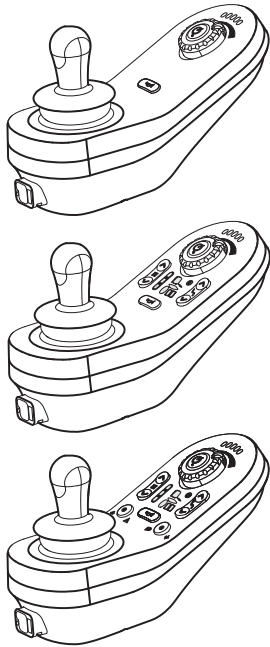


# Invacare® LiNX

DLX-REM110, DLX-REM211, DLX-REM216

en **Remote  
User Manual**



This manual **MUST** be given to the user of the product.  
**BEFORE** using this product, this manual **MUST** be read and saved for  
future reference.



**Yes, you can.®**

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# 1 General

## 1.1 About This Manual

This document is a supplement to the product's user documentation. This component itself does not bear a CE and a UKCA mark but is part of a product that complies with the Medical Device Regulation 2017/745, Class I and Part II UK MDR 2002 (as amended) Class I concerning medical devices. It is therefore covered by the product's CE and UKCA marking. See the product's user documentation for more information.

Only use this component if you have read and understood this manual. Seek additional advice from a healthcare professional who is familiar with your medical condition and clarify any questions regarding the correct use and necessary adjustment with the healthcare professional.

Note that there may be sections in this document, which are not relevant to your component, since this document applies to all available models (on the date of printing). If not otherwise stated, each section in this document refers to all models of the component. Invacare reserves the right to alter component specifications without further notice.

Before reading this document, make sure you have the latest version. You find the latest version as a PDF on the Invacare website. Previous product versions may not be described in this Manual's current revision. If you require assistance, please contact Invacare.

If you find that the font size in the printed document is difficult to read, you can download the PDF version from the website. The PDF can then be scaled on screen to a font size that is more comfortable for you.

For more information about the component, for example safety notices and recalls, contact your Invacare representative. See addresses at the end of this document.

In case of a serious incident with the component, you should inform the manufacturer and the competent authority in your country.

## 1.2 Symbols in This Manual

Symbols and signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage. See the information below for definitions of the signal words.



### **WARNING!**

Indicates a hazardous situation that could result in serious injury or death if it is not avoided.



### **CAUTION!**

Indicates a hazardous situation that could result in minor or slight injury if it is not avoided.



### **NOTICE!**

Indicates a hazardous situation that could result in damage to property if it is not avoided.



### **Tips and Recommendations**

Gives useful tips, recommendations, and information for efficient, trouble-free use.

### **Other Symbols**

(Not applicable for all manuals)



### **UK Responsible Person**

Indicates if a product is not manufactured in the UK.



### Triman

Indicates recycling and sorting rules (only relevant for France).

## 1.3 Warranty

The terms and conditions of the warranty are part of the general terms and conditions particular to the individual countries in which this product is sold.

## 1.4 Service Life

We estimate a service life of five years for this product, provided it is used in strict accordance with the intended use as set out in this document and all maintenance and service requirements are met. The estimated service life can be exceeded if the product is carefully used and properly maintained, and provided technical and scientific advances do not result in technical limitations. The service life can also be considerably reduced by extreme or incorrect usage. The fact that we estimate a service life for this product does not constitute an additional warranty.

## 1.5 Limitation of Liability

Invacare accepts no liability for damage arising from:

- Non-compliance with the user manual
- Incorrect use
- Natural wear and tear
- Incorrect assembly or set-up by the purchaser or a third party
- Technical modifications
- Unauthorised modifications and/or use of unsuitable spare parts

## 1.6 General Safety Notes



### WARNING!

#### Risk of Injury or Damage to the Power Wheelchair

Do not install, maintain or operate this equipment before you have read and understood all the instructions and all the manuals for this product and all other products that you use or install together with this product.

- Follow the instructions in the user manuals.



### WARNING!

#### Risk of Serious Injury or Damage to the Power Wheelchair or Surrounding Property

Wrong settings can make the power wheelchair uncontrollable or unstable. An uncontrolled or unstable wheelchair can cause an unsafe situation such as a crash.

- Performance adjustments must only be made by qualified technicians or by persons who completely understand the programming parameters, the adjustment process, the configuration of the power wheelchair and the capabilities of the driver.
- Performance adjustments must only be made in dry conditions.

**WARNING!****Risk of Injury or Damage due to Electrical Shorts**

Connector pins on cables connected to the power module can still be live even when the system is off.

- Cables with live pins should be connected, restrained or covered (with non-conductive materials) so that they are not exposed to human contact or materials that could cause electrical shorts.
- When cables with live pins have to be disconnected, for example, when removing the bus cable from the remote for safety reasons, make sure to restrain or cover the pins (with non-conductive materials).



or train) maybe the Gyro function is impaired and drive demands can result in unintended movement.

- When driving on a moving vehicle choose a drive function with disabled Gyro.
- If the power wheelchair does not have a drive function with disabled Gyro, contact your Invacare provider.

**CAUTION!****Risk of Injury from Hot Surfaces**

Remote module can get hot when exposed to strong sunlight for long periods.

- Do not leave power wheelchair in direct sunlight for long periods.

**WARNING!****Risk of Injury or Damage to the Power Wheelchair**

Risk of unintended movement of the power wheelchair or seating system when loose personal belongings (e.g. jewellery, scarfs) become entangled around the joystick.

- Make sure that any loose items are clear of the joystick when your power wheelchair is powered up.
- Power off your power wheelchair immediately to stop any movement.

**NOTICE!**

If you touch the connector pins, they can become dirty or they can be damaged by electrostatic discharge.

- Do not touch the connector pins.

**NOTICE!**

There are no user-serviceable parts inside any case.

- Do not open or disassemble any case.

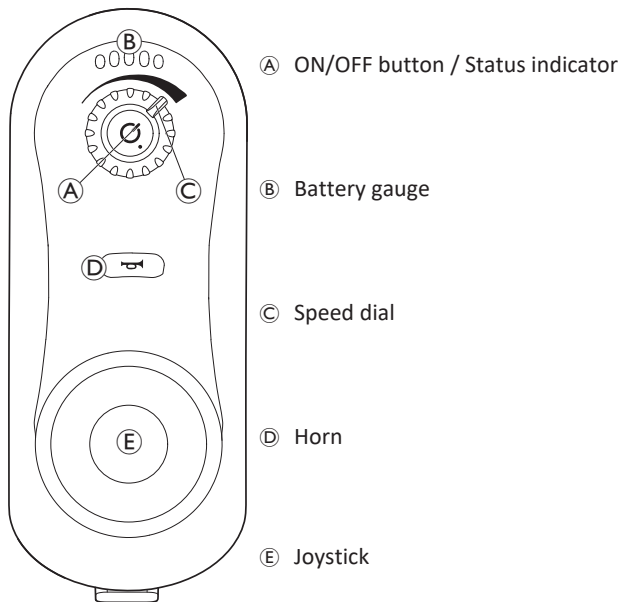
**CAUTION!****Risk of Injury due to Unintended Movement**

It is recommended that the power wheelchair, fitted with a Gyro module, has a drive function with disabled Gyro. If the power wheelchair is used in a moving vehicle (e.g. boat, bus

## 2 Components

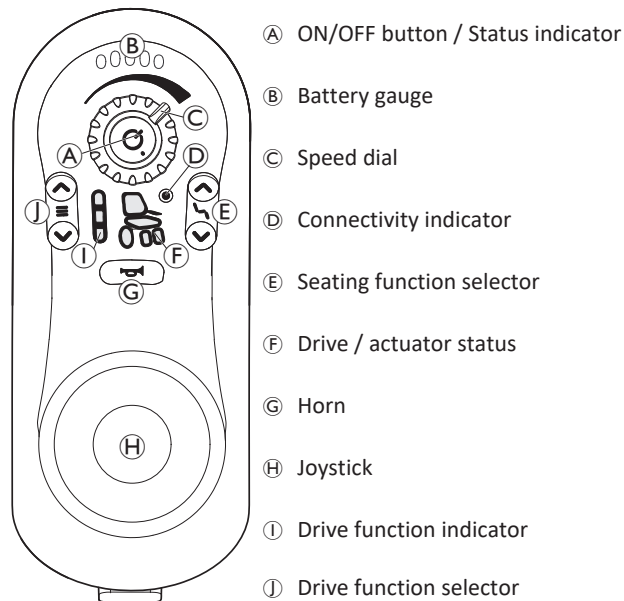
### 2.1 User Interface DLX-REM110

- Drive function



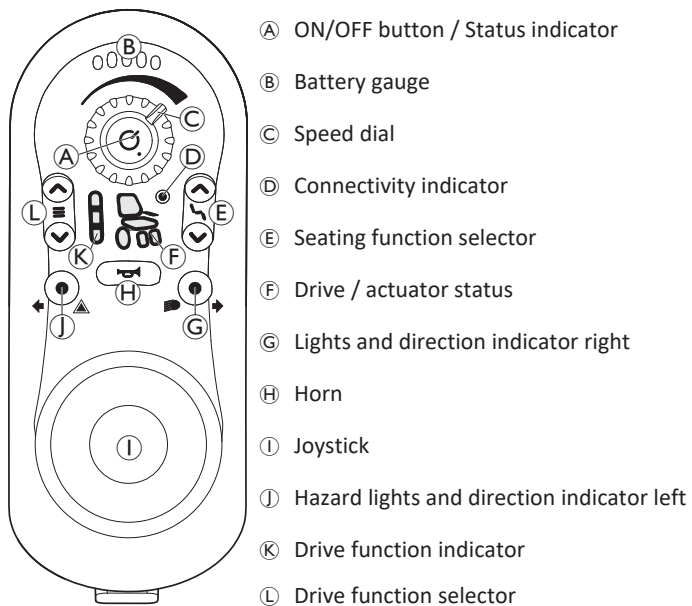
### 2.2 User Interface DLX-REM211SS

- Drive function
- Seating function



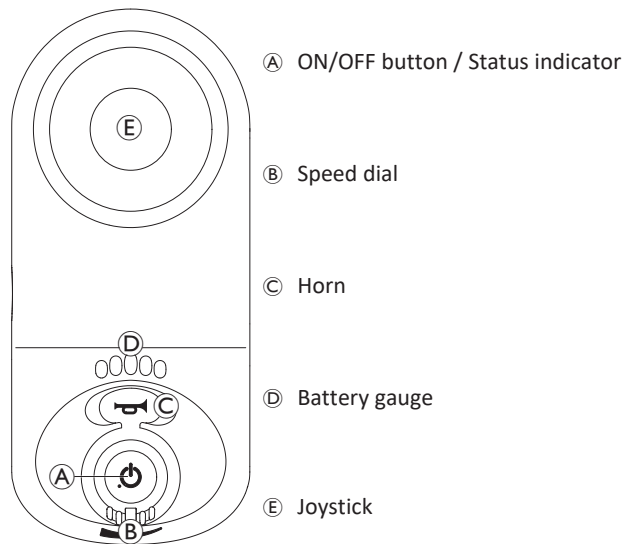
## 2.3 User Interface DLX-REM216

- Drive function
- Seating function
- Light system



## 2.4 User Interface DLX-REM050 (only as Attendant Control Unit)

- Attendant control unit with drive function



## 2.5 The Status Indicator

The status indicator is located inside the ON/OFF button. When the LiNX remote is not powered up, the status indicator is not lit. When the LiNX remote is powered up and there are no faults with the system, the status indicator lights green. If there is a fault with the system when powered up, the status indicator flashes red. The number of flashes indicates the type of fault, refer to *5.1.1 Fault Codes and Diagnosis Codes, page 24*.

## 2.6 Battery Gauge

The battery charging status is shown in the battery gauge.



### Maximum driving range

Green, green, amber, amber and red LEDs on.



### Decreased driving range

Red, amber and one green LED on.



### Decreased driving range

Red and two amber LEDs on.



### Decreased driving range

Red and one amber LED on.  
Consider charging batteries.



### Very low driving range

Only red LED on.  
Batteries need immediate charging.



## 2.7 Labels on the Product

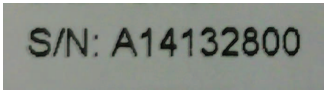
	(A)		Recommendation to read the instruction manual before using the module.					
	(B)	IPx4	This is the enclosure's ingress protection rating.					
	(C)		This is the WEEE symbol (Waste Electrical and Electronic Equipment Directive) <sup>1</sup> .					
	(D)		Tamper evident seal.					
	(E)		Product label containing: <ul style="list-style-type: none"> <li>• Dynamic Controls' website</li> <li>• Dynamic Controls' part description</li> </ul>					
	(F)		Product label containing: <ul style="list-style-type: none"> <li>• The serial number</li> <li>• The part number</li> </ul>					
	(G)		The petrol pump indicates the battery charger input.					
	(H)		<table border="0"> <tr> <td>1. Hardware version</td> <td>4. Application version</td> </tr> <tr> <td>2. Hardware major version</td> <td>5. Application major version</td> </tr> <tr> <td>3. Hardware minor version</td> <td>6. Application minor version</td> </tr> </table>	1. Hardware version	4. Application version	2. Hardware major version	5. Application major version	3. Hardware minor version
1. Hardware version	4. Application version							
2. Hardware major version	5. Application major version							
3. Hardware minor version	6. Application minor version							

<sup>1</sup> This product has been supplied from an environmentally aware manufacturer. This product may contain substances that could be harmful to the environment if disposed of in places (landfills) that are not appropriate according to legislation.

- The 'crossed out wheelie bin' symbol is placed on this product to encourage you to recycle wherever possible.
- Please be environmentally responsible and recycle this product through your recycling facility at its end of life.

## Serial Number and Date of Manufacture

The serial number on a Dynamic Controls product provides both the date of manufacture as well as a unique serial number for the particular module.



S/N: A14132800

The format, as shown above, is **MYnnnnnn**, where:

- **M** is for the month of manufacture, using the letters A to L (A = Jan, B = Feb, C = Mar, etc.),
- **YY** is the year of manufacture,
- **nnnnnn** is a unique six digit sequential number.

For example, the remote's serial number, as shown above, begins with A14 indicating that it was manufactured in January 2014, and its unique, sequential value is 132800.

## 3 Setup

### 3.1 General Information on Setup

The tasks described in this chapter are intended to be performed by trained and authorised service technicians for initial setup. They are not intended to be performed by the user.

#### 3.1.1 Conditional Control Input / Output (Control IO)

The individual programming of the wheelchair with one of the LiNX Access Tools must be made by a qualified technician.

The LiNX system now supports conditional control IO, extending the current always rule-based model, where a single output action is always activated in response to a single input action. With the introduction of conditional control IO, a qualified technician can now create:

- multiple always rules — one or more outputs are always activated from a single input,
- conditional rules — one or more outputs are activated from a single input if the specified conditions are true,
- conditional/else rules — an output is activated from a single input if a specified condition is true, else (otherwise) an alternative output is activated if the same specified condition is false.

The benefit of conditional IO is two-fold. Firstly, a single input can now activate multiple outputs. Secondly, control inputs can be overloaded. Overloading is where a single input can have multiple uses, each of which depends on specified conditions.

This means that an input can be used to activate one output if the system is in one state or function, and then activate a different output when the system is in another state or function. For example, a buddy button that is used to stop a wheelchair when driving can also be used to extend a seating motion when in a seating function.

### 3.2 Wiring

For safe and reliable operation, the installation of looms and cables must follow the basic principles of power wiring.

Cables must be secured between their connectors and any point of flexing so that flexing forces are not transferred to the connectors.



#### CAUTION!

##### Risk of Injury and Damage to the Remote

Damage to cables increases wiring impedance. A damaged cable can potentially produce localised heat, sparks or arcing and become a source of ignition to surrounding flammable material.

- The installation must ensure that all power cables, including the bus cable, are protected against damage and potential contact with flammable materials.



#### NOTICE!

Cables and remote modules can get damaged if not positioned properly.

- Route and position cables and remote modules so that they are free from physical strain, abuse or damage, such as snagging, crushing, impacts from external objects, pinching or abrasion.

Adequate strain relief must be provided for all cables, and the mechanical limits of the cables and looms must not be exceeded.

Ensure that connectors and connector sockets are shielded from water splashes and water ingress. Cables with female connectors should face horizontally or downwards. Ensure all connectors are fully mated.



**CAUTION!**

**Risk of Injury and Damage to the Remote**

Connector pins on cables connected to the power module can still be live even when the system is off.

- Cables with live pins should be connected, restrained or covered so that they are not exposed to human contact or materials that could cause electrical shorts.

Make sure that the cables do not extend beyond the wheelchair to prevent them from being caught or damaged by external objects. Take particular care on wheelchairs with movable structures such as a seat lifter.



**WARNING!**

**Risk of Injury or Damage due to Electrical Shorts**

Continuous contact between user and cable can result in frayed cable jacket. This increases risk of electric shorts.

- Avoid routing the cable where it will come into continuous contact with the end user.

When installing the bus cable, avoid undue straining of the cable and connection points. Flexing of the cable should be minimised wherever possible, to extend service life and minimize the risk of accidental damage.



**NOTICE!**

Regular bending can damage bus cable

- Use of a cable chain to support the bus cable, where the cable is subject to regular cyclic bending, is recommended. The maximum stretch of the chain should be less than the length of the bus cable. The force applied to flex the cable should never exceed 10 N.



Appropriate life testing should be carried out to determine / confirm the expected service life and inspection and maintenance schedule.

### 3.3 Connecting the Remote



**CAUTION!**

**Risk of Unintended Stops**

If the plug of the remote cable is damaged, the remote cable may come loose while driving. The remote may lose power, could suddenly power down and force an unintended stop.

- Always check the plug of the remote for damage.  
Contact your provider immediately in case of a damage.



**NOTICE!**

The remote plug and connector socket fit together in one way only.

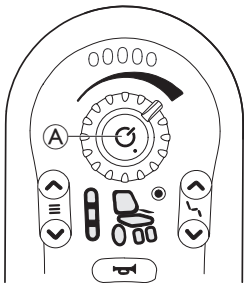
- Do not force them together.

1. Lightly push to connect the plug of the remote cable and the connector socket with an audible click.

## 4 Usage

### 4.1 Operating the Remote

Your wheelchair always powers up in drive function 1 and is ready to drive. For remotes that provide multiple drive functions (DLX-REM211 or DLX-REM216) the drive function can be changed. For details about changing the drive function, refer to *4.4 Activating the Drive Function, page 17*.



#### Powering up the Remote

1. Press ON/OFF button **A**.

If there is no fault with the system, the status indicator lights up green and the battery gauge displays the current battery status, refer to *2.6 Battery Gauge, page 8*.

If there is a fault with the system when powering up, the status indicator indicates the fault with a series of red flashes, refer to *5.1.1 Fault Codes and Diagnosis Codes, page 24*. If the fault is one that prevents the system from driving, the battery gauge flashes continuously.

#### Powering down the Remote

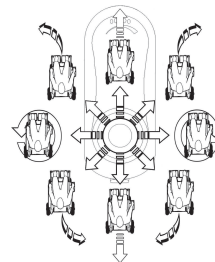
1. Press ON/OFF button **A**.
2. System powers down and status indicator switches off.

The ON/OFF button can also be used to perform an emergency stop, refer to *4.7 Emergency Stop, page 19*.

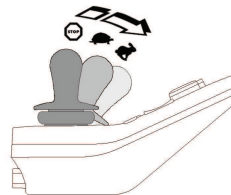
The ON/OFF button is also used to lock the system, refer to *4.2 Locking / Unlocking the Remote, page 14*.

#### 4.1.1 Using the Joystick

The joystick controls the direction and speed of the wheelchair.



When the joystick is deflected from the centre (neutral) position, the wheelchair moves in the direction of the joystick movement.



The speed of the wheelchair is proportional to the joystick deflections, so that the further the joystick is moved from the neutral position, the faster the wheelchair travels.

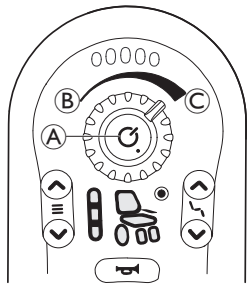
If the user moves the joystick back to the neutral position, the wheelchair slows down and stops.

If the user releases the joystick from any position other than the neutral position, the joystick returns to the neutral position and the wheelchair slows down and stops.

The joystick can also be used to wake up the system when in sleep mode, if this parameter has been enabled by the provider, refer to 4.9 *The Sleep Mode, page 20.*

#### 4.1.2 Controlling the Maximum Speed

The speed dial allows you to limit the maximum speed of the mobility device (that is the speed when the joystick is fully deflected) to suit your preferences and environment.



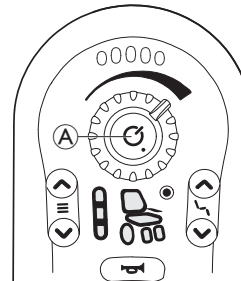
The speed dial (A) offers ten discrete steps between the lowest speed (B) and the highest speed (C).

#### 4.2 Locking / Unlocking the Remote

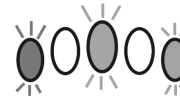
By default, lock function is disabled. Contact your provider to change the configuration.

If function is enabled, the system can be locked / unlocked using below described sequence.

#### Locking the Remote

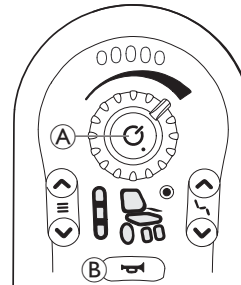


1. Press ON/OFF button (A) for more than four seconds when remote is powered up.



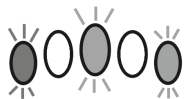
When entering the locked state, the battery gauge indicates the transition by flashing LEDs red, amber and green (far left, middle and far right) three times.

#### Unlocking the Remote



1. Press ON/OFF button (A).
2. Press horn (B) twice within ten seconds.

If you implement the unlock sequence incorrectly or press the ON/OFF button again before the unlock sequence is complete, the system returns to the locked state.



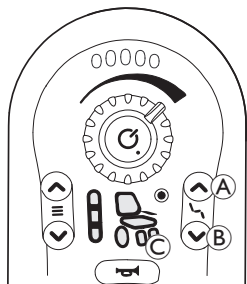
During an unlock attempt, the battery gauge indicates the system is in a locked state by flashing LEDs red, amber and green (far left, middle and far right) until either the system is powered off, unlocked or the Sequence Timeout is reached.



If an DLX-REM050 is used as attendant control unit, it is locked or unlocked, too. You can also lock and unlock the system DLX-REM050. When unlocking the system via the DLX-REM050, the DLX-REM050 is in charge automatically. For information about operating the DLX-REM050, refer to *4.11 Attendant Control Unit (DLX-REM050)*, page 22. For information about operating the DLX-ACU200, refer to the user manual of the DLX-ACU200.

## 4.3 Operating Powered Seating Functions

### Activate Seating Function



1. Press Seating function key **A**.
  - The wheelchair changes to seating function and the Drive / actuator status display **C** lights up amber.
2. Press Seating function selector keys **A** and **B** or move joystick left or right several times until desired seating function lights up, refer to table *Seating Functions*.
3. Deflect joystick to front or rear to activate actuator.



The distance you deflect the joystick determines the dynamics of the movement.

If you only deflect the joystick a little, the actuator only moves slowly. If you deflect the joystick as far as you can, the actuator moves faster.

### Seating Functions

Not every wheelchair has all options.



Powered seat tilt



None



Powered recline



Unspecified



Seat lifter



Left or central powered elevating legrest

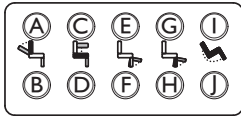


Right powered elevating legrest



Both powered elevating legrests

### 4.3.1 The 10 Way Switch Module




1. Press and hold button to move particular seating function. Seating function moves as long as button is pressed.

The lower row of buttons move the seating function to it's home position, see table below for details.

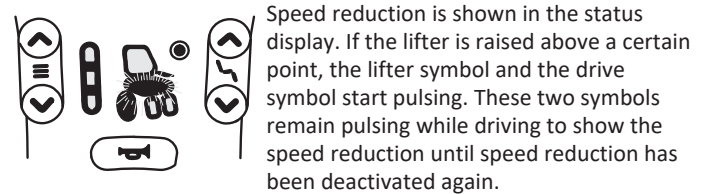
- |                   |                      |
|-------------------|----------------------|
| Ⓐ Recline down    | Ⓕ Legrest left down  |
| Ⓑ Recline up      | Ⓖ Legrest right up   |
| Ⓒ Lifter up       | Ⓗ Legrest right down |
| Ⓓ Lifter down     | Ⓘ Tilt backwards     |
| Ⓔ Legrest left up | Ⓣ Tilt forwards      |

### 4.3.2 Speed Reduction and Seating Function Inhibits

-  The mentioned speed reduction and seating function inhibits do not apply to all Invacare wheelchair models.

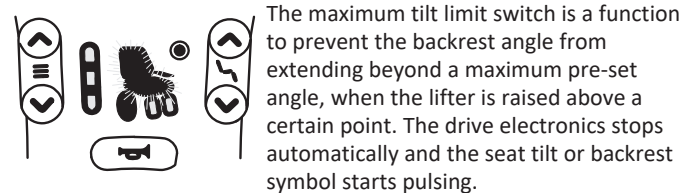
#### Speed Reduction

If the lifter has been adjusted above a certain point, the drive electronics considerably reduces the speed of the wheelchair. If speed reduction has been activated, drive mode can only be used to carry out movements in reduced speed and not for regular driving. To drive normally, adjust the lifter until the speed reduction has been deactivated again.

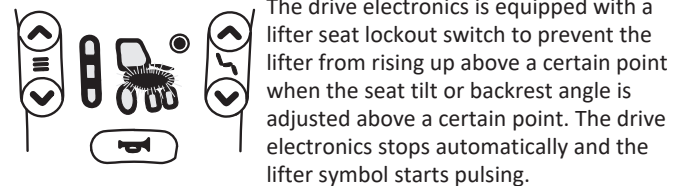


#### Seating Function Inhibits

##### Tilt Limit

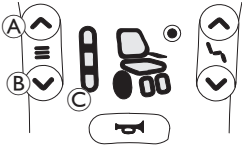


##### Lifter Seat Lockout





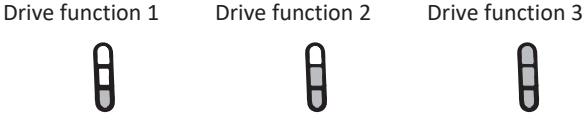
### 4.4 Activating the Drive Function




1. Press Drive function key **A**.  
The remote switches to drive function, the Drive function indicator **C** shows the pre-selected drive function (1,2 or 3) and the wheel in the drive status display lights up green.

2. Press Drive function selector keys **A** or **B** until desired drive function lights up.

- The Drive function indicator **C** shows the drive function.



 With the Drive function selector key you can choose between three different drive functions, that are configured by Invacare and can be customised to your needs and requests by the provider.

### 4.5 Audible Cues

Next to visual cues of seating and drive functions, audible cues can be set up for REM2XX remotes. Audible Cues are sounds played through the remote’s speaker in response to certain system events or navigation actions. The configuration of audible cues can only be made via LiNX Access Tool (iOS or PC) and needs to be done by a qualified technician.


Audible cues are designed to help understand where you are in the LiNX system and are especially beneficial for:

- users with impaired vision or
- users who cannot see the remote or
- users who wish to have additional feedback from their actions, so there is no need to constantly monitor the remote.


There are two types of audible cues.

- Event cues: These are cues played in response to system events.
- Navigation cues: These are cues played in response to menu navigation actions.

#### Event Cues



 Not all system events have an audible cue. For example, no audible cue is played when the system moves into sleep mode.

Event cues comprise two or three notes and are played on entering a specific state.

Sound	Event Cue Condition
	Played before powering off

#### Navigation Cues

Navigation cues are played when activating a function.

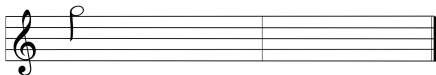
Sound	Navigation Cue Condition
	Played when activating a drive function.
	Played when activating a seating function.

## Function Identifier

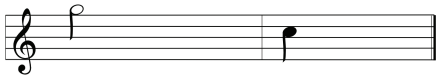
A function identifier is an optional audible cue that is played directly after a navigation cue. It provides a count by repeating the same note and it is useful, for example, to identify functions of the same type within the same profile.

The function identifier can be set your provider. The number of times this note repeats can be **1** to **6**. This parameter can also be set to **None** or **Reverse**. If set to **None**, no function identifier cue is played after a navigation cue. If set to **Reverse**, a single note is played with a longer duration and higher frequency than the note used for the repeating function identifier.

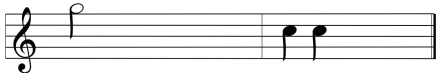
Function = Drive 1                      Identifier = None



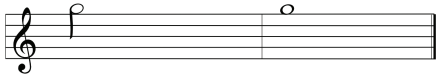
Function = Drive 2                      Identifier = 1



Function = Drive 3                      Identifier = 2




Function = Drive 4                      Identifier = Reverse




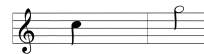
In this example four drive functions of the same profile are shown. The function identifier are has been set for each drive function with the following values: **None**, **1**, **2** and **Reverse**.

## Profile Index

### Profile Index

Profile 1  A profile index is played when navigating between profiles, playing one note for the first profile and two notes for the second profile.

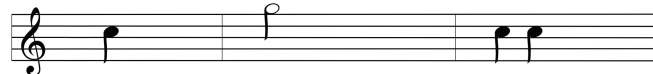
Profile 2 



In this example in the first profile is entered a drive function.

### Example

Profile Index                      Function                      Identifier



If function identifiers are used, then three sound elements are played:

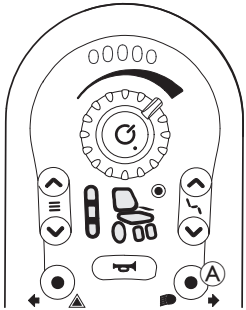
1. profile index (e.g. one note to indicate first profile)
2. navigation cue (e.g. drive function)
3. function identifier (e.g. function identifier is set to 2)

## 4.6 Operating the Light System

### Operating the Lights

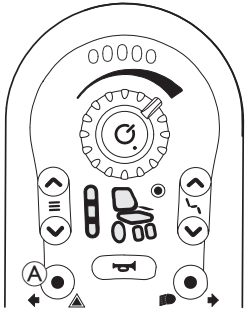


If you drive outside, turn on the lights under bad visibility conditions or darkness.



1. Short press Light button (A).  
The lights are turned on or off.

### Operating the Hazard Lights

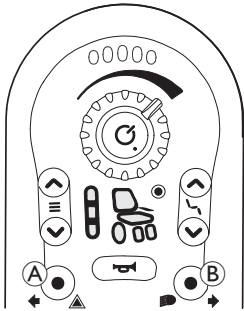


1. Short press Hazard lights button (A).  
The hazard lights are turned on or off.

## Operating the Direction Indicators

### Direction Indicator Left

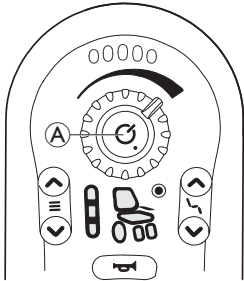
1. Press Hazard lights button (A) for more than three seconds.  
Left direction indicator is turned on.
2. To turn off direction indicator, short press Hazard lights button again.



### Direction Indicator Right

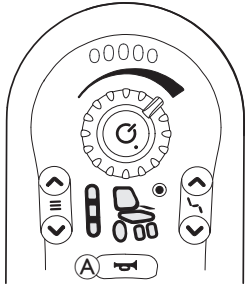
1. Press Light button (B) for more than three seconds.  
Right direction indicator is turned on.
2. To turn off direction indicator, short press Light button again.

## 4.7 Emergency Stop



If you press the ON/OFF button (A) while driving, an emergency stop is carried out. The remote powers down after this.

## 4.8 The Horn



Press the horn button **A** to sound the horn. The horn sounds for as long as the horn button is pressed.

The horn button is also used for unlocking a locked system, refer to 4.2 *Locking / Unlocking the Remote*, page 14.

## 4.9 The Sleep Mode

The sleep mode is no factory setting, but can be enabled by your provider. If this parameter is set ON, the system goes into sleep mode after a period of time without user activity. This period of time can be set by the provider.

The transition to sleep mode is indicated by the remote module's LEDs dimming gradually. During the transition, the joystick, horn, speed dial and power button will continue to operate.

To wake the system from sleep, either press the ON/OFF button or move the joystick, if this parameter has been enabled by the provider.

## 4.10 Charging the Batteries



### WARNING!

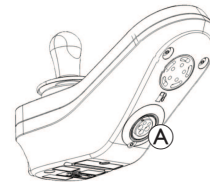
#### Risk of Injury, Damage or Death

Improper routing of charger cord(s) may cause tripping, entanglement or strangulation hazard that may result in injury, damage or death.

- Ensure all charger cord(s) are routed and secured properly.
- Close supervision and attention is needed when charging the wheelchair near children, pets or people with physical / mental disabilities.



Please cycle the power prior to charging if wheelchair has not been used within 24 hours. This will ensure the enhanced battery gauge registers the charge to give an accurate reading during use of wheelchair. If it is not powered up, the battery gauge does not indicate the charging state. For more information about the charging state, see user manual of your charger.



1. Plug the battery charger into the remote's charger socket **A**.

If the remote is powered up, the battery gauge indicates the system is connected to the charger by cycling between a left-to-right chase sequence, and then displaying the approximate battery charge state at the end of the chase sequence.



Battery charge state 1

Red LED on.



Battery charge state 2

Red and one amber LED on.



Battery charge state 3

Red and two amber LEDs on.



Battery charge state 4

Red, amber and one green LED on.



Fully charged

Green, green, amber, amber and red LEDs on.

For more information about the drive inhibit mode, refer to *5.3 Drive Inhibit Indication, page 26*.

## Battery Synchronisation



**NEW Batteries Only**—The wheelchair power must be on during charging to ensure that accurate battery charge levels display on the remote. New batteries must be charged fully. The Battery synchronization Procedure **MUST** be performed within 24 hours of powering on the wheelchair. The Battery synchronization procedure can be found in the LiNX service manual and must be performed by a provider or qualified technician.

### 4.10.1 Battery Alarms

#### High Voltage Warning



The batteries are overcharged.  
All LEDs on and the green LEDs flashing.

1. Disconnect battery charger.

#### Low Voltage Warning



The batteries are empty.  
Only one red LED on and flashing.

1. Power down wheelchair.
2. Charge batteries immediately.

## 4.11 Attendant Control Unit (DLX-REM050)



The ON/OFF button of the attendant control unit is sealed with a label, which indicates to read the user manual of the remote before using the attendant control unit for the first time. You can remove the label after reading the user manual.



The attendant control unit is a component of the wheelchair's control system, intended to allow attendants to interact with the system. The attendant control unit allows the attendant to take control of drive function, as configured and connected within the wheelchair's control system.



Before using the attendant control unit for the first time, you should familiarize well with its operation. Invacare recommends to test the behavior of the attendant control unit without an occupant to avoid injury. When handing over to other attendants, they need a sufficient instruction as well.

When two remote modules are connected in the same system, both are capable of performing the same functions but only one of them has control of the system at any one time. While one remote is in charge, the other does not respond to any commands except for its ON/OFF button, which can always turn off the system.

### Powering up

Either of the remotes can power up the system with their own ON/OFF button. The remote that powers up the system has control of the system (remote-in-charge). The other remote (remote-not-in-charge) has no control of the wheelchair except for its ON/OFF button, which can still be used to power down the system.

The system is automatically powered up in drive function one. As an attendant you cannot change the drive function. You can just control the maximum speed with the speed dial on the attendant remote.

### Powering down

No matter which remote is in charge in the dual remote system, the wheelchair can be powered down by pressing the ON/OFF button on either remote.

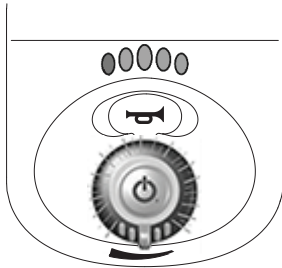
### Changing who's in Charge

To change which remote is in charge, power down the system with either remote, and then power up the system again with the remote that requires the control.

## Remote-in-charge Indication

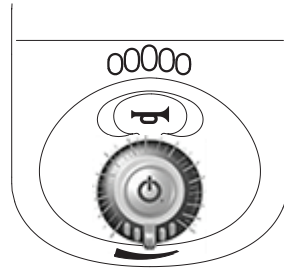
### Remote-in-charge

All indicators, including the battery gauge displays as normal.



### Remote-not-in-charge

The battery gauge is switched off and all other indicators operate normally.



## Fault Handling and Indication

If a fault is present on one of the remotes in a dual remote system, the fault is indicated on both remotes.

If one of the remotes in a dual system is faulty, the system can be driven with the other remote. If, however, the ON/OFF button on the remote-in-charge has a fault, the system does not operate.

If one of the remotes is disconnected from the system when it is powered down, the remaining remote displays a fault (refer to Flash code 2 in *5.1.1 Fault Codes and Diagnosis Codes, page 24*) when the system is powered up again to indicate that it was expecting two remotes in the system. To clear the fault, cycle the power with the ON/OFF button.

## 5 Troubleshooting

### 5.1 Fault Diagnosis

If the electronic system shows a fault, use the following fault-finding guide to locate the fault.



Ensure that the drive electronics system is powered up before starting any diagnosis.

#### If the Status Display is OFF:

- Check whether the drive electronics system is powered up.
- Check whether all cables are correctly connected.
- Ensure that the batteries are not discharged.

#### If a Fault Number is Displayed in the Status Display:

- Proceed to the next section.

#### 5.1.1 Fault Codes and Diagnosis Codes



If there is a fault with the system when it is powered up, the status indicator flashes red. The number of flashes indicates the type of fault.

The table below describes the fault indication, and a few possible actions that can be taken to rectify the problem. The actions listed are not in any particular order and are suggestions only. The intention is that one of the suggestions may help you clear the problem. If in doubt, contact your provider.



Flash Code	Fault Description	Possible Action
1	Remote fault	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Check other remotes, if installed.</li> <li>• Contact your provider.</li> </ul>
2	Network or configuration fault	<ul style="list-style-type: none"> <li>• Restart power wheelchair.</li> <li>• Check cables and connectors.</li> <li>• Recharge the batteries.</li> <li>• Check charger.</li> <li>• Contact your provider.</li> </ul>
3	Motor 1 <sup>1</sup> fault	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Contact your provider.</li> </ul>
4	Motor 2 <sup>1</sup> fault	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Contact your provider.</li> </ul>
5	Motor 1 <sup>1</sup> magnetic brake fault	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Check left magnetic brake is engaged.</li> <li>• Refer to the chapter “Pushing the Power Wheelchair in Freewheel Mode” in the user manual of your power wheelchair.</li> <li>• Contact your provider.</li> </ul>
6	Motor 2 <sup>1</sup> magnetic brake fault	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Check right magnetic brake is engaged.</li> <li>• Refer to the chapter “Pushing the Power Wheelchair in Freewheel Mode” in the user manual of your power wheelchair.</li> <li>• Contact your provider.</li> </ul>
7	Module fault (other than remote module)	<ul style="list-style-type: none"> <li>• Check cables and connectors.</li> <li>• Check modules.</li> <li>• Recharge batteries.</li> <li>• Contact your provider.</li> <li>• If the power wheelchair was stalled, reverse away or remove obstacle.</li> </ul>

1 Configuration of the motors depending on the power wheelchair model

## 5.2 OON (“Out Of Neutral”)

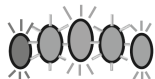
OON (“Out Of Neutral”) is a safety feature that prevents accidental driving or seating movements, when:

- the system is powering up,
- after a function change or
- when the system comes out of an inhibit or drive lock-out.

### Drive OON Warning

The joystick must be in the centre position:

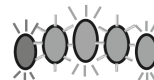
- when a system is powering up,
- on a function change or
- when transitioning from a drive lock-out or inhibit state.



Otherwise a drive OON warning is displayed. During a drive OON warning, the battery gauge LEDs and the drive wheel indicator (if fitted) flash continually (all on, followed by all off) to alert the user. In this state the wheelchair does not drive. If the joystick is returned to the centre position, the warning clears and the wheelchair drives normally.

### Seating OON Warning

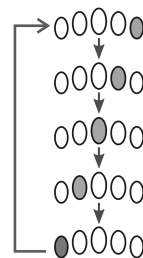
When a system is powering up or after a function change, no direct access switches can be active, otherwise a seating OON warning is displayed.



During a seating OON warning, the battery gauge LEDs and the seating indicator flash continually (all on, followed by all off) to alert the user. In this state the seating motions do not operate. If the switches are deactivated, the warning clears and the seating motions operate normally.

## 5.3 Drive Inhibit Indication

The drive inhibit mode ensures that the wheelchair does not drive when connected to the charger.



Drive inhibit mode is indicated by the battery gauge with a right-to-left chase sequence. The chase sequence continues until the fault condition has been cleared.

## 5.4 Cut-off Voltage



When the battery voltage decreases below the battery cut-off voltage:



- the status indicator flashes red (Flash code 2, refer to 5.1.1 *Fault Codes and Diagnosis Codes*, page 24),
- the red LED on the battery gauge flashes,
- the horn sounds once every ten seconds.

## 6 Technical Data

Mechanical Specifications	
Permissible operating, storage and humidity conditions	
Temperature range for operation according to ISO 7176-9:	• -25 °C ... +50 °C
Recommended storage temperature:	• 15 °C
Temperature range for storage according to ISO 7176-9:	• -40 °C ... +65 °C
Operating humidity range according to ISO 7176-9:	• 0 ... 90 %RH
Degree of protection:	• IPX4 <sup>1</sup>

1 IPX4 classification means that the electrical system is protected against spray water.

Operating forces		
	DLX-REM050	DLX-REM110/211/216
Joystick		• 1.9 N
Power button		• 2.5 N
Speed dial		• 1.2 N
Horn button	• 4.4 N	• 2.5 N

Electrical Specifications				
Parameter	Min.	Nominal	Max.	Units
Operating voltage (Vbatt)	• 17	• 24	• 34	• V
Idle current	-	• 56	-	• mA at 24V
Quiescent current (power off)	-	-	• 0.23	• mA at 24V

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