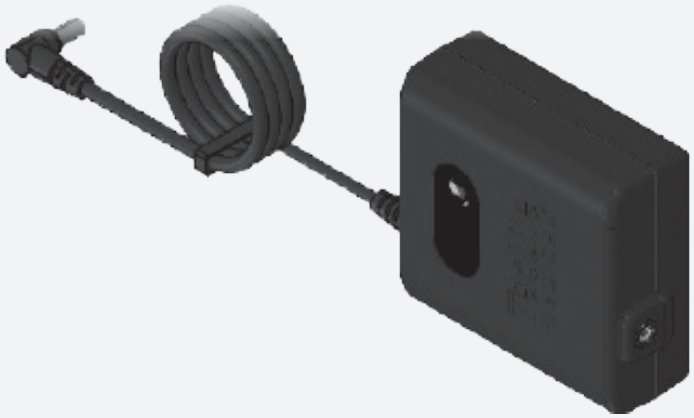
Nimbl® Battery User Guide

Model 3INR19/66 10.905V 3.4AH 37.08WH



nimbl™
BATTERY

Tactile MEDICAL®

Table of Contents

CHAPTER 1

Before You Get Started

Read the entire guide before attempting to connect or operate this product. Keep this guide for future reference.

The Nimbl battery is a Lithium-ion rechargeable battery pack to be used with the Nimbl system.

This guide provides the information needed use your Nimbl battery.

1.1 How to Contact Tactile Medical

If you have questions about the Nimbl battery, contact Tactile Medical:

- **Text or Call:** 612.355.5100
- **Toll Free Phone:** 833.3TACTILE (833.382.2845)
- **Email:** productsupport@tactilemedical.com
- **Product Support Hours:** 7 a.m. to 7 p.m. CT, Monday–Friday

1.2 Safety Precautions and Explanation of Symbols

The Nimbl battery symbols adhere to the ISO15223-1 2021 International Standard.

	**Manufacturer Information**
	**Manufacturer's Model ID**
	**Do NOT Dispose with General Household Waste** Dispose depleted battery in a safe and proper way. Do not throw the battery into fire or water. Reference lithium-ion disposal centers in your designated area.
	**Keep Dry**

WARNING: Risk of Personal Injury

- Use the battery only for its intended purpose, as directed in this guide. Use only the power adapter provided with your Nimbl system.
- Use only accessories approved by Tactile Medical. Other accessories may damage the system or interfere with system function.
- Setup the controller unit in a manner that provides easy access to the power adapter should it become necessary to unplug quickly.
- Never operate the controller unit if the battery or plug is not working properly, if it has been damaged, or if the controller unit has been dropped into water. Return it to Tactile Medical for inspection and/or replacement.
- Do not modify the power adapter or plug.
- Keep the battery away from heated surfaces.
- Never operate the controller unit where the battery or tubing harness will present strangulation or tripping hazard.
- Strangulation potential: Battery and tubing bundle should never be placed near or around a person's neck.
- Do not use the Nimbl system in the presence of flammable gasses, including flammable anesthetics.
- Do not operate the device while smoking.

WARNINGS:

- Unplug the battery when not in use.
- Do not use the battery near water or while bathing.
- Do not reach for the controller unit if it falls into water. Unplug the controller unit at the electrical outlet immediately.
- Do not dissemble or assemble the battery.
- Do not short-circuit the battery.
- Do not heat or burn the battery.
- Do not use the battery near a heat source.
- Do not wet the battery.
- Do not charge the battery near the fire or in direct sunlight.
- Charge the battery with a dedicated charger and charge correctly.
- Do not damage batteries.
- Do not solder directly on batteries.
- Do not plug the battery directly into a power supply socket.
- Do not use batteries to power other devices.
- Do not make direct contact with leaking batteries.
- Do not mix the use of different types of batteries.
- Keep the battery away from small children.
- Do not put the battery into a micro-wave oven or other pressure vessels.
- Do not put leaking battery near the fire.
- Do not use abnormal batteries.
- Do not use device in the Emergency Medical Service (EMS) environment.

CAUTIONS:

- Do not use the battery in an environment with strong and direct sunlight to avoid heat generation, deformation, and smoking. The protection circuits installed in batteries can prevent accidents.
- Do not use the battery near a place that can generate static. The recommended charging temperature range is between 0° and 50°. If battery leakage gets into contact with your skin or clothes, please rinse with fresh water otherwise it may cause skin irritation.

1.3 Indications For Use

The Nimbl battery is intended for use with the Nimbl system.

1.4 Unpacking Instructions

When your Nimbl battery arrives, it is important that you carefully unpack the contents and ensure that you have all the equipment required to begin operation. If the Nimbl battery is exposed to storage temperature extremes, allow the battery to stabilize at room temperature for at least six hours before use.

Included in the box, you should find the following:

- Battery
- Tie
- Velcro cable
- User Guide

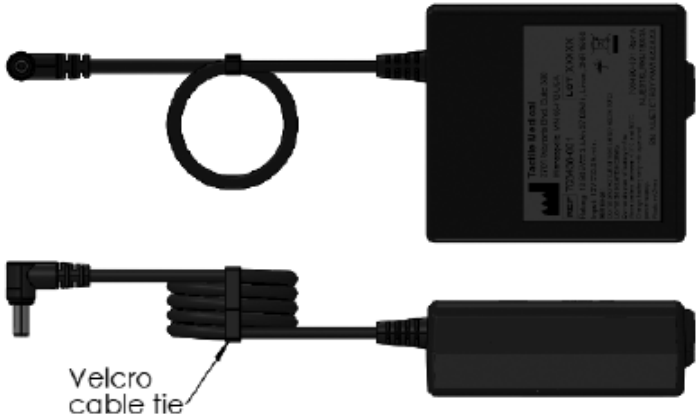
Product Support: Text or Call 612.355.5100
Toll Free Phone: 833.3TACTILE (833.382.2845)

CHAPTER 2

The Nimbl Battery

The Nimbl battery is a Lithium-ion rechargeable battery pack to be used with the Nimbl system.

NOTE: *No special skills, training or knowledge is required to operate the Nimbl battery.*



CHAPTER 3

Battery Set-Up

1. Plug the battery into the power port on the controller.
2. Operate the controller like normal and as is instructed in the Nimbl user guide.
3. To confirm charge level of the battery, press the button on the front of the battery. Five LEDs indicates full charge, and no LEDs indicates no charge.
4. The power supply can be used to power the Nimbl controller or to charge the battery. Plug the Nimbl power supply into the wall and into the port on the battery to charge the battery. The LEDs on the battery unit will stop flashing when fully charged.

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CHAPTER 4

Storing the Nimbl Battery

To store the Nimbl battery, follow the steps outlined below:

1. Unplug the power adapter of the battery from the controller unit and from the electrical outlet. If charging, disconnect the charging cable and then it is ready to put away.
2. The battery must be stored at 50–60% state of charge while in storage for up to three months. Check battery every 3–6 months to ensure it maintains a half charged state. 3–6 months the battery shall be maintained.
3. Store the battery in a cool, dry place. Keep it out of excessive heat or cold. (See **Chapter 7** for allowable storage temperatures.) Store it away from children and pets.

CHAPTER 5

Troubleshooting and Specifications

If you experience a problem with the Nimbl battery, contact Product Support.

- **Text or Call:** 612.355.5100
- **Toll Free Phone:** 833.3TACTILE (833.382.2845)
- **Email:** productsupport@tactilemedical.com
- **Product Support Hours:** 7 a.m. to 7 p.m. CT, Monday–Friday

*__Tactile Medical Product Support can be reached via text or phone at 612.355.5100, or toll free via phone at 833.3TACTILE (833.382.2845), 7 a.m. to 7 p.m. CT, Monday–Friday.__

CHAPTER 6

Return Policy

6.1 Return Policy

Returns are accepted for unopened product within 60 days of receipt.

6.2 Equipment Lifetime

When used and maintained as instructed, the average expected battery cycle life is ≥400 cycles.

Tactile Medical reserves the right to modify product specifications as part of its continuing program of product development and quality improvement.

CHAPTER 7

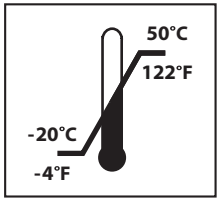
Technical Information

7.1 Technical Information

The Nimbl battery has the following characteristics:

Table 1: Nimbl Battery	
Manufacturer	NuEnergy/Arrow
Model Number	3INR19/66 10.905V 3.4Ah 37.08Wh
Part Number	NUE31SLRMJ13X4A
Certifications	IEC 62133 (includes IEC 61960), UN 38.3, UL1642 (Cells)
Typical Capacity	3500 mAh
Nominal Voltage	10.905 V
Input Charge Voltage (with DC-DC)	12.6 V, 0.5 A
Charging Cut-Off Voltage	12.6 V
Discharge Cut-Off Voltage	9.0 V
Size	93 mm x 82.5 mm x 33 mm

Battery Operating Temperature Limits (-20°C to ~50°C)



Battery Operating Humidity Limits (<65% to ±5%)

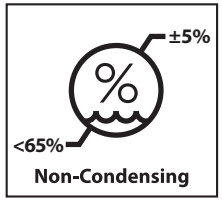


Table 2: Battery Characteristic and Usage			
No.	**Item**	**Characteristics**	
1	Typical Capacity	3500 mAh; 0.2 C discharge	
2	Rated Nominal Capacity	3400 mAh; 0.2 C discharge	
3	Packaging/Format	3S1P	
4	Nominal Voltage	10.905 V	
4	Input Charge Voltage (With DC-DC)	12.6 V, 0.5 A	
5	Charging Cut-Off Voltage	12.6 V	
6	Discharge Cut-Off Voltage	9.0 V	
7	Standard Charging Method	0.2 C CC charge to 12.6 V, then CV 12.6 V until charge current declines to ≤0.02 C	
8	Maximum Charge Current	1 C	
9	Standard Discharge Current	0.2 C constant current discharge to 9.0 V	
10	Maximum Discharging Current	1 C	
11	Operating Temperature	Charge: 0~45°C Discharge: -20~60°C	
12	Storage Temperature	-20~60°C	1 month
		-20~45°C	3 months
		-20~20°C	12 months
13	Weight	≤220 g	
14	Battery Impedance	≤280 mΩ	
15	Waterproofing	IP66	

Table 3: Cell Characteristics		
No.	**Item**	**Characteristics**
1	Cell Model	LG18650-MJ1
2	Nominal Voltage	3.635 V
3	Maximum Voltage	4.2 V
4	Nominal Capacity	3500 mAh
5	Minimum Capacity	3400 mAh
6	Maximum Continuous Charging Current	IC (3400 mAh)
7	Maximum Continuous Discharging Current	10 A
8	Dimensions	18.4 +0.1/-0.3 mm x 65 ± 0.2 mm
9	Weight	Approx. 49.0 g

Table 4: Electrical Performance Characteristics		
Item	**Testing Method**	**Specifications**
0.2 C Discharge Capacity	After standard charge, rest 0.5~1 h, then 0.2 C discharge to cut-off voltage	Discharge capacity is not less than 90% min
1 C Discharge Capacity	After standard charge, rest 0.5~1 h, then 1 C discharge to cut-off voltage	Discharge capacity is not less than 90% of the minimum capacity
Cycle Life	Test Conditions: Charge: 0.2 C to 4.2 V Discharge: 0.2 C to 2.5 V When the discharge capacity is reduced to 80% of the rated capacity, stop test	Cycle life ≥400 cycles
Capacity Retention	After fully charged (23±2) in the 28 days of storage environment temperature, discharge at 0.2 C_5A to cut-off voltage, then charge using standard charging method, then discharge at 0.2 C_5A to cut-off voltage	Remaining capacity ≥85% Recovery capacity ≥90%

Table 5: Environmental Characteristics		
Item	**Test Method**	**Criteria**
Constant Temperature and Constant Humidity Test	After standard charge, test conditions: Temperature: 40±5° C Relative Humidity: 90~95% RH Storage Time: 48 hours Then return to room temperature for 2 hours, then 1 C discharge to cut-off voltage	No explosion, no fire, no leakage Discharge capacity is not less than 60% initial capacity
Vibration Test	After standard charge, fix the cell to the vibration table then it is subjected to a vibration test for 30 minutes per axis of XYZ Frequency Rate: 1 oct/min Vibration Frequency: 10 Hz–30 Hz Excursion (single amplitude): 0.38 mm Vibration Frequency: 30–55 Hz Excursion (single amplitude): 0.19 mm	No explosion, no fire, no leakage
Shock Test	After standard charge, test conditions: Acceleration: 100 m/s^2 Pulse Lasting Time: <16 ms Shock Times: 1000±10 times	No explosion, no fire, no leakage

Table 6: Safety Characteristics		
Item	**Test Method**	**Criteria**
Overcharge Test	Discharge: 1 C to 2.5 V Charge: 1 C last for 2.5 hours	No explosion, no fire
Short-Circuit Test	After standard charge, short circuit the positive and negative, and the resistance of copper wire is not more than 80 mΩ When the temperature falls 10° C lower than peak, stop test	No explosion, no fire
Thermal Test	Put cell into an oven, test conditions: Temperature Rate: 5±2° C/min Ending Temperature: 130±2° C Keep temperature for 30 minutes, then stop test	No explosion, no fire

Table 7: PCBA Protection and Safety Features				
Item	**Min.**	**Typ.**	**Max.**	**Unit**
Overcharge Protection Voltage 1	4.275	4.3	4.325	V
Overcharge Protection Delay Time 1		≤2		S
Overcharge Recovery Voltage 1	3.95	4.05	4.10	V
Overcharge Protection Voltage 2	4.3	4.35	4.4	V
Overcharge Protection Delay Time 2		≤5.0		S
Fuse broken, battery permanent invalidation				
Over Discharge Protection Voltage 1	2.6	2.7	2.8	V
Over Discharge Protection Delay Time 1		≤2		S
Over Discharge Recovery Voltage 1	2.9	3.0	3.1	V
Discharge-Current Protection 1		12±1		A
Over Current Protection Delay Time 1		≤2		S
Discharge Over Current Recovery 1	Removal load ≥20 S or charge release			
Discharge-Current Protection 2		15±1		A
Over Current Protection Delay Time 2		≤2		S
Discharge Over Current Recovery 1	Removal load ≥20 S or charge release			
Discharge-Current Protection 2		25±3		A
Over Current Protection Delay Time 2		≤31		ms
Discharge Over Current Recovery 2	Removal load ≥5 S or charge release			
Over Charge-Current Protection 1		6±1		A
Charge Current Protection Delay Time 1		≤2		S
Charge Over Current Recovery 1	1. Removal charger ≥20 S 2. Discharge current ≥200 mA 3. Battery voltage ≤15.9 V release			
Charge-Current Protection 2		7±1		A
Charge Current Protection Delay Time 2		≤2		S
Charge Over Current Recovery 2	1. Removal charger ≥20 S 2. Discharge current ≥200 mA 3. Battery voltage ≤15.9 V release			
Short-Circuit Protection Current	30	45	50	A
Short-Circuit Protection Delay Time		≤427		uS

Table 7: PCBA Protection and Safety Features (continued)				
Item	**Min.**	**Typ.**	**Max.**	**Unit**
Communication Recovery	Removal load ≥20 S or charge release			
High Temperature Protection of Discharge	57	60	63	°C
High Temperature Protection of Discharge Release	52	55	58	°C
Low Temperature Protection of Discharge	-7	-10	-13	°C
Low Temperature Protection of Discharge Release	-2	-5	-8	°C
High Temperature Protection of Charge	47	50	53	°C
High Temperature Protection of Charge Release	42	45	48	°C
Temperature Protection Delay Time	≤2			S
BMS Current Consumption (μA)	≤400			μA
Interior Resistance (Ω)	RS ≤30 mΩ			
LED Indication	NO LEDs			0–29% RSOC
	LED1			30–44% RSOC
	LED2			45–58% RSOC
	LED3			59–72% RSOC
	LED4			73–86% RSOC
	LED5			87–100% RSOC
	Notes: Single press of LED display button will activate gas gauge and LED indication. The LEDs will automatically shut off after 4 seconds. LED display will flash when charging. After charging, LED turns off after 3–5 seconds, once disconnected from charger.			

7.2 Battery Label

The battery label is located on the back of the battery. To read the label, place the battery facing away from you at eye level at a distance that maximizes character clarity — generally 20 inches (50 cm) to 40 inches (100 cm) with an illumination of 500 lx minimum.

Call Tactile Medical Product Support if label reading issues remain:

- **Text or Call:** 612.355.5100
- **Toll Free Phone:** 833.3TACTILE (833.382.2845)
- **Email:** productsupport@tactilemedical.com
- **Product Support Hours:** 7 a.m. to 7 p.m. CT, Monday–Friday

NOTE:

- *Battery label is not to scale.*
- *Battery label depiction may be different than that on your battery.*
- *See page 1 for symbol definitions.*

*Symbols, QR codes and numbers are only placeholders

For Additional Questions

If you have any questions that are not covered by this User Guide, our team is here to help. Please contact our Product Support Team using one of the following options:

- **Text or Call:** 612.355.5100
- **Toll Free Phone:** 833.3TACTILE (833.382.2845)
- **Email:** productsupport@tactilemedical.com
- **Fax:** Toll free: 866.435.3949
- **Mail:** Tactile Medical, 3701 Wayzata Blvd, Suite 300 Minneapolis, MN 55416 U.S.
- **Product Support Hours:** 7 a.m. to 7 p.m. CT, Monday–Friday

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Product Support
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