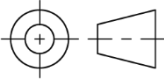




NOTES:

1. PAGE COUNT - 40
2. PAGE FORMATTED FOR – A4 (8.3 X 11.7 INCHES) OR 8.5 X 11 INCHES
3. MATERIAL - MINIMUM 60 LB (OR 90 GSM) OFFSET TEXT
4. ORIENTATION - PORTRAIT
5. COLOR - BLACK AND WHITE
6. SPECIAL INSTRUCTIONS -
 - A. DO NOT PRINT THIS DRAWING.
 - B. THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY.
 - C. SEE ATTACHED DOCUMENT ARTWORK FOR INSPECTION AND PRINTING.
 - D. DOCUMENT ARTWORK CONTROLLED BY INVACARE TECHNICAL DOCUMENTATION ONLY.

 3 RD ANGLE PROJECTION ANSI/ASME Y14.5M-1994 UNLESS OTHERWISE SPECIFIED	ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED			 = CRITICAL QUALITY ATTRIBUTE  = KEY CHARACTERISTIC IDENTIFICATION	
	TOLERANCES: INCHES METRIC DECIMALS: X = N/A X = ± .3mm .X = ± .1 X = ± .5mm .XX = ± .02 .XX = ± .13mm .XXX = ± .005 .XXX = N/A FRACTIONS: ± 1/64 N/A ANGLES: ± .5°	PART DESCRIPTION: MANUAL, USER LINX REHAB LITE REMOTE		PART NO. REVISION	
C/N NO. 162691	RELEASED TO PRODUCTION	PRE-RELEASE REVISION: 00	INVACARE CORP. ELYRIA, OH.	TEMPLATE SIZE: A SCALE: 1:1 DRAWN BY: CW DATE: 07/12/2021	60126083 B

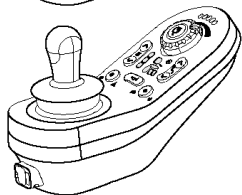
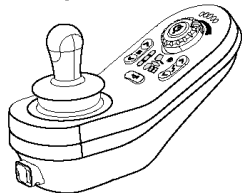
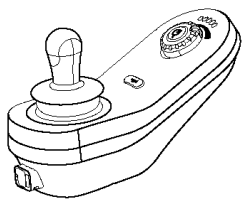
LiNX[®] Control System

REM110, REM210, REM211, REM215, REM216
Supplement to power wheelchair user manual

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.

Contents

1 General	4
1.1 About This Manual	4
1.2 Symbols	4
1.3 Prescription Statement	4
1.4 Intended Use	4
1.4.1 Intended Use—REM 110 and REM200 Series	4
1.5 Indication for Use	4
1.6 Service Life	4
2 Safety	5
2.1 General Guidelines	5
2.1.1 Live Edit Guidelines	7
2.1.2 Usage Guidelines	7
2.1.3 Setup and Service Guidelines	8
3 Electromagnetic Compatibility (EMC) Information	9
3.1 Electromagnetic Compatibility	9
3.1.1 Minimizing Emissions	9
4 Components	10
4.1 User Interface—	10
4.1.1 User Interface—REM110	11
4.1.2 User Interface—REM210 and REM211	11
4.1.3 User Interface—REM215 and REM216	12
4.2 Labels on the Product	12
4.2.1 Labels on Adaptive Switch Labs Parts	13
4.2.2 Serial Number and Date of Manufacture	13
5 Setup	15
5.1 Connecting the Remote	15
6 Usage	16
6.1 Operating the Remote	16
6.1.1 Powering Up the Remote	16
6.1.2 Powering Down the Remote	16
6.1.3 Joystick	16
6.1.4 Maximum Speed Control	16
6.2 Using Emergency Stop	16
6.3 Activating the Drive Function	17
6.4 Using Audible Cues	17
6.5 Operating the Lights	17
6.6 Operating the Hazard Lights	17
6.7 Operating the Turn Signals	17
6.7.1 Use the Left Turn Signal	17
6.7.2 Use the Right Turn Signal	17
6.8 Operating the Horn	18
6.9 Locking/Unlocking the Remote	18
6.10 Using Sleep Mode	18
6.11 Using Rest Mode	18
6.11.1 Entering Rest	18
Entering Rest from a Drive or Seating Function via Timeout	18
Entering Rest from Any Function via Control Input	18
Entering Rest from Menu Select via Timeout	19
Entering Rest from Menu Navigation via Control Input	19
6.11.2 In Rest	19
6.11.3 Exiting Rest	19
6.12 Operating Powered Seating Functions	19
6.12.1 Through External Switches	19
Egg Switch	19
Stereo Toggle Switch	20
Stereo Button Switch	20
4-way Toggle Switch	20
4-way Button Switch	21
6.12.2 Through the Joystick	21
Activating the Seating Function	21
Understanding Displayed Symbols and Meanings	22
6.12.3 Speed Reduction and Seating Function Inhibits	22
Speed Reduction	22
6.13 Charging the Batteries	22
6.13.1 Battery Alarms	23
High-Voltage Warning	23
Low-Voltage Warning	23
6.14 Using the USB Charger	24
7 Maintenance	25
7.1 Maintenance Information	25
7.2 Setup/Delivery Inspection	25
7.3 User/Attendant Inspection Checklists	25
7.3.1 Inspect/Adjust Weekly	25
7.3.2 Inspect/Adjust Monthly	25
7.3.3 Inspect/Adjust Periodically	25
7.4 Service Inspection	25
7.4.1 Six-Month Inspection	26
7.5 Cleaning	26
8 Troubleshooting	27
8.1 Fault Diagnosis	27
8.1.1 Fault Codes and Diagnosis Codes	27
8.2 OON (“Out Of Neutral”)	28
8.2.1 Drive OON Warning	28
8.2.2 Seating OON Warning	28
8.3 Drive Inhibit Indication	28
8.4 Cut-off Voltage	29
9 Technical Data	30
9.1 Technical Specifications	30
9.1.1 Mechanical Specifications	30
9.1.2 Electrical Specifications	30
10 Wireless Technology	31
10.1 Wireless Technology Overview	31
10.2 Intended Wireless (Electromagnetic) Environment	31
10.3 LiNX Wireless Functions	31
10.3.1 Remote Diagnostics	31
10.3.2 Configuration	32
10.4 Quality of Service	32
10.4.1 Data Integrity	32
10.4.2 Safeguards and Redundancy	33
10.5 Wireless Coexistence	33
10.6 Cybersecurity	33
10.6.1 Cybersecurity Controls	33
10.6.2 User Actions	34
11 Warranty	35
11.1 Limited Warranty—US	35

© 2021 Invacare Corporation

All rights reserved. Republication, duplication or modification in whole or in part is prohibited without prior written permission from Invacare. Trademarks are identified by ™ and ®. All trademarks are owned by or licensed to Invacare Corporation or its subsidiaries unless otherwise noted.

Invacare reserves the right to alter product specifications without further notice.

Making Life’s Experiences Possible is a registered trademark in the U.S.A.

LiNX is a registered trademark of Dynamic Controls.

Bluetooth is a registered trademark of Bluetooth SIG, Inc.

IOS is a trademark or registered trademark of Cisco in the U.S. and other countries and is used under license to Apple, Inc.

11.2 Limited Warranty—Canada	35
11.3 Repair or Replacement	35
11.4 Disclaimers	35
11.4.1 Limitations and Exclusions	35

1 General

1.1 About This Manual

This document is a supplement to the mobility device's documentation.

For more information about the product, for example product safety notices and product recalls, contact your local Invacare representative. Before reading this manual, make sure you have the latest version. You will find the latest version on the Invacare website. For the address and website see the back page of this manual.

1.2 Symbols

Signal symbols and/or 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.



DANGER!

-Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

-Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

-Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.



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



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



This symbol identifies a list of various tools, components and items which you will need in order to carry out certain work.

1.3 Prescription Statement

Per 21 CFR 801.109(b)(1) the device is labeled for prescription use only.



CAUTION!

Federal Law (USA) restricts this device to sale by or on the order of a licensed physician.

1.4 Intended Use



Refer to the user manual for the power wheelchair base and for the seating system for the intended use of the mobility device.

1.4.1 Intended Use—REM 110 and REM200 Series

The REM110 is a variant of the LiNX remote module family, intended to allow powered wheelchair users to interact with the LiNX System. The REM110 allows control of drive functions, as well as providing an input for battery charging and a Bluetooth® interface for programming and diagnostics.

The LiNX REM210, REM211, REM215, and REM216 are remote modules of the LiNX family, intended to allow powered wheelchair users to interact with the LiNX System.

The REM210 and REM211 remote modules allow control of drive and actuator functions. The REM215 and REM216 remote modules allow control of drive, actuator and lighting functions.

All of the above REM200-series remote modules provide an input for battery charging. The REM211 and REM216 remote modules allow the use of more than two actuators.

1.5 Indication for Use


Refer to the user manual for the base and for the seat for the indication for use for the mobility device.


1.6 Service Life


The expected service life is five years, presuming the product is used daily and in accordance with safety instructions, maintenance instructions and intended use as stated in this manual.


2 Safety


2.1 General Guidelines


-  The safety section contains important information for the safe operation and use of this product. Refer to the wheelchair base and seating system user manuals for additional safety and operation information.


 **WARNING!**
Risk of Death, Injury or Damage
 Improper use of this product may cause injury or damage.
 -If you are unable to understand the warnings, cautions or instructions, contact a health care professional or provider before attempting to use this equipment.
 -DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manual, service manuals or instruction sheets supplied with this product or optional equipment.


 **WARNING!**
Risk of Death, Injury or Damage
 Continued use of the product with damaged parts could lead to the product malfunctioning and causing injury to the user and/or caregiver.
 -Check all product components and carton for damage and test components before use. In case of damage or if the product is not working properly, stop using the product and contact a qualified technician or Invacare for repair.

 **WARNING!**
Risk of Injury, Damage or Death
 Improper setup, service, adjustment or programming may cause injury, damage or death.
 -Qualified technician MUST set up, service and program the wheelchair.
 -DO NOT allow non-qualified individuals to perform any work or adjustments on the wheelchair.
 -DO NOT set up or service the wheelchair while occupied except for programming or unless otherwise noted.
 -Turn off power BEFORE adjusting or servicing the wheelchair. Note that some safety features will be disabled.
 -Ensure all hardware is securely tightened after setup, service or adjustments.
 -Warranty is void if non-qualified individuals perform any work on this product.

 **DANGER!**
Risk of Death, Serious Injury, or Damage
 Continued use of a wheelchair that is not set to the correct specifications may cause erratic behavior of the wheelchair, resulting in death, serious injury, or damage.
 -Performance adjustments should only be made by professionals of the healthcare field or persons fully conversant with this process and the driver's capabilities.
 -After the wheelchair has been set up/adjusted, check to make sure that the wheelchair performs to the specifications entered during the set up procedure. If the wheelchair does not perform to specifications, turn the wheelchair Off immediately and reenter set up specifications. Contact Invacare, if wheelchair still does not perform to correct specifications.

 **WARNING!**
Risk of Injury or Damage
 Failure to remove the LiNX Access Key (LAK) from the wheelchair after programming is complete may lead to unauthorized access to the wheelchair settings.
 -Always remove the LAK from the wheelchair when programming is complete.

 **WARNING!**
Risk of Serious Injury or Damage
 Use of unapproved accessories may result in serious injury or damage.
 -Invacare products are specifically designed and manufactured for use in conjunction with approved Invacare accessories. Unapproved accessories have not been tested by Invacare and are not recommended for use with Invacare products.
 -DO NOT use unapproved accessories.
 -To obtain approved Invacare accessories, contact Invacare by phone or at www.invacare.com.

 **WARNING!**
Risk of Serious Injury or Damage
 Loss of power due to loose electrical connections could cause the wheelchair to suddenly stop, resulting in serious injury or damage.
 -ALWAYS ensure all electrical connections are tightly connected so they don't vibrate loose.

**WARNING!****Risk of Injury or Damage**

Connector pins on the cables connected to the power module can still be live even when the system is off. Human contact or other materials may cause an electrical short. To prevent injury or damage due to electrical shorts:

- Cables with live pins should be connected, restrained or covered (with non-conductive materials) so 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).

**DANGER!****Risk of Death, Serious Injury, or Damage**

Corroded electrical components due to water, liquid exposure, or incontinent users can result in death, serious injury, or damage.

- Minimize exposure of electrical components to water and/or liquids. Electrical components damaged by corrosion **MUST** be replaced immediately.
- Wheelchairs that are used by incontinent users and/or are frequently exposed to water/liquids may require replacement of electrical components more frequently.

**DANGER!****Risk of Death, Serious Injury, or Damage**

Lighted cigarettes dropped onto an upholstered seating system can cause a fire, resulting in death, serious injury, or damage.

Wheelchair occupants are at particular risk of death or serious injury from these fires and resulting fumes because they may not have the ability to move away from the wheelchair.

- DO NOT smoke while using this wheelchair.

**WARNING!****Risk of Injury, Damage or Death**

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

- Ensure all cable(s) are routed and secured properly.
- Ensure there are no loops of excess cable extending away from the chair.
- Close supervision and attention is needed when operating the wheelchair near children, pets or people with physical/mental disabilities.

**WARNING!****Risk of Injury, Damage or Death**

Pinched or severed cable(s) may be a shock or fire hazard and may cause injury, damage or death.

- Ensure all cable(s) are routed and secured properly.
- Inspect cable(s) periodically for proper routing, pinching, chafing or other similar wear.
- Replace any damaged cables immediately.

**Risk of Damage to the Mobility Device**

There are no user-serviceable parts inside any case.

- Do not open or disassemble any case.



As a manufacturer of wheelchairs, Invacare endeavors to supply a wide variety of wheelchairs to meet many needs of the end user. However, final selection of the type of wheelchair to be used by an individual rests solely with the user and his/her healthcare professional capable of making such a selection. Invacare recommends working with a qualified rehab technology provider, such as an ATP, (Assistive Technology Professional).

The information contained in this document is subject to change without notice.

2.1.1 Live Edit Guidelines



WARNING!

Risk of Injury or Damage

- Rapid and unfamiliar parameter changes may lead to injury or damage.
- Qualified technicians should make the user aware that in live edit mode, the performance of the wheelchair will be changed instantly.
- After programming in live edit mode, the wheelchair performance should be checked for driving safety. Ensure the wheelchair performance is appropriate to the capabilities and needs of the user.
- Users should use caution when driving the wheelchair while operating in Live Edit mode.
- Users should use care to stay in the programming range.
- Always perform live edit changes in a safe environment.



Live edit adjustments are best done in an unrestricted but safe area. The presence of an attendant is recommended. The Bluetooth® range of the programmer is 33 ft (10 m). If the wheelchair drives out of range of the Bluetooth programmer, the programmer must reconnect before the parameters can be changed.

2.1.2 Usage Guidelines



DANGER!

Risk of Death, Serious Injury, or Damage

- Misuse of the wheelchair may cause component failure and/or cause the wheelchair to start smoking, sparking, or burning. Death, serious injury, or damage may occur due to fire.
- DO NOT use the wheelchair other than its intended purpose. If the wheelchair starts smoking, sparking, or burning, discontinue using the wheelchair and seek service IMMEDIATELY.



WARNING!

Risk of Injury, Damage or Death

- Misuse of wheelchair may result in injury, damage or death.
- Use care when operating the wheelchair on roads, streets or other roadways.
- Use care when operating the wheelchair when vision is impaired by poor lighting such as unlit rooms, during the night or similar situations.
- ALWAYS be aware of motor vehicles and your surroundings.



WARNING!

Risk of Injury, Damage or Death

- Use of the wheelchair while judgment or ability is impaired may result in injury, damage or death.
- DO NOT operate the wheelchair under the influence of alcohol, medications or other substances that impair judgment or function.
- Changing medications may affect your ability to operate the wheelchair. Discuss the impact on your ability to operate the wheelchair with a health care professional when changing medications.
- DO NOT operate the wheelchair under conditions where judgment or function may be impaired. This may include but is not limited to lack of sleep or poor sight.
- Always be aware of your surroundings.



WARNING!

Risk of Injury, Damage or Death

- Loss of traction or stability on rough or unstable terrain may cause injury, damage or death.
- Use care when operating the wheelchair on rough or unstable terrain. This would include but is not limited to areas of rock, mulch, mud, uneven pavement, roots and similar conditions.
- Be aware of your surroundings and conditions that might affect the ability to operate the wheelchair.



WARNING!

Risk of Serious Injury

- Impacting objects in the surrounding environment can cause serious injury.
- When maneuvering the wheelchair around, ALWAYS have assured cleared distance with all objects in environment.



CAUTION!

Risk of Injury

- The remote module can get hot when exposed to strong sunlight for long periods.
- Do not leave mobility device in direct sunlight for long periods.



DANGER!

Risk of Death, Serious Injury, or Damage

- A malfunctioning joystick could cause unintended/erratic movement resulting in death, serious injury, or damage.
- If unintended/erratic movement occurs, stop using the wheelchair immediately and contact a qualified technician.

2.1.3 Setup and Service Guidelines

**DANGER!****Risk of Death, Serious Injury, or Damage**

Use of incorrect or improper replacement (service) parts may cause death, serious injury, or damage.

- Replacement parts **MUST** match original Invacare parts.
- ALWAYS** provide the wheelchair serial number to assist in ordering the correct replacement parts.

**WARNING!****Risk of Serious Injury**

Sharp edges can cause serious injury.

- Be mindful that some parts may have sharp edges. Use caution when encountering these sharp edges.

**WARNING!****Risk of Serious Injury**

Hot surfaces can cause severe burns.

- Be mindful of potential hot surfaces and avoid touching.

**WARNING!****Risk of Death, Serious Injury, or Damage**

An improperly connected joystick could cause loss of power, resulting in death, serious injury, or damage.

- Ensure the joystick is securely connected to controller.


**CAUTION!****Risk of Damage**

Operating the wheelchair in rain or dampness may cause the wheelchair to malfunction electrically and mechanically or prematurely rust or may damage the upholstery.

- DO NOT** leave the wheelchair in a rain storm of any kind.
- DO NOT** use the wheelchair in a shower.
- DO NOT** leave the wheelchair in a damp area for any length of time.
- Check to ensure that the battery covers are secured in place, joystick boot is **NOT** torn or cracked where water can enter and that all electrical connections are secure at all times. **DO NOT** use if the joystick boot is torn or cracked. If the joystick boot becomes torn or cracked, replace **IMMEDIATELY**.

3 Electromagnetic Compatibility (EMC) Information

3.1 Electromagnetic Compatibility

-  Refer to the power wheelchair base and seating system user manuals for more electromagnetic compatibility information for your mobility device.

Dynamic Controls Electronic Controllers have been tested on typical, representative vehicles to confirm compliance with the following appropriate EMC standards:

- USA: ANSI/RESNA WC-2:2009 Sec 21
- Europe: EN12184:2014, ISO7176 - 21:2009

National and international directives require confirmation of compliance on particular vehicles. Since EMC is dependent on a particular installation, each variation must be tested. The guidelines in this section are written to assist with meeting EMC requirements in general.

3.1.1 Minimizing Emissions

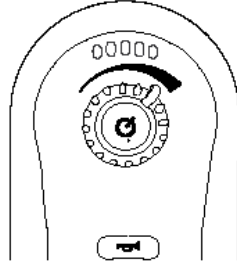
To minimize emissions and to maximize the immunity to radiated fields and ESD, follow the wiring recommendations in the LiNX System Service Manual.

4 Components

4.1 User Interface—

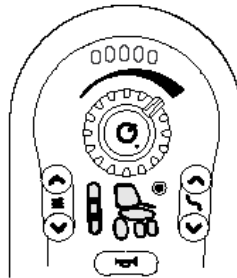
Non-Expandable Remotes

REM110



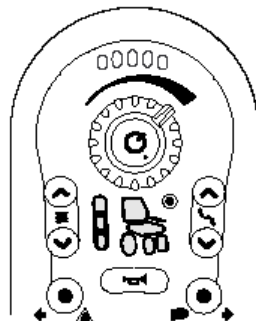
- Drive function

REM210



- Drive function
- Seating function (up to two actuators)

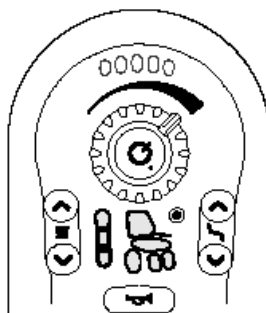
REM215



- Drive function
- Seating function (up to two actuators)
- Lights/Hazard lights

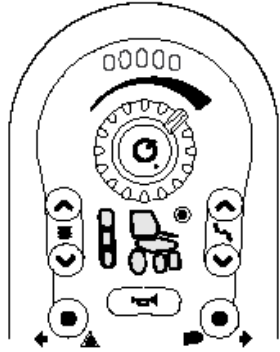
Expandable Remotes

REM211



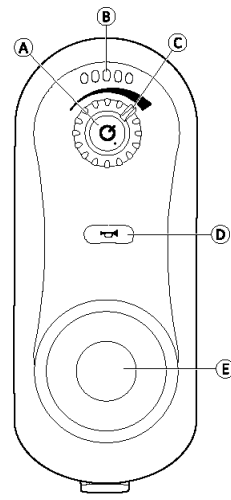
- Drive function
- Seating function (two or more actuators)

REM216




- Drive function
- Seating function (two or more actuators)
- Lights/Hazard lights

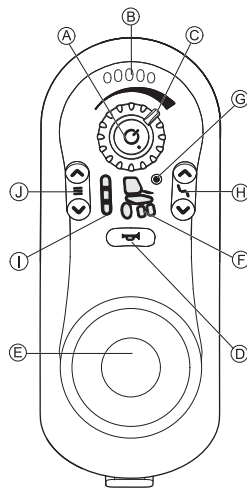
4.1.1 User Interface—REM110



- (A) ON/OFF button/Status indicator
- (B) Battery gauge
- (C) Speed dial
- (D) Horn
- (E) Joystick


4.1.2 User Interface—REM210 and REM211

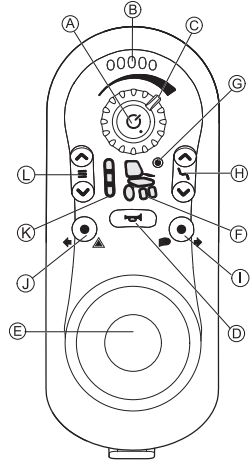
 The REM210 and REM211 remotes have the same user interface. The REM211 remote has a ring around the base of the joystick.



- (A) ON/OFF button/Status indicator
- (B) Battery gauge
- (C) Speed dial
- (D) Horn
- (E) Joystick
- (F) Drive/actuator status
- (G) Connectivity indicator
- (H) Seating function selector
- (I) Drive function indicator
- (J) Drive function selector

4.1.3 User Interface—REM215 and REM216

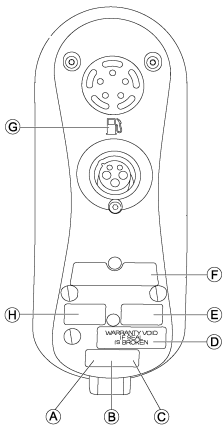






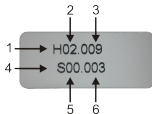
 The REM215 and REM216 remotes have the same user interface. The REM216 remote has a ring around the base of the joystick.



- (A) ON/OFF button/Status indicator
- (B) Battery gauge
- (C) Speed dial
- (D) Horn
- (E) Joystick
- (F) Drive/actuator status
- (G) Connectivity indicator
- (H) Seating function selector
- (I) Lights and direction indicator right
- (J) Hazard lights and direction indicator left
- (K) Drive function indicator
- (L) Drive function selector

4.2 Labels on the Product

4.2.1 Labels on Adaptive Switch Labs Parts

		 READ INSTALLATION MANUAL BEFORE USE	<p>Recommendation to read the instruction manual before using the module.</p>
	(B)	IPx4	<p>This is the enclosure's ingress protection rating.</p>
	(C)		<p>This is the WEEE symbol (Waste Electrical and Electronic Equipment Directive). 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.</p> <ul style="list-style-type: none"> • The 'crossed-out-wheeled-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.
	(D)		<p>Tamper-evident seal.</p>
	(E)		<p>Product label containing:</p> <ul style="list-style-type: none"> • Dynamic Controls' 'dynamic' logo • Dynamic Controls' website address • Dynamic Controls' part description
	(F)		<p>Product label containing:</p> <ul style="list-style-type: none"> • The product's bar code • The product's serial number • The product's part number
	(G)		<p>The petrol pump indicates the battery charger input.</p>
	(H)		<p>Hardware and application firmware version label</p> <ol style="list-style-type: none"> 1. Hardware version 2. Hardware major version 3. Hardware minor version 4. Application version 5. Application major version 6. Application minor version

4.2.2 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 **MYynnnnnn**, 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 serial number begins with A14. This indicates the remote was manufactured in January 2014. Its unique sequential value is 132800.

5 Setup

5.1 Connecting the Remote



CAUTION!

Risk of Unintended Stops

If the plug of the remote cable is broken, the remote cable may come loose while driving. The remote could suddenly switch off when losing power. This results in an unintended stop.

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



Risk of Damage to the Remote

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

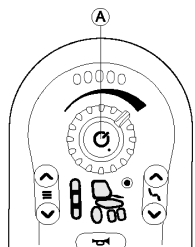
-Do not force them together.

1. Lightly push to connect the plug of the remote cable and the connector socket. The plug must lock in place with an audible click.

6 Usage

6.1 Operating the Remote

Your wheelchair always powers up in drive function 1 and is ready to drive. For remotes that provide multiple drive functions (REM210, REM211, REM215, or REM216) the drive function can be changed. For details about changing the drive function, refer to 6.3 *Activating the Drive Function, page 17*.



6.1.1 Powering Up the Remote

Press the ON/OFF button (A).

If there is no fault with the system, the status indicator lights green and the battery gauge displays the current battery status. Refer to 1.1 *Battery gauge, page 1*.

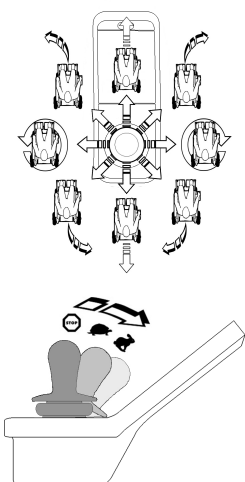
If there is a fault with the system when powering up, the status indicator indicates the fault with a series of red flashes. Refer to 1.1 *Fault codes and diagnosis codes, page 1*. If the fault prevents the system from driving, the battery indicator continuously flashes.

6.1.2 Powering Down the Remote

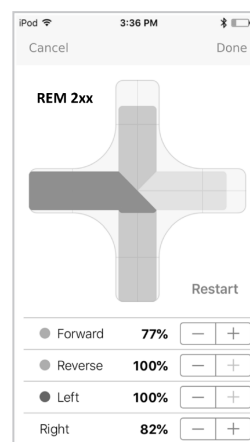
1. Press the ON/OFF button (A). The system powers down, and the status indicator switches off.

The ON/OFF button can also be used to perform an emergency stop (see 1.1 *Emergency stop, page 1*) and to lock the system (see 1.1 *Locking/unlocking the remote, page 1*).

6.1.3 Joystick



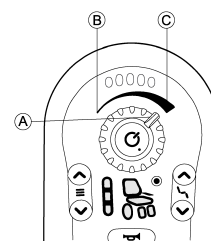
Joystick shaping is used to calibrate a joystick to reduce the extent to which users must deflect their joystick to reach full demand in one or more quadrants. This feature, which must be configured by providers, may benefit users with limited hand movement. Contact your provider for more information.



6.1.4 Maximum Speed Control

1. Swipe-and-Tap Mode	Tap Mode
Slide the set point (E) up or down.	Tap the top or bottom of the speed slider (D). Plus and minus symbols indicate where to tap.

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



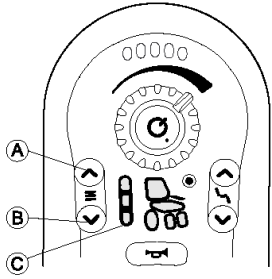
The speed dial (A) offers 10 discrete steps between the lowest speed (B) and the highest speed (C).

Joystick shaping is used to calibrate a joystick to reduce the extent to which users have to deflect the joystick to reach full demand in one or more quadrants. This feature may benefit certain users, such as those who have limited hand movement.

6.2 Using Emergency Stop

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

6.3 Activating the Drive Function



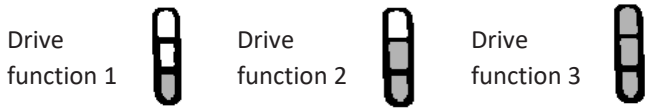
1. Press the Drive function key (A).

The remote switches to drive function, the Drive function indicator (C) shows the preselected drive function (1, 2 or 3) and the wheel in the drive status display lights up green.



2. Press the Drive function selector keys (A) or (B) until the desired drive function lights up.

The Drive function indicator (C) shows the drive function.



i Use the Drive function selector key to select among three drive functions that are configured by Invacare and can be customized by the provider.

6.4 Using Audible Cues

Audible cues are sounds played through the remote speaker in response to certain system events or navigation actions performed by the user. They are designed to help users understand what function or profile they are using and are especially beneficial for:

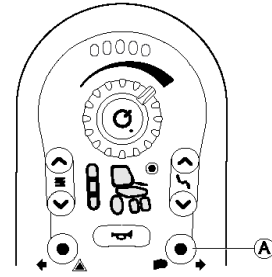
- users with impaired vision or users who cannot see the display
- users who want additional feedback from their actions without the need to constantly monitor the display

i Audible cues are available only on REM200-series remotes.

6.5 Operating the Lights

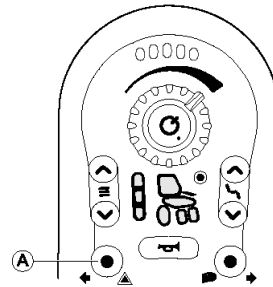
i If you drive outside, turn on the position lights in bad visibility conditions or darkness.

1. Short press the Light button (A).



The lights turn on or off.

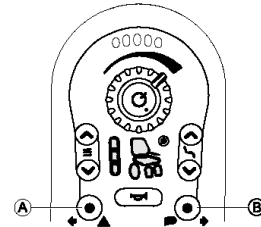
6.6 Operating the Hazard Lights



1. Short press the Hazard lights button (A).

The hazard lights turn on or off.

6.7 Operating the Turn Signals



6.7.1 Use the Left Turn Signal

1. Press the Hazard lights button (A) for more than three seconds.

The left turn signal turns on.

2. To turn off the left turn signal, short press the Hazard lights button again.

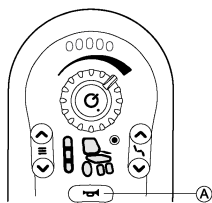
6.7.2 Use the Right Turn Signal

1. Press the Light button (B) for more than three seconds.

The right turn signal turns on.

2. To turn off the right turn signal, short press the Light button again.

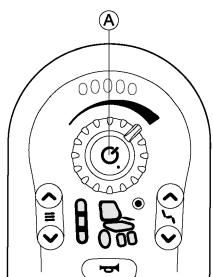
6.8 Operating the Horn



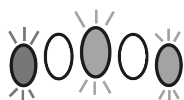
Press the horn button **A** to sound the horn. The horn sounds as long as the horn button is pressed.

The horn button is also used to unlock a locked system. Refer to [6.9 Locking/Unlocking the Remote](#), page 18.

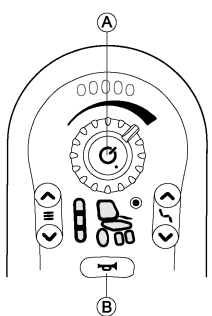
6.9 Locking/Unlocking the Remote



- 1.
1. Press the ON/OFF button **A** for more than four seconds.

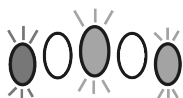


When entering the locked state, the battery indicator indicates the transition by flashing LEDs red, amber and green (far left, middle and far right) three times.



1. Press the ON/OFF button **A**.
2. Press the horn **B** twice within 10 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 indicator 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 or unlocked or the Sequence Timeout is reached.

6.10 Using Sleep Mode

Sleep mode is not set at the factory but can be enabled by your provider. If this parameter is set to ON, the system goes into sleep mode after a period of time without user activity. This period can be set by the provider.

During the transition period, the remote module LEDs gradually dim. The joystick, horn, speed dial and power button continue to operate.

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

6.11 Using Rest Mode


The rest state of the LiNX system provides the occupant with a safe environment in which to sleep, rest or carry out other activities without fear of accidentally triggering an unwanted action with the driver control.

The rest state is entered automatically after a period of user inactivity (timeout) or manually by the user via a control input, as configured by the provider. Contact your provider for more information.

6.11.1 Entering Rest

The system can be programmed to enter rest automatically after a period of inactivity or manually via a control input or both. Specifically, rest can be entered from:

- A drive or seating function via timeout
- Any function via a control input, such as an egg switch
- Menu select via timeout
- Menu navigation via control input

 Entry to rest is prohibited when a system is being programmed. If the system is in rest and a LiNX Access tool connects to a LAK, rest is exited.

Entering Rest from a Drive or Seating Function via Timeout

To enter rest from a drive or seating function via timeout, the function's profile must be enabled for timeout into rest and the rest timeout must expire. The rest timeout is reset whenever there is user activity.

Entering Rest from Any Function via Control Input

To enter rest from any function via a control input, a user must activate a control input that has been configured to enter rest when activated. Entry to rest will not occur in the following conditions:

- There is any demand from the driver control
- The wheelchair is driving

- Any seating actuator is active

Entering Rest from Menu Select via Timeout

To enter rest from menu select via timeout, the profile that was active before entering menu navigation must be enabled for timeout into rest and the rest timeout must expire. The rest timeout is reset whenever there is user activity.

Entering Rest from Menu Navigation via Control Input

To enter rest from menu navigation via control input, a user must activate a control input that has been configured to enter rest when activated. Entry to rest will not occur in the following conditions:

- There is any demand from the driver control
- Any seating actuator is active

6.11.2 In Rest

If audible cues are enabled in the system, when the system transfers into rest from a function or menu navigation, an audible signal is emitted to let the user know that they are entering into the rest state.

The LiNX system can operate in the rest state with the driver control fully or partly disabled. When the driver control is fully disabled, user demands from the driver control have no effect. This is the most secure option for users, giving them the confidence that any subsequent demands from the driver control, intentional or accidental, will not result in any action, such as driving or seating.

When the driver control is partly disabled, the system is allowed to respond to a long press into one or more of the driver control's quadrants to perform a preconfigured action. The action could be Exit Rest or one of any number of available actions.

Although the partly disabled mode does not provide the same extent of confidence as the fully disabled mode, it is useful for those users that require quick access to valued or often-used functions and actions. For example, the driver control can be configured to provide quick access to a favorite menu or function.

When in rest mode, only the power button is illuminated. All other indicators are switched off.

6.11.3 Exiting Rest

The system remains in rest until one of the following occurs:

- Normal operation is resumed manually.
- The system times out into sleep if configured to do so.
- The system is power cycled.

How normal operation is resumed manually depends on if the driver control is fully disabled or partly disabled.

To manually resume normal operation when the driver control is **fully disabled**, the user can:

- Activate a control input that is normally configured for accessing user functions, menu navigation or settings.
- Activate a control input that is normally configured for performing a profile or function change.
- Activate a control input that is specifically configured to exit rest and return the user to the location they were in before entering rest; this is used for both user functions and menu navigation.

To manually resume normal operation when the driver control is **partly disabled**, the user can:

- Perform a long press into a quadrant that is configured for accessing user functions, menu navigation or settings.
- Perform a long press into a quadrant that is specifically configured to exit rest and return the user to the location they were in before entering rest.
- Perform long press into a quadrant that is configured for performing a profile or function change or any other action available when configuring the long press.

If audible cues are enabled, an audible signal is emitted as the system re-enters the functions or navigation menu.

6.12 Operating Powered Seating Functions

Powered seating functions, such as powered elevating legrests or powered recline, are carried out as described in this section.

6.12.1 Through External Switches



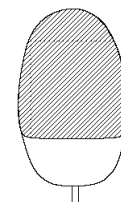
Not all configurations and combinations of powered seating functions through external switches are available on all products.

With an external switch, seating functions can be controlled while driving and without using the joystick.

Egg Switch

The egg switch alternates powered seating functions of the following single power configurations:

- Powered recline only
- Powered seat tilt only
- Center-mount elevating legrest (LNX) only



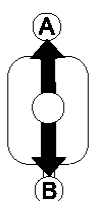
1. Make sure the mobility device is on a level surface and is turned on.
2. Press and hold the tagged area of the egg switch to run the powered seating function.

- Release the egg switch if the desired seating position is reached.
If the egg switch is pressed again within three seconds, the powered seating function moves in the same direction.
- To alternate direction, press the egg switch after it has been released for more than three seconds.

Stereo Toggle Switch

The stereo toggle switch alternates powered seating functions of the following single power configurations:

- Powered recline only
- Powered seat tilt only
- Center-mount elevating legrest (LNX) only



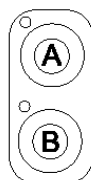
- Make sure the mobility device is on a level surface and is turned on.
- Deflect and hold the toggle switch up (A) or down (B) to move a particular seating function.

The seating function moves as long as the toggle switch is deflected.

Stereo Button Switch

The stereo button switch alternates powered seating functions of the following single power configurations:

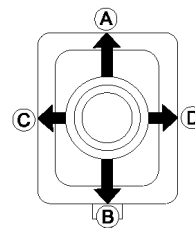
- Powered recline only
- Powered seat tilt only
- Center-mount elevating legrest (LNX) only



- Make sure the mobility device is on a level surface and is turned on.
- Press and hold the stereo buttons (A) or (B) to move a particular seating function.

The seating function moves as long as the button is pressed.


4-way Toggle Switch



- Make sure the mobility device is on a level surface and is turned on.
- Deflect and hold the toggle switch in the appropriate direction to move a particular seating function.

The seating function moves as long as the toggle switch is deflected.

See the following tables for direction and powered seating function combinations.

 The tables show the factory settings. For reprogramming, contact your provider.

Powered Seat Tilt and Powered Recline

(A) (Forward)	Powered seat tilt up
(B) (Reverse)	Powered seat tilt down
(C) (Left)	Powered recline up
(D) (Right)	Powered recline down

Powered Seat Tilt, Recline, Elevate and Legrest

(A) (Forward)	Powered seat tilt toggle up/down
(B) (Reverse)	Powered seat recline and legs up/down
(C) (Left)	Powered seat elevate up/down
(D) (Right)	Powered seat legs up/down

Powered Seat Tilt and LNX Legrest

(A) (Forward)	Powered seat tilt up
(B) (Reverse)	Powered seat tilt down
(C) (Left)	LNX up
(D) (Right)	LNX down

Powered Recline and LNX Legrest

(A) (Forward)	Powered recline and LNX up
(B) (Reverse)	Powered recline and LNX down
(C) (Left)	LNX up
(D) (Right)	LNX down

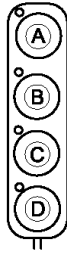
Powered Seat Tilt and Elevating Seat

- Ⓐ (Forward) Powered seat tilt up
- Ⓑ (Reverse) Powered seat tilt down
- Ⓒ (Left) Elevating seat up
- Ⓓ (Right) Elevating seat down

Dual-Powered Elevating Legrests

- Ⓐ (Forward) Left powered elevating legrest up
- Ⓑ (Reverse) Left powered elevating legrest down
- Ⓒ (Left) Right powered elevating legrest up
- Ⓓ (Right) Right powered elevating legrest down


4-way Button Switch



1. Make sure the mobility device is on a level surface and is turned on.
2. Press and hold the appropriate button to move a particular seating function.

The seating function moves as long as the button is pressed.

See the following tables for buttons and powered seating function combinations.

 The following tables show the factory settings. For reprogramming, contact your provider.

Powered Seat Tilt and Powered Recline

- Ⓐ Powered seat tilt up
- Ⓑ Powered seat tilt down
- Ⓒ Powered recline up
- Ⓓ Powered recline down

Powered Seat Tilt, Recline, Elevate and Legrest

- Ⓐ Powered seat tilt toggle up/down
- Ⓑ Powered seat recline and legs up/down
- Ⓒ Powered seat elevate up/down

Powered Seat Tilt, Recline, Elevate and Legrest

- Ⓓ Powered seat legs up/down

Powered Seat Tilt and LNX Legrest

- Ⓐ Powered seat tilt up
- Ⓑ Powered seat tilt down
- Ⓒ LNX up
- Ⓓ LNX down

Powered Recline and LNX Legrest

- Ⓐ Powered recline and LNX up
- Ⓑ Powered recline and LNX down
- Ⓒ LNX up
- Ⓓ LNX down

Powered Seat Tilt and Elevating Seat

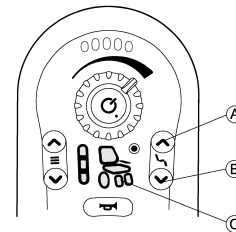
- Ⓐ Powered seat tilt up
- Ⓑ Powered seat tilt down
- Ⓒ Elevating seat up
- Ⓓ Elevating seat down

Dual-Powered Elevating Legrests

- Ⓐ Left powered elevating legrest up
- Ⓑ Left powered elevating legrest down
- Ⓒ Right powered elevating legrest up
- Ⓓ Right powered elevating legrest down

6.12.2 Through the Joystick


Activating the Seating Function



1. Press the Seating function key Ⓐ.









The wheelchair changes to the seating function, and the Drive/actuator status display Ⓒ lights up amber.

- Press the Seating function selector keys **A** and **B** or move the joystick left or right several times until the desired seating function lights up. Refer to *Understanding Displayed Symbols and Meanings*, page 22.
- Deflect the joystick to the front or rear to activate the actuator.


 The distance you deflect the joystick determines the dynamics of the movement.
If you deflect the joystick only a little, the actuator moves slowly.
If you deflect the joystick as far as you can, the actuator moves faster.

Understanding Displayed Symbols and Meanings

Not every wheelchair has all options.

	Powered seat tilt
	Powered recline
	Elevating seat
	Left or center-mount powered elevating legrest
	Right powered elevating legrest
	Both powered elevating legrests
	None
	Unspecified

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



Speed reduction is shown in the status display. If the elevating seat is raised above a certain point, the elevating seat symbol and the drive symbol pulse. These two symbols continue pulsing while driving to show the speed reduction until speed reduction is deactivated.

6.13 Charging the Batteries



WARNING!

Risk of Injury or Damage

Using the wrong battery charger may cause explosion and destruction of batteries. To avoid injury or damage:

- Only use the battery charger supplied with your mobility device or a charger that has been approved by Invacare.



WARNING!

Risk of Injury or Damage

Explosive gases can be generated while charging. To avoid flammable gas buildup and injury or damage due to explosion:

- During charging, keep the wheelchair and battery charger away from sources of ignition, such as flames and sparks.
- Charge the wheelchair in a space at least twice the volume of the wheelchair.



WARNING!

Risk of Injury, Damage or Death

Improper routing of the charger cord(s) may cause a 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.





WARNING!

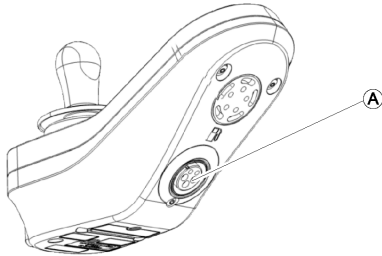
Risk of Injury or Damage

Using a damaged extension cord may cause fire and electric shock. To avoid injury or damage:

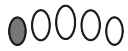



- Only use an extension cord if it is absolutely necessary. If you must use one, make sure it is in good condition.

 Refer to the charger user manual, the power wheelchair base user manual and instructions supplied with the batteries for more information about charging the batteries.

1. Plug the battery charger into the remote charger socket .




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 and red LEDs on.

The LiNX system does not have to be powered up when charging the batteries; however, if it is not powered up, the battery gauge does not indicate the charging state. For more information about the charging state, refer to the charger user manual or the power wheelchair base user manual. While charging, the wheelchair is in drive inhibit mode. The drive inhibit mode ensures the wheelchair does not drive when connected to the charger. For more information about drive inhibit mode, refer to *8.3 Drive Inhibit Indication, page 28*.

 **NEW Batteries Only**—The wheelchair power must be on during charging to ensure accurate battery charge levels display on the remote. New batteries must be fully charged. 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.

6.13.1 Battery Alarms

High-Voltage Warning



The batteries are overcharged. All LEDs are on, and the green LEDs flash.

1. Disconnect the battery charger.

Low-Voltage Warning



The batteries are empty. Only one red LED is on and flashes.

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

6.14 Using the USB Charger



WARNING!

Risk of Injury

If you use a mobile phone while operating the mobility device, accidents could lead to injury or property damage.

- Only use a mobile phone in conjunction with hands-free equipment to operate the mobility device while driving.



Risk of Property Damage

Handle the USB charger with care; otherwise, damage could occur.

- Always keep the USB charger dry. If the USB charger gets wet, let the USB charger dry before use.
- Do not use or store the USB charger in dusty or dirty areas.
- Do not insert sharp objects into the USB ports.




WARNING!

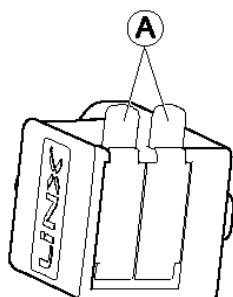
Risk of Injury or Damage

Erratic or unintended movement of the wheelchair may occur if wireless transmitters are connected to the wheelchair. To avoid injury or damage:

- DO NOT use the USB charger connector as a wireless transmitter.
- Only use the USB charger for the purposes described in this manual.

With the USB charger, you can charge the battery of your mobile phone or a compatible device when you do not have access to a regular power source. Both USB ports can be used at the same time, and each USB port has a charging current up to 1 A.

1. Open the bung .



2. Connect the device with the USB port.



Replace the bung when the USB ports are not in use.



Use of the USB charger influences the drive range of the mobility device. For more information about the drive range, refer to the Technical Data chapter in the mobility device user manual.

7 Maintenance

7.1 Maintenance Information

- ! **Risk of Damage to the Remote**
There are no user-serviceable parts in any electronic component.
-Do not attempt to open any case or undertake any repairs, else warranty will be voided and the safety of the system may be compromised.

- 🔧 If any component is damaged in any way, or if internal damage may have occurred (for example by being dropped), have it checked by qualified personnel before operating.
Where any doubt exists, consult your nearest Invacare provider.

7.2 Setup/Delivery Inspection

- 🔧 Setup/delivery inspection should be performed by the provider at the time of delivery/setup.
Initial adjustments should be made to suit your personal body structure needs and preferences. Thereafter weekly, monthly and periodic inspections should be performed by the user/attendant between six-month service inspections.
Every six months, and as necessary, take your wheelchair to a qualified technician for a thorough inspection and servicing.

- Check all parts for shipping damage. In case of damage, DO NOT use.
- Check that cables are routed and secured properly to ensure cables do NOT become entangled and damaged during normal operation of the seating system.
- Ensure proper operation of powered functions (for example, drive, seating and legrests).

7.3 User/Attendant Inspection Checklists

- 🔧 Every six months, and as necessary, take your wheelchair to a qualified technician for a thorough inspection and servicing.
Weekly, monthly, and periodic inspections should be performed by the user/attendant between six-month service inspections.
Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your wheelchair. To operate properly and safely, your wheelchair MUST be cared for just like any other vehicle. Routine maintenance will extend the life and efficiency of your wheelchair.

7.3.1 Inspect/Adjust Weekly

- Ensure proper operation of powered functions (for example, drive, seating and legrests).

7.3.2 Inspect/Adjust Monthly

- Check all components for loose, damaged or corroded components, such as connectors, terminals or cables. Contact your Invacare provider to replace damaged components.
- Ensure all connectors are fully mated.
- Inspect cables to ensure they are properly routed and secured. Periodic inspection is recommended as it may reveal loose and/or damaged cables. Contact your Invacare provider to re-secure or replace cables.
- Check for and remove any foreign objects or material.

7.3.3 Inspect/Adjust Periodically

- Check the joystick boot for damage. Contact your Invacare provider for replacement if it is damaged.
- Check that all labels are present and legible. Replace them if necessary.

7.4 Service Inspection

- 🔧 Every six months, take your wheelchair to a qualified technician for a thorough inspection and servicing.
Service inspections MUST be performed by a qualified technician.

The following are recommended items to inspect during regular service inspections performed by a qualified technician. Actual items to be inspected during the service inspection may vary according to the specific wheelchair:

7.4.1 Six-Month Inspection

- Inspect cables to ensure they are properly routed and secured. Periodic inspection is recommended as it may reveal loose and/or damaged cables. Re-secure all loose cables and replace them by following the recommendations outlined in the LiNX service manual.
- Ensure proper operation of powered functions (drive, seating, legrests, etc.).
- Inspect electrical components for signs of corrosion. Replace them if they are corroded or damaged.
- Check that all labels are present and legible. Replace them if necessary.

7.5 Cleaning


WARNING!
Risk of Injury, Damage or Death

Electrical shock may cause injury, damage or death.

- Always unplug the product from the electrical outlet before cleaning.
- Always unplug accessories from the electrical outlet before cleaning.


CAUTION!
Risk of Damage

Cleaning or maintenance may cause damage to carpeting or flooring.

- Place the wheelchair in a well-ventilated area where cleaning or maintenance can be performed without risk of damage to carpeting or flooring.


CAUTION!
Risk of Damage

Exposure to liquids may damage components or accessories of wheelchair and electronics.

- DO NOT spray with any type of water or liquid.
- Electrical components damaged by corrosion MUST be replaced immediately.


CAUTION!
Risk of Damage

Improper cleaning may cause damage to the product.

- DO NOT use chemicals, solvents or abrasive cleaners.



Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your wheelchair. To operate properly and safely, your wheelchair must be cared for just like any other vehicle.

Keep all electronic components free of dust, dirt and liquids.

1. Use a cloth dampened with warm water and mild non-abrasive soap to clean this product.
2. Dry the surface with a dry cloth.
3. DO NOT use solvents or kitchen cleaners.

8 Troubleshooting

8.1 Fault Diagnosis

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



Ensure 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 the batteries are not discharged.

If a Fault Number Displays in the Status Display:

- Proceed to the next section.

8.1.1 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 clear the problem. If in doubt, contact your provider.

Flash Code Fault Icon	Fault Description	Possible Action
1	Remote fault	<ul style="list-style-type: none"> • Check cables and connectors. • Contact your provider.
2	Network or configuration fault	<ul style="list-style-type: none"> • Check cables and connectors. • Recharge the batteries. • Check the charger. • Contact your provider.
3	Motor 1 ¹ fault	<ul style="list-style-type: none"> • Check cables and connectors. • Contact your provider.
4	Motor 2 ¹ fault	<ul style="list-style-type: none"> • Check cables and connectors. • Contact your provider.
5	Left magnetic brake fault	<ul style="list-style-type: none"> • Check cables and connectors. • Ensure the left magnetic brake is engaged. • Refer to the “Pushing the mobility device in freewheel mode” chapter in the wheelchair user manual. • Contact your provider.

Flash Code Fault Icon	Fault Description	Possible Action
6	Right magnetic brake fault	<ul style="list-style-type: none"> • Check cables and connectors. • Ensure the right magnetic brake is engaged. • Refer to the “Pushing the mobility device in freewheel mode” chapter in the wheelchair user manual. • Contact your provider.
7	Module fault (other than remote module)	<ul style="list-style-type: none"> • Check cables and connectors. • Check modules. • Recharge the batteries. • If the chair was stalled, reverse away or remove any obstacles. • Contact your provider.

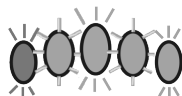
1 Configuration of the motors depends on the wheelchair model.

8.2 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
- When the system comes out of an inhibit or drive lockout

8.2.1 Drive OON Warning

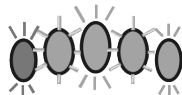


The joystick must be in the center position:

- When a system is powering up
- On a function change
- When transitioning from a drive lockout or inhibit state

Otherwise, a drive OON warning displays. During a drive OON warning, the battery gauge LEDs and the drive wheel indicator (if equipped) 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 center position, the warning clears and the wheelchair drives normally.

8.2.2 Seating OON Warning



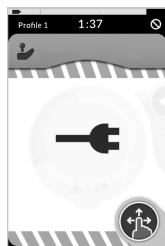
When a system is powering up or after a function change, no direct access switches can be active; otherwise, a seating OON warning displays.

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.

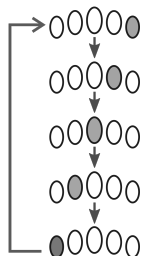
8.3 Drive Inhibit Indication

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

The following screen indicates the drive inhibit mode.



Drive inhibit mode is indicated by a right-to-left chase sequence on the battery gauge.



The chase sequence continues until the fault condition is cleared.

8.4 Cut-off Voltage



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

- The status indicator flashes red (flash code 2, refer to 1.1 *Fault codes and diagnosis codes, page 1*)
- The red LED on the battery gauge flashes
- The horn sounds once every 10 seconds

9 Technical Data

9.1 Technical Specifications

9.1.1 Mechanical Specifications

Permissible Operating, Storage and Humidity Conditions	
Temperature range for operation according to ISO 7176-9:	-13°F (-25°C)-122°F (+50°C)
Recommended storage temperature:	59°F (15°C)
Temperature range for storage according to ISO 7176-9:	-40°F (-40°C)-149°F (+65°C)
Operation humidity range according to ISO 7176-9:	0–90% RH
Degree of protection:	IPX4 ¹

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

Operating Forces	
Joystick	1.9 N
Speed dial	1.2 N
Horn	2.5 N

9.1.2 Electrical Specifications

Parameter	Minimum	Nominal	Maximum	Units
Operating voltage (Vbatt)	17	24	34	V
Idle current	-	56	-	mA at 24V
Quiescent current (power off)	-	-	0.23	mA at 24V

10 Wireless Technology

10.1 Wireless Technology Overview

The LiNX control system uses Bluetooth wireless technology. Bluetooth is a wireless communications system that is designed to operate in short-range wireless personal area networks (WPAN).

LiNX supports both the Smart (low energy) and Classic Bluetooth protocols. These operate in the spectrum range 2.400 GHz to 2.4835 GHz industrial, scientific and medical (ISM) band. Bluetooth Classic uses 79 x 1 MHz channels, and Bluetooth Smart uses 40 x 2 MHz channels.

Within a channel, data is transmitted using Gaussian frequency shift modulation. The bit rate is 1Mbit/s, and the maximum transmit power is 5mW. Both Bluetooth protocols use frequency hopping to counteract narrowband interference problems.

Bluetooth Technology Specifications

Technical Specification	Classic Bluetooth	Smart (Low Energy) Bluetooth
Class	Class 2	
Distance/Range (theoretical maximum)	10 m (33 ft)	
Over the Air Data Rate	1-3 Mbit/s	1 Mbit/s
Application Throughput	0.7-2.1 Mbit/s	0.27 Mbit/s
Security	56/128-bit and application layer user defined	128-bit AES with Counter Mode CBCMAC and application layer user defined
Robustness	Adaptive fast frequency hopping, FEC, fast ACK	Adaptive frequency hopping, Lazy Acknowledgment, 24-bit CRC, 32-bit Message Integrity Check
Latency (from a non-connected state)	Typically 100 ms	6 ms
Network Topology	Scatternet	
Power Consumption	5 mW	
Service Discovery	Yes	
Profile Concept	Yes	

10.2 Intended Wireless (Electromagnetic) Environment

The intended environments for the LiNX wheelchair are defined as the user's home, assisted living facilities, nursing homes, vocational settings and healthcare facilities. Across these environments, numerous medical and non-medical equipment items also operate wirelessly.

10.3 LiNX Wireless Functions

The LiNX control system functions that use Bluetooth include:

- **Remote diagnostics**—provides status information of the powered wheelchair (battery status, fault conditions etc.).
- **Configuration**—allows a trained provider, dealer, therapist or clinician using the programming and diagnostic tools to configure the LiNX control system.

10.3.1 Remote Diagnostics

The system transmits wheelchair-specific diagnostic information to an Apple iOS device. This information helps with the technical support of the wheelchair.

The information provides the status of the wheelchair electronics, including:

- Battery charge status
- Active and historical fault data
- Wheelchair driving time
- Information about the modules attached to the wheelchair (e.g., module serial numbers)

The information updates once every 12 hours when connected or when requested by an application on the iOS device. Note the wheelchair may be in motion at the time of transmission.

10.3.2 Configuration

The LiNX Programming and Diagnostic (P&D) tools use Bluetooth to communicate with the LiNX control system via the LiNX Access Key (LAK). The LAK is a standalone device that plugs into a remote module. A system cannot be configured without using the LAK and only manufacturers, trained providers, dealers, therapists or clinicians have access to the LAK. This means that end users, their friends, relatives or caregivers cannot change the configuration.

There are two levels of access:

- Manufacturer (or OEM)
- Distributor (provider/clinician)

The levels of access permit the following:

- **LAK Manufacturer Level**

With this level, the manufacturer sets the system's default parameters to suit a particular wheelchair.

- **LAK Distributor Level**

With this level, a subset of the system's parameters is configured by trained providers, dealers, clinicians or therapists. Critical parameters are limited within a predetermined range as set by the manufacturer.

Although the wheelchair may be in motion when the system is being configured, instructions for safe use, training and built-in safety mechanisms minimize the potential for non-life threatening injuries resulting from inappropriate configuration of the wheelchair. The likelihood of the aforementioned hazardous situation occurring is remote. A human intermediary, knowledgeable in the control system and specific user needs, can intervene to prevent harm to the wheelchair user during wheelchair setup. The P&D tools do not allow direct control of the LiNX wheelchair. Complete control of the wheelchair remains with the end-user at all times. Should a user determine during the customization process that the wheelchair setup is inappropriate in providing full control in everyday usage, they may return the joystick to the neutral position and the wheelchair will come to a complete and safe stop in a controlled manner.

Similarly, the user, provider, therapist or clinician may at any time turn off the control system using the power button/s within the system (for example, on the primary remote module or the attendant control unit). Such action will also bring the wheelchair to a complete and safe stop in a controlled manner.

10.4 Quality of Service

As per the risk assessment, none of these items can cause or contribute to a safety hazard should the data link be compromised. Data latency and/or the probability of loss of service creates an inconvenience only and does not inhibit the user's therapy or treatment.


10.4.1 Data Integrity

Errors in the integrity of the data transmitted are a nuisance and will not cause a safety-related issue. Data is not used for clinical purposes.

Loss of or incorrect data transmitted in Mouse Mover mode could result in the loss of or incorrect movement of the user's PC cursor. Similar conditions exist with normal off-the-shelf USB or wireless PC mice when their batteries are low.

Loss of diagnostic data transmitted could result in a gap in historical information presented to a service technician. Errors in the wheelchair-specific diagnostic information could result in short-term erroneous information being presented to a technician. Both conditions may result in wheelchair troubleshooting taking longer than initially estimated.

Loss of configuration data transmitted in programming and diagnostic mode would result in no effect. The existing wheelchair configuration would be maintained. Errors in the configuration data transmitted would be rejected by built-in safety mechanisms and/or detected during the subsequent evaluation of the configuration updates through the prescribed user testing.

-  The programming and diagnostic tools serve no specific medical purpose and do not control the wheelchair's operation. Complete control of the wheelchair's actions remain with the user at all times.

10.4.2 Safeguards and Redundancy

Safeguards will include warnings in the user manuals around minimum separation distances, the ability to turn off the Bluetooth connections, inherent encryption of the Bluetooth protocols, and direct indication to a user when a connection is made.

Due to the nature of the functions using the wireless technology, there is no requirement for redundancy.

Security risks are addressed by compliance to recognized standard AAMI-TIR57:2016 - Principles for medical device security - Risk management (FDA recognition No: 13-83) and the NIST Framework, as appropriate.

The built-in safety features, such as and without limitation, necessity for the LiNX Access Key to be physically present when configuring the device, the use of standard Bluetooth security protocols, single connection at any point in time, limited range, limited exposure time and the visual indication of an established connection, minimize the threats and vulnerabilities from malicious attack.

10.5 Wireless Coexistence

Wireless coexistence testing has been conducted in line with ANSI C63.27 using the radiated anechoic chamber (RAC) test method. The LiNX Access Key has been tested per ISO 7176-21:2009 Clause 5.2.3 at 20 v/m field strength. During testing the LiNX Access Key disconnected from its paired device when subjected to a frequency of 2.44 GHz. The function of the wheelchair was not impacted by the disruption of the LiNX Access Key wireless communication. If the LiNX Access Key becomes disconnected from its paired device during use, remove the wheelchair from the RF field and wirelessly reconnect the device.

10.6 Cybersecurity

The LiNX product range has been designed with cybersecurity in mind to assure device functionality and safety. The cybersecurity measures taken address:

- The embedded software
- The programming and diagnostic tools' software
- Bluetooth wireless technology

10.6.1 Cybersecurity Controls

A number of controls are in place to assure the LiNX system software maintains its integrity from the point of origin, to the point at which a system leaves the control of the manufacturer and during product use.

These are summarized below:

- Devices leaving the point of origin are equipped with a tamper-evident seal, which allows for the detection that a product's case has been opened and thus potentially compromised. The Factory Test Interface is not accessible without opening the case of any given module.
- Once the system leaves the point of origin, it can only have its software upgraded using the Programming and Diagnostic tools by a healthcare professional or a service technician with a LiNX Access Key (LAK) connected to the charging port. Access controls and licensing are provided through the physical LAK.
- Programming can occur only using either the P&D tools or via the Single Wire Communication interface, both through the charging port. The embedded system ensures safe envelopes for programmed parameters.
- The system will run only valid software. Cyclic Redundancy Checks (CRC) are conducted on the software before it is executed.
- LiNX products use Class 2 Bluetooth wireless technology. This technology has built-in safety features that can maximize the product's integrity. These features include:
 - Operating range to 10 m (33 ft)
 - Use of standard Bluetooth security protocols
 - Single connection at any point in time
 - Limited exposure time
 - Visual indication when in a connectivity function

10.6.2 User Actions

Users are not required to take any specific actions in order to assure cybersecurity of the LiNX system. However, should the user be concerned about the Bluetooth connection for any reason, the user can switch off the Bluetooth functionality by powering down the system. The user also has the option to power up the system with the Bluetooth functionality disabled.

11 Warranty

11.1 Limited Warranty—US

Except as otherwise set forth below, Invacare warrants that the following components of the mobility device (“product”) will be free from defects in materials and workmanship for a period of one (1) year from the date Invacare ships the product to the original purchaser or provider: base frame, electronics and electrical components (excluding batteries), motors, powered seating actuators, gearboxes, bearings and bushings, seat frame, fixed seat post, upholstered materials, padded materials, casters, tires, and tubes (excluding normal wear and tear). Invacare warrants all product batteries will be free from defects in materials and workmanship for a period of six (6) months from the date Invacare ships the product to the original purchaser or provider. The warranties described above are referred to as the “Warranty”. A copy of the original product invoice is required for coverage under the Warranty.

11.2 Limited Warranty—Canada

Except as otherwise set forth below, Invacare warrants the base frame of the mobility device (“product”) will be free from defects in materials and workmanship for a period of five (5) years from the date Invacare ships the product to the original purchaser or provider. Invacare warrants that the seat frame and fixed seat post will be free from defects in materials and workmanship for a period of three (3) years from the date Invacare ships the product to the original purchaser or provider. Invacare warrants that the following components of the product will be free from defects in materials and workmanship for a period of two (2) years from the date Invacare ships the product to the original purchaser or provider: electronics and electrical components (excluding batteries), motors, powered seating actuators, gearboxes. Invacare warrants that the following components of the product will be free from defects in materials and workmanship for a period of one (1) year from the date Invacare ships the product to the original purchaser or provider: bearings and bushings, upholstered materials (excluding normal wear and tear), padded materials (excluding normal wear and tear), brake pads (excluding normal wear and tear), casters (excluding normal wear and tear), tires and tubes (excluding normal wear and tear). Invacare warrants all product batteries will be free from defects in materials and workmanship for a period of six (6) months from the date Invacare ships the product to the original purchaser or provider. The warranties described above are referred to as the “Warranty”. A copy of the original product invoice is required for coverage under the Warranty.

11.3 Repair or Replacement

Invacare's sole obligation and the original purchaser's exclusive remedy under the Warranty is limited to Invacare's repair and/or replacement, at Invacare's option, of defective components and batteries covered by the Warranty. Such repair or replacement does not include any labor or shipping charges incurred by Invacare in the replacement and/or repair of any such component or battery. For Warranty service, please contact the provider from whom you purchased your product. In the event you do not receive satisfactory Warranty service, please write directly to Invacare at the address on the bottom of the back cover. Provide provider's name address, date of purchase, indicate nature of the defect and, if the product is serialized, indicate the serial number. Do not return products to Invacare without Invacare's prior written authorization.

11.4 Disclaimers

The Warranty may not be modified or waived in any manner whatsoever without Invacare's express written authorization. THE WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AND TO THE EXTENT AS MAY BE PROHIBITED BY STATE OR PROVINCIAL LAW, IN NO EVENT SHALL INVACARE BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM OR ARISING OUT OF OR RELATED TO A DEFECT IN ANY PRODUCT, OR INVACARE'S PERFORMANCE OR FAILURE TO PERFORM ANY OF ITS OBLIGATIONS UNDER THIS WARRANTY, WHETHER OR NOT INVACARE HAS BEEN ADVISED, KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY OF SUCH DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS.

11.4.1 Limitations and Exclusions

The Warranty is extended only to the original purchaser who purchases the product new and unused from Invacare or a provider. The Warranty is not extended to any other person or entity and is not transferable or assignable to any subsequent purchaser or owner. Coverage under the Warranty will end upon any such subsequent sale or other transfer of title to any other person. The Warranty does not apply to serial numbered products if the serial number has been removed or defaced, products subject to neglect, abuse, accident, improper operation, maintenance or storage, commercial or fleet use, products modified without Invacare's express written authorization (including, but not limited to, modification through the use of unauthorized parts or attachments), products damaged by reason of repairs made to any component without Invacare's express written authorization, or to a product damaged by circumstances beyond Invacare's control, and such evaluation will be solely determined by Invacare.

The Warranty does not apply to problems arising from normal wear and tear or failure to adhere to the product instructions. A change in operating noise, particularly relative to motors and gearboxes does not constitute a failure or defect and will not be repaired or replaced as all products are expected to exhibit changes in operating noise due to aging.

Notes

Notes

Notes

Invacare Corporation

USA One Invacare Way, Elyria, OH 44035, USA • 800-333-6900 • www.invacare.com

Canada 570 Matheson Blvd E Unit 8, Mississauga, Ontario, L4Z 4G4 Canada • 800-668-5324 • www.invacare.ca

Manufacturer



Invacare Corporation • One Invacare Way • Elyria, OH 44035, USA



Dynamic Controls • 39 Princess Street Riccarton • Christchurch Canterbury New Zealand 8140
www.dynamiccontrols.com/en/