



# **Altius System® Patient Controller and Battery Charger Manual**

**Caution: Federal (US) law restricts this device to sale by or on the order of a physician**  
LB-0199 Rev X7

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|---|-----------------|-------------------|
|  | LB-0199         | X7                |
|   | Document Number | Revision          |
| <b>ALTIUS PATIENT CONTROLLER AND BATTERY CHARGER MANUAL</b>                       |                 |                   |
| DCO NUMBER:   | 24-0010         | RELEASE DATE: TBD |



Neuros Medical (USA), Inc  
 26800 Aliso Viejo Parkway, Suite 250  
 Aliso Viejo CA 92637, USA  
 Support Phone Number: 883-240-4462

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Please read the complete documentation provided before you use the device.

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The Altius System® is protected by several U.S. Patents.  
 For an up-to date list of relevant patents and patent applications, visit our patents page:  
<http://www.neurosmedical.com/patents>

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Information available for Neuros Altius system:

The information for prescribers manual and patient manual provide information about indications, contraindications, warnings, precautions, adverse events, sterilization, patient selection, individualization of treatment, and component disposal.

Product manuals, such as this Patient Controller and Battery Charger guide, the programming guide, and implant manual provide device descriptions, package contents, device specifications, battery longevity and instructions for use.

For information that supports the clinical use of the Altius system, refer to the clinical summaries manual.

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## 1. Explanation of Symbols

|   |  |
|---|--|
| <b>REF</b>  | <b>Model Number</b>                          |
| <b>SN</b>   | <b>Serial Number</b>                         |
| <b>QTY</b>  | <b>Quantity</b>                              |
| <b>UDI</b>  | <b>Unique Device Identifier</b>              |
|    | <b>Consult Instructions for Use</b>          |
|    | <b>Refer to Instructions for Use</b>         |
|  | <b>Caution</b>                               |
|  | <b>Magnetic Resonance (MR) unsafe</b>        |
|  | <b>Do Not Use if Package is Damaged</b>      |
|  | <b>Temperature Limitations for Transport</b> |
| <b>Rx Only</b>  | <b>Prescription only</b>                     |
| <b>MD</b>   | <b>Medical Device</b>                        |
|  | <b>Humidity</b>                              |
|  | <b>Atmospheric Pressure</b>                  |
|  | <b>Keep Dry</b>                              |

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|   |  |
|---|--|
|    | <b>Keep Out of Sun</b>                                 |
|    | <b>Non- Ionizing Electromagnetic Radiation</b>         |
|    | <b>Type BF Applied Part</b>                            |
| IP22  | <b>Ingress Protection Rating</b>                       |
|    | <b>Manufacturing Date</b>                              |
|    | <b>Manufacturer</b>                                    |
|   | <b>Battery Charger Data Port – Not for Patient Use</b> |
|  | <b>Battery Charger Power Port</b>                      |
|  | <b>Battery Charger Symbol</b>                          |
|  | <b>IPG Symbol</b>                                      |
|  | <b>Battery Charger Signal Strength Indicator</b>       |

## 2. Introduction

This manual is written for people who are considering or have received the Neuros Altius high frequency nerve block system. The Altius system is designed to help people living with lower limb loss who experience chronic post-amputation pain.

This manual is designed to help you understand the operation of the Altius system components intended for patient use, the Patient Controller and Battery Charger.

For information on indications, contraindications, warnings, and precautions, please see the Patient Manual (LB-0196). If you have any questions about this information, please contact your doctor.

The Altius Patient Controller and Altius Battery Charger are type BF Applied Parts.

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### 3. Warnings

Warnings are statements about the safety of your device. You should take warnings very seriously. If you do not follow these warnings, it is possible you could be hurt, and or the Altius system could be damaged.

#### **Magnetic resonance imaging (MRI) Safety Information.**

The safety of having an MRI/NMRI with the Altius System has not been tested or evaluated. Patients must not have an MRI/NMRI without consulting the doctor who implanted the Altius System.

MRI exposure may result in dislodgement of the Altius IPG or Cuff Electrode(s), heating of the Altius IPG, injury to the nerve, and increased voltage through the Cuff Electrodes or Altius IPG.

If a MRI/NMRI is needed for any reason, the entire Neuros Altius system must be explanted prior to the diagnostic MRI/NMRI. For patients implanted with the Altius IPG, receiving an MRI/NMRI diagnostic scan, without first explanting the IPG may result in severe patient injury, death or device malfunction.

#### **3.1. Warnings about Other Medical Treatments**

Always tell your doctors, nurses or other health care providers (including dentists, physical therapists, prosthetists, and others) that you have the Altius system implanted in your body. There are some procedures that are not recommended for people with the Altius system. Receiving these procedures, medical therapies or diagnostics may damage your Altius IPG. This may require you to come in for a device check, or have your device surgically replaced.

**Caution:** If you are to undergo any of these procedures, have your healthcare professional call Neuros Medical for proper instructions.

The Following medical therapies or procedures may affect treatment or cause permanent damage to the Altius IPG (while on or off), particularly if used or performed in close proximity to the implanted components:

- lithotripsy — high-output sound or shock waves often used to treat gall stones and kidney stones
- electrocautery — the use of a heated electric probe to stop bleeding during surgery
- external defibrillation — the use of electrically charged paddles to restart the heart in an emergency
- radiation therapy — ionizing energy commonly used to treat cancer

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- ultrasonic scanning — very high frequency sound waves used to produce images of internal organs or tissue for diagnostic purposes
- RF nerve lesioning/RF Ablation — use of radio frequency energy to interrupt nerve conduction as a treatment for chronic neck and spine pain
- high-output ultrasound — high frequency sound waves which may be applied as physical therapy to treat certain bone and muscle injuries, for muscle therapy, or to improve blood flow.
- TENS (Transcutaneous Electrical Nerve Stimulation) – Electrical current is applied through the skin to stimulate nerves as a treatment pain from various sources.

### **3.2. Caution and Warnings Associated With Battery Charger and Patient Controller Operation**

- The Altius System IPG may not properly detect a Dose on signal and fail to deliver therapy due to a software or hardware problem, necessitating replacement.
- The Altius System IPG may not properly detect a Dose off signal and fail to turn therapy off due to a software or hardware problem, necessitating replacement.
- An Altius System IPG may detect environmental interference and inappropriately deliver therapy. See Patient Manual (LB-0195) for more information on Electromagnetic Interference.
- An Altius Patient Battery Charger may not function as designed due to a software or hardware problem and not charge the IPG as intended. A replacement Battery Charger will be required.
- An Altius Patient Controller may not function as designed due to a software or hardware problem and not activate the IPG as intended. A replacement Controller will be required.
- Heat due to charging. The implanted generator may become warm while charging. If you experience discomfort, please stop charging and contact your physician immediately.

## **4. Altius Patient Controller and Battery Charger Overview**

### **4.1. Altius Patient Controller Overview**

You may receive your Patient Controller from your health care provider following your implant procedure. Please note, your Patient Controller will not be operational until after your initial programming visit. If you attempt to use it prior to your initial programming, therapy will not activate, and the Contact Physician light may illuminate. Discuss this with your physician during the initial programming visit.

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The patient controller allows you to choose to activate therapy when you need it. You can press either dose 1 or dose 2, and then bring it over your implanted IPG to activate the therapy. Dose 1 is intended to be your primary therapy, and Dose 2 is intended to be an alternate therapy that is a lowered therapy compared to Dose 1. Your physician or clinical staff programming your device should go over this with you.

If for any reason, you need to stop the therapy, you may press the off button and then hold it over your IPG.

The Altius system Patient Controller, or Altius Controller is powered by two replaceable AA batteries.

**Contact Physician**

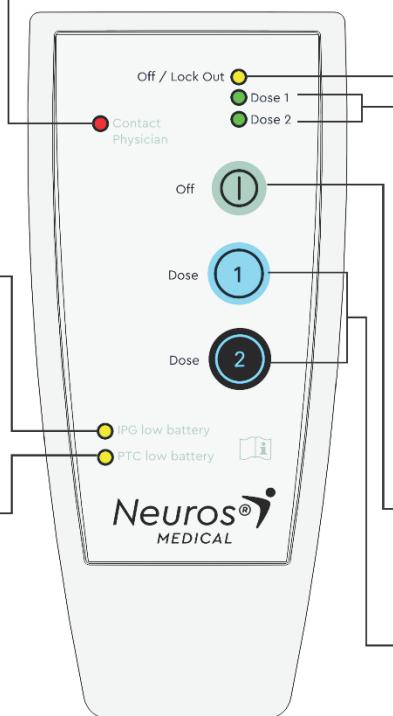
Indicates generator or patient internal error code. Please contact your physician.

**IPG low battery**

Lights up when the IPG needs to be recharged

**PTC low battery**

Lights up when the patient controller needs new AA batteries

**Off/Lock Out**

Lights up after pressing Off button confirming stop of treatment. Or lights up after pressing a Dose button indicating that treatment is temporarily locked out.

**Dose 1, Dose 2**

Lights up for 10 seconds after pressing a dose button confirming start of treatment.

**Off**

Press to stop "treatment".

**Dose**

Press to start Dose 1 or Dose 2 "treatment".

See Section 6 of this manual for details on the proper operation of the Patient Controller.

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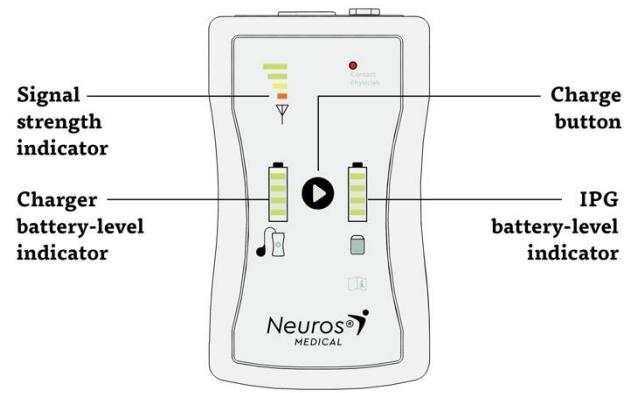
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## 4.2. Altius Battery Charger Overview

The Altius Battery Charger is used to recharge your IPG.

Please refer to Section 7 of this manual for details on the proper operation of the charger.



## 5. Living with the Altius System

### 5.1. General Expectations

You will be able to feel the Altius IPG beneath the skin. Normal body movement will cause no harm to it or the attached lead(s). However, it is important that you not try to move or turn the pulse generator. It has been implanted with a specific orientation to the skin to ensure proper communication with your Battery Charger, Patient Controller, and the Programmer system which is used by your doctor to set and monitor the Altius System.

### 5.2. Effect on Your Activities

Once the wounds from your surgery are healed, you can expect to resume your normal activities, including sexual intimacy. Your implanted Pulse Generator and Cuff Electrode(s) are unaffected by walking, bending over or other normal daily activities.

You may notice that running a therapy session with your prosthetic on versus off, may result in a stronger or weaker sensation. This is normal and expected as the electrodes makes more or less direct contact with your nerve(s).

### 5.3. Medications

#### 5.3.1. Pain relief Medications

The Altius System is intended to treat lower limb post-amputation pain which results from both residual limb pain and phantom pain. Once your device is activated, you should consult your physician on how to manage your pain relief medication in relation to the Altius system and the therapy that it delivers.

#### 5.3.2. General Medications

General Prescription medications, taken as directed, have no effect upon the proper operation of your Altius IPG. In general, the implantation of your Altius Pulse Generator should not require you to alter the use of any general medication.

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#### 5.4. The Importance of Your Patient ID Card

Each Altius Implantable Pulse Generator is supplied with a Patient ID card. This will be provided to you by your doctor following the implantation of your device. In addition, the information they provide to Neuros Medical allows the company to register you as a recipient of a device it manufactured so that your doctor may be properly and completely notified in the event a product advisory is issued.

Front

Neuros  
MEDICAL

Patient name \_\_\_\_\_

Physician name \_\_\_\_\_

Physician facility \_\_\_\_\_

Physician phone number \_\_\_\_\_

**Contact physician for medical questions or emergency.**

Back

LB-0200 Rev A | June XX, 2023

This person has an implanted Altius® medical device manufactured by Neuros Medical, Inc.

**Warning information**

MRI, pacemaker implants or other active implantable devices and diathermy are unsafe. If you need to bypass devices with strong magnetic fields, such as store anti-theft systems and airport screening systems, you can present your implant card to the screening personnel.

For important safety information, contact Neuros Medical, or visit [neurosmedical.com/manual](http://neurosmedical.com/manual).

**Neuros Medical, Inc.**  
26800 Aliso Viejo Pkwy, Suite 250 | Aliso Viejo, CA 92656  
[NeurosMedical.com](http://NeurosMedical.com) | 883.240.4462

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**IMPLANT INFORMATION**

|         |                |
|---------|----------------|
| MFG     | Neuros Medical |
| Product | Altius System  |

Implant date

|       |     |      |
|-------|-----|------|
| MONTH | DAY | YEAR |
|-------|-----|------|

IPG

Place IPG label here

Cuff Electrode(s)

Place cuff electrode label here

Place cuff electrode label here

Interior

It is important that you always carry your Patient ID card and a list of your medications with you. In the event of a medical emergency, the Patient ID card contains information of great importance to an attending physician and will assist in expediting any emergency medical care you may require. In addition, it is important to notify all of your health care providers that you have had an Altius device implanted.

Next time you visit your doctor or dentist, show them your Patient ID card so that a copy of it may be made for their records.

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## 6. Using Your Altius System - Patient Controller

## 6.1. Using Your Patient Controller

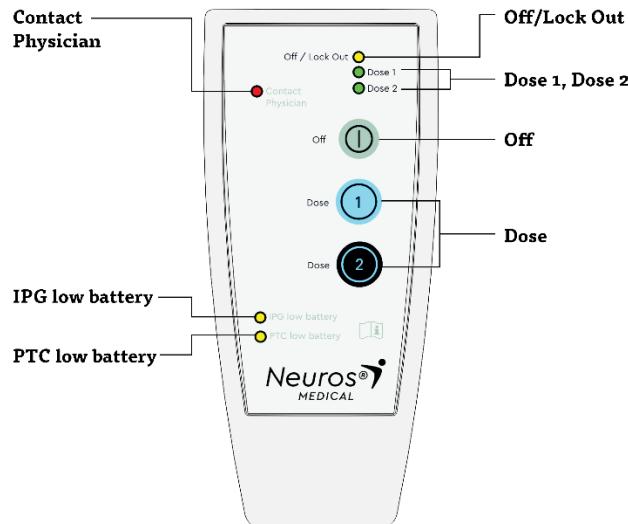
The Altius Patient Controller has three buttons and several light indicators.

Each Button on the patient controller initiates a function as described in detail on the following pages of this section.

## Buttons and Basic Operation

To use the patient controller and functions, you will simply press a button as you would on any typical remote and then hold it over your Altius IPG to transmit the button command.

The following figure describes the buttons and lights of the patient controller:



## 6.2. Communicating with the Altius IPG

Effective communication between your IPG and the patient controller is necessary. To establish communication with your generator:

1. Press the button, or or you intend to activate. Please note, the Patient Controller provides audible signals (sounds) to confirm the status of the IPG each time a button is pressed. See section 6.7 below for details.
2. Place the controller over the IPG, over your lightweight clothing

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- a. The patient controller should not contact your skin directly.
3. The distance between IPG and the patient controller should be less than 2 inches.

The patient controller is your direct link to choose available treatment. You cannot turn on your generator without the patient controller.

Warning: When using the Patient Controller in an environment that is 40°C (104°F) or hotter, the Patient Controller may warm up to 43.4°C (110.1°F). If you feel any part of the system getting too hot, stop using the Patient Controller and wait for it to cool down.

### 6.3. About Your Altius IPG Battery

When the patient controller detects that your generator battery is low, the "IPG low battery" indicator will light up and stay on until the generator is recharged. See "Charging the Altius generator"

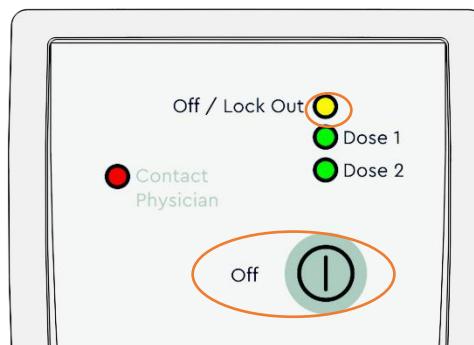
Warning: Failure to consistently charge your Altius IPG Battery may result in a failure of the device to deliver therapy. If the IPG battery is too low, the device may need to be replaced.

### 6.4. Turning Treatment Off

The patient controller has a dedicated Treatment off Button.

You may press  at any time to turn treatment off.

After pressing the  button, the patient controller "Off/Lock Out" indicator briefly lights up confirming the off status



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## 6.5. Starting a Treatment Session

Your Altius IPG has been programmed with two therapies: "Dose 1" or "Dose 2"

To start a treatment session:

1. Make sure that you are in a stationary, comfortable position, sitting or reclining (Couch, Sofa or Armchair, etc.).

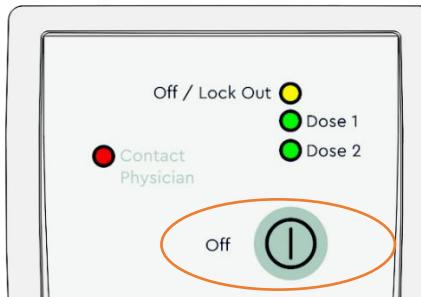
**Warning:** Walking or standing with prosthesis. Do not start or use treatment while walking or standing with your prosthesis. Any sudden response to treatment may interfere or impair your ability to stand or walk.

2. Press and release the  or  button to start a treatment session. Pressing any button after that will change it to that button/dose command to the IPG.
3. The green  Dose 1 or Dose 2 indicator light will briefly light up confirming which treatment was started.



4. The treatment will automatically turn off after the prescribed duration of time.
5. Once you have started a treatment dose, you will have a short window where you can turn off the dose and restart it if you pressed the wrong button. If you miss this window, you cannot switch to another dose until after the Lock Out period has ended. (See Next section "Lock Out")
6. If the yellow Off/Lock Out indicator light turns on after pressing the  or  button, the generator is momentarily "locked out" and a new treatment session cannot be started at this time.

Note: The treatment session can be turned off at any time by pressing the off button.

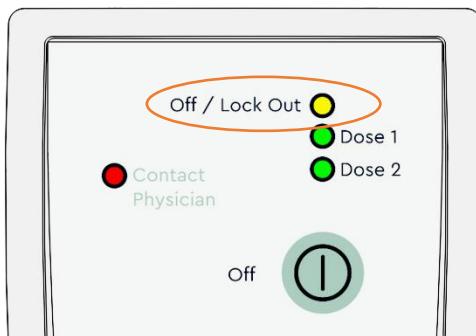


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## 6.6. Lock Out

After a treatment session has started, there is a prescribed “lock out” during which a new treatment session cannot be started.

For example, after pressing ①, pressing ② will cause the “Off / Lock Out” indicator to light up. The next treatment cannot be started until after the first treatment turns off and the prescribed lockout has passed.



## 6.7. Audible Signals from your Patient Controller

The patient controller provides audible signals (sounds), to confirm the status of the generator, each time a button is pressed.

**One beep.** The command was accepted by the generator.

**Two beeps.** The command is not allowed. For example, the generator is momentarily locked out and a treatment session cannot be started (see “Lock out”).

**Steadily repeating beeps.** The patient controller is out of range of the generator and needs to be better aligned to establish communication. This beeping will continue for roughly 10 seconds to give you time to better align the patient controller with the generator. If during this time communication is established, the command will be sent to the generator and either one beep or two beeps confirming the status of the generator will occur (see One beep or Two beeps above).

**Three quick beeps.** The controller could not establish communication with the generator and has stopped trying. You will only hear three quick beeps after the conclusion of the slow repeated beeps

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if communication was not established. The Patient Controller should be moved closer to the IPG and the button command should be attempted again.

## 6.8. Understanding Battery Status

### About the Patient Controller Batteries lights

As a user of the Altius System for amputation pain, it's essential that you understand the importance of battery power. The replaceable batteries in your patient controller and the rechargeable battery in your generator work together to provide you with dependable treatment. Always pay attention to the battery status indicator described in this section.

When the patient controller batteries need to be charged, the "PTC low battery" indicator will light up. If the patient controller battery is not replaced before draining completely, your patient controller will not communicate with your generator to start treatment sessions. Replace the patient controller batteries as soon as possible after the indicator light comes on to maintain patient controller function.

*Note: Make a habit of replacing the patient controller batteries when you first see the "PTC low battery" indicator light up. See "Patient controller battery replacement".*



## 6.9. Altius Patient Controller Battery Replacement

**Caution:** Small parts such as the AA battery could be hazardous if swallowed or cause choking if ingested or inhaled. Keep small parts and accessories out of the reach of children.

To replace batteries in your patient controller:

1. On the rear of the patient controller, slide down the battery compartment lock.
2. Lift off the battery cover by grabbing the cover near the middle of the Patient Controller and lifting up.
3. Remove the old batteries.

**Caution:** when removing the old batteries, be careful that the bottom metal contact plate does not come out. If it does come out, contact your physician for a replacement controller.

4. Place two new AA batteries in the slots, matching the positive (+) and negative (-) markings in the compartment.

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**Warning:** If the batteries are not placed correctly according to the positive (+) and negative (-) markings, the patient controller may heat up. If this happens it is recommended to remove the batteries, and let the patient controller cool down, before putting the batteries back in. If you have any concerns that the patient controller may be damaged, contact your physician.

5. Align the battery compartment cover on the case starting at the bottom of the patient controller.
6. Slide up the battery compartment lock.

## 7. Using Your Altius System - Battery Charger

### 7.1. Battery Charger Description

The charging system for your Altius generator consists of the charger unit, a charging paddle (coil), and an AC Adapter power supply. When it is not being used, keep the charger connected to the power supply so it is always ready to recharge your generator.

The Battery Charger is powered by a single 18650 Li Ion battery cell with a nominal capacity of 2500mAh and is used to charge the battery of the Altius IPG. The device is supplied with an AC Adapter power supply (Cell-Con Battery Charger AC Adapter; Input: 100–240VAC, 50-60Hz, 0.3A; Output: 8.4V, 1.3A) to charge the Battery Charger from a standard wall outlet.

**Warning:** If the Altius IPG is not charged regularly, it will not be able to deliver therapy, or may stop delivering therapy during a treatment session.

**Caution:** The Altius Battery Charger is subject to, and/or could be the cause of, potential electromagnetic or other interference from other electrical devices operated in the vicinity. Portable and mobile RF equipment is especially prone to impair the normal function of the charger.

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Figure: Altius Battery Charger with AC adapter Power Supply

## 7.2. Importance of Charging Your Altius IPG

Your Altius generator uses a rechargeable battery to provide treatment. How often you charge your Altius IPG depends on how frequently you use the treatment. Charging frequency is determined by usage frequency. The low battery Indicator will light if battery is low in the IPG. Low battery can interrupt treatment. Developing a charging routine rather than waiting to charge until the low battery indicator light comes on will help avoid treatment interruptions due to low battery.

Charging your Altius IPG should be done at least once a week. The need and frequency for charging sessions is be determined by how frequently you use your device, and how short or long you would like an individual charging session to last. In general, if you are regularly using your Altius IPG, you should run at least one charging session a week.

**Note:** Throughout the service life of your device it is recommended that you recharge at least once per month even if you have chosen to no longer use the treatment. If your device is not charged for an extended period of time, such as months or years, it may be impossible to recharge the Altius generator and treatment will no longer be available.

**Warning:** The Altius IPG Charger shall not be used on board aircraft. The Altius Charger shall not be used on board a ship without prior consent from the ship's crew.

**Note:** Consult local regulations if using the Charger outside of the country where it was purchased.

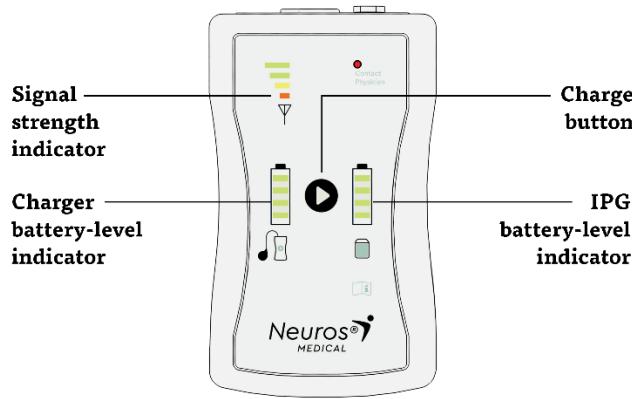
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**Warning:** Do not attempt to connect any equipment to the I/O port of the Altius Charger. This port is solely for factory or service personnel use.

### 7.3. Altius Battery Charger Features

Your Altius IPG Battery Charger has several features which have the following significance:

- IPG-Charger Coupling Signal Strength Indicator: Bar graph display depicting connection between the charger and the Altius IPG
- If there is an issue with the Battery Charger or the IPG, the Contact physician light will turn on. If this happens, contact your physician, and you may need to come to your doctor's office to have the issue resolved.
- Charger Battery Status Indicator: Bar graph display depicting the state-of-charge of the Altius Battery Charger
- Start Button: Start button for the Altius Battery Charger
- IPG Battery Status Indicator: Bar graph display depicting the current state-of-charge of the Altius IPG battery



### 7.4. To Prepare the Charger

Charging the internal battery of the Altius Battery Charger consists of two steps:

1. Plug the AC Adapter power supply into a standard AC wall outlet

**Warning:** Only use the AC Adapter Power Supply provided with the Altius Battery Charger to charge the Battery in the Charger.

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Caution: Do not touch the DC contacts of the Battery Charger. However, it poses no significant risk if inadvertent contact is made.

2. Plug the other end of the AC Adapter power supply into the Battery Charger

The battery-level lights on the charger will cycle indicating that the charger is actively being charged. Once the charger is fully charged, the battery-level lights will stop cycling and remain continuously on.

Note: The charging process is fully automatic, and so can be left to charge unattended.

The charger is completely ready and able to fully charge your Altius generator when all 4 battery level lights are continuously on and no longer cycling.

If the battery lights are still cycling, the charger may only partially charge the Altius generator. Battery Charger may be used, but it may not be able to return your Altius generator to a full charge and you may need to charge again sooner than you normally would.



### 7.5. Charging Your Altius Generator

The Battery Charger used to charge the battery of the Altius IPG. It is especially designed to properly control the charging process with minimal intervention and to ensure your safety.

Note: Inspect the Battery Charger for any damage before each use. Contact your physician if a replacement Battery Charger is needed.

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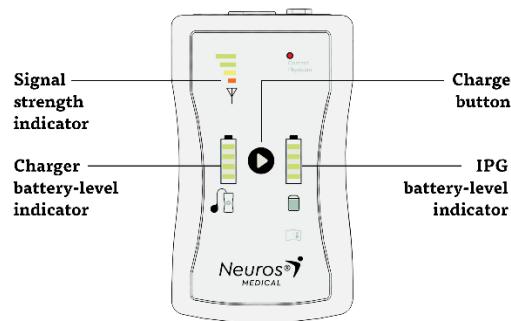
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1. When the charger battery level indicator is solid with four green bars, disconnect the charger from the power supply. A long audible beep will confirm the adapter is no longer connected to the charger.

Note: Charging the internal battery of your Charger and charging your Altius IPG CANNOT be done at the same time. You FIRST have to charge the battery of your Charger and THEN you can charge your Altius IPG.



2. Make sure that you are in a stationary, comfortable position, sitting or reclining (Couch, Sofa or Armchair, etc.).
3. Place the charging coil (paddle) over your Altius IPG, over your clothing. You may use an accessory belt to hold the charging paddle in place.

Warning: When Charging in an environment that is 40°C (104°F) or hotter, the Charging paddle may warm up to 42.7°C (108.8°F), and the Charger case may also warm up to 42.8°C (109°F). If you feel any part of the system getting too hot, stop charging and wait for the battery charger to cool down.

Note: The Altius IPG cannot be charged if a treatment session is in progress

Note: The charger should not be operated close to other electronic equipment. If sufficient spatial separation cannot be maintained, the charger needs to be monitored to ensure normal function.

4. Turn on the charger by pressing-and-holding the button for 3 seconds and then release. Once the button is released, you should hear repeated short beeps confirming that the charger is ON but the charging coil is not in the correct position.

Note: The Battery Charger will beep for 10 seconds, if it has not been positioned correctly at the end of the 10 seconds, then it will stop attempting to couple with the Altius IPG.

5. Use the signal strength indicator to adjust the position of the charging coil. Move the charging coil until one or two green indicators light up. The short beeps will stop when the charging coil is placed in the correct position and the IPG is being charged.

Note: If moving the Paddle (Charging Coil) does not light up the green indicators, charging can still be done with only a yellow indicator light on.

6. Once the Charging Coil has established a link with the Altius IPG, the charger will begin the charging process.

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Note: If the charging Coil positioning is poor or if the charging paddle has been displaced, the Charger will display a decreasing number of illuminated bars on the IPG-Charger Coupling Signal Strength Indicator. In addition, you will hear an audio signal sounding approximately once per second. If this occurs, please move the charging paddle back into the correct position.

Note: If the position of the charging paddle with respect to the Altius IPG remains poor, the charging process is automatically suspended. When this occurs, a new charging session must be initiated by pressing the  Button again.

7. The IPG Battery Status Indicator depicts how the charging process of your Altius IPG is progressing.

Note: Depending on how long since the last charging session, and how much you have used the device, the charging may take anywhere from 30 minutes to up to 2 hours. If you cannot fully charge your Altius IPG in one session, you may need to increase your charging frequency.

8. When the charger emits a long beep, charging is complete. If all 4 battery level indicators light up, the generator is fully charged. The charger will automatically shut off. If you need to end a charging session you can either remove the charging paddle from over the IPG, and the Battery Charger will shut off after 10 seconds, or you may press the  Button and hold for 3 seconds to turn off the charger.

Caution: Do not confuse the end-of-charge signal (one long distinct beep) with the steadily repeating misalignment beep.

The charger monitors the temperature of your implanted Altius IPG so that its temperature rises only minimally. If you wish to resume the charging session after a pause, please wait for approximately 10 minutes before initiating a new charging session to allow the temperature of your implanted Altius IPG to return to normal.

It is estimated that the rechargeable IPG battery will provide you with 10 years of service under typical settings usage, and weekly charging. Under higher than typical settings and usage, your IPG may require more frequent charging and may last less than 10 years of service.

#### Audible Signals from the Altius Battery Charger

**One Beep.** Charging is complete and the charger stopped automatically or the charger was stopped by pressing and holding the  button for 3 seconds

**Three Beeps.** Charger battery level is too low to continue to charge the generator and charging has stopped. You will need to charge the charger before you can start recharging the generator.

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**Steadily Repeating Beeps.** The charging coil is not in the correct position and cannot start charging the generator. Move the position of the charging coil until a yellow or green indicator lights up.

## 8. HELP Section

### 8.1. Help with Treatment

If you are unable to start treatment:

1. Press the desired dose button and listen for a single beep.
2. If you hear a single beep but do not see a dose indicator light up, look to see if the “IPG low battery” indicator lights up.
3. If the “IPG low battery” indicator lights up, charge the generator. When charging is complete, try to start treatment.
4. If treatment still will not start, call your physician.

### 8.2. Treatment Session Increases or Decreases on its Own

The level of sensation you feel during treatment may change over time. The amount of sensation you feel from treatment may also change depending on body position (lying down, standing, or bending), and also if you are wearing, or not wearing your prosthetic.

### 8.3. Treatment Shuts Off before Completing a Treatment Session

When the generator battery needs to be recharged, it will stop treatment. Check the battery status with the patient controller and recharge if necessary, then turn treatment back on. If the generator regularly stops treatment before you charge, you can charge more often.

The Altius IPG is also equipped with a magnetic switch for use in cases where a physician in an ED (Emergency Department) may need to ensure that your device is off.

Although unlikely, anti-theft screeners such as those at the entrance of stores, can turn treatment off. If you cannot turn the generator back on with your patient controller, you may need to recharge the generator.

### 8.4. There is No Feeling From Treatment

If you no longer feel therapy, it may be due to your body is adapting to the sensation, in which case the treatment is still being delivered but you may no longer feel it.

**Caution:** If you experience a full session, but do not feel the therapy for any part of it you may need to visit your doctor.

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## 8.5. Help with Your Patient Controller

### **“IPG low battery” lights up on the patient controller**

The batteries in your implanted generator are low and should be charged soon. See “Charging your Altius generator” Section 7.5.

### **“PTC low battery” lights up on the patient controller.**

The batteries in your patient controller need to be replaced with two fresh AA batteries. See “Altius Patient Controller Battery replacement” Section 6.9.

### **“Contact physician” lights up on the patient controller.**

The Altius IPG or patient controller has generated an internal error code. This may indicate a system failure that prevents treatment from being delivered by the generator. Please contact your physician.

### **No response from patient controller.**

After pressing a dose button, watch for one of the indicators to light up and listen for an audible sound. If none of the indicators light up and you cannot hear

any beeps, the batteries in your patient controller may need to be replaced with two fresh AA batteries. See “Altius Patient Controller Battery replacement.” Section 6.9.

If after pressing a dose button you see a dose indicator light up and hear one beep, the generator has received the command and will begin a treatment session.

If you do not feel the sensation, it may be due to nerve accommodation to the sensation in which the treatment is still being delivered but you may no longer feel it. If you do not feel the sensation for the whole treatment session, contact your physician.

If you see the Off / Lockout Out indicator light and hear two beeps, you are unable to deliver treatment at this time. See “Lock out” Section 6.6.

## 8.6. Help with Your Battery Charger

### **“Contact Physician” lights up on the charger.**

The implantable generator or charger has generated an internal error code. This may indicate a system failure that prevents treatment from being delivered by the generator. Please contact your physician.

### **Charger not charging.**

Make sure charger is unplugged from power supply as shown in the picture below.

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### 8.7. Contact Physician Indicator

The Altius Charger was designed to provide you with certain warnings regarding the status of the Altius IPG as well as the Charger device itself. If the charger detects a situation that requires action, the "Contact Physician" indicator will illuminate and you should contact your doctor to schedule a prompt Altius IPG check-up. Your IPG may not respond to therapy activation using the patient controller until the situation is resolved.

**Note:** Remember you should always conduct a recharge session to ensure that your device is working.

## 9. Altius Patient Controller & Battery Charger Cleaning

**Caution:** DO NOT use solvents or cleaning cloths impregnated with chemical cleaning agents

**Warning:** DO NOT attempt to clean the electrical connectors of the Battery Charger or the AC adapter

**Warning:** DO NOT submerge the Patient Controller, Battery Charger or the AC adapter in water or any other liquid. Damage to the devices may result.

### Cleaning the Patient Controller

Once a month the Altius Patient Controller is recommended to be cleaned using a mild detergent applied with a damp cloth. Do not use abrasive cleansers.

Use a dry cloth to dry the Patient Controller to remove any excess moisture.

### Cleaning the Battery Charger

**Warning:** Before and After cleaning the Battery Charger and AC Adapter Power Supply, ensure that it is disconnected from the Charger's AC adapter, and the AC Adapter is unplugged from the AC mains.

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Once a month the Battery Charger and AC Adapter is recommended to be cleaned using a mild detergent applied with a damp cloth. Do not use abrasive cleansers.

Use a dry cloth to dry the device to remove any excess moisture, and let it air dry before plugging everything back together.

## 10. Altius Patient Controller & Battery Charger Maintenance

The Altius Patient Controller only requires periodic replacement of the replaceable AA batteries. There are no other User replaceable parts.

The Altius Battery Charger & AC Adapter do not have any user replaceable parts.

**Warning:** No modification of this equipment is allowed.

The Altius Patient Controller and the Altius Battery Charger with AC Adapter are expected to have a useful life of at least 5 years.

**Warranty:** If you experience an issue with your Altius Patient Controller or Battery Charger within 3 years from date of issue, contact your medical provider or Neuros Medical for a replacement.

### 10.1. Power Ratings

The Altius Patient Controller is powered by two standard AA alkaline batteries. Each battery should be a standard AA alkaline battery with an operating voltage of 1.5V new, and a max Amp-hour rating of ~2 amp-hours.

The Battery Charger AC adapter has the following power ratings:

Input Voltage: 100-240VAC 50-60Hz

Input Current: 0.3A max.

Output Voltage: 8.4V

Output Current: 1.3A max.

## 11. Altius Patient Controller & Battery Charger Storage and Handling

Once you receive your Patient Controller & Battery Charger do not expose them to extreme temperatures. They should be stored in a cool and dry place. Do not leave the devices in your car or outdoors for extended periods of time. The electronics in both units are sensitive, and can be damaged by these extreme conditions, particularly high heat.

The Patient Controller should be able to be used to activate therapy in most temperatures.

Use of the battery charger should try to be avoided in temperatures above 80°F (27°C). If possible, try to move to a cool location prior to starting a charging session.

Your Patient Controller & Battery charger should be kept at normal room temperature, humidity, and pressure conditions.

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Temperature Usage range of 5°C- 40°C (41°F - 104°F)

Relative Humidity range of 15% - 90%

Atmospheric Pressure of 700 hPa – 1060 hPa, or from 10,000 ft above sea level (Pressurization of a commercial aircraft) to 1,300 ft below sea level (the lowest elevation of dry land on earth)

The Patient Controller and Battery when not being used should be stored between -25°C - 70°C (13°F - 158°F)

When moving the Altius Patient Controller and/or Altius Battery Charger from very cold or very hot storage areas (such as your car), wait at least an hour to use either device. The devices require time to return to a safe operating temperature.

## 12. Altius Patient Controller & Battery Charger Disposal

If the Altius Patient Controller & Battery Charger is no longer needed, you may return them to your doctor's office.

**Warning:** DO NOT discard the Charger in the trash. The Charger contains Lithium batteries as well as environmentally unfriendly (Lead Solder) components. If disposal of the Altius IPG Charger is necessary, properly dispose of it in accordance with local regulations governing the disposal of such material.

## 13. Device Lifetime/Replacement

### Generator Lifetime/Replacement

The anticipated life of the generator battery varies, depending on the generator settings and utilization patterns over time.

At typical settings, and usage, and with weekly charging, the battery is predicted to last 10 years. Your specific situation and settings may result in shorter or longer battery life.

All Neuros Altius generators eventually require surgical replacement as a result of battery depletion. When the battery is depleted, communication with the generator or continued treatment will not be possible. Generator replacement does not, in of itself, require cuff replacement unless a cuff break is suspected.

Generator replacement or removal requires an additional surgery to open of the generator's pocket in your abdomen. Replacement of the generator typically requires 60 minutes or less. Contact your clinician to discuss removal or replacement of your generator.

### Cuff lifetime, removal and replacement

A cuff requires replacement when a break is suspected.

Contact your physician to discuss removal or replacement of your cuff electrode.

Caution: Significant impacts or falls, may lead to a cuff breaking.

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## Appendix I: Replaceable Parts & Cables

The Altius System is fully replaceable, there are no User serviceable parts.

For replacement of any part of the Altius System please contact your Neuros Medical Representative.

**WARNING:** Use of accessories, and cables other than those specified or provided by Neuros Medical could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

| Neuros Medical Part Name              | Expected Service Life | Neuros Medical Part Number | Cable Length (If Applicable)    |
|---------------------------------------|-----------------------|----------------------------|---------------------------------|
| Altius Patient Controller             | 5 Years               | FG-604-000                 | N/A                             |
| Altius Battery Charger                | 5 Years               | FG-603-000                 | 61cm (24in) (Charger to Paddle) |
| AC Adapter for Altius Battery Charger | 5 Years               | PC-200-044                 | 170cm (66 in)                   |
| Altius Programmer Wand                | 5 Years               | FG-606-000                 | 305cm (10ft)                    |
| Programmer Application PC (PAPC)      | 5 Years               | FG-608-000                 | N/A                             |

### Implantable replaceable Components

| Neuros Medical Part Name | Neuros Medical Part Number | Cable Length (If Applicable) |
|--------------------------|----------------------------|------------------------------|
| Altius IPG*              | FG-601-000                 | N/A                          |
| Cuff Electrode Small     | FG-600-001                 | 100cm (39 in)                |
| Cuff Electrode Medium    | FG-600-002                 | 100cm (39 in)                |
| Cuff Electrode Large     | FG-600-003                 | 100cm (39 in)                |

\*The battery in the Altius IPG has undergone simulated bench tests to demonstrate battery longevity at nominal settings and usage is 10 years.