Instruction manual
munevo DRIVE R-net
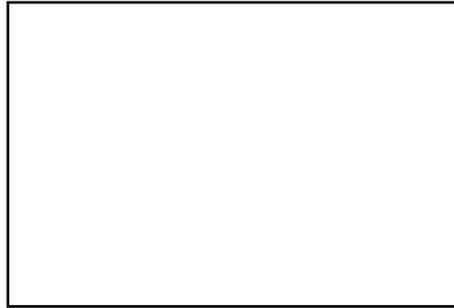
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Visually impaired people can obtain this user guide in PDF format at:

www.munevo.com

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1. General information

INFORMATION
Date of last update: **2026-01-20 (YYYY-MM-DD)** • Read this document carefully. • Observe the safety instructions.

INFORMATION
You can request these operating instructions as a PDF file from the customer service department at **support@munevo.com** or from the manufacturer's service department (see reverse for address). • The PDF file can also be displayed in enlarged form. • If you have any further questions about the instructions for use, please contact the specialist personnel who gave you **munevo DRIVE R-net.**

1.1 Foreword

Dear **munevo** user,

Thank you for choosing **munevo DRIVE R-net.** For the proper use of the system, the operating instructions provide you and the persons accompanying you with all the necessary knowledge about the structure, function, operation and maintenance of the product. Please familiarise yourself with the contents of the operating instructions to ensure safe and secure use of **munevo DRIVE R-net.** In addition, you will receive information and tips on possible faults or malfunctions that may occur.

Knowledge of these instructions is essential for the safe use of **munevo DRIVE R-net.** In particular, the chapter "Safety" must be read carefully by the operator and accompanying person before using the device for the first time.

For reasons of better readability, the masculine form has been chosen in the text, nevertheless the information refers to members of all genders.

⚠ CAUTION
Users who cannot read (e.g. children of young age) must be instructed in detail about the symbols used in the application, their meaning and effect as well as about the contents of these instructions for use. In addition, extended practice time in the presence of an accompanying person is recommended.

1.2 Intended use

munevo DRIVE R-net is exclusively for the individual use of people with walking disabilities for self-transportation indoors and outdoors and is to be used in conjunction with a power wheelchair. **munevo DRIVE R-net** is used to control power wheelchairs, in particular driving, adjusting the seat position and is based on the use of Smartglass technology. The **munevo** software on the Smartglass and the **munevo** adapter box controls a power wheelchair by recognising the head movements of the wheelchair user.

System requirements power wheelchair - control system:
• Curtiss-Wright - R-Net (incl. Permobil Power Platform)

Any other use is considered improper. The manufacturer is not liable for any

personal injury or damage to property resulting from improper use, but only the operator.

munevo DRIVE R-net may only be used by a person who has read the instructions for use and is therefore a prerequisite for use in order to operate **munevo DRIVE R-net** safely and without errors and to protect persons from danger.

The operational safety of **munevo DRIVE R-net** is only guaranteed if it is used as intended, in accordance with the information in these operating instructions. The operator is ultimately responsible for accident-free operation.

> ⚠ **WARNING**
>
> Check head calibration, function and position of the emergency stop button daily before use. You will be reminded of this during system start-up.

Figure 1-1: Start-up screen

1.3   Areas of application

The functional diversity of **munevo DRIVE R-net** and its intuitive operability allow it to be used by people with walking disabilities:

- Paralysis
- Loss of limb (leg amputation)

- Limb defect/deformity
- Joint contractures/damage
- Other diseases

In the case of individual care, attention must also be paid to the following:

- Physical and mental condition
- Age of the disabled person
- Living conditions
- Environment

1.4   Contraindications

- Cognitive impairments and intellectual disability that preclude independent use of the wheelchair.
- Severely restricted freedom of movement (< 3°) of the head around its three axes
- Limited vision that cannot be compensated by visual aids and leads to restrictions in everyday life
- Influence of interfering medicines (consult doctor or pharmacist)
- Circumstances that preclude the independent use of special controls

> ⚠ **WARNING**
>
> Persons with spasticity that leads to uncontrolled movements of the head and means that an EMERGENCY STOP button cannot be actuated by means of the head may only use **munevo DRIVE R-net** when accompanied by another person. This person can stop the wheelchair in emergency situations.

> ⚠ **WARNING**
>
> People who suffer from narcolepsy or have a tendency to fall asleep involuntarily, which could cause the

head to trigger uncontrolled driving signals, may only use **munevo DRIVE R-net** when accompanied by another person. This person can stop the wheelchair in emergency situations.

⚠️ WARNING
Users who can control their wheelchair with **munevo DRIVE R-net** but are unable to operate an EMERGENCY STOP button should have an accompanying person with them at all times.

1.5 Side effects

Headache
Looking at the Smartglass screen can cause eye muscle fatigue and a mild headache.

Tension in the neck muscles
The unfamiliar movements and range of motion can lead to fatigue and tension due to the exertion.

1.6 Service

ⓘ INFORMATION
Service and repairs to **munevo DRIVE R-net** are only carried out by trained personnel authorised by **munevo.** In the event of problems, contact the specialist dealer who fitted **munevo DRIVE R-net** for you.

If you have any questions or if a problem cannot be solved despite consulting the operating instructions, please contact the medical supply store that sold and installed the control unit for you.

In terms of customer satisfaction, **munevo** strives to support customers in every way so that they are satisfied with the product for a long time to come.

2 Security

2.1 Meaning of the symbolism

⚠️ WARNING
Warnings of possible serious accident and injury hazards.

⚠️ CAUTION
Warnings about possible risks of accident and injury.

ⓘ NOTE
Warning of possible technical damage.

ⓘ INFORMATION
Instructions for operation. Notes for service personnel.

2.2 Standards and guidelines

All safety information in this instruction manual refers to the currently valid national laws and regulations of the European Union. In other countries, the applicable laws and national regulations must be observed.

In addition to the safety instructions in these operating instructions, the generally applicable regulations of the Employer's Liability Insurance Association (BGV), the regulations for accident prevention (UVV) and for environmental protection must be observed and complied with. All

information in these operating instructions must be followed without restriction at all times.

munevo DRIVE R-net is built according to the currently valid rules of technology and is safe to operate. The safety of **munevo DRIVE R-net** is confirmed by the CE mark and the declaration of conformity.

2.3　General safety instructions

⚠ **WARNING**

Danger of suffocation
Make sure that the packaging materials do not get into children's hands.

⚠ **WARNING**

Residual risks
Despite all measures to minimise the risks of using **munevo DRIVE R-net,** residual risks cannot be excluded.
A list of the residual risks can be found in the appendix, under item 14.4.

⚠ **CAUTION**

Risk of accident and injury due to non-observance or non-compliance with the safety instructions
All safety instructions in these operating instructions and in all applicable documents must be observed and complied with. The instructions must be available to the operator at all times.

⚠ **CAUTION**

Risk of accident and injury due to improper use

munevo DRIVE R-net may only be used as intended and may only be used by people who have read the operating instructions.

⚠ **CAUTION**

Risk of accident when driving without experience
Driving without experience can unintentionally lead to collisions and other dangerous situations. Practise using **munevo DRIVE R-net**, preferably on level, manageable terrain. Your medical supply store and **munevo will be** happy to answer any questions you may have about using **munevo DRIVE R-net.**

⚠ **CAUTION**

Recalibration due to change in seating position due to fatigue
If the seating position changes significantly due to fatigue, recalibration should be carried out. It may be necessary to adjust the seat to prevent the body from slipping too much.

⚠ **CAUTION**

Recalibration due to change of seat setting (tilt)
If the seat setting is changed (tilting backwards), recalibration is necessary. A corresponding note in the application indicates this calibration.

⚠ **CAUTION**

Synchronicity between wheelchair and glasses

When a wheelchair display is available, attention should be paid to the wheelchair display indications when opening other wheelchair modes to avoid unintentionally activating a different mode or profile than selected in the glasses. If a lack of synchronicity is noticed, opening the "Drive" screen on the glasses should synchronize the chair and glasses. In some cases, pressing the profile button on a secondary input module, such as a joystick, can switch to the munevo driving profile on the chair. If the problem remains, a contact person at the responsible medical supply store should be contacted.

ⓘ INFORMATION
Improper use of **munevo DRIVE R-net** or failure to observe warnings will result in the loss of warranty claims.

⚠ WARNING
Flame protection
Plastic parts meet the requirements according to UL94.

2.4 Safety requirements for transport, storage and assembly

Transport and storage

⚠ CAUTION
Damage due to improper transport. Always transport the smartglass in the case provided to avoid damage.

For more information on correct transport and optimal storage conditions, please refer to chapter 6 "Transport and storage".

Assembly

⚠ WARNING
Improper assembly
munevo DRIVE R-net may only be installed by authorised dealers to prevent improper installation.

Munevo DRIVE R-net components may only be installed by a dealer authorised and trained by **munevo.** The dealer carries out the assembly according to the instructions in the service manual.

Incorrect installation will invalidate the warranty or guarantee.

Furthermore, opening the components without having consulted **munevo** beforehand also leads to the exclusion of warranty or guarantee.

Any modification to the components will invalidate the CE certification.

⚠ WARNING
Glass settings under the Admin menu must only be accessed by trained professionals or by munevo. No changes must be made to any setting of the smartglass which is not provided or allowed by munevo in the service manual.

2.5 Safety during operation

⚠ WARNING
Risk of accident and injury due to faulty safety functions

The operator is obliged to satisfy himself of the safe and proper condition of **munevo DRIVE R-net**, including the safety functions, before each use. **munevo DRIVE R-net** may only be operated when all safety functions are in working order.

⚠ WARNING

Risk of accident and injury due to modified wheelchair programming
Changes to the speed or acceleration parameters can lead to unpredictable and uncontrollable driving characteristics resulting in accidents. Always test the driving behaviour of your power wheelchair after completing the programming.

⚠ WARNING

Risk of accident when driving without experience
Driving without experience can lead to collisions and other dangerous situations. Practice using **munevo DRIVE R-net** in conjunction with your power wheelchair before using it for the first time on level, manageable terrain.

⚠ WARNING

Extreme caution should be exercised near unsecured landings, steep slopes or elevated surfaces. Unintentional movements or excessive speed in such situations can lead to injury and damage to property.
Reduce speed when travelling over uneven terrain as unintended head movements and manoeuvres may occur.

⚠ WARNING

Danger of accident due to uncontrolled driving behaviour
When operating **munevo DRIVE R-net** with your power wheelchair, uncontrolled movements may occur due to malfunctions. In this case, contact your authorised specialist dealer immediately. Immediately take **munevo DRIVE R-net** out of operation if you detect faults, defects or other dangers that could lead to personal injury.

⚠ WARNING

Observe health status when using four-directional driving
Use four-directional driving or the tilt-down gesture to drive with caution. If the user faints while driving in these two modes, the wheelchair will continue to drive. If there are chances that fainting or exhaustion can occur while driving, using three-directional driving or the tilt-up to drive gesture is recommended, where the wheelchair will stop if the user faints while driving.

⚠ WARNING

In environments where there is a risk of collision with other objects, driving must not be deactivated.

⚠ WARNING

Electromagnetic radiation
When operating **munevo DRIVE R-net,** interference may occur due to electromagnetic fields. Observe the following special features during operation:

Munevo DRIVE R-net is tested according to the EMC regulations (EN 60601-1-2), but its functionality can still be affected by electromagnetic fields.
Switch off the power wheelchair in case of unexpected operation or in case of unintentional release of the brakes as soon as this can be done safely. In this case, contact your authorised specialist dealer immediately.

⚠ WARNING

Interference with other units
Please note that the components of munevo emit electromagnetic radiation. In very rare cases, this radiation can interfere with medical devices (such as pacemakers or defibrillators). Please keep a sufficient distance to the devices or contact your doctor or manufacturer. Switch off **munevo DRIVE R-net** if no function is required. If you notice a malfunction of another device, please stop using **munevo DRIVE R-net.**

⚠ WARNING

Interference from other accessories
The use of ACCESSORIES, transducers and wiring other than those specified or provided by **munevo** for this unit may result in increased ELECTRICAL EMISSIONS or reduced electromagnetic immunity of the unit and may result in improper operation.

⚠ WARNING

Interference from HF devices

CARRIABLE HF communication devices (radios) (including their ACCESSORIES such as antenna cables and external antennas) should not be used at a distance of less than 30 cm from the **munevo DRIVE R-net** parts and cables designated by **munevo.** Failure to observe this may result in a reduction in the performance characteristics of the device.

⚠ WARNING

Using other functions
Please only use the functions (such as camera, changing seat position) and settings provided by munevo DRIVE R-net such as calibration, lighting, volume, hazard lights, language, Wi-Fi, etc. when the wheelchair is parked in a safe place.

ⓘ NOTE

Damage due to overheating or cold
munevo DRIVE R-net is only functional in the temperature range from 0 °C to +35 °C. It must not be operated outside this temperature range.

ⓘ INFORMATION

When driving on public roads, the road traffic regulations must be observed.

⚠ WARNING

Operating with sufficient feedback
Use the smartglasses only when sufficient feedback can be received from the system. The glasses provide

visual and auditory feedback. Ensure either one of the types of feedback is sufficient to operate the product safely. If visual or auditory feedback alone is not enough in certain situations, ensure that both feedback can be received during operation.

2.6 Network security

Information on network security can be found in section 10.2 "IT security measures".

2.7 Safety requirements for care, maintenance and disposal

⚠ CAUTION
Risk of accident and injury due to incorrect maintenance, repair or adjustment Maintenance of **munevo DRIVE R-net** may only be carried out by personnel authorised and trained by **munevo.** This also applies to all repairs and adjustments to the **munevo DRIVE R-net** adapter box. Incorrect adjustment can lead to loss of functionality.

⚠ CAUTION
Check for updates regularly Please check regularly whether updates are available for the munevo DRIVE R-net application by synchronizing the application (Support -> Sync). (see 4.6.8.4)

⚠ CAUTION
munevo DRIVE R-net adapter box checks for updates on its own regularly. When it's in the process of

checking for updates or updating, the LED on the adapter box will either blink in green color or the green LED will be ON. **Do not** unplug the adapter box during the update process as it may lead to the adapter box to not function properly. For more information on the update process of the adapter box, see 7.1.

⚠ CAUTION
Risk of injury due to uncontrolled movements Always remove the fuse when carrying out any maintenance work with the battery cover open.

ⓘ NOTE
Damage to the electronics due to water penetration Under no circumstances should **munevo DRIVE R-net** be cleaned with a water jet or high-pressure cleaner. Avoid direct water contact with electronics at all costs.

ⓘ INFORMATION
munevo DRIVE R-net must be checked at least once a year by an authorised specialist for functionality and driving safety.

2.8 Requirement for the operator

⚠ CAUTION
Risk of accident and injury due to improper operation. **munevo DRIVE R-net** may only be used by a competent operator. The operator and any accompanying

person therefore read the operating instructions fully before the use of **munevo DRIVE R-net.**

The operator must have read the complete operating instructions. Operation while overtired, under the influence of alcohol or medication is not permitted. The operator must not have any mental impairment that temporarily or permanently impairs attention or judgement.

> ⚠ CAUTION
>
> Mental impairment or taking medication, both prescription and over-the-counter, may affect your ability to use the wheelchair safely. Consult your doctor about taking medication.

2.9 Safety functions

In order to be able to stop the wheelchair in dangerous situations, a POWER button is fitted to the wheelchair. This button is connected to the munevo DRIVE R-net adapter box directly. The wheelchair can always be switched off and on again with this button. This button is also designated to be used as an EMERGENCY STOP button, so that the user can power off the wheelchair in emergency situations where the operation of the wheelchair is uncontrolled.

> ⚠ WARNING
>
> **Risk of accident and injury due to faulty safety functions**
> The operator is obliged to check the proper condition of the safety device, EMERGENCY STOP button, before each use. **munevo DRIVE R-net** may

only be operated if the EMERGENCY STOP button is functional.

> ⚠ WARNING
>
> **Risk of accident and injury in emergency situations**
> The EMERGENCY STOP button serves as an EMERGENCY STOP. In emergency situations such as uncontrolled driving behaviour of the power wheelchair, the EMERGENCY STOP button must be actuated. The EMERGENCY STOP button must be attached to the wheelchair in such a way that it can be easily operated and reached by the user at all times.

Fall detection:

If the glasses fall down during use or get into an abnormal orientation, this is recognised as a fall and the wheelchair is stopped immediately. To prevent further unwanted functions from being performed, the glasses lock themselves. Before further use, the glasses must be unlocked by tilting the head to the left for 3 seconds. (see 4.6.12). Fall detection is enabled when the driving or seat screen is opened on the glasses.

2.10 Warning and labels

The label is located on your **munevo DRIVE R-net** adapter box and on the front of this instruction manual. The label shows the exact model, serial number and other technical data.

When contacting your specialist dealer or **munevo** GmbH, please always have the serial number ready.

Symbols used according to EN ISO 15223-1	
Manufacturer image	Manufacturer
Date of manufacture image	Date of manufacture
SN	Serial number
REF	Product reference number
LOT	Batch number
MD	Medical device
CH REP	Authorised representative, e.g. for Switzerland
Storage image	Storage temperature range
Warning image	Examine the instructions for use for important safety-related information.
Instructions image	Follow the instructions for use
Moisture image	Protect from moisture
WEEE image	Note on disposal in accordance with the WEEE Directive.
CE image	CE marking "European Conformity

Table 2- 1: Symbols used

3 Scope of Delivery

The scope of delivery includes:

Fitted to the wheelchair:

- **munevo DRIVE R-net** adapter

- 2xM6 screws and nuts for fastening the bracket

⚠ CAUTION
It is recommended to mount the munevo DRIVE R-net adapter box properly on the wheelchair.

For you:

- Operating instructions
- **munevo** Smartglass
- Case
- Power supply unit
- Smartglass charging cable

4 Operation

4.1 Fitting the glasses

⚠ CAUTION
If the glasses are not positioned correctly, the display may obstruct your view and cause an accident. If positioned too low, you may tend to tilt your head upwards when looking straight ahead. This may cause neck strain and blurred vision if you wear glasses with prescription lenses.

The **munevo** Smartglass is worn like normal glasses. The display should be just above the line of sight of the right eye.

The glasses are delivered with a titanium frame. If prescription lenses are required to compensate for a visual impairment, the titanium frame can be replaced with an appropriate spectacle frame, see 4.2. The following describes how the frame can be replaced:
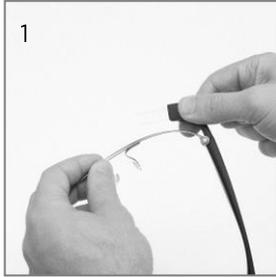
1. Hold the glasses with your right hand just behind the "display" as shown in "1".
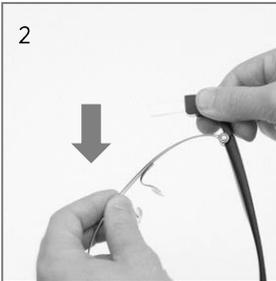
2. With your left hand, fold the frame towards you.
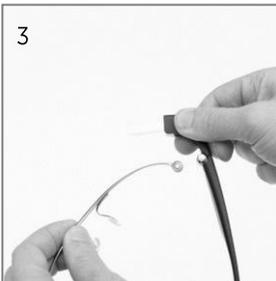
3. Now you can replace the frame with another one.
4. Attaching the frame: Place the frame back on the joint and fold it forward until it clicks into place ("click").

4.2 Spectacle frames for prescription lenses

Instead of the titanium frame, there are two spectacle frames to which the Smartglass can be clipped. The frames (brown, grey) are shown below:

Figure 4-1: Sajama spectacle model - brown

Figure 4-2: Avella spectacle model - grey

For both frames there is also a right temple to wear them without the Smartglass. When removing the temple, proceed as described in 4.1, hold the spectacles as described in 1. However, do not hold the spectacles in front of the hinge, but hold the button of the hinge pressed down when closing.

4.3 Gestures

The **munevo DRIVE R-net** application is operated using head movements. A distinction is made between driving signal input, i.e. gestures that result in movements of the wheelchair, and menu control, i.e. gestures to control the application menu. In addition to head movements, the menu can also be controlled via voice control. In addition, the touchpad on the side of the glasses

can be helpful, especially for caregivers/assistants.

The following head movements are used to operate the app and drive the wheelchair.

1. **Application**

a. Head movement - horizontal head nodding is used to switch between menu items.

b. Head movement - vertical head nod
   i. Up - back to the previous menu
   ii. Down - Confirm

2. **Driving mode**

a. Head movement - Lateral head tilt is used for turning right and left or cornering. The more the head is tilted, the tighter the turn.

b. Head movement - Backward tilt of the head is used to drive the wheelchair forward or backward (depending on the selected driving mode). It is also possible to change the direction of the tilt for driving. In the Admin menu there is a menu item "Driving gestures" in which "tilt down" can be selected.

For more information on operating the product, various instruction videos can be viewed at www.munevo.com

4.4 Voice control

Munevo DRIVE R-net can also be controlled using voice commands. Voice control can be activated under "Settings". Before the first use, it must be confirmed that the instructions in the user manual have been read.

To use voice commands, a dialogue must be activated **by tilting upwards for two seconds** or the **wake word** "**ok munevo**". An acoustic signal now confirms that a voice command can be given. You have 10 seconds to do this. If no voice command is given during this time or if the user tilts downwards, the voice control dialogue is closed, and the glasses do not wait for a command.

In addition, the voice control dialogue can be closed with the word "cancel".

Closing the voice control dialogue is also confirmed by an acoustic signal. This signal can be heard both after a correct voice command has been given and when the voice control dialogue is cancelled, or an incorrect voice command has been given.

Under Settings you can select whether voice commands can be initiated by a "wake-up word" or a "tilt movement". Only one of these two possibilities can be active at the same time.

A small symbol at the top of the screen indicates that the voice control is switched on and which initiation option has been selected. "Tilt up" is indicated by a small arrow next to the microphone, the wake-up word by OK next to the microphone.
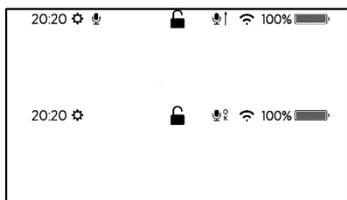
Figure 4-3: Different voice control modes

Further information on the setting options of the voice control is provided in the following chapter 4.6.5.5.

4.4.1   New version
If a new version of the voice control is available, this is indicated by an orange dot next to the Settings and Voice Control menu. The download only runs when the voice control screen is open.

The download may take several minutes, depending on the speed of your internet connection.

4.4.2   Available Voice Commands
All menu items can be selected by voice commands. "Go to settings", for example, will navigate to the settings menu. The command "Open" can be used to select the menu items directly. Examples are:

• "Open Calibration"
• "Please open gallery"
• "Open Add-ons"

Likewise, actions in the menu can be carried out directly by voice control. Examples of this are:

• "Switch on hazard lights"
• "Establish a connection with the WiFi".
• "Start the tilt calibration".

It is possible to navigate directly to seat profiles on the glasses. Note that the voice commands such as "go to …", "open …" or "navigate to …" will all navigate to the respective seat profile and the profile will need to be activated by a nod down to change the position. The voice commands support most common seat profile names such as "recline", "backrest", "footrest", etc. It is not possible to use custom seat profile names. In such situations where custom seat profile names are configured on the wheelchair, it is recommended to use the seat profile position instead of the name. Example commands can be found in the text below.

The following is an overview of the possible voice commands. Please note

that the commands can be varied and not only used as described below. As an example, we have described the commands differently in the various categories. The following list is only a selection of voice commands.

Navigate through the menu:
• "Go to Settings"
• "Open Drive"
• "Seat Setting"
• "Open Add-Ons"
• "Turn on the light"

Camera:
• "Photo please"
• "Take a picture"

Calibration:
• "Start Tilt Calibration"
• "Please Calibrate Nod"

Volume:
• "Change the volume to 0"
• "Change the volume to 10".
The volume can be adjusted in the range 0 (mute) - 10 (loud).

Voice commands:
• "Show the commands"
• "Open wake word"
• "Voice control off"

Language:
• "Switch to German"
• "Switch to English"
• "Select French"
• "Select Dutch"
• "Go to language"

Internet:
• "Connect to the Internet"
• "Connect to the WiFi"
• "Scan for Internet Connection"

Sync:
• "Start Sync"
• "Update the glasses"
• "Sync the app"
• "Update the device"

Seat:
• "Go to tilt"
• "Open recline"
• "Go to footrest"
• "Open seat height"
• "Go to seat 1"
• "Go to memory 4"
Seat positions can be used instead of seat profile names. Positions 1 through 14 and memory positions 1 through 6 are supported.

4.5 Switching on the Smartglass

If the Smartglass was switched off, it must be started via the button on the inside of the battery module (behind the right ear) (press for 2 seconds). After the start-up process, the user is in the main menu of the application. The glasses can be switched off by holding the button for 2 seconds. If the glasses do not start despite previous charging, press and hold the button for 15 seconds to perform a reset. Then press again for 2 seconds and the glasses should start.

Figure 4-4: Switching on the glasses

4.6 Menu structure

In order to achieve better operability, it is possible to navigate to the left as well as to the right in most menu items. munevo DRIVE R-net is available in the three versions "Driving only", "Basic" and "Advanced". The menu items displayed depend on the version selected. The version can be changed in the Admin menu. After starting the glasses, you are automatically in the main menu, at "Driving". See figure "Application menu structure" under appendix for an overview of menu items in different application modes.

4.6.1 Driving

```
┌─────────────────┐
│     Driving     │
└─────────────────┘
         │
         ▼
┌──────────┐     ┌──────────┐
│ Forward  │ ──▶ │ Backwards│
└──────────┘     └──────────┘
```
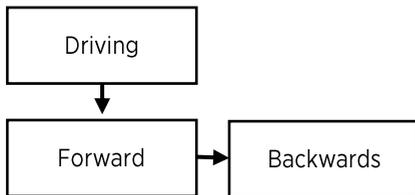
Figure 4-5: Changing the direction of travel

In the "Driving" menu, the normal driving mode ("Forward") and the reverse mode ("Reverse"), as well as different driving profiles can be selected. By nodding left, one switches between the indoor and outdoor mode, by nodding right, one can switch between the forward and reverse mode. The reverse mode can also be selected in the activated driving state by nodding to the right, provided the head is in the zero position.

By default, a single nod right gesture is enabled to change the driving direction, however, starting with version 10.22.2 of the glass application, the driving direction can also be changed using a double-nod right gesture from the activated driving screen. This functionality can be enabled or disabled from the Settings menu on the glasses.

4.6.1.1 Profiles

Two driving profiles with different wheelchair speeds can be selected:

```
┌─────────────────┐
│     Driving     │
└─────────────────┘
         │
         ▼
┌──────────┐     ┌──────────┐
│ Outdoor  │ ◀── │  Indoor  │
└──────────┘     └──────────┘
```
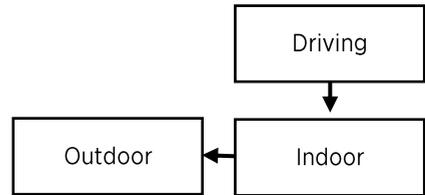
Figure 4-6: Changing the driving profile

Indoor - slow profile to be able to ride safely and in control indoors.

Outdoor - faster profile to cover long distances outdoors.

> ⚠ **WARNING**
> Before driving, the driving profile and speed levels must be checked.

4.6.1.2 Activate drive

Nod down in the driving menu to activate the driving functionality. An orange profile symbol and arrows a little further apart indicate this on the display. Now you can control the wheelchair by tilting your head (see section 4.6.11). Nod down again to deactivate munevo DRIVE R-net. The profile symbol is now white again and the arrows are closer together. Only in deactivated mode can you change the profile and select all other menu items. If "Drive" is activated and you are in the zero position (the wheelchair is not moving), you can still

switch between forward and reverse mode by nodding right.

While driving, the screen is not visible, so you can concentrate better on driving and battery consumption is reduced. As soon as you stop, the screen reappears on the display.

4.6.1.3   Simplified driving mode

Munevo DRIVE R-net provides a driving mode called "Simplified mode". With the simplified mode, as soon as the driving screen is opened, driving is activated. Driving profile selection is removed from the simplified mode. The simplified mode can be used with one of two options, a four-directional and a three-directional control. The three- or four-directional control can be activated from the Admin menu using the "Drive mode" screen.

4.6.1.4   Four-directional driving

With this mode, all four directions to control a wheelchair can be accessed easily with head tilts. Unlike the three-directional driving mode, there's no need to change the driving direction with a right nod to drive forwards/backwards. Driving can be deactivated when the head is in neutral position. This can be visualized by the dot or the driving profile in the middle of the arrows, which when visible, indicates that the head is in the neutral position. The four-directional driving mode can be activated for any application mode (drive-only, basic, advanced) through the Admin menu.

4.6.1.5   Three-directional driving

This is the default driving mode of the application. This mode allows driving the wheelchair using three directions: left,

right, up/down (depending on if tilt-down to drive is activated). If tilt-down to drive is deactivated from the Admin menu, tilting the head upwards will drive the wheelchair in the forwards direction if forward direction is active, and in the reverse direction if reverse direction is active. However, if tilt-down to drive is activated from the Admin menu, tilting the head downwards will drive the wheelchair in the forwards direction if forward direction is active, and in the reverse direction if reverse direction is active. Tilting the head left/right will drive the wheelchair in the left/right direction. Driving can be deactivated when the head is in neutral position. This can be visualized by the dot or the driving profile icon in the middle of the arrows, which when visible, indicates that the head is in the neutral position.

4.6.1.6   Neutral position calibration

Munevo DRIVE R-net provides a setting to enable calibrating a new neutral position before driving starts. This setting is available in the Admin menu. For drive-only, basic and advanced driving modes, if the head position is different than the calibrated neutral position when activating driving, a calibration screen is shown for a moment to calibrate the new neutral position. For the simplified driving mode, the neutral position recalibration screen is shown as soon as the driving screen is opened. This calibration only recalibrates the new neutral position and takes a just few seconds. The user's calibration is then adjusted to the new neutral position so the user can drive the wheelchair with ease. Once the calibration finishes,

driving is activated, and the user can start driving the wheelchair.

If neutral position recalibration setting is deactivated in the Admin menu, a warning message is shown instead to inform that the head position when activating driving is different than the calibrated neutral position. From this warning screen, the user can either choose to continue driving anyways, or can recalibrate the new head position before driving.

4.6.1.7 Safety zone

Starting with version 10.39.1 of the glass application, safety zone function is available to enhance user safety while driving. Once setup, the safety zone will trigger the glasses to stop driving and lock if the head position moves outside the defined safety zone in any of the four directions (up, down, tilt left or tilt right). When within the safety zone, the glasses function normally as expected.

4.6.1.8 Drive Settings

Munevo DRIVE R-net provides an option to customize drive settings from the Admin menu. You can choose between two control types (Admin > Control type) and further customize settings for one of the options.

Default:

This is the default control type that munevo DRIVE R-net comes with.

Custom:

This mode offers customization to drive function compared to the default mode. With this mode you can customize the deadband while driving the wheelchair, which makes the control of the wheelchair smoother, depending on the selected deadband value.

   Deadband:

   This setting offers to customize the deadband in the left/right direction while driving. The value can be chosen from 0% to 50%, where 0% means there will be no deadband in the left/right when driving the wheelchair, offering the most precise control in the left/right direction. The higher this value is, the more deadband there will be for the left/right direction, offering more room for the head to tilt left or right without changing the direction of the wheelchair, when you want to drive the wheelchair straight.

4.6.2 Speed Adjustment

Starting with version 10.17.5 of the glass application, the wheelchair's speed can be adjusted directly from the driving screen of the glasses. When the function is enabled, the driving screen shows speed adjustment icon on the left side of the driving screen, which can be accessed by a single nod-left when driving is deactivated and a double nod-left when driving is activated. On the right side of the driving screen, the profile can be changed when driving is deactivated and, in 3-directional driving mode, the driving direction can be changed when driving is activated.

The speed adjustment screen can be customized to allow for changing the speed using left and right nods or using

up and down nods. For adjustments using left and right nods, nodding left will reduce the speed and nodding right will increase the speed. For adjustments using up and down nods, nodding up will increase the speed and nodding right will decrease the speed. The speed change will be reflected on the glass display as well as on the wheelchair display. The speed levels allowed are between 1 and 5. Once the desired speed level is set, nodding right or nodding down will exit the speed adjustment screen and will go back to the driving screen. Note that if the speed adjustment screen is accessed from the activated driving screen using a double nod-left gesture, then to exit the speed adjustment screen the head must be in neutral position. When it is so, the arrow pointing to exit the screen will be shown, which is otherwise hidden.

Note that on the wheelchair, the speed level is shared between driving profiles. This means that individual driving profiles do not store separate speed levels on the wheelchair.

Note that the speed adjustment functionality is available for R-net wheelchairs.

4.6.3 Seat adjustment

The seat setting can be adjusted via this menu item. The different seat modes can be selected by nodding sideways. Nodding downwards activates the selected mode, tilting to the left and right (identical to the driving gestures) changes the corresponding seat position. Nodding upwards exits the submenu of the activated seat mode. It is then possible to change the mode or exit the menu.

After changing the seating position, you should recalibrate the gestures for controlling the wheelchair, as the tilt of the head may have changed as a result. However, you will also be informed of this when you activate the driving mode. You can still activate the driving mode by nodding downwards. However, only do this if you are sure that your current zero position does not deviate significantly from your calibrated position, otherwise the wheelchair will start moving. To recalibrate the zero position, nod to the right and then down when the warning is displayed. For a more detailed explanation of calibration, see 4.6.13.

Starting with version 11.2.2 of the glass application, the safety zone functionality is also available for the seating function. The safety zone for the seating function will also allow for a safe user experience when changing seat positions. For seating, the safety zone will trigger only in the left and right directions as those are the control directions for changing seat positions. When triggered, it will exit the seating screen and lock the glasses.

Starting with version 11.2.2 of the glass application, neutral calibration of the head position can also be enabled for the seating screen. When enabled, if the head position is different than the neutral calibrated head position before opening any seat profile on the glasses, a recalibration screen will show up to recalibrate the neutral head position. Once recalibrated, the seat profile can be adjusted as usual.
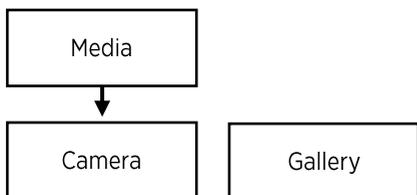
4.6.4 Media

```
┌─────────────────┐
│      Media      │
└─────────────────┘
         │
         ▼
┌───────────────┐  ┌───────────────┐
│    Camera     │  │    Gallery    │
└───────────────┘  └───────────────┘
```

Figure 4-7: Media menu structure

The camera and the gallery can be accessed via the menu item "Media".

4.6.4.1 Camera

Using the camera, you can easily take a photo of your surroundings or other people. As soon as the menu item "Camera" is activated, you have 5 seconds to position your head accordingly before the photo is taken. You can see the section of the camera or the subsequent photo on the screen of the Smartglass. If a photo has been taken, this is automatically shown on the display. By nodding downwards, you open a new menu. You have the option of taking another photo, deleting the photo you have just taken or sharing it. To do this, your medical supply store or munevo must store an e-mail contact who will receive the photos by e-mail. See figure "Camera menu structure" under appendix for an overview of menu items available for the camera functionality.

ⓘ INFORMATION
Frequent use of the photo function can, under certain circumstances, greatly reduce the battery life.

4.6.4.2 Gallery

In the gallery, you can view, share or delete the photos via the screen. The pictures can be shared to an email address that is set for the glasses. To configure the email address, please contact **munevo**.

4.6.5 Settings

In the menu item Settings, the calibration and Smartglass settings, such as volume and language, can be adjusted. The lighting of the wheelchair is also controlled here. See figure "Settings menu structure" under appendix for an overview of different settings provided by the glass application.

4.6.5.1 Calibration

In this submenu, the calibration of the sensors can be carried out, both for the menu control gestures and for the driving gestures. The exact calibration procedure is explained on the screen and via the loudspeaker. The chapter Calibration (4.6.13) goes into more detail.

4.6.5.2 Light

You can switch the lighting of your wheelchair on and off via the menu item Light. Nodding to the right switches on the headlights and rear lights of your wheelchair, nodding to the right again switches them off. Nod upwards to leave.

4.6.5.3 Hazard lights

The warning lights of the wheelchair can be switched on and off via the menu item Warning lights. Nodding to the right switches the warning lights on, nodding to the right again switches them off. Nod upwards to leave.

4.6.5.4 Volume

The volume of the application can be set via this menu item. The desired volume level can be selected by nodding sideways (right or left). To exit, nod upwards.

4.6.5.5 Voice control

This menu item can be used to change the settings of the voice control. You can select whether the voice control can be activated with a wake-up word or by tilting. In addition, the voice control of munevo DRIVE R-net can be deactivated here. See figure "Voice control menu structure" under appendix for an overview of settings related to voice control.

Tilt up activation

Under this menu item, you can set the voice control to be activated by tilting upwards and holding for two seconds. To do this, "Tilt up activation" must be selected by nodding downwards. In the screen that now opens, the tilting can be activated or deactivated by nodding to the right.

Wake word

You can set the voice control to be activated by the wake word "ok munevo". To do this, select "wake word" by nodding downwards. In the screen that now opens, the "wake word" can be activated or deactivated by nodding to the right.

Commands

Some examples of voice commands and their function are displayed under the menu "Commands".

4.6.5.6 Language

The language of the application can be set via this menu item. You can switch between **German, English, French, Dutch, Spanish, Italian and Czech** by nodding sideways. The selection is confirmed by nodding downwards. The app then restarts in the selected language. If the menu items are not played in the correct pronunciation, connect the Smartglass to the Internet and carry out the language selection again.

> ⚠️ **CAUTION**
>
> The selected language is also used for voice control. When the language is changed, a corresponding note appears in the glasses which must be confirmed.

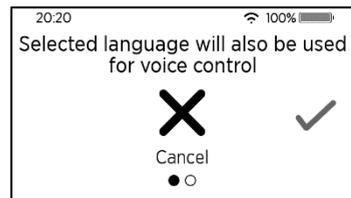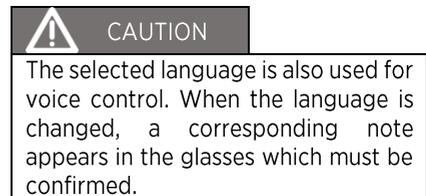Figure 4-8: Language change warning

4.6.5.7 Time zone and format

Starting with application version 10.35.6 of the glass application, the time zone and the time display format can be changed via this menu item. The time zone menu shows all the time zones where munevo DRIVE is available. And depending on user preference, the time display format can be changed between 12-hour and 24-hour format.

4.6.6   Brightness

⚠ WARNING
Using the glasses with the display turned off is only recommended if the audio feedback while operating the glasses is audible for daily usage. If the glasses are operated in noisy environments, it is recommended to turn the display on to rely on visual feedback of the glasses.

In this screen, the display brightness can be adjusted between 5 levels. From the minimum brightness level, the display can also be completely turned off. Operating the glasses with the display completely turned off will provide maximum battery life. The application will function in the same manner as it does with the display turned on. Navigating through the application in screen-off mode can be done using audio feedback that the glass provides. Note that if the volume of the glasses is set to zero, enabling screen-off mode will turn the volume up to 30% so that audio feedback can be heard to operate the glasses. If the volume level is too low for use, please turn the volume up to a level where you can comfortably hear the audio feedback.

4.6.7   Wi-Fi

In this menu item, the glasses can be connected to a Wi-Fi access point so that they can access the Internet. This is necessary, for example, to update to the latest version of the application (more information on updating under Sync, section 4.6.8.4). You need someone's help for this. More on this in the appendix, under 14.3.

4.6.8   Support

The Support menu provides individual information about the unit and the software. The emergency function is very important.

4.6.8.1   Emergency

The emergency function allows the user to send a message to his or her emergency contact if an internet connection is available (e.g. via a smartphone). In the emergency menu, the sending of the message can be confirmed by nodding downwards. A nod upwards allows the user to exit the menu without sending the emergency message.

4.6.8.2   App Info

Information about the unit can be accessed via this item. To exit, an upward nod gesture of the head is performed as usual.

4.6.8.3   Regulatory Info

Information about regulatory info of the product. To exit, an upward nod gesture of the head is performed as usual.

4.6.8.4   Sync

The munevo app can be updated to the latest version by synchronisation. You will be informed about new versions or changes either by e-mail or via your specialist dealer. An internet connection is required for synchronisation. Once updated to a new version, you can see the changes in the new update under the "Release Notes" section.

Check for updates for your app every month to ensure you have the latest version installed.

Information about the updates in the newly updated glass application can be found via this item. To exit, an upward nod gesture of the head is performed as usual.

4.6.9 Standby

Tilting to the **right** for 3 seconds locks the application. Tilting to the **left** for 3 seconds unlocks it again (see 4.6.12). After 1 minute, the glasses automatically go into sleep mode and switch off the display to reduce battery consumption. To use the glasses again, tilt the head to the **left for** 3 seconds.

4.6.10 More symbols

Symbol	Meaning
	Lock symbol
	Unlock symbol
	Symbol for state of charge
	Low battery level

Table 4- 1: Symbols in the display

4.6.11 Driving gestures

The wheelchair can be driven by tilting the head. Tilting the head backwards/upwards causes the wheelchair to move forwards. If you bring the head to the starting position/zero position, the wheelchair stops. By tilting the head to the right or left, the wheelchair can be steered accordingly. The speed of the wheelchair or the turning radius can be controlled

proportionally via the strength of the tilt. For example, the more the head is tilted, the tighter the curve. The maximum positions are set with the help of the calibration. The starting position can also be individually adjusted via this.

Summary of gestures:

- Tilt backwards/upwards - driving the wheelchair straight ahead.
- Lateral tilt - turning the wheelchair to the right and left. In combination with the backwards/upwards tilt, curves of different radii can be driven.

4.6.12 Lock mode

If the driving mode is deactivated, you can move your head without the wheelchair driving. However, it can happen that nodding movements open the menu and menu items are selected without this being intentional. In conversations, for example, you often move your head up and down. To prevent this from selecting a driving mode and driving off unintentionally, there is a lock mode. Tilting to the **right for** 3 seconds locks the application. Tilting to the **left for** 3 seconds unlocks it again. If the application is locked, this is indicated by the orange lock. (See illustration under 4.6.10).

You can always lock the application when the small white lock is visible at the top centre.

Locking will start after a brief moment of tilting the head to the right instead of starting to lock right away. This is to ensure that no unintended locking starts while using the application. The same

goes for unlocking the application, where it starts unlocking after a brief moment of tilting the head to the left.

4.6.13 Calibration

4.6.13.1 Menu calibration ("nod")

The purpose of this calibration is to record the possible nodding movements of the head that are used for menu control. After selecting the menu item "Nod", you are asked to hold your head still. This serves to measure the minimum movement, for example due to a tremor. Thereupon, the nodding movements are performed three times in succession in all directions; the directions are given on the screen. A green dot and a beep signal the readiness for the movement. For the pitching movements, the rotation speeds are decisive; they should be selected so that they can be performed without effort. An orange tick confirms the calibration.

4.6.13.2 Driving calibration ("Tilt")

During this calibration, the maximum values of the tilt of the head are recorded. It is important that the maximum possible tilt angles are not necessarily carried out. Rather, the inclination that is comfortable should be selected. After selecting the menu item "Tilt", the head must also be held still here. The position of the head

corresponds to the later starting position/zero position in which the wheelchair stands still. It can be calibrated as comfortable as you like. The tilt angles for the three directions, backwards, to the right and to the left, are then calibrated. Unlike the menu calibration, one tilts the head in the prompted direction to the desired maximum position and holds it for 5 seconds. When the calibration is complete, an orange tick appears.

The downward tilt gesture can be calibrated in the tilt calibration screen. This step is going to be active when any of the screens requiring the downward tilt is activated on the glass:

- Four-way driving
- When downward tilt for driving the wheelchair is active
- Any screen that has a four-way control for add-ons
- When voice control is active

5 Product Description

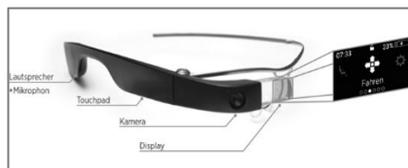### 5.1 Smartglass

5.1.1 Overview

Figure 5-1: Overview Smartglass

> ⚠ **WARNING**
>
> **Danger of explosion.** Only use chargers, batteries and cables approved by **munevo to** charge the Smartglass. The use of non-approved chargers or cables may cause the battery to explode or damage the Smartglass.

> ⚠ **WARNING**
>
> **Heat when charging the glasses**
> It is normal for the battery to generate heat when charging. The batteries in our glasses are protected against overheating.

5.1.2 Charging the Smartglass

1. Connect the USB cable to the USB power supply. Then connect the other end of the USB cable to the Smartglass.

Figure 5-2: Connecting the charging cable

2. Plug the USB power supply unit into a mains socket.
3. When the Smartglass is fully charged, first disconnect the cable from the glasses and then disconnect the charger from the mains socket.

> ⓘ **NOTE**
>
> - Use the supplied USB cable and USB power adapter. A third-party charger may not charge the Smartglass properly.
> - Incorrect connection of the charger or use of an unapproved charger may cause serious damage to the unit. Damage caused by improper use is not covered by the warranty.

> ⓘ **INFORMATION**
>
> - To save energy, please unplug the charger when not in use.
> - The charger supplied does not have an on/off switch. It must therefore be disconnected from the socket so that no energy is wasted.

The glasses offer fast charging, through which they can be charged up to at least 50% within 20 minutes. To use the fast charging feature, fold the glasses by closing the hinge and then connect them to a charger.

The glasses can also be charged while driving. For this purpose, the supplied USB cable must be used to charge the glasses via an appropriate USB PD 2.0 compliant source such as a power bank or a USB output port of the wheelchair.

5.1.3 State of charge

The charge status of the battery can be read in the display. It is shown by a small battery in the upper right corner. If the charge level falls below 30 %, you will be

informed of this by means of visual feedback and if the charge falls below 20% you will be informed by means of audio feedback as well.
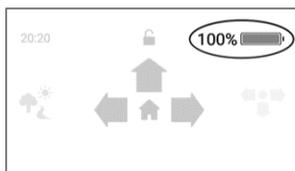

Figure 5-3: State of charge

5.1.4   Battery care

Before first use, a new battery should be charged to 80 - 100 %. In principle, a battery should not be completely emptied before it is recharged. A memory effect, which occurred with earlier batteries, does not exist with modern batteries.

Excessive heat and cold can affect the longevity of the battery, so the glasses should only be stored in a temperature range of -20 to 45°C. Make sure that the battery is kept charged between 30 - 50% if you do not use the glasses for a longer period of time. This protects the battery from deep discharge.

5.1.5   Use of the glasses in wet conditions

ⓘ   NOTE
External force, such as a blow or a fall, can damage the housing and the unit may no longer be water resistant as a result.

It is recommended not to expose the glasses to rain, especially heavy rain or water, for a long period of time.

5.2   munevo DRIVE R-net adapter

The **munevo DRIVE R-net** Adapter receives the driving signals from the Smartglass via **Bluetooth** radio technology and forwards them to an R-net power wheelchair as control signals. To enable use outside buildings, the **munevo DRIVE R-net** adapter is protected against splash water.

5.2.1   Splash and dust protection according to IP53

Please note that the following instructions only refer to contact with water and dust, other liquids are not covered by this. The adapter and the smart glass can be damaged by the ingress of water or dust. Follow these instructions to prevent damage to the unit.

ⓘ   NOTE
External force, such as a blow or a fall, can damage the housing and the unit may no longer be dust and water resistant as a result.

The **munevo** Smartglass meets the conditions of the IP53 protection class (according to DIN EN 60529). The first code number "5" indicates that the glasses are protected against dust and foreign bodies in harmful quantities. The second code number "3" means that there is protection against falling water spray up to 60° from the vertical. It can be worn outdoors. In the event of rain, seek dry ground as soon as possible to avoid damage.

6   Transport and Storage

6.1   Transport

When transporting the Smartglass, please always switch off the Smartglass and use the case provided to avoid damage. Transport this case in such a way that it is protected against falling and other violent impacts. Avoid permanent direct exposure to sunlight.

> ⚠ **CAUTION**
>
> **Damage due to improper transport**
> Always transport the smartglass in the case provided to avoid damage.

6.2   Storage

Optimally, store the Smartglass at a temperature between -20°C and 45°C and the adapter box at a temperature between 5°C and 40°C. Avoid storage in a humid environment. Do not store the product in direct, permanent sunlight.

7   Maintenance and Care

7.1   Software updates

When a new version of the **munevo DRIVE R-net** software is available for the glasses, the glasses can be updated by using the sync function (see 4.6.8.4). If any important or major changes are made as a result of a software update, you will gladly receive an updated version of the operating instructions via e-mail.

Starting with version 11.2.2 of the glass application, if the glasses are connected to the internet, they will automatically check for any available update to download. If there is an update available, the glasses will show a pop-up message when the application starts to allow for the installation of the update. The user can choose to install the update right away, install the update later, in which case the pop-up message is shown the next time the glasses start, or ignore the update, in which case the pop-up message will appear only when there's another new update available.

The munevo DRIVE R-net adapter box checks for software updates routinely by itself. It ensures to only do so when the device and the wheelchair is not in use. When checking for an update, the adapter box will turn on the green LED, either in a blinking pattern or a stable ON state, and will not be available for use until the update process is complete. The update process usually takes 5-10 minutes. Once updated, the adapter box will power itself off. It can be powered on again normally using the POWER/EMERGENCY STOP button, which will power the adapter box as well as the wheelchair.

In some cases, the adapter box might not be able to update itself, due to reasons such as poor network connectivity which can happen in areas where the cell reception is bad. If it fails an update process, the adapter box will turn on the red LED for 2 minutes to indicate failure, after which it will power itself off. The adapter then can be powered back on as usual using the POWER/EMERGENCY STOP button, which will, in this case, run the same older version of the software. The adapter will continue to check for updates and try to update again when the conditions are favorable.

7.2 Cleaning and care

> **⚠ NOTE**
>
> Do not use aggressive cleaning agents, chemical substances or hard brushes to clean the products. Under no circumstances should cleaning be carried out with a water jet or high-pressure cleaner.

The components of **munevo DRIVE R-net** must be cleaned at regular intervals, depending on their use and the degree of soiling. Please use a soft, slightly damp cloth and a mild cleaning agent to clean the products.

7.3 Maintenance intervals

> **ⓘ INFORMATION**
>
> If you need a spare part, please contact your medical supply store. Only spare parts from **munevo** may be used. Non-observance will result in the loss of warranty claims.

> **ⓘ INFORMATION**
>
> If problems occur during maintenance, please contact your medical supply store.

Before each use, the functionality of the control unit must be checked. The activities specified in Appendix 14.1 must be carried out by the user or a caregiver in accordance with the intervals.

> **ⓘ NOTE**
>
> In some cases, effects on performance cannot be prevented if maintenance and storage are not carried out in accordance with the instructions given here.

8 Malfunction/ Troubleshooting

8.1 Error

Appendix 14.2 is intended to help you correct errors. If it is not possible to rectify the problem, please contact your medical supply store.

8.2 Defect/Failure

If one of the components of **munevo DRIVE R-net** no longer works, please also contact your medical supply store.

8.3 Serious incidents

In the event of a serious incident, both the manufacturer and the competent supervisory authority must be informed immediately.

The competent, assessing supervisory authorities for **munevo DRIVE R-net** can be contacted as follows:

Austria - Federal Office for Safety in Health Care
Radetzkystr. 2, 1030 Vienna, Austria
T: +43 1 71100 4206
E-Mail: meddev@bmgf.gv.at

Belgium - FAMHP - Federal Agency for Medicines and Health Products Place
Victor Horta 40, Box 40, 1060 Brussels, Belgium
T: +32 2 528 4259, F: +32 2 528 4120
E-mail: meddev@afmps.be

Cyprus - Ministry of Health, Cyprus Medical Devices Competent Authority
1 Prodromou & 17 Chilonos Street, 1448 Nicosia, Cyprus
T: +357 22605572/735 – F: +357

22468427
E-mail: cymda@mphs.moh.gov.cy

Denmark – Danish Medicines AgencyAxel
Heides Gade 1, 2300 Copenhagen, Denmark
T: +45 44 88 9667
E-mail: med-udstyr@dkma.dk

France – Agence Nationale de Sécurité du Médicament et des Produits de Santé (ANSM)
143 - 147 Boulevard Anatole France, 93285 Saint Denis Cedex, France T: +33 1 55 87 37 75, F: +33 1 55 87 37 42
E-mail: dmcdiv@ansm.sante.fr

Germany – Federal Institute for Drugs and Medical Devices (BfArM)
Kurt-Georg-Kiesinger-Allee 3, 53175 Bonn, Germany
T: +49 228 207 5355, F: +49 228 207 5207
E-mail: medizinprodukte@bfarm.demedizinprodukte@bfarm.de

Ireland – Health Products Regulatory Authority (HPRA)
Kevin O'Malley House, Earlsfort Centre, Earlsfort Terrace, Dublin 2
T: +353 1 676 4971
E-mail: info@hpra.ie

Netherlands – Health and Youth Care Inspectorate
Postbus 2518, 6401 DA Heerlen, The Netherlands+31
88 1205000, F: +31 88 1205001
E-mail: meldpunt@igj.nl

Norway – Norwegian Medicines Agency
Postboks 240 Skøyen, 0213 Oslo, Norway
T: +47 22 89 77 00
E-mail: meddev-no@noma.no

Spain – Agencia Española de Medicamentos y Productos Sanitarios
C/ Campezo 1, Edificio 8, ES – 28022 Madrid
E-mail: sgps@aemps.es

Switzerland – Swissmedic – Medical devices
Hallerstr. 7, 3012 Bern, Switzerland
T: +41 58 462 02 11, F: +41 58 462 02 12
E-Mail: medical.devices@swissmedic.ch

Switzerland Representative
Easy Medical Device
Bernoulistrasse 20, 4056 Basel - Switzerland
E-mail: swiss@easymedicaldevice.com
Phone: +41 799036836

A serious incident is present at:

- a malfunction
- a failure
- a change in the characteristics or performance
- improper labelling
- improper instructions for use

which has led, could have led or could lead (in)directly to the death or serious deterioration of the state of health of a patient, a user or another person.

9   Technical Data

9.1   European Device Information

UDI-DI:	04260691380034 (REF: MDRV10)
SRN:	DE-MF-000006277

9.2 Adapter

Dimensions	85 x 45 x 34 mm (LxWxH)
Plastic housing	ABS
Connectivity	Bluetooth (2.402-2.48 GHz) LTE-M
Operating temperature range:	0 – 35°C
Storage temperature range:	5 – 40°C Keep dry

Subject to technical changes

9.3 Google Glass

Display	640 x 360 Px
Camera	8 MP
Connectivity	Wi-Fi - 802.11 a/b/g/n/ac, dual band Bluetooth 5.0 (2.402-2.48 GHz)
Memory	3GB LPDDR4 32GB eMMC Flash
Operating temperature range:	0 – 35°C
Storage temperature range:	-20 – 45°C Keep dry
Battery	800 mAh
Protection class	IP53

Subject to technical changes

10 System Requirements

10.1 Network requirements

- Wireless router: to use all functions of **munevo DRIVE R-net,** especially the update function, you

should have a functioning Wi-Fi (wireless network); IEEE 802.11 a/b/g/n/ac

- Internet connection: **munevo** glasses have been designed to provide software updates via your internet connection. For best performance, use DSL, cable or fibre optic.

- Cellular reception: **munevo DRIVE R-net** adapter box connects to the cellular network for updates. For the adapter to connect to the internet for updates, ensure the wheelchair is in a location with good cellular reception.

Instructions on how to connect the glasses to the Internet can be found in the appendix, under 14.3.

10.2 IT security measures

10.2.1 Security of Bluetooth wireless technology

The communication via Bluetooth Low Energy between the Smartglass and the adapter is secured using state-of-the-art methods to maintain data security and integrity.

The data transmission and the data itself are encrypted using the AES-256 bit standard. This high standard enables the user of **munevo DRIVE R-net** to have secure and trustworthy signal communication.

10.2.2 Device safety

The device must not be used for the installation and use of any application other than the **munevo DRIVE R-net** application. The complete **munevo DRIVE R-net** system is designed in such

a way that any kind of modification is excluded. This applies to both the Smartglass and the adapter.

10.2.3 Network security

All communication on our website takes place in a secure network with SSL encryption. Through these and other measures, the highest standard of protection for your personal data can be offered. In addition, **munevo** continuously takes various measures to protect the system against attempted data modification, eavesdropping or similar.

11 Notes on Reuse

The special control **munevo DRIVE R-net** is suitable for reuse. The features and performance must not change in such a way that the safety of patients and, if applicable, third parties is endangered during the service life.

Based on market observation and the state of the art, the manufacturer has calculated the use of the product to be 5 years, taking into account the intended use and the service and maintenance specifications. Periods of storage at the specialist dealer or cost unit are not included. It should be clearly emphasised that the product is reliable far beyond this defined period of time with appropriate care and maintenance. If the service life is reached, the user or a responsible assistant should contact the specialist personnel who adapted the product or the manufacturer's service department (for address see back cover).

The components of the **munevo DRIVE R-net** must be thoroughly cleaned and disinfected before being used again. Afterwards, the entire product must be checked by **munevo** or an authorised specialist for condition, wear and damage.

Any worn and damaged parts as well as components unsuitable/inappropriate for the new user must be replaced.

12 Disposal

12.1 Disposal of the transport packaging

Packaging materials should be recycled according to national and local regulations. If recycling is not possible, all packaging elements can also be disposed of in residual waste (household waste).

12.2 Disposal of the units

If **munevo DRIVE R-net** is the property of the health insurance fund, it is returned to the health insurance fund for disposal.

If **munevo DRIVE R-net** is privately owned, the following instructions apply to disposal:

- The disposal guidelines of the country of manufacture apply.
- For disposal in other countries, the country-specific disposal and environmental protection regulations apply.

INFORMATION

In the event of disposal, all components and materials of the special control unit must be disposed of in an environmentally friendly manner and in accordance with the legal requirements or recycled.

munevo offers an end-of-life disposal programme for electronic products in accordance with WEEE regulations. For detailed information, please call: +49 89 55 06 49 -04

13   Legal Notice

13.1   Liability

munevo GmbH is only liable if the product is used under the specified conditions and for the specified purposes. **munevo** recommends to handle the product properly and to maintain it according to the instructions for use. The manufacturer is not liable for damages caused by components and spare parts that have not been approved by **munevo.** Repairs may only be carried out by authorised specialist dealers or by the manufacturer himself.

13.2   CE conformity

The product complies with the requirements of Directive 2017/745 (MDR). Based on the classification criteria for medical devices according to Annex VIII of the directive, the product has been classified as Class I. The declaration of conformity was therefore drawn up by **munevo GmbH** under its sole responsibility in accordance with Directive 2017/745 (MDR) Annex IX.

13.3   Warranty

The statutory warranty valid at the time of delivery shall apply.

Prerequisites:

- There is a manufacturing or material defect.
- The cause of the change in the product is not natural or function-related wear or ageing.
- The damage was not caused by the fact that **munevo DRIVE R-net** was not used as intended.

Excluded from warranty:

- Damage caused by improper use and force majeure.
- All parts that are subject to wear or ageing to the usual extent due to their function, insofar as these are not production or material defects.
- Damage caused by improper or inadequate care and repairs, conversions or replacement of parts not carried out professionally.
- Accidental damage or other external influences, insofar as these are not due to information or product defects.
- Damage caused by improper or inadequate care (e.g. cleaning the components with a strong water jet).
- Fluctuations in consumption and battery performance as well as a decrease in capacity due to age. They are normal in traffic, technically unavoidable and as such not a material defect.

13.4 Warranty conditions of munevo GmbH

munevo GmbH provides a 2-year warranty from the date of purchase for material and manufacturing defects of the product. Excluded from the warranty are:

- Damage resulting from improper use
- Wear parts
- Damage that is attributable to the customer's own fault

The Smartglass battery is guaranteed for 1 year from the date of purchase.

A warranty claim is void if the units have been opened by unauthorised persons.

13.5 Licences

Information on the licences we use and a reference to current versions can be found at www.munevo.com.

14   Appendix

14.1   Maintenance plan

Maintenance and inspection intervals	daily	weekly	monthly	annual
Check function and position of the emergency stop button	X			
Clean all components with a soft cloth and a mild detergent.		X		
Checking the cables • Has the cable been crushed or kinked? • Connections on input module and adapter tight?			X	
Check housing for damage - by medical supply store				X
Check adapter bracket for damage - by medical supply store				X
Check all screws for tightness - by medical supply store				X

Table 14- 1: Maintenance schedule

14.2   Troubleshooting

Error	Possible cause	Remedy
Glasses do not turn on	Battery not charged	Please connect the glasses to a mains socket using the charging cable and mains adapter supplied and wait for approx. 10 minutes.
	Battery charged for a long time, yet the glasses do not start up	Press and hold the on/off button for 10 sec., wait 2 sec. and then start the glasses as usual by pressing the button for 2 sec. If the glasses still do not switch on, please contact your dealer.
Glasses do not connect with adapter.	Adapter not supplied with power	• Check whether the wheelchair is switched on • Check cable to adapter for damage or kinks • Is the cable correctly connected to the wheelchair?
	unknown	Switch off the wheelchair and glasses and switch them on again after a short waiting time. In certain cases, unplugging the adapter from the wheelchair, plugging it back in and powering the adapter using the POWER/EMERGENCY STOP button may help.
	Adapter defective	LED does not light up despite carrying out the previously mentioned measures; contact your specialist dealer.
	Adapter updating	Check the adapter's LED. • A green LED, either blinking or stable ON, indicates the update process being carried out. In this case, wait until the adapter powers off and stays powered off (LED turns OFF) for a duration of more than 30 seconds, and then restart the adapter and the wheelchair using the POWER/EMERGENCY STOP button. • A red LED, if stable for more than 2 minutes, indicates a failure with the adapter box. Contact your medical supply store or munevo customer service.
When changing the seating position, the glass display does not show the same seating profile as on the wheelchair.	• Incorrect seat profiles stored on the wheelchair. • Application was not synchronised after a visit to the medical supply store to change the seat profiles.	Try to synchronise the application first and restart the wheelchair. If the seat profiles in the application still differ from those of the wheelchair, contact your medical supply store or munevo customer service to update the seat profiles.
Pictures from the camera or the gallery cannot be shared.	No e-mail address is stored	In order to be able to share pictures, you need to deposit a friend/family member's email address. To change this address, please

		contact munevo customer service. You must then synchronise the device.
My emergency messages are not delivered to my carer	There is no email -address on file	In order to be able to send the emergency message, you must store an e-mail address of your carer. To change this address, please contact munevo customer service. You must then synchronise the device.
The application sometimes crashes or hangs	Current version of the application?	Please try to synchronise the application to get the latest version. If the problem persists, contact your medical supply store.
My glasses heat up very quickly.		A certain amount of heat is normal, especially during charging. If the heat from the glasses is uncomfortable, please contact your medical supply store.

Table 14- 2: Troubleshooting

Status and warning notices in the application and their meaning

Status/warning notice	Meaning
Scanning for the adapter	The Smartglass tries to establish a Bluetooth connection with the adapter. The wheelchair must be switched on for this.
Scan again	If no connection could be established between the smartglass and the adapter, the scan mode (the two devices search for each other) can be started again. To do this, nod downwards. If this is not desired, the glasses can be locked or you can exit the corresponding submenu by nodding upwards.
Scanning not possible. Please restart the glasses.	If you cannot establish a connection after several attempts, it may help to restart the glasses and adapter (wheelchair).
Bluetooth connection lost	If the glasses lose the Bluetooth connection to the adapter, this warning is displayed. The wheelchair cannot be controlled at this moment.
No seat profiles found. Nod down to synchronise the device.	The seat does not find any stored seat profiles when opening the seat menu. Synchronising will load these onto the glasses if they have been created. If they have not been created, contact your sales representative.
No emergency email found. Nod down to synchronise the device.	The glasses do not have a stored e-mail address for sending the emergency e-mail. A synchronisation will load this to the glasses, if they have been created. If not, contact your responsible field staff member.
The battery should be at least 20% to update the application.	Synchronisation of the application is only possible when the battery is at least 20% charged.
New version available. Please nod down to synchronise the device.	If there is a new version of the application and you have an internet connection, nod down on the Sync menu item to update to the new version.

Table 14- 3: Status and warning notices

14.3   Connecting Smartglass with Wi-Fi

1.   In order to connect the smartglass to the Internet, you must create a QR code of your Wi-Fi and then scan it with the glasses. To do this, go to the following website: **https://www.qifi.org**

Enter the name of your Wi-Fi

Enter your Wi-Fi password

After clicking on "Generate" the QR code appears
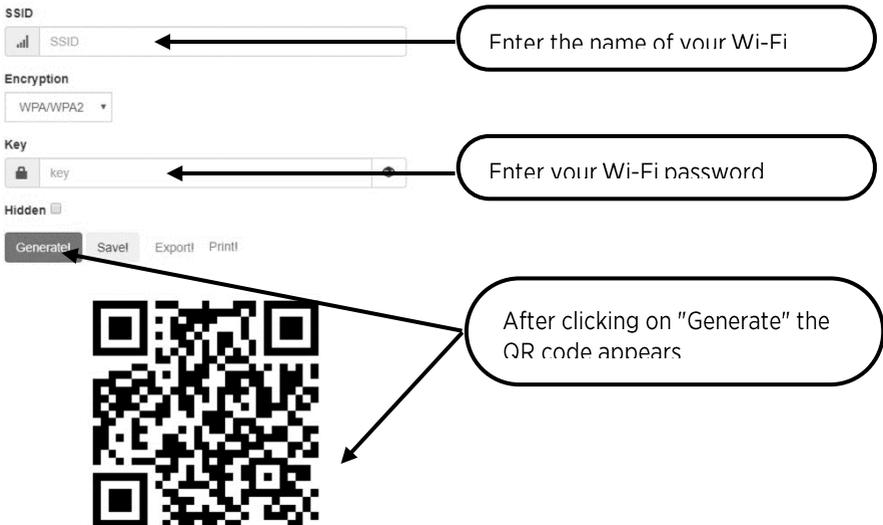
2.   There is a menu item "Wi-Fi/WLAN" in the "Settings" menu, which can be used to open the QR code scanner by tapping on the touchpad. Open it and scan the previously generated QR code by pointing the camera at the QR code. You can see the section of the camera on the display of the Smartglass and can position it accordingly. A short sound signal confirms successful scanning. The glasses then automatically connect to the Wi-Fi.

Figure 14-1: Wi-Fi/WLAN menu in the application

Note: If you have other security functions active that do not allow devices to connect to your Wi-Fi, make sure that these are at least temporarily deactivated.

14.4   Residual risks

Risk/danger situation	Risk reduction measure	Remaining risk
Alteration or loss of the Bluetooth connection between the Smartglass and the adapter may result in loss of control of the wheelchair.	Using the EMERGENCY STOP button (see 2.9), the wheelchair can be stopped and switched off to avoid dangerous situations caused by unintentional movements of the wheelchair.	If the user has to operate the EMERGENCY STOP in a dangerous situation (e.g. in heavy city traffic), a residual risk cannot be excluded. The wheelchair may be poorly visible in certain environmental conditions and thus exposed to a residual risk of not being seen. The presence of a third person / companion who can intervene can further minimise the residual risk.
Risks related to electromagnetic interference are explained in 2.5. These interferences can lead to the loss of connection described above.	munevo DRIVE R-net was developed and tested according to the specific requirements of IEC 60601-1-2 and ISO 7176-21.	Although the risks have been mitigated as far as possible, electromagnetic interference may still occur and pose a residual risk.
Battery defect in the Smartglass and associated ignition or acid leakage.	Google Glass, a high-quality product, is used as part of munevo DRIVE R-net. The Google Glass battery is fully enclosed, leakage is very unlikely.	Although the risk has been mitigated as far as possible, leakage or ignition may still occur as the battery still contains appropriate materials.

Table 14- 4: Residual risks

14.5 Gestures

1. menu gestures

Vertical head nod (nodding in agreement, "yes")
- Down - Menu selection & activate/deactivate driving)
- Up - back, to the previous menu

Horizontal head nod ("no" movement)
- Right - next menu item
- Links - previous menu item

2. driving gestures

Tilt up/down
- Accelerate, forward or backward depending on mode

Lateral tilt
- Cornering and turning the wheelchair

3. lock/unlock

Tilt right for 3 sec -> Lock
Tilt left for 3 sec -> Unlock

14.6 Menu Structure
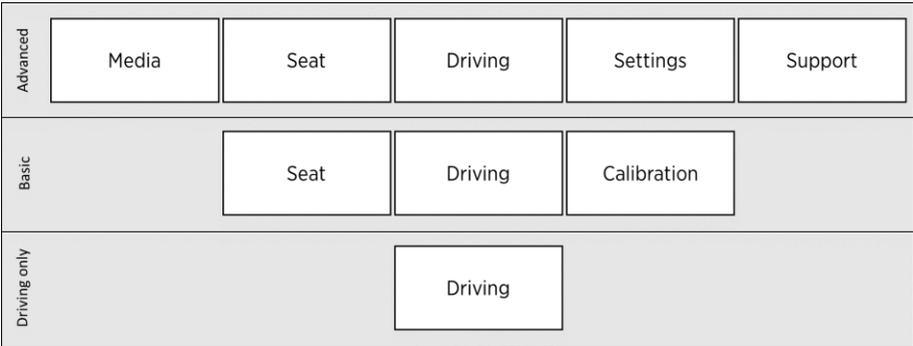
Figure 14-2: Application menu structure
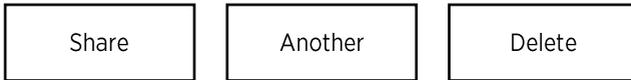
Figure 14-3: Camera menu structure
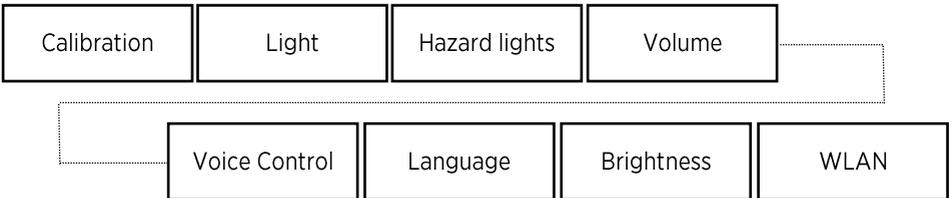
Figure 14-4: Settings menu structure

Figure 14-5: Voice control menu structure