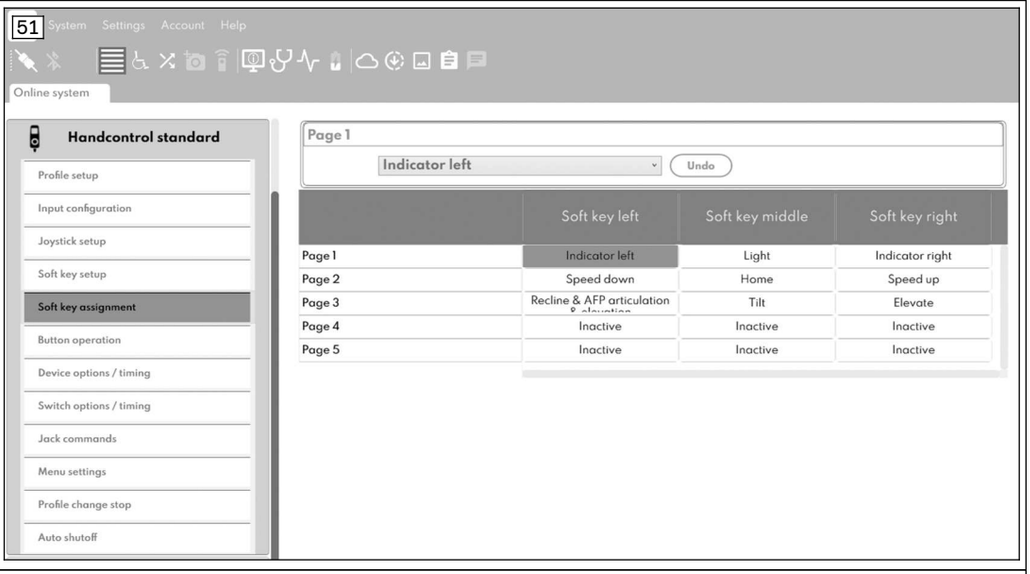
7.4.3 Adapting the function buttons (softkeys)

7.4.3.1 Adjusting settings and assignment of function buttons

Assigning pages for function keys

Menu	**Parameter settings > Handcontrol standard > Soft key setup**
Screenshot	
Settings	The function buttons on the hand module can be configured as desired. For this purpose, the available functions are distributed to different pages: • For the individual driving profiles (“Drive 1, 2, 3, 4”) and the seat menu (“Seat”), the side of the function button assignment that is to be displayed first can be selected. From this page, the user can switch forwards to the subsequent pages ([Change softkey functions] button on the hand module). • For the display of speed (“Speed indication”), time (“Time indication”) and distance (“Distance indication”) separate pages are available, which can either be disabled or assigned to a page. • The remaining pages can be assigned individually.

Assigning functions to the function buttons

Menu	**Parameter settings > Handcontrol standard > Soft key assignment**
Screenshot	
Settings	For pages that are not reserved for displaying speed, time or distance, the 3 function keys can be assigned individually. The default settings offer a meaningful function mapping for most users.

	• If “Inactive” is selected, the item on this page remains blank and the corresponding function key is disabled. • When the seat menu is open, the following function button functions are **not** displayed: – Quick access to seat menu because it is already open – All seat functions since they can be operated directly in the seat menu – Functions to increase or reduce the speed and the speed display because driving is not possible in the seat menu • Only pages configured with at least one active function are displayed to the user. Blank pages (not configured or not displayed) will be skipped.

7.5 Power seat functions

⚠ CAUTION

Incorrect configuration of the control device

Collision, faulty operation and loss of comfort due to improper parameter settings

- ► Note that modified power seat function settings may lead to collisions or impairment of user comfort.
- ► The seat tilt is adjusted exclusively using the **“Tilt combined” function**. It is based on two actuators which are moved at the same time. These two actuators and their individual functions “Tilt” and “Anterior tilt” are concealed in the seat menu for the user and must **not** be enabled.
- ► The back support angle adjustment is based on two synchronised actuators (“Recline” and “Back”). These two actuators and their individual functions “Recline” and “Back” are concealed in the seat menu for the user and must **not** be enabled.
- ► The individual “Recline” and “Back” functions are only temporarily required for certain adjustments by qualified personnel described in this document. Observe all notices in the corresponding sections and do not make any other changes.

7.5.1 Changing the back support length adjustment range of action

The technical pivot point of the back support deviates from the user's anatomical pivot point. This is why a length adjustment actuator is used for the power back support angle adjustment in addition to the angle actuator. It compensates for the resulting parallel offset to the back support surface. In general, the user should be positioned as close as possible to the technical pivot point and therefore to the back support surface. Once adjusted, the length adjustment works best in this position.

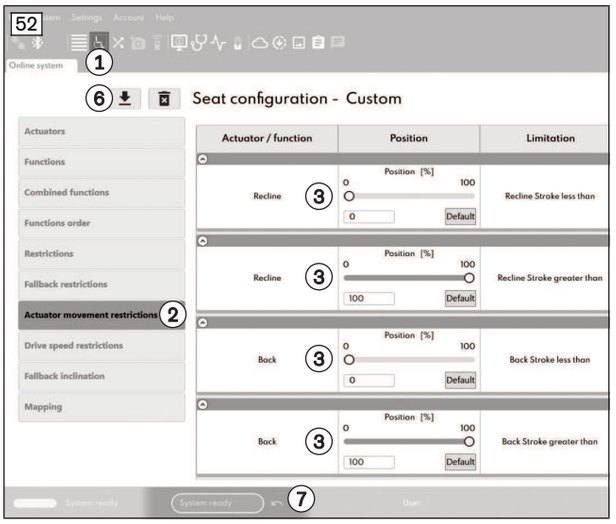
Restrictions can be used to adjust the lower and upper position of the length adjustment and the back support angle. In between, the length adjustment moves linearly relative to the back support angle. This relationship is only permissible for a certain angle range (approx. 55° on average) and dependent on the position of the anatomical pivot point. The standard range is set to 110° –165°. It can be changed by the qualified personnel.

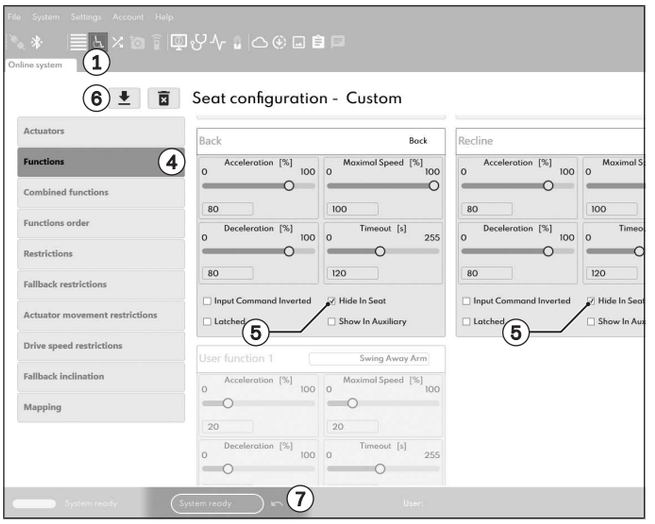
For more information on programmable restrictions: see page 47

Preparing for a change to length adjustment

Before the length adjustment can be set, all power seat functions for the back must be enabled without any restrictions:

1) Call up the seat configuration settings (see fig. 52, item 1).
2) Open the **“Actuator movement restrictions”** group (see fig. 52, item 2).
3) Reset all restrictions for **“Recline”** and **“Back”** (see fig. 52, item 3):
   → Set the respective **“less than”** restriction to **0 %**.
   → Set the respective restriction **“greater than”** to **100 %**.
   → Do **not** change any other restrictions.
4) Open the **“Functions”** group (see fig. 52, item 4).
5) **Deactivate** the **“Hide In Seat”** checkbox in the sections **“Back”** and **“Recline”** (see fig. 52, item 5).
6) Use the button [⬇] to save the settings on the control device (see fig. 52, item 6).
7) Close programming mode (see fig. 52, item 7).
8) Use the [on/off] button to turn the control device off and on again.
   → The changed restrictions are adopted. This process may take a few seconds.
   → The back support and its length adjustment can now be selected and moved independently on the hand module or LCD module.

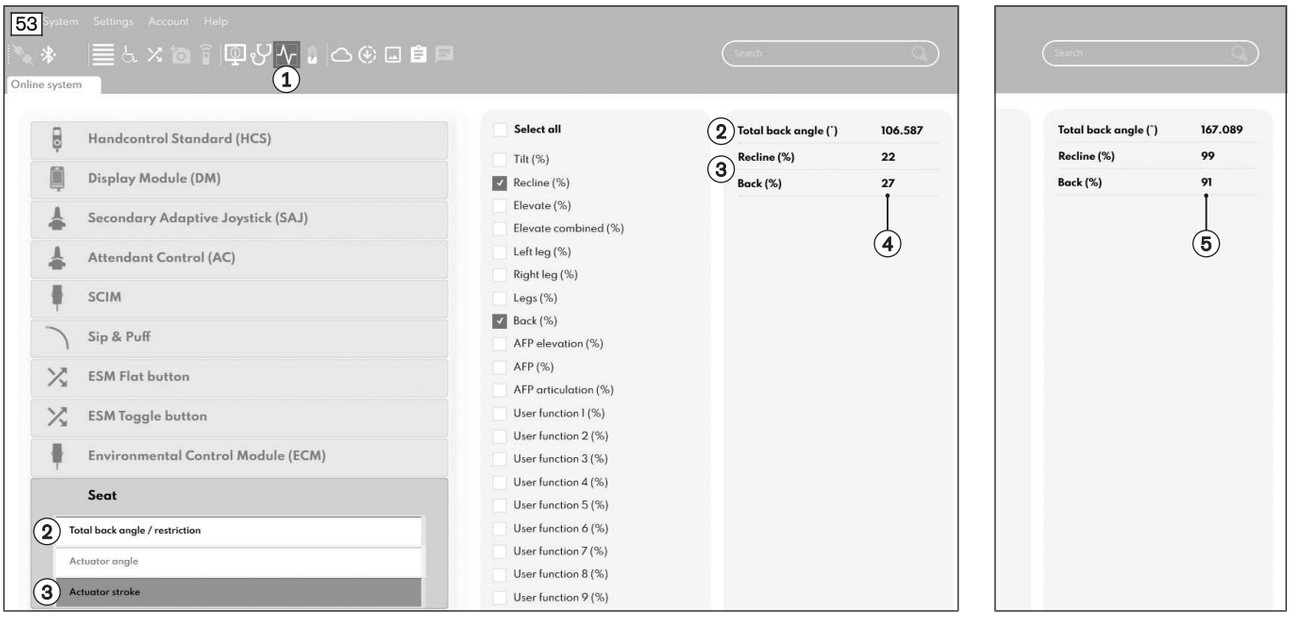




Measuring the upper and lower position for length adjustment

To adjust the length adjustment, the optimal positions must be measured at the top and bottom:

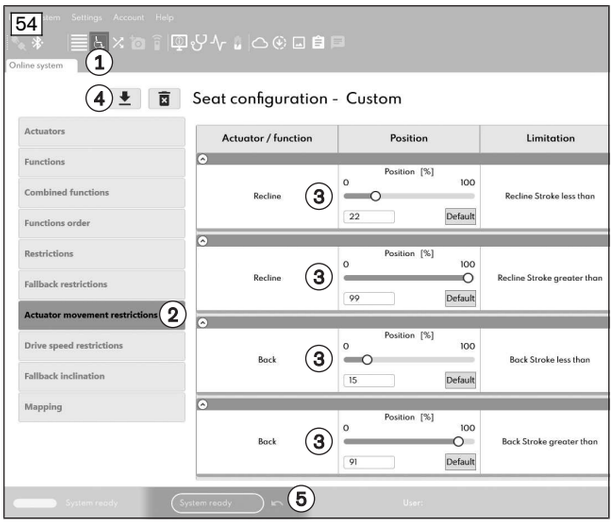
1) Call up the monitoring functions (see fig. 53, item 1).
2) Open the **“Total back angle/restrictions”** group and activate the **“Total back angle”** value (see fig. 53, item 2).
3) Open the **“Actuator strokes”** group and activate the **“Recline”** and **“Back”** values (see fig. 53, item 3).
4) Move the back support and length adjustment to a comfortable upper position:
   → Move the back support angle to a comfortable driving position (here approx. 107°).
   → Individually adjust the length adjustment so the user is optimally positioned. Ideally, the length adjustment in the upper position is fully extended (0 %).
   → Read and note down the percent values from the monitoring function or save them as a screenshot (see fig. 53, item 4).
   → **If a chin control is installed**: Adapt the chin swivel arm in the upper position to the user and then swing it out again.
   → **If no chin control is installed**: Clearly mark the position of the user on the back support (marking on the head support and head; marking on the back support pad and user). A sliding mat between the user and the back support pad can help the user assume various positions.
5) Move the back support to the rear to a lying, lower position:
   → Use the combined function to move the back support angle back as far as possible (here approx. 167°).
   → **If a chin control is installed**: Swing the chin swivel arm back in.
   → Adjust the length adjustment so the user is optimally positioned. The chin control or marking should be in the same position as before.
   → If the length adjustment is insufficient, reduce the back support angle.
   → Read and note down the percent values from the monitoring function or save them as a screenshot (see fig. 53, item 5).

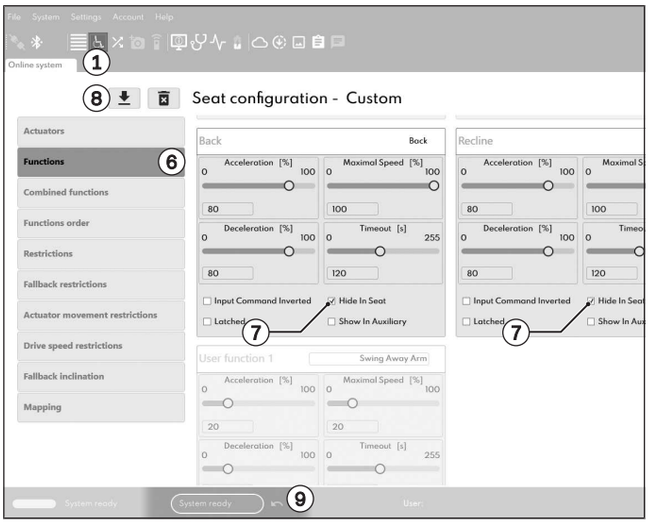


Adjusting the range of action of length adjustment

The measured values must be entered in the restrictions and stored on the control device:

1) Call up the seat configuration settings (see fig. 54, item 1).
2) Open the **“Actuator movement restrictions”** group (see fig. 54, item 2).
3) Enter the measured values as restrictions for **“Recline”** and **“Back”** (see fig. 54, item 3):
   → Set the respective **“less than”** restriction to the **lower value**.
   → Set the respective restriction **“greater than”** to the **upper value**.
   → Do **not** change any other restrictions.
4) Use the button [⬇] to save the settings on the control device (see fig. 54, item 4).
5) Close programming mode (see fig. 54, item 5).
6) Use the [on/off] button to turn the control device off and on again.
   → The changed restrictions are adopted. This process may take a few seconds.
7) With the combined function, check the synchronous movement pattern across the entire adjustment range. Readjust the top and bottom position of the length adjustment if required.
8) Once the movement pattern has been optimised, open the **“Functions”** group (see fig. 54, item 6).
9) **Activate** the **“Hide In Seat”** checkbox in the sections **“Back”** and **“Recline”** to hide these seat functions from the user (see fig. 54, item 7).
10) Use the button [⬇] to save the settings on the control device (see fig. 54, item 8).
11) Close programming mode (see fig. 54, item 9).





7.5.2 Changing the range of action of the length adjustment for the leg support

The technical pivot point of the leg support deviates from the anatomical pivot point of the knee. Therefore, a length adjustment actuator is used for the power leg support adjustment in addition to the angle actuator. This compensates for the resulting parallel offset to the lower leg.

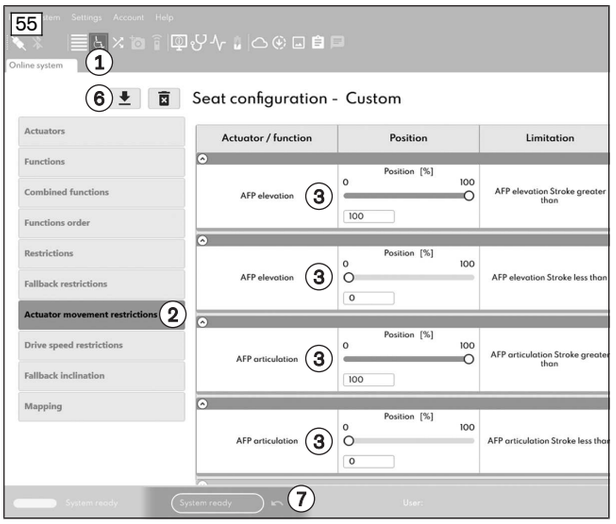
Restrictions can be used to adjust the lower and upper position of the length adjustment and the leg support angle. In between, the length adjustment moves linearly to the leg support angle. The range of action of the length adjustment can be adjusted by qualified personnel.

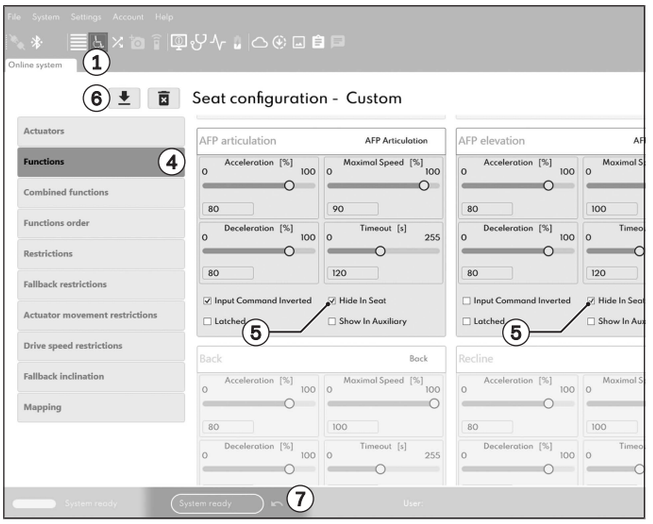
For more information on programmable restrictions: see page 47

Preparing for a change to length adjustment

Before the length adjustment can be set, all power seat functions for the leg support must be enabled without any restrictions:

1) Call up the seat configuration settings (see fig. 55, item 1).
2) Open the **“Actuator movement restrictions”** group (see fig. 55, item 2).
3) Reset all restrictions for **“AFP articulation” (lower leg length)** and **“AFP elevation” (knee angle)** (see fig. 55, item 3):
   → Set the respective **“less than”** restriction to **0 %**.
   → Set the respective restriction **“greater than”** to **100 %**.
   → Do **not** change any other restrictions.
4) Open the **“Functions”** group (see fig. 55, item 4).
5) In the **“AFP articulation” (lower leg length)** section, deactivate the **“Hide In Seat”** checkbox (see fig. 55, item 5).
6) Use the button [⬇] to save the settings on the control device (see fig. 55, item 6).
7) Close programming mode (see fig. 55, item 7).
8) Use the [on/off] button to turn the control device off and on again.
   → The changed restrictions are adopted. This process may take a few seconds.
   → The leg support and its length adjustment can now be selected and moved independently on the hand module or LCD module.

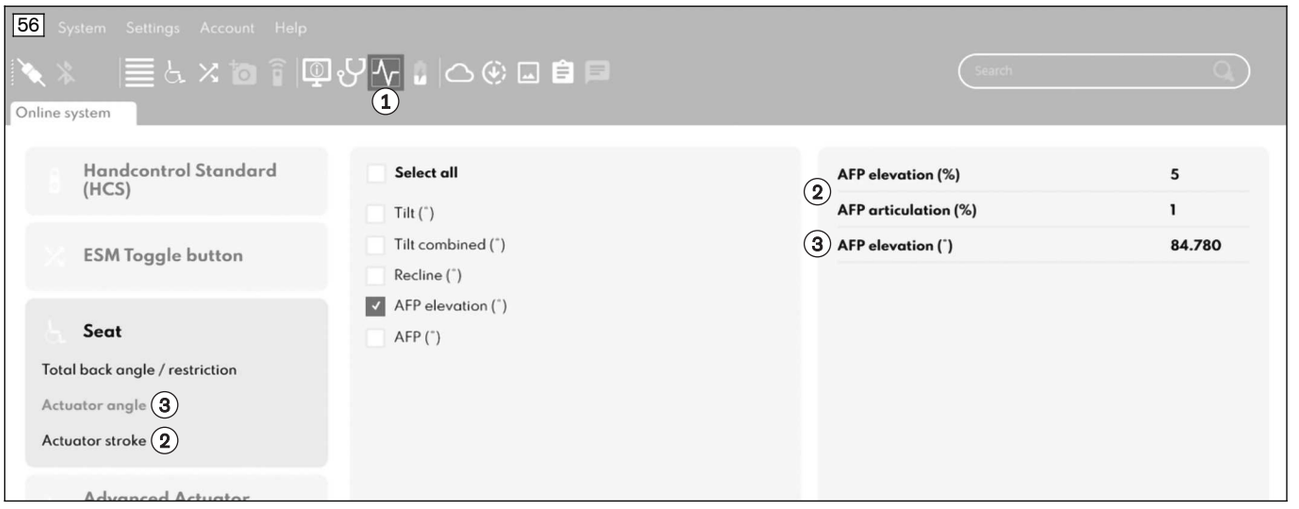




Measuring the upper and lower position for length adjustment

To adjust the length adjustment, the optimal positions must be measured at the top and bottom:

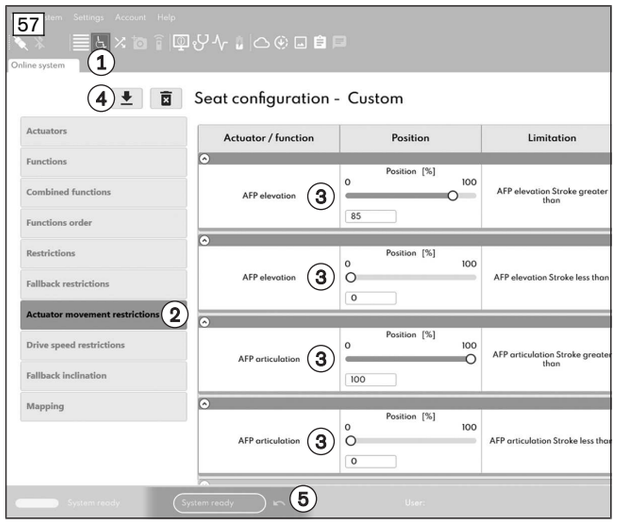
1) Call up the monitoring functions (see fig. 56, item 1).
2) Open the **“Actuator strokes”** group and activate the values **“AFP articulation” (lower leg length)** and **“AFP elevation” (knee angle)** (see fig. 56, item 2).
3) Open the **“Actuator angle”** group and activate the value **“AFP elevation” (knee angle)** (see fig. 56, item 3).
4) Fully retract both actuators for the leg support and length adjustment:
   → The leg support is at an angle of **approx. 90°** to the seat. The foot plate is located as high up as possible. The percentage values for the actuators in the monitoring function correspond to **0 %** in this position.
   → The mechanical adjustment of the lower leg length must be carried out in this position (see page 14). The lower leg length must be mechanically adjusted so that the leg support offers the user a comfortable sitting position.
5) Bring the leg support to the horizontal position:
   → For this, use the combined function for the leg support angle and back support angle if possible.
   → Move the leg support angle upwards as far as possible using the combined function (approx. 170°).
   → Check whether there is a gap between the foot plate and the foot or whether the foot plate exerts pressure on the legs so that the knees lift slightly.
   → Individually adjust the length adjustment so the user is optimally positioned. The foot plate should be in contact with the feet but not compress the legs or elevate the knees.
   → If the length compensation is insufficient, reduce the leg support angle slightly. Then individually set the length adjustment again.
   → Read and note down the percentage values using the monitoring function or save them as a screenshot (see fig. 56, item 2).

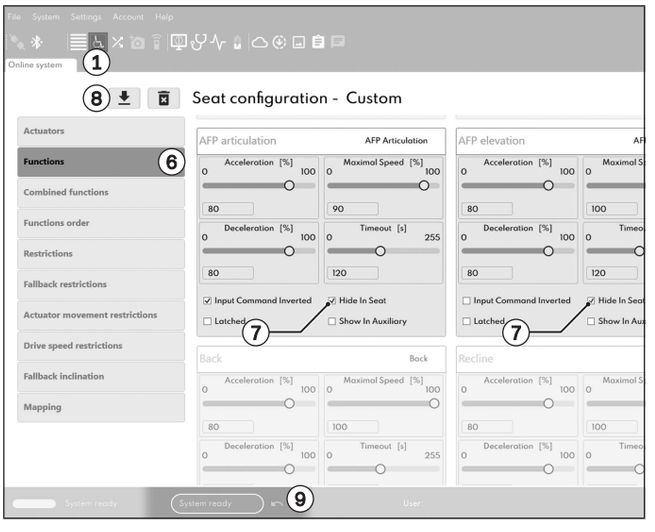


Adjusting the range of action of length adjustment

The measured values must be entered in the restrictions and stored on the control device:

1) Call up the seat configuration settings (see fig. 57, item 1).
2) Open the **“Actuator movement restrictions”** group (see fig. 57, item 2).
3) Enter the measured values as restrictions for **“AFP articulation” (lower leg length)** and **“AFP elevation” (knee angle)** (see fig. 57, item 3):
   → Set the respective **“less than”** restriction to the **lower value** (0 % as standard).
   → Set the respective restriction **“greater than”** to the **upper value**.
   → Do **not** change any other restrictions.
4) Use the button [⬇] to save the settings on the control device (see fig. 57, item 4).
5) Close programming mode (see fig. 57, item 5).
6) Use the [on/off] button to turn the control device off and on again.
   → The changed restrictions are adopted. This process may take a few seconds.
7) With the combined function, check the synchronous movement pattern across the entire adjustment range. Readjust the top and bottom position of the leg support if required.
8) Once the movement pattern has been optimised, open the **“Functions”** group (see fig. 57, item 6).
9) In the sections **“AFP articulation” (lower leg length)** and **“AFP elevation” (knee angle)** respectively, **activate** the **“Hide In Seat”** checkbox to hide these seat functions from the user (see fig. 57, item 7).
10) Use the button [⬇] to save the settings on the control device (see fig. 57, item 8).
11) Close programming mode (see fig. 57, item 9).



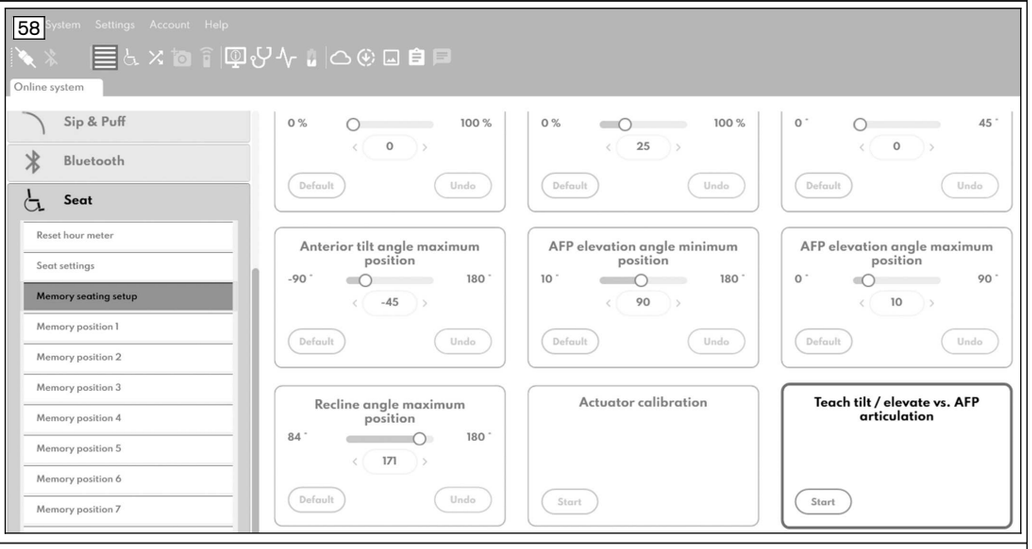


7.6 Calibration functions

7.6.1 Teaching the distance between the leg support and the floor

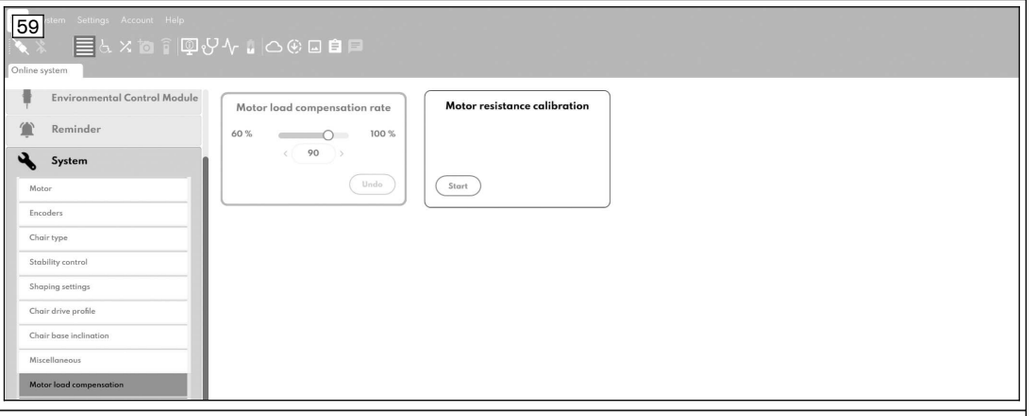
INFORMATION

The taught distance between the leg support and the floor is only taken into account for seat angles that are horizontal or tilted to the rear. For forward seat angles (anterior functions), the limit values apply according to the table in the following menu: Parameter settings > Seat > Anterior tilt position

Menu	**Parameter settings > Seat > Memory seating setup > Teach tilt/elevate vs. AFP articulation**
Screenshot	
Procedure	The taught distance between the leg support and the floor is taken into account when adjusting the power seat functions. The distance must be readjusted if the lower leg length has been changed (see page 14) or if the rollers of the leg support frequently and unintentionally touch the ground during use. Press the “Start” button to teach a new distance. Follow the on-screen instructions step by step. The following notes provide additional information on each step: 1) Move the seat to the initial position (driving position): → Set the leg support to a **90°** angle to the seat bottom. → Move the length adjustment of the leg support all the way up. → **Optional:** Set the seat tilt to **0°** horizontally. → **Optional:** Move the seat height adjustment all the way down. → Once the seat is in the initial position, confirm the step with the “OK” button. 2) A query appears asking whether the training procedure should be started. → Confirm the query with the “OK” button. The software then checks whether the seat is in the initial position. → If one of the prerequisites is not met, an error message appears. → **INFORMATION: If necessary, use the monitoring of the actuators to check the prerequisites (see page 29). Then restart the teaching procedure.** 3) If the prerequisites are met, an instruction is displayed to move the leg support: → Move the length adjustment of the leg support down until the lowest point of the leg support is just above the floor. → Depending on the lower leg length set, the ground contact controls or the actuator form the lowest point of the leg support. → Make sure there is sufficient space (approx. **20 mm**) between the leg support and the ground. → Leave the seat tilt and seat height adjustment (depending on equipment) in the initial position. → When the leg support is lowered accordingly, confirm the step with the “OK” button.

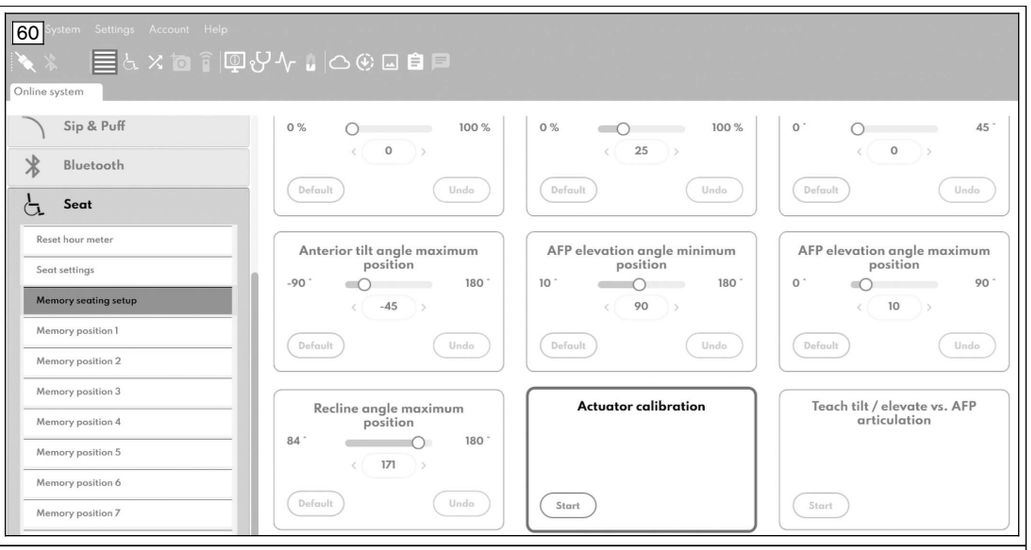
	4) You will be instructed to adjust the seat tilt or seat height adjustment (depending on equipment): → Move the seat tilt or seat height adjustment all the way up so the leg support has enough space to extend. → Then move the length adjustment of the leg support all the way down. → Move the seat tilt or seat height adjustment back down until the lowest point of the leg support is just above the floor. → Make sure there is sufficient space (approx. **20 mm**) between the leg support and the ground. → If the seat tilt or seat height adjustment is lowered correspondingly, confirm the step with the “OK” button. 5) If the learning procedure was successful, a query appears asking whether the new values should be saved. → To complete the teaching procedure, confirm the query with “Yes”. 6) Verify the proper functioning of all power seat functions.

7.6.2 Calibrating the motor resistance

Menu	**Parameter settings > System > Motor load compensation > Motor resistance calibration**
Screenshot	
Procedure	If the wheelchair’s driving characteristics change over time, it may make sense to recalibrate the motor resistance. The routine can only be started when the wheelchair is ready and the control device is in a driving profile: 1) Securely jack up the wheelchair using suitable means so the drive wheels are not in contact with the ground and can turn freely during calibration. 2) Switch to a driving profile on the wheelchair control device (e.g. D1). **INFORMATION: The [Mode] button can be pressed to change the driving profiles.** 3) Start the calibration with the “Start” button. 4) While a driving profile has been selected,press the input device (e.g. joystick) for the driving direction **forwards**. → Keep the input device for driving straight-ahead operated until the calibration is complete. → When the motor resistance values are displayed in the software, the calibration is complete. The software automatically saves the new values. 5) Use the [On/Off] button to turn the control device off and on again. → The calibration is applied in the process. This process may take a few seconds. 6) Check the driving characteristics of the wheelchair. If calibration errors occur, the wheelchair circuit breaker must be deactivated and reactivated again after waiting for at least 5 seconds. Then you can try the calibration again.

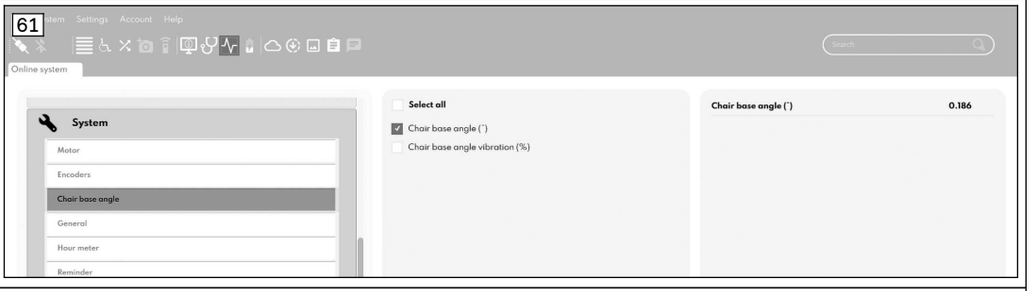
7.6.3 Calibrating the seat actuators

Menu	**Parameter settings > Seat > Memory seating setup > Actuator calibration**

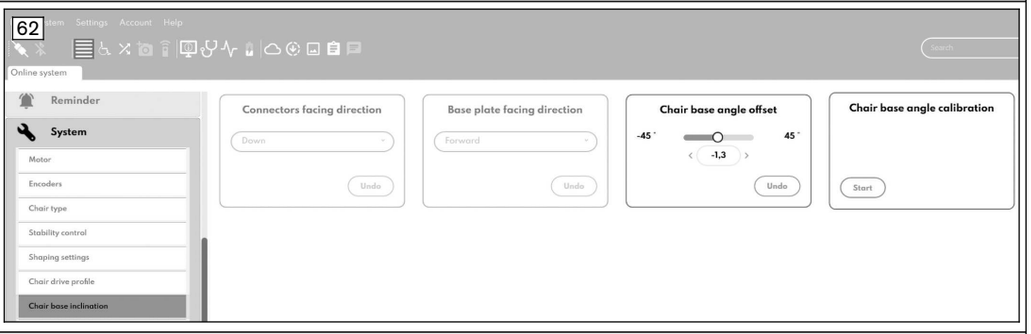
Screenshot	
Procedure	Calibration of the seat actuators is only required if a corresponding error message appears on the wheelchair control device. The calibration can be started with the “Start” button. Follow the on-screen instructions step by step. The following notes provide additional information on each step: 1) A message appears on the control device of the wheelchair stating that no load must be placed on the seat. → Ensure that no person is in the seat and that there is no load on the seat. → Actuate the input device (e.g. joystick) **forwards** to confirm the step. 2) The calibration is automatic. → Observe the movements of the actuators during calibration. → If necessary, the calibration can be cancelled at any time by actuating the input device in any direction. 3) If the calibration was successful, a prompt appears asking whether the new values should be saved. → To complete the teach-in procedure, confirm the prompt with “Yes”. 4) Use the [on/off] button to turn the control device off and on again. → The calibration is applied in the process. This process may take a few seconds. 5) Check the proper functioning of all power seat functions.

7.6.4 Calibrating the mobility base inclination

Reading current sensor values

Menu	**Monitoring functions > System > Chair base angle**
Screenshot	
Settings	An acceleration sensor is installed in the power module (controller) of the control device, which is used as the input variable for restrictions. The “Chair base angle” value of the sensor can be read using the monitoring functions. While the user is sitting in the wheelchair, the value should ideally be **0°** on a horizontal, level surface. For more information on monitoring functions: see page 29

Recalibrating sensor

Menu	**Parameter settings > System > Chair base inclination > Chair base angle calibration**
Screenshot	
Procedure	If the read value for the mobility base inclination deviates, the sensor can be recalibrated. The routine should only be started when your wheelchair is ready: 1) Move all actuators to their relaxed hand positions: → Set the leg support to a **90°** angle to the seat bottom. → Move the back support all the way forward. → **Optional:** Set the seat tilt to **0°** horizontally. → **Optional:** Move the seat height adjustment all the way down. 2) Drive the wheelchair onto a horizontal, level surface. **INFORMATION: If possible, the user should sit in the seat now.** 3) Perform the calibration with the “Start” button in the “Chair base angle calibration” section. 4) **If the calibration was carried out without the user sitting: Manually adjust** the value “Chair base angle offset”: → **Wheelchair with front-wheel drive:** increase the value determined from the calibration **by +0.7**. → **Wheelchair with mid-wheel drive:** Increase the value determined from the calibration **by +0.4**.

7.7 Programmable restrictions

INFORMATION

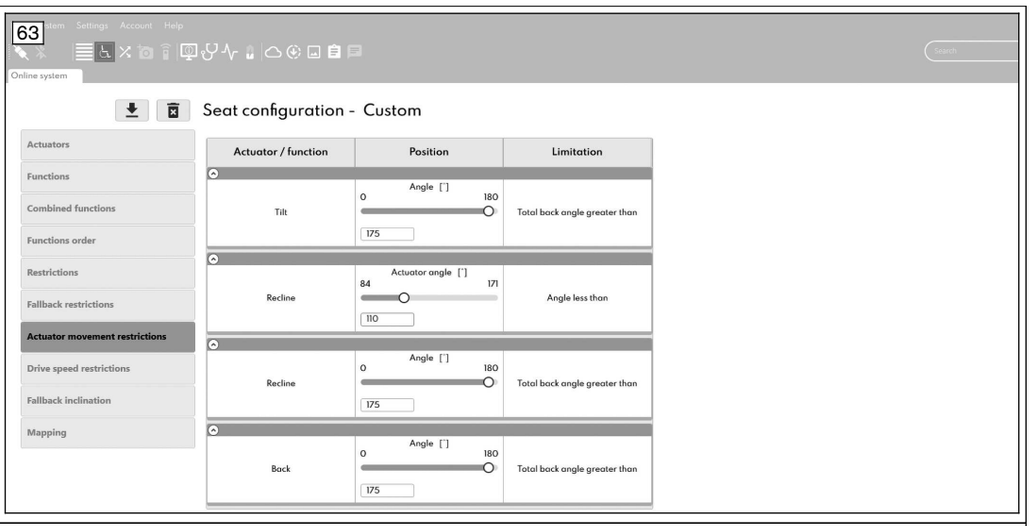
The product comes with restrictions pre-set at the factory for the actuator movements and driving speed in order to ensure static and dynamic stability at all times. These cannot be changed.

Existing restrictions can only be changed within the “Dealer” access level in the following menus: **Seat configuration > “Actuator movement restrictions”** and **“Drive speed restrictions”**

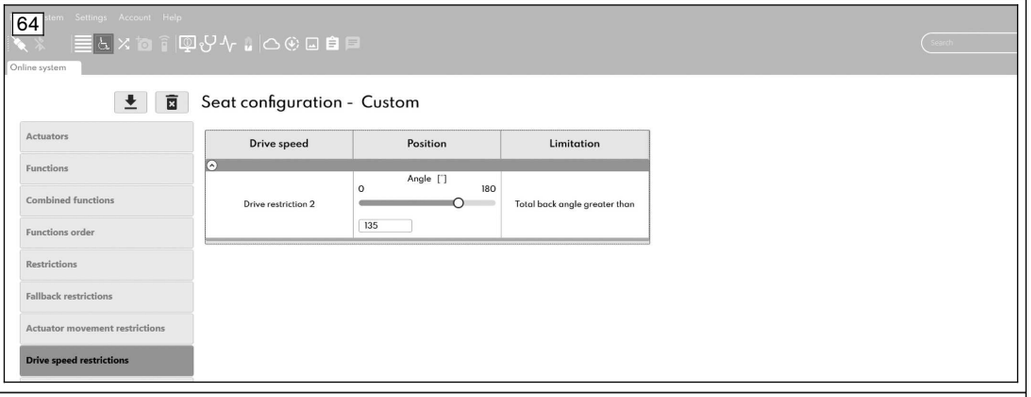
Further restrictions can be requested from Ottobock if necessary.

7.7.1 Restrictions for actuator movements

Menu	**Seat configuration > Actuator movement restrictions**

Screenshot	
Settings	The restrictions for actuator movement serve to limit the movement of the seat functions, e.g. depending on the current back support angle. Restrictions are preprogrammed at the factory and can be adjusted by the qualified personnel to the user's abilities. The qualified personnel can only adjust the values of the existing restrictions. New restrictions can only be programmed by the manufacturer. The button saves changed settings on the control device. The button discards changes.

7.7.2 Restrictions for driving speed

Menu	**Seat configuration > Drive speed restrictions**
Screenshot	
Settings	The restrictions for the driving speed are used to limit or block the driving function, e.g. depending on the current back support angle. Restrictions are preprogrammed at the factory and can be adjusted by qualified personnel to the user's abilities. Qualified personnel can only adjust the values of the existing restrictions. New restrictions can only be programmed by the manufacturer. By default, qualified personnel can only process restriction 2. Restriction 2 means a limited speed (creep speed). The button saves the changed settings on the control device. The button discards changes.

8 Delivery

8.1 Preparing for handover

The product is pre-configured at the factory according to the order. Since some time may elapse between ordering and delivery, the needs of the user may have changed in the meantime. Therefore, the qualified personnel must make preparations to respond to the user's questions and change requests during delivery.

When handing over to the user, the product and scope of functions must be explained in detail and tested together with the user. Any adjustments must be made by qualified personnel as needed.

The following overview shows the most important points that must be observed by qualified personnel before and during handover to the user.

1) Packing the product for delivery:
   → Attach or pack the optional accessories, e.g. head support, knee pad, belts, etc. (see separate instructions for use).
   → Check that the product has been optimally pre-configured according to the order (see page 50).
   → Include the required tools (see page 66).
   → Include the device for programming with all required access data and any cables (see page 19).
   → Include all instructions for use (user and qualified personnel) for the product and for all optional accessories (see separate instructions for use).
2) Transporting the product to the customer:
   → **If necessary:** Reduce the pack size of the product (see page 50).
   → Observe the information on proper transportation (see page 51).
3) Recheck the useability of the product at the customer location:
   → **If the pack size was reduced:** Restore the driving position (see page 9).
   → Check that the option for the packaging position is deactivated (hidden). This feature should not be available to the user.
4) Adjust the power seat functions for the user transfer depending on the product equipment (e.g. back support angle, seat tilt etc.).
5) Have the user sit in the seat. Check the mechanical seat settings in coordination with the user and make adjustments as needed:
   → Adjust the alignment of the head support on the mounting kit (see separate instructions for use).
   → Adjust the position of the forearm supports (see page 11).
   → Adjust the seat depth and seat width (see page 13).
   CAUTION! A reduced seat depth negatively affects stability. Only make minor changes to the factory settings and observe the safety notes in the corresponding sections.
   → Adjust the leg support and lower leg length (see page 14).
   → **Optional:** Adjust the knee pad (see instructions for use (user)).
   → **Optional:** Adjust the belts (see instructions for use (user)).
   CAUTION! If a retractor belt is fitted, this can cause constrictions when changing sitting positions. Inform the user about the special features of the belt used.
6) **Optional:** Remove the rear marker panel and luggage rack and put them to the side.
7) Connect the control device to the device for programming via cable or Bluetooth (see page 19).
8) If the lower leg length of the leg support was changed, update the dealer information, line 1 (see page 27).
9) Compare the system time of the control device (with or without user, see page 28).
10) Check the other control device parameters and adjust them if necessary (see page 19 ff.):
   → **If needed:** Reduce the actuator restrictions for the total angle to prevent collisions between the accessories on the back support and the chassis (Changing the total angle limit).
   → Adjust the length adjustment of the back support (with user, see page 38).
   → **Optional:** Calibrate the special control (Proportional or Mini proportional input, Adapting the special control).
   → Adjust the length adjustment of the leg support (with user, see page 41).
   → Restart the control device before making further adjustments.
11) **Optional:** Check and adjust the memory functions (depending on equipment, Programmable seat positions (memory function)):
   → Ensure that no collisions occur. When driving is possible, check that there is sufficient space between the leg support and the floor.
   → Check whether the acoustic signal is audible when the seat positions are reached. If no acoustic signal is audible, the respective memory function must be saved again.
   → If the length adjustment of the back support or leg support has been changed, check the following memory functions and save them again: M1, M4, A5 (if available). Make sure that the acoustic signal is audible when the seat positions are reached.
   → If the seat height or lower leg length have been changed, check the following memory functions and save them again: A2, A3, A5 (if available). Make sure that the acoustic signal is audible when the seat positions are reached.

→ The drive-away lock must be active with memory function A2. The tilt angle must be between -13° and -17°. The leg support angle must be between 10 % and 16 %. The value for “Recline” must be < 27 %.
→ For the A3 and A5 memory functions, the driving speed must be limited (creep speed).
→ If the memory functions were changed, restart the control device and check the memory functions again.
→ **If necessary:** Set up additional memory functions at the user’s request.

12) Calibrate the chassis inclination (with user, see page 46).
13) Make sure that the leg support does not touch the ground when the leg support angle is adjusted with length adjustment. If the leg support touches the ground, calibrate the control device to the new distance to the floor (without user, see page 44). This check is particularly necessary when the seat height has been changed or the lower leg length has been increased.
14) Hide the length adjustment of the back support and leg support in the seat menu for the user. Select the “Hide In Seat” checkbox and save the settings on the control device.
15) Check the driving characteristics with the user and adjust as needed. A wireless Bluetooth connection is recommended for adjusting the driving parameters. The total angle for the driving reduction can be adjusted at the user’s request.
16) Save the settings on the control device and locally on the device for programming.
17) Perform a final inspection (see page 50).
18) Provide the instructions for use (user) to the user. Arrange a follow-up appointment in order to fine-tune the product settings based on the user’s experience.

Further fitting appointments must be scheduled according to the user’s needs. Especially for users with a changing anatomy (e.g. body dimensions or weight), an adjustment is recommended at least **once every six months**.

8.2 Final inspection

A final inspection must be performed before delivery of the power wheelchair:

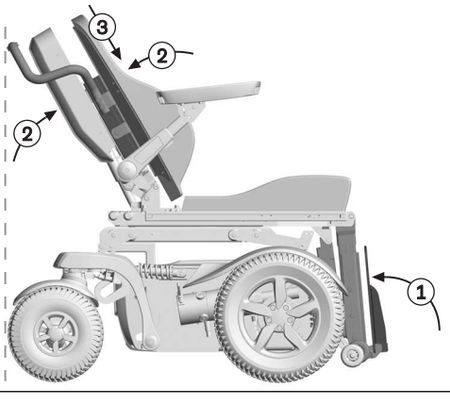
- Are all options installed according to the order form?
- Has the product been adapted optimally to the physical and mental conditions of the user (seat, forearm supports, leg support, foot plates, control elements)?
- Are the batteries charged?
- Do all manual and power functions work properly?
- Do all control functions work properly?
- Do the brakes work?
- If intended: Are all options required to take part in road traffic installed and fully functional (e.g. warning triangle, lights, warning flashers)?

8.3 Transport to the customer

8.3.1 Reducing the transportation size

The transportation size can be reduced for easier transportation.

65



Reducing the transportation size

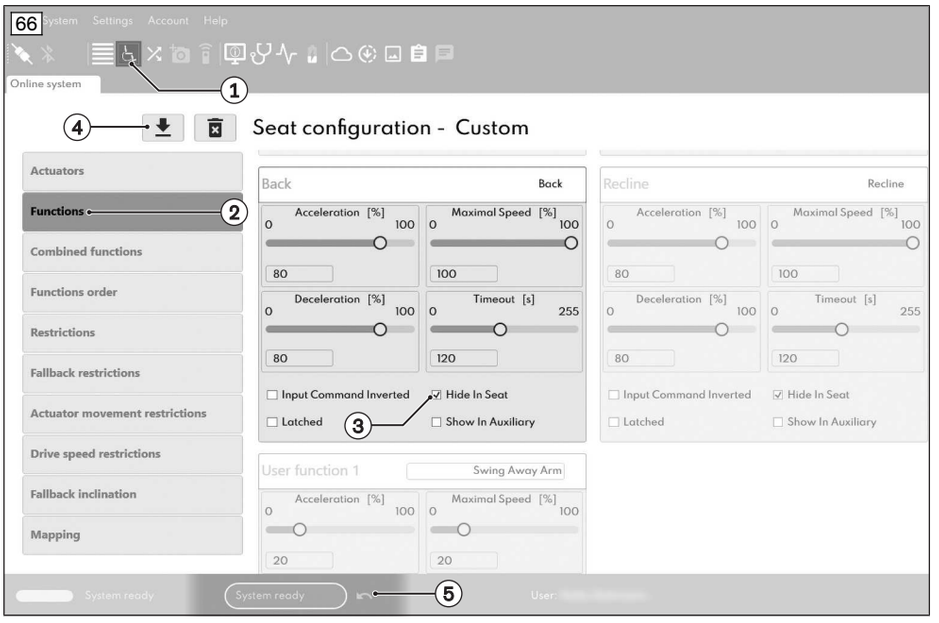
1) Fold up the foot plates of the leg support towards the back to the stop so that they do not fold down on their own (see fig. 65, item 1).
2) Adjust the back support angle so that the outermost, highest point of the back support is as low as possible but does not project beyond the seat and the mobility base (see fig. 65, item 2).
3) Retract the length adjustment of the back support to the minimum (see fig. 65, item 3).
   INFORMATION: This packaging item can only be established with the use of the ECON adjustment software (see page 19).

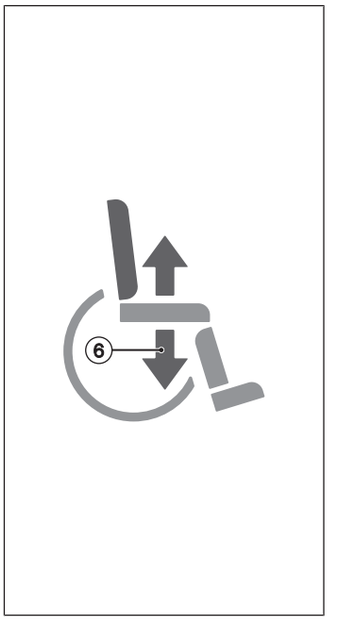
Establishing the packaging position

A packaging position can be produced for transport to the customer in order to reduce the packing size.

1) Switch on the control device.
2) Adjust the back support angle so that the outermost, highest point of the back support is as low as possible, but does not project beyond the seat and the mobility base.

3) Start the ECON software on the device and connect it to the wheelchair control device (see page 19).
4) Call up the seat configuration settings (see fig. 66, item 1).
5) Open the **“Functions”** group (see fig. 66, item 2).
6) Deactivate the **“Hide In Seat”** checkbox in the **“Back” section** (see fig. 66, item 3).
7) Use the button to save the settings on the control device (see fig. 66, item 4).
8) Close programming mode (see fig. 66, item 5).
   → The length adjustment of the back support can now be accessed directly as a seat function on the hand module or LCD module.
9) Select the seat function for length adjustment of the back support and move down as far as possible (see fig. 66, item 6).
10) **Re-tick** the **“Hide In Seat”** checkbox to hide this seat function from the user (see fig. 66, item 3).
11) Use the button to save the settings on the control device (see fig. 66, item 4).
12) Close programming mode (see fig. 66, item 5).
13) Turn the control device off again and prepare the wheelchair for transport.
14) Reestablish the driving position after transport (see page 9).





8.3.2 Preparing for transport

⚠ CAUTION

Securing the power wheelchair insufficiently during transport

Crushing, pinching of body parts due to failure to observe transportation instructions

- ► During transportation in vehicles or aircraft, on lifting platforms or in lifts, turn the control unit of the power wheelchair off and lock the brake.
- ► The power wheelchair must be secured in accordance with the regulations for the transport device.
- ► During transport in a vehicle, the power wheelchair must be secured sufficiently with cargo straps. Only attach the cargo straps to the corresponding transportation eyelets and specified tie-down points.

NOTICE

Improper transport

Damage to the product due to failure to observe transportation instructions

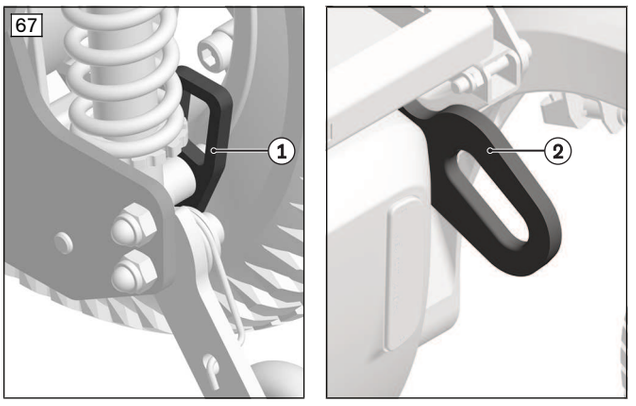
- ► Ensure that the seat is lowered all the way and the backrest is in a vertical position prior to loading and for transporting the power wheelchair.
- ► Only use sufficiently large hoisting devices to transport the power wheelchair (see section "Technical data" for the weight of the power wheelchair).

NOTICE

Use of unsuitable packaging

Damage to the product caused by transportation using incorrect packaging

► Use only the original packaging for delivery of the product.



Transporting the power wheelchair

1) Position the power wheelchair in its transport location.
   INFORMATION: To lift or carry the power wheelchair, use the eyebolts in the front and back on the frame.
2) Switch the control device off.
3) Verify brake locking. It should not be possible to push the power wheelchair.
   If necessary, lock the brake.
4) Use the eyebolts and cargo straps to attach the power wheelchair to the transport vehicle (see fig. 67, items 1/2).

8.4 Handing over the product

⚠ WARNING

Lack of instruction

Tipping over, falling of the user due to lack of knowledge

► Instruct the user or the attendant in the proper use of the product when handing it over.

The following steps must be performed for the safe handover of the product:

- Have the user get into the product and perform a trial seat fitting. Pay special attention to proper positioning according to medical considerations.
- The user and any attendants must be instructed in the safe use of the product. In particular, the enclosed instructions for use (user) are to be used.
- The instructions for use (user) must be issued to the user or an attendant during handover of the wheelchair.
- The user or attendant should acknowledge that they have been instructed in how to use the product and were informed of the residual risks.
- **Depending on equipment:** The supplied instructions for use for accessories have to be handed over in addition.

9 Maintenance and repair

9.1 Maintenance

The manufacturer recommends regular maintenance of the product every **12 months**.

See the service manual for the maintenance plan and all information on proper maintenance and repair of the product.

9.2 Troubleshooting

The wheelchair control device displays warnings and errors in as much detail as possible by differentiating between numerous error codes. Not all displayed errors can be corrected by the user. The following overview shows all possible error codes and corrective actions for qualified personnel.

Some warnings or errors cannot be rectified immediately, but require the professional replacement of parts. Observe all notices in the service manual for the product when replacing components.

The control device stores faults that have occurred in a list. The timestamp in the error memory is not meaningful. The system time may deviate from the actual time, e.g. due to extended storage with the main fuse deactivated or when the user makes adjustments.

The system time must be checked by the qualified personnel and corrected as needed before the product is handed over to the user.

Error messages (selection) on the ICON hand module or ICON LCD module

Error code	Error type	Meaning	Correction
1	Error	Motor 1 not connected	1. Turn off the control device; 2. Check the motor connections; 3. Turn on the control device
2	Error	Motor 2 not connected	
3	Error	Brake 1 not connected	1. Turn off the control device; 2. Open and close the brake lever; 3. Check the motor connections; 4. Turn on the control device
4	Error	Brake 2 not connected	
5	Warning	Attendant control: on/off jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
6	Warning	LCD module: on/off jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
7	Warning	Hand module: on/off jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
8	Warning	Secondary joystick: on/off jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
9	Warning	Attendant control: mode jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
10	Warning	LCD module: mode jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
11	Warning	Hand module: mode jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
12	Warning	Secondary joystick: mode jack disconnected	1. Turn off the control device; 2. Pull out and reconnect the jack connector; 3. Turn on the control device
13	Warning	9-pin D-SUB plug disconnected from the ICON AID adapter (SCIM)	1. Turn off the control device; 2. Pull out and reconnect the D-SUB plug connector; 3. Turn on the control device
14	Warning/error	Proportional input device (e.g. external joysticks or buttons) not connected (a) or incorrect input device configured (b)	a): 1. Turn off the control device; 2. Pull out and reconnect the connection on the D-SUB plug of the ICON AID adapter (SCIM); 3. Turn on the control device b): 1. Check that the input device is functioning properly; 2. Check the configuration of input devices
15	Warning	Motor cable not connected to the power module (controller)	1. Turn off the control device; 2. Pull out and reconnect the motor plug connectors; 3. Turn on the control device
16	Error	Brake 1 short-circuited or incorrectly programmed	1. Turn off the control device; 2. Open and close the brake lever; 3. Check the motor connections; 4. Turn on the control device
17	Error	Brake 2 short-circuited or incorrectly programmed	
18	Warning	Short circuit on the actuator	1. Turn off the control device; 2. Pull out and reconnect the connectors for the actuator plug on the seat module; 3. Turn on the control device
19	Warning	Short circuit on the motor connection	1. Turn off the control device; 2. Pull out and reconnect the motor plug connectors; 3. Turn on the control device

Error code	Error type	Meaning	Correction
20	Warning/error	Battery undervoltage	Charging the battery
21	Error	Battery overvoltage (batteries may be overcharged)	Discharge the batteries slightly (e.g. by driving slowly uphill) If the error persists: check the batteries and replace if necessary
22	Warning	Speed reduction (battery overvoltage)	Discharge the batteries slightly (e.g. by driving slowly uphill) **INFORMATION: The system reduces the speed if the battery charge is high but below the threshold that causes the overvoltage error (error 21).** If the error persists: check the batteries and replace if necessary
23	Error	Motor error 1	1. Turn off the control device; 2. Open and close the brake lever; 3. Check the motor connections; 4. Turn on the control device
24	Error	Motor error 2	
25	Error	Brake error 1	1. Turn off the control device; 2. Open and close the brake lever; 3. Check the motor connections; 4. Turn on the control device
26	Error	Brake error 2	
27	Error	Motor power error message	1. Turn off the control device; 2. Allow the system to cool; 3. Check the motor connections; 4. Turn on the control device If the error persists: Check the motors and replace them if necessary
28, 29	Warning	Power module (controller) error message due to electric motor shut-off	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
30	Error	Power module (controller) error message due to electric motor shut-off	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
31	Warning	Motor blockage detected	1. Reset and try to overcome the obstacle at higher speed; 2. If the motor is blocked again: drive around the obstacle or look for a place with a lower obstacle height
32	Error	Excess temperature	**INFORMATION: The wheelchair will stop to protect the system electronics.** 1. Turn off the control device; 2. Allow the system to cool; 3. Turn on the control device
33	Warning	Speed reduction (excess temperature)	**INFORMATION: The wheelchair will reduce its speed to protect the system electronics.** 1. Turn off the control device; 2. Allow the system to cool; 3. Turn on the control device
34	Error	Voltage drop on the primary module BUS system (hand module/LCD module)	1. Turn off the control device; 2. Check the cable on the hand module/LCD module; 3. Pull out and reconnect the cable; 4. Turn on the control device
35	Error	Joystick not in neutral position	1. Turn off the control device; 2. Put the joystick in neutral position; 3. Turn on the control device
36	Warning	Joystick not in neutral position	1. Turn off the control device; 2. Put the joystick in neutral position; 3. Turn on the control device
37	Warning		

Error code	Error type	Meaning	Correction
		Switch function on joystick/button pressed when the unit is turned on	1. Turn off the control device; 2. Release the pressed button function; 3. Turn on the control device
38	Error	Switch function on joystick/button not programmed	1. Turn off the control device; 2. Program the switch function; 3. Turn on the control device
39	Warning/error	Incompatible module connected	1. Turn off the control device; 2. Remove the incompatible module; 3. Turn on the control device **INFORMATION: Only use original Ottobock control modules.**
40	Warning	Motor connected but not configured (encoder error)	1. Connect the programming device; 2. Activate the encoder for motors Alternatively: 3. If encoders are enabled but not in use: disable the encoder with the programming device and pull out the motor cable.
41	Error	Input module is not configured	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
42	Error	Incompatible version of secondary module detected	1. Turn off the control device; 2. Remove the incompatible module; 3. Turn on the control device **INFORMATION: Only use original Ottobock control modules.**
43	Warning	Motor 1: Current measurement out of range	1. Turn off the control device; 2. Allow the system to cool; 3. Check the motor connections; 4. Turn on the control device
44	Warning	Motor 2: Current measurement out of range	
45	Warning	Input module not present	1. Connect the programming device; 2. In the “Startup Configuration” menu: configure the input module
46	Warning	Bluetooth not working	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
48	Error	Invalid 1-switch scanner sequence	1. Connect the programming device; 2. Check whether the scanner sequence is meaningful (e.g. empty)
49	Error	Strain gauge error	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
50	Warning	Control device module has been exchanged or replaced	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
51	Warning	Control device module added	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
52	Warning	Control device module removed	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
53	Warning	Sip and puff control was active when the control device was switched on (instead of in the relaxed hand position)	1. Turn off the control device; 2. Do not activate sip and puff control when switching on the control device
54	Error		

Error code	Error type	Meaning	Correction
		Sip and puff control was out of the relaxed hand position when the control device was turned on	1. Turn off the control device; 2. Do not activate sip and puff control when switching on the control device
55	Warning	Installed firmware is a test version of the software	1. Connect the programming device; 2. Install original software (only if no tests are to be conducted); 3. Switch on the control device
56	Warning	Overvoltage on a seat actuator	1. Turn off the control device; 2. Pull out and reconnect the connectors for the actuator plug on the seat module; 3. Turn on the control device
57	Error	Severe excess temperature on a seat actuator	1. Turn off the control device; 2. Allow the system to cool; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
58	Error	Defective H-bridge (error in a seat actuator)	1. Turn off the control device; 2. Pull out the actuator plug connections on the seat module and reconnect them; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
59	Error	ADC overrun (problem with analogue/digital conversion)	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
60	Error	Pressure sensor of the sip and puff control not connected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device; 4. If the error persists: replace the sip and puff control module
61	Warning	Non-active input activated (e.g. displaced joystick on hand module despite attendant control being the active input device)	1. Turn off the control device; 2. Change the input device (depending on programming: either use the additional menu or restart the system on the desired input device)
62	Warning	Error on the actuator relay	1. Turn off the control device; 2. Wait 5seconds for system reboot; 3. Turn on the control device; 4. If the error persists: replace the module or update firmware
63	Error	Sip and puff control: sip parameter programmed incorrectly	1. Connect the programming device; 2. In the “Sip & Puff” > “Pressure Fine Adjustment” menu: readjust the sip function parameters
64	Error	Sip and puff control: puff parameter programmed incorrectly	1. Connect the programming device; 2. In the “Sip & Puff” > “Pressure Fine Adjustment” menu: readjust the puff function parameters
65	Warning	Switch function on joystick/button not programmed	Check configuration of special control and its parameters.
66	Warning	Undervoltage on the actuator	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device; 4. Charge the battery; 5. If the error persists: adjust the programming
67	Error	Undervoltage on the actuator	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device; 4. Charge the battery; 5. If the error persists: adjust the programming
68	Warning	Speed reduction (current limitation)	**INFORMATION: The system reduces the speed if the current is too high.** Allow the system to cool and drive slower

Error code	Error type	Meaning	Correction
69	Warning	Actuator timeout (actuator was active for the programmed maximum time)	1. Turn off the control device; 2. Check the actuators; 3. Turn on the control device; 4. Check the proper functioning of the seat functions
72	Warning	Speed reduction (stability control)	**INFORMATION: The system reduces the driving speed if the wheelchair loses control during driving.** Drive slower and adapt driving behaviour to the conditions of the terrain
73	Warning	Timeout for speed feedback	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device If the error persists: check the power module (controller) of the control device and replace if necessary
74	Warning	Intervention while driving on a ramp	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device; 4. Check ramp according to the product's climbing ability; 5. Adjust the ramp if necessary
80	Warning	System in configuration mode	Turning the power off only after configuration is complete
81	Error	Overcurrent in motor M1	1. Turn off the control device; 2. Allow the system to cool; 3. Check the motors for ease of movement and wheels for blockages; 4. Turn on the control device
82	Error	Overcurrent in motor M2	
83	Warning	Automatic firmware update during processing (in the primary system module)	Turn off the power only after the update is complete
84	Warning	Speed reduction (seat type/stability control not compatible or not supported)	1. Turn off the control device; 2. Check the configuration and parameter set of the control device
85	Warning	Gyro signal offset (speed limit or temperature range exceeded)	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device If the error persists: check the power module (controller) of the control device and replace if necessary
86	Error	Switching the control device off and on again required	1. Turn off the control device and wait briefly; 2. Turn on the control device
87	Error	Excessive temperature on a seat actuator	1. Turn off the control device; 2. Allow the system to cool; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
88	Warning	Front light not connected	1. Turn off the control device; 2. Check the front light connections and if necessary check front lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
89	Warning	Rear light not connected	1. Turn off the control device; 2. Check the rear light connections and if necessary check the rear lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
90	Warning	Left direction indicator not connected	1. Turn off the control device; 2. Check the direction indicator connections and if neces-

Error code	Error type	Meaning	Correction
			sary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
91	Warning	Right direction indicator not connected	1. Turn off the control device; 2. Check the direction indicator connections and if necessary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
92	Warning	Current to front light is too low	1. Turn off the control device; 2. Check the front light connections and if necessary check front lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
93	Warning	Current to rear light is too low	1. Turn off the control device; 2. Check the rear light connections and if necessary check the rear lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
94	Warning	Current to left direction indicator is too low	1. Turn off the control device; 2. Check the direction indicator connections and if necessary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
95	Warning	Current to right direction indicator is too low	1. Turn off the control device; 2. Check the direction indicator connections and if necessary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
96	Warning	Overvoltage on left direction indicator	1. Turn off the control device; 2. Check the direction indicator connections and if necessary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
97	Warning	Overvoltage on right direction indicator	1. Turn off the control device; 2. Check the direction indicator connections and if necessary check the direction indicator for damage; 3. Turn on the control device; 4. If the error persists: replace the light
98	Warning	Overvoltage on front light	1. Turn off the control device; 2. Check the front light connections and if necessary check front lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
99	Warning	Overvoltage on rear light	1. Turn off the control device; 2. Check the rear light connections and if necessary check the rear lights for damage; 3. Turn on the control device; 4. If the error persists: replace the light
100	Warning	Lighting voltage set too high	1. Connect the programming device; 2. Set the “Light Voltage” parameter to the voltage required by the lighting; 3. Check for short circuit if necessary
150	Error	Tilt actuator not providing feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module

Error code	Error type	Meaning	Correction
151	Error	Tilt actuator outside tolerance	1. Recalibrate the tilt setting; 2. If the error persists: replace the actuator or actuator module
152	Error	Tilt actuator defective	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
153	Error	Tilt function error	1. Connect the programming device; 2. Adjust the direction of inclination of the actuator correctly **INFORMATION: This error indicates that the feedback from the tilt actuator does not match the set direction of inclination.**
154	Error	Inclination home switch defective	Replacing a switch, actuator or actuator module
156	Error	Back support angle actuator not providing feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
157	Error	Back support angle actuator outside tolerance	1. Recalibrate the back support angle setting; 2. If the error persists: replace the actuator or actuator module
158	Error	Back support angle actuator switch defective	Replacing a switch, actuator or actuator module **INFORMATION: The switch is defective if the feedback from the actuating drive exceeds the positions programmed as the maximum/minimum value or the back support is not moving forwards/backwards.**
159	Error	Lift seat actuator not providing feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
160	Error	Lift seat actuator outside tolerance	1. Recalibrate the lift height setting; 2. If the error persists: replace the actuator or actuator module
161	Error	Lift seat actuator switch defective	Replacing a switch, actuator or actuator module **INFORMATION: The switch is defective if the feedback from the actuating drive exceeds the positions programmed as the maximum/minimum value.**
162	Error	Lift seat actuator not moving	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module **INFORMATION: The lift seat actuator switch may be defective.**
163	Error	AFP actuator not providing feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3.

Error code	Error type	Meaning	Correction
		INFORMATION: AFP = Articulated Foot Plate. For Ottobock = centrally mounted leg support.	Turn on the control device; 4. If the error persists: replace the actuator or actuator module
164	Error	AFP actuator outside tolerance	1. Recalibrate the actuator setting; 2. If the error persists: replace the actuator or actuator module
165	Error	AFP actuator switch defective	Replacing a switch, actuator or actuator module **INFORMATION: The switch is defective if the feedback from the actuating drive exceeds the positions programmed as the maximum/minimum value or the actuator is not moving forwards/backwards.**
166	Error	AFP angle actuator not providing feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
167	Error	AFP angle actuator outside tolerance	1. Recalibrate the actuator setting; 2. If the error persists: replace the actuator or actuator module
168	Error	AFP angle actuator switch defective	Replacing a switch, actuator or actuator module **INFORMATION: The switch is defective if the feedback from the actuating drive exceeds the positions programmed as the maximum/minimum value or the actuator is not moving forwards/backwards.**
169	Error	AFP lift actuator does not provide feedback	1. Turn off the control device; 2. Check the actuator, actuator module and cabling; 3. Turn on the control device; 4. If the error persists: replace the actuator or actuator module
170	Error	AFP lift actuator outside tolerance	1. Recalibrate the actuator setting; 2. If the error persists: replace the actuator or actuator module
171	Error	AFP lift actuator switch defective	Replacing a switch, actuator or actuator module **INFORMATION: The switch is defective if the feedback from the actuating drive exceeds the positions programmed as the maximum/minimum value or the actuator is not moving forwards/backwards.**
172	Error	Actuator feedback supply short-circuited	1. Check the actuator return guide wiring for damage; 2. If the error persists: replace the actuator or actuator module
174	Warning	Invalid memory position	**INFORMATION: The saved position is inconsistent or cannot be reached.** 1. Check the parameters for the memory positions; 2. Save the memory position in the control device again with a different setting

Error code	Error type	Meaning	Correction
175	Error	Error with minimum actuator stroke length	1. Connect the programming device; 2. Ensure that all actuators can move freely and unencumbered; 3. Re-run calibration. **INFORMATION: At least one actuator did not reach the minimum stroke length during the calibration process.**
176	Error	Error with minimum actuator adjustment time	1. Connect the programming device; 2. Ensure that all actuators can move freely and unencumbered; 3. Re-run calibration. **INFORMATION: At least one actuator did not reach the minimum adjustment time during the calibration process.**
177	Error	Invalid calibration data for the actuator	1. Connect the programming device; 2. Ensure that all actuators can move freely and unencumbered; 3. Re-run calibration.
178	Error	Actuator feedback supply outside tolerance	1. Turn off the control device; 2. Check the actuator, actuator module and cables; 3. Turn on the control device; 4. Recalibrate the actuators; 5. If the error persists: replace the actuator or actuator module
203	Error	Test error prior to driving	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
204	Warning/error	Communication error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
205	Warning	Memory error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
206	Warning/error	Data error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
208	Warning/error	Monitoring error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
209	Warning	Monitoring software: download error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
210, 211	Error	Software error detected	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
212	Warning	Reset to default values	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
213	Warning	Parameter database restored	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Check all BUS components; 4. Turn on the control device; 5. Check the configuration and parameter set of the control device
214	Warning	Error while loading the parameters database	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device
215	Warning	Parameter database not saved	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device

Error code	Error type	Meaning	Correction
220	Error	Invalid firmware	Integrity check of the firmware package failed; reload firmware
221	Error	Gyroscope/acceleration sensor error	1. Turn off the control device; 2. Wait 5 seconds for system reboot; 3. Turn on the control device

10 Disposal

10.1 Disposal information

NOTICE

Disposal of batteries

Pollution due to incorrect disposal

- ► Observe the information printed on the batteries by the manufacturer.
- ► Note that the batteries may not be disposed of as household waste.

All components of the product must be disposed of properly in accordance with the respective national environmental regulations.

10.2 Information on re-use

⚠ CAUTION

Used seat padding

Functional and/or hygienic risks due to re-use

- ► Replace the seat padding if the wheelchair is to be re-used.

The product is suitable for re-use.

Similar to second-hand machines or vehicles, products that are being re-used are subject to increased strain. Features and performance must not change in a way that could impair the safety of users or third parties during the period of use.

The relevant product must be thoroughly cleaned and disinfected before re-use. Then have the product inspected by qualified personnel with respect to its condition, wear and tear, and damage. Worn and damaged parts as well as components that do not fit or are unsuitable for the user must be replaced.

Detailed information on replacing components as well as information on the required tools can be found in the service manual.

11 Legal information

All legal conditions are subject to the respective national laws of the country of use and may vary accordingly.

11.1 Liability

The manufacturer will only assume liability if the product is used in accordance with the descriptions and instructions provided in this document. The manufacturer will not assume liability for damage caused by disregarding the information in this document, particularly due to improper use or unauthorised modification of the product.

11.2 Warranty

Further information on the warranty terms and conditions is available from the manufacturer's service department.

12 Technical data

INFORMATION

- ► Much of the technical data below is specified in mm. Please note that product settings – unless specified otherwise – cannot be adjusted in the mm range, only in increments of approx. **0.5 cm** or **1 cm / 2 cm**.
- ► Note that the values achieved during adjustment may deviate from the values specified below. The deviation can be **±10 mm and ±2°**.

INFORMATION

The following tables may contain technical data that do not apply to your product due to the selected configuration.

Application class (according to DIN EN 12184)
Class B

Drive type
Front-wheel drive

Front-wheel drive weight	
Maximum weight	172 kg (379 lbs)

Load	
Maximum load	160 kg (352.7 lbs); the load is reduced depending on equipment

User weight*	
Maximum user weight (User + luggage)	120 kg (264.5 lbs)

* The product is set to the specified maximum user weight. The product's features and certain settings affect stability. The product settings and features may not be changed or only slightly changed depending on the maximum user weight.

** Reduced to **136 kg** if equipped with the Dahl docking system mounting kit.

Dimensions and weights (front-wheel drive)*	
Overall width	Maximum: 650 mm (25.6")
Overall length (with vertical leg support)**	Maximum: 1260 mm (49.6")
Weight of the heaviest removable component	Luggage carrier option: 2.2 kg (4.8 lbs) Head support option: 1.1 kg (2.4 lbs)
Transport weights***	See "Weight"; see "Weight of the heaviest removable component"
Permissible overall weight with user and accessories	Version 6 km/h and 7.2 km/h with LINIX drive manufacturer: 320 kg (705 lbs) Version 6 km/h and 7.2 km/h with AMT drive manufacturer: 380 kg (838 lbs) Version 10 km/h: 320 kg (705 lbs)
Minimum turning radius****	650 mm (25.6")
Minimum turning circle*****	1300 mm (51.2")
Front/rear tyre size	9"/10"
Drive wheel tyre size	14"

* Depending on equipment selected

** + 20 mm (0.8") with luggage carrier

*** Weight of the heaviest component

**** Depending on configuration and options; specified value = smallest setting

***** DIN EN 12184, class A

Transportation size	
Storage length	Minimum: 920 mm (36.2")
Storage width	Maximum: 650 mm (25.6")
Storage height	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")

Dimensions – APS seat	
Effective seat depth*	300 – 560 mm (11.8" – 22")
Effective seat width*	320 – 560 mm (15.6" – 22")
Effective back width*	300 – 560 mm (11.8" – 22")
Front seat height**	420 – 580 mm (16.5" – 22.8")
Lower leg length***	230 – 440 mm (9" – 17.3")
Back support height****	650/750 mm (25.6"/29.5")

Dimensions – APS seat	
Distance from arm support to seat	180 – 400 mm (7.1” – 15.7”)
Front position of the arm support	200 – 350 mm (7.9” – 13.8”)

* In increments of 20 mm

** At 0° seat inclination, without seat cushion, in increments of 20 mm

*** In increments of 10 mm

**** Deviations possible with ADI back support (Baxx line)

Seat and back support adjustment	
Set pre-tilt of the seat	0°/2°/4° (depending on order and/or selected option)
Seat inclination*	With lift/tilt module: minimum: -30°; maximum: 45°
	With tilt module: minimum: 0°; maximum: 45°
Back support angle**	Minimum: 85°; maximum: 165°
Leg support angle**	Minimum: 90°; maximum: 170°

* Value range varies depending on selected option; specifications do not take set pre-tilt into account

** Specifications do not take set pre-tilt into account

Seat function (power)	
Back support angle adjustment	Continuously adjustable up to 70° (85° – 120°; 100° – 140°; 95° – 165°)*
Leg support adjustment	Continuously adjustable up to 75°
Seat tilt**	Adjustable in the posterior direction by up to 45° (with centre of gravity shifting)
Seat height adjustment**	Adjustable by up to 300 mm (11.8”); max. load: up to 160 kg (352.7 lbs)
Combined seat height adjustment/seat tilt 1**	Seat height adjustment: adjustable by up to 300 mm (11.8”) Seat tilt: adjustable by up to 15° anterior and 45° posterior Max. load: up to 160 kg (352.7 lbs)
Combined seat height adjustment/seat tilt 2**	Seat height adjustment: adjustable by up to 300 mm (11.8”) Seat tilt: adjustable by up to 30° anterior (“Active Touch” factory setting) and 45° posterior; includes knee pad Max. load: up to 160 kg (352.7 lbs)

* Indication-related

** Depending on equipment selected

Drive wheels	
Wheel size	14"
Tyre type	PU tyres

Caster wheels	
Wheel size	9"
Tyre type	PU tyres

Driving data	
Speed*	See nameplate for precise information: 6 km/h (3.7 mph); 7.2 km/h (4.4 mph); 10 km/h (6.2 mph)**
Climbing ability (basic model)**	Minimum: 9° (15.8 %); maximum: 10° (17.5 %)
Static stability – uphill	Minimum: 9° (15.8 %); maximum: 10° (17.5 %)
Static stability – downhill	Minimum: 9° (15.8 %); maximum: 10° (17.5 %)
Static stability – sideways	Minimum: 9° (15.8 %); maximum: 10° (17.5 %)
Dynamic stability uphill, forwards***	Minimum: 6° (10.5 %); maximum: 10° (17.5 %)
Dynamic stability uphill, backwards***	Minimum: 6° (10.5 %); maximum: 10° (17.5 %)
Dynamic stability – sideways****	Minimum: 6° (10.5 %); maximum: 10° (17.5 %)
Obstacles that can be overcome (e.g. curbs*****)	Minimum: 50 mm (2”); maximum 65 mm (2.5”)
Braking distance (according to DIN EN 12184)******	At 6 km/h (3.7 mph): 1000 mm (39.4”) – on level surfaces At 7.2 km/h (4.4 mph): 1200 mm (47.2”) – on level surfaces

Driving data	
	At 10 km/h [6.2 mph]: 2100 mm (82.7”) – on level surfaces

* The specified speed can deviate by ±10 %.

** The control device and the motors must be protected against overloading. For this reason, the continuous climbing ability depends on the overall weight (wheelchair weight + user weight + luggage) as well as the ground conditions, exterior temperature, battery voltage and user’s driving style. In individual cases, the ability to climb continuously may be significantly lower than the value specified.

*** Approved climbing ability with lowered seat functions, upright back support and lowered leg supports

**** When turning on slopes

***** Maximum curb height that the wheelchair can drive down safely

****** **CAUTION! The braking distance can be correspondingly longer due to user weight, luggage, installed options and condition of the tyres, and due to weather and surface conditions.**

Electrical circuit*	
IP protection rating (according to DIN EN 60529)	IP44
Operating voltage	24 V DC
Lighting LED front light LED rear light	 12 V, maintenance-free 12 V, maintenance-free
Automatic circuit breaker	100 A
Battery charger	For more information, see the included battery charger instructions for use

* The product meets all requirements under ISO 7176-14.

Battery	
Batteries	2 x 12 V; 62 Ah (C5) / 79.6 Ah (C20); gel; maintenance-free

Minimum driving distance range (on level surfaces)*	
Battery with 62 Ah (C5) / 79.6 Ah (C20)	Approx. 30 km (18.6 miles)

*The specified distance range was determined under defined conditions according to ISO 7176-4. In practice, the distance range can be reduced by up to **50 %**. For information on this, see the section “Distance range” in the instructions for use (user).

Control device	
Model	ICON enAble® X1 control device in combination with power module and seat module
Max. output current per motor	120 A
Max. seat functions that can be controlled	6
Gyro stability control	Integrated in power module
Nominal input voltage	24 V
Operating voltage range	17 – 33 V
Absolute maximum voltage	35 V
Protection rating	IPX4

Control device accessories	
Model	ICON standard hand module (HCS = Handcontrol Standard)
Force for operating the joystick on the hand module	1.6 N
Nominal input voltage	24 V
Operating voltage range	17 – 33 V
Absolute maximum voltage	35 V
Protection rating	IPX4
Bushing for charging external devices (USB-C)	Charging voltage: 5 V (no power delivery) Max. charging current: 3 A Max. charging power: 15 W

Allowable environmental conditions	
Operating temperature	-15 °C to +40 °C (+5 °F to +104 °F)
Transport and storage temperature	-15 °C to +40 °C (+5 °F to +104 °F)
Relative humidity	45% to 85%; non-condensing

Corrosion protection	
Corrosion protection	Cathodic dip coating / powder coating

13 Appendices

13.1 Required tools

The following tools are required for adjustments and maintenance work:

- Allen wrenches in sizes 3, 4, 5, 6
- Ring and open-ended wrenches in sizes 10, 11, 13, 19 and 24
- Torque wrench (measurement ranges 5 – 50 Nm)
- Phillips head screwdriver (size: 2)
- Device for programming, including all required access data and any cables

13.2 Torque values of the screw connections

Unless otherwise specified, screw connections are tightened with the following torque values:

- Thread diameter M4: 3 Nm
- Thread diameter M5: 5 Nm
- Thread diameter M6: 10 Nm
- Thread diameter M8: 25 Nm

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