

REBEL HAND

Instructions for Use



REBEL

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2.0 Getting Started

Thank you for choosing the REBEL Bionics Hand. This document is designed to help you understand how to safely and effectively use your device. We highly recommend reading this document carefully before using the prosthesis. It contains essential safety information, usage instructions, and maintenance guidelines.

The prosthesis must be fitted and adjusted by qualified personnel. Users should receive proper instruction from a certified clinician before first use. Please refer to your clinician if you have any questions.

Your device's serial number and UDI are located on the packaging. Please retain this information for warranty and support purposes.

Any serious incidents related to this product **MUST** be reported to your clinician and the manufacturer immediately.

We recommend keeping this document for future reference throughout the lifetime of your prosthesis.

3.0 Safety Precautions

3.1 Indications of Use

The REBEL Hand is a lightweight, water-resistant upper-limb prosthesis intended for individuals with limb loss. It is optimized for unilateral use and is especially suited to smaller users, including women and children.

The device supports functional daily activities such as gripping, pushing, and driving. The device features a passive flex wrist and twin-axis thumb for enhanced usability without requiring a glove.

3.2 Contraindications

The REBEL Bionics Hand should initially be fit by a Certified Clinician who has received the proper training.

- **Do NOT** use the REBEL Hand if the user is unable to understand or follow safety instructions, as this may result in unsafe operation.
- **Do NOT** use the device in environments containing flammable liquids or gases, as this poses a risk due to the presence of electronic components.
- **Do NOT** operate the hand while the batteries are charging. The power supply automatically disables the device during charging, and any malfunction in this process may lead to unsafe conditions.
- **Do NOT** use the hand if it exhibits unexpected movements (e.g., fingers or thumb moving without input). Discontinue use and contact your clinician immediately.
- **Do NOT** use the device if any part of the power supply, plug, or cables is visibly damaged.
- **Do NOT** expose the hand or power supply to open flames, solvents, corrosive chemicals, or submersion in water.
- **Do NOT** use the hand for extreme activities or sports such as rock climbing, powerlifting, or any activity involving high-impact or water immersion.
- **Do NOT** use the hand to operate firearms or other high-risk tools.
- **Do NOT** use the hand to support body weight, such as when using crutches.
- **Do NOT** use the device near strong magnetic or electrical interference sources, such as theft prevention systems.
- **Do NOT** attempt to disassemble or modify the device. All servicing must be performed by REBEL Bionics or authorized personnel.
- **Do NOT** use the hand if the user has severe skin conditions or open wounds at the socket interface site.
- Avoid use near strong electromagnetic fields (e.g., MRI rooms, theft prevention systems) to prevent signal interference.

3.3 Conditions of Use

The REBEL Bionics hand is intended for everyday use in home and community environments. It must be fitted by a certified prosthetist and used only with compatible power systems (6–8.4V). The device is water-resistant and should not be submerged beyond specified limits. It is not suitable for extreme sports, high-impact activities, or environments with flammable substances. All materials used in the Rebel Hand are free from known carcinogenic, mutagenic, or endocrine-disrupting substances above regulatory thresholds.

3.4 Clinical Benefits

The REBEL Bionics Hand enhances upper-limb function by enabling intuitive control of multiple grip patterns through myoelectric signals and physical inputs. Key benefits include:

- Improved independence in daily tasks such as dressing, eating, and driving
- Reduced compensatory movements due to integrated flex wrist
- Enhanced control for users with limited signal consistency via thumb tap and dorsal button
- Customizable grip strength and switching logic for tailored performance

These features support better ergonomics, reduced fatigue, and increased confidence in social and professional environments.

4.0 Environmental Exposure

OPERATIONAL AND STORAGE HUMIDITY	Maximum 80% humidity, non-condensing	
STORAGE AND USE TEMP RANGE	-20°C to +38.9°C	-4°F to +140°F
PRESSURE RANGE	700-1060 hPA	

5.0 Electrical Safety

Only approved power systems (6-8.4V) should be used, and the device must never be operated while charging. If the power supply, plug, or cables show visible damage, usage must be discontinued immediately. The hand contains semiconductors that are sensitive to electrostatic discharge (ESD), and portable RF equipment should be kept at least 30 cm away to avoid performance degradation.

6.0 Physical Limitations

The hand is not designed for high-impact activities or excessive force. Any drop in performance, overheating, or unusual noises should prompt immediate removal and technical inspection.

7.0 Maintenance

All maintenance must be performed by REBEL Bionics or trained service personnel. Users and clinicians must not attempt to disassemble or modify the device. Unauthorized repairs or tampering will void the warranty. Any damage caused by intentional harm or neglect will not be covered under the warranty. Annual servicing is recommended to maintain optimal performance.

8.0 Training

Initial use should be accompanied by professional training to ensure safe and effective operation. The hand includes advanced control features such as grip switching and thumb tap functions, which require proper instruction to avoid misuse.

Users with bilateral limb loss or limited dexterity may require additional training or assistive tools to operate dorsal button or thumb tap functions effectively.

9.0 Cleaning

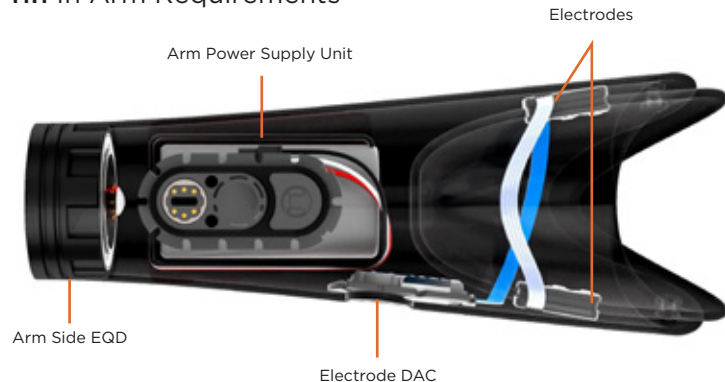
Clean with a soft cloth and hot soapy water. Do NOT use any solvents or abrasives to clean the charge point as this might cause damage.

10.0 Storage

Store in a cool, dry place within the environmental limits when not in use. Avoid prolonged exposure to direct sunlight, freezing temperatures, or high humidity during transport. Use original packaging for protection.

11.0 Arm Integration and EQD System

11.1 In Arm Requirements



The arm architecture includes:

1. EQD Please refer to section 6.0
2. Power Supply System please refer to Power Supply Technical Manual.
3. Electrode System please refer to Electrode Technical Manual.

11.2 EQD Specifications

The REBEL Hand connects to the prosthetic arm using the EQD (Electronic Quick Disconnect) system, also known as QWD (Quick Wrist Disconnect). This standard interface ensures secure mechanical and electronic coupling with most terminal devices.

The EQD supports axial and lateral forces up to 32kg, weighs 150g, and includes standard Molex connectors.



11.3 Connecting & Locking

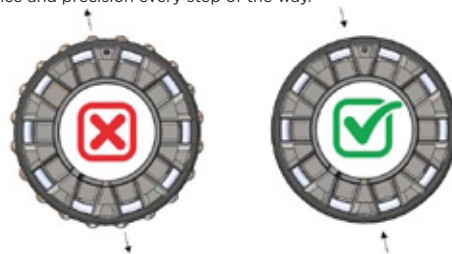
To connect, press the EQD along its central axis until a click confirms secure locking. Rotate and pull to verify. Locking may fail if ball bearings are misaligned, the release ring is jammed, or the bump ring is dislodged—each requiring technical support.

Any attempts to lock the EQD in this state will result in a damaged bearing and will void the warranty.

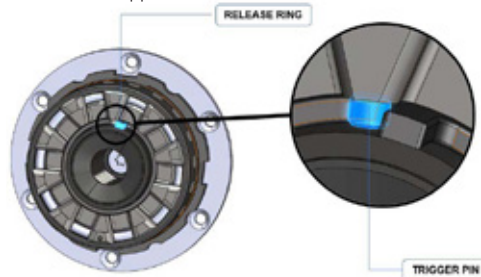


11.3 Connecting & Locking

The arm-side EQD combines the timeless reliability of a traditional lamination ring with a cutting-edge, modernized locking interface—delivering a seamless blend of classic durability and next-generation adaptability. Designed with customization in mind, this innovative solution empowers you to tailor your setup to meet the exact demands of your application, ensuring both performance and precision every step of the way.

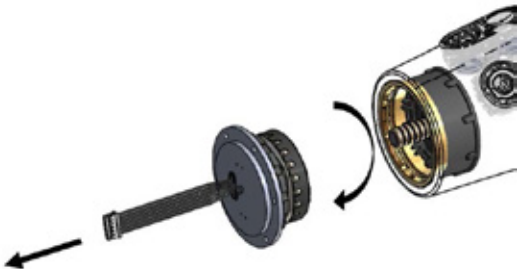


The EQD will not lock if the release ring is jammed against the trigger pin. If this case occurs, please rotate the toggle away from the trigger pin. This will free the release mechanism and enable the lock mechanism to work as intended. If the release ring cannot be rotated, please refer the EQD to technical support.



11.4 Ejection

To eject, rotate the EQD until the ratcheting mechanism releases it. If it rotates smoothly without ejecting, tighten the bearing clockwise until the mechanism engages.



11.4.1 Ejection Guidance

In rare cases, the EQD may fail to eject properly if it does not unlock during the rotation process. If this occurs, discontinue use and contact technical support.

If the EQD rotates smoothly without engaging the ratcheting mechanism, this indicates that the bearing has loosened from the body. To resolve this, rotate the EQD clockwise until the ratcheting mechanism re-engages and the hand ejects. This issue requires tightening and should be reported to technical support for inspection and servicing.

12.0 Use

12.1 Power Supply Requirements

To operate the REBEL Bionics Hand, a compatible external power supply is required. This device must be connected and activated before the hand can function. For detailed instructions on powering on, charging, and maintaining the power supply, please refer to the Power Supply Instructions for Use provided with that product.

12.2 Electrode Requirement

The REBEL Bionics Hand requires a compatible myoelectric electrode system to function. These electrodes detect muscle signals and translate them into hand movements. For setup, calibration, and maintenance instructions, please refer to the Electrode System Instructions for Use provided with that product.

12.3 Integrated Flex Wrist


The Rebel Hand includes a passive, spring-loaded flex wrist designed to enhance comfort and reduce compensatory movements. In its default state, the wrist flexes freely and naturally returns to a neutral position, supporting smoother, more ergonomic motion during daily tasks.



The wrist can also be manually locked into three positions:

- Neutral (0°)
- Flexion (30°)
- Extension (-30°)

Locking is achieved by pressing the wrist locking button once to secure the desired position. Pressing the button again unlocks the wrist, allowing it to return to its passive mode. This feature improves functional positioning and stability during specific activities such as driving, lifting, or typing.

12.4 Dorsal Button and Light Functions

	<p>Start up</p> <p>Stays blue for 60 seconds or as long as the Bluetooth connection is live.</p>
	<p>Fault Condition</p> <p>Fast flashing red.</p>
	<p>Low Power warning <7V</p> <p>Fast flashing amber.</p> <p>50% speed.</p>
	<p>Very low power warning <7V</p> <p>Solid amber.</p> <p>Quick buzz on vibration when it goes on.</p>
	<p>2 second hold of the dorsal button</p> <p>Stays green for 4 seconds to say it's in home grip.</p> <p>Quick buzz on vibration when it goes on.</p>

	<p>Active grip switch trigger</p> <p>Stays green for 2 seconds to say the hand has received a grip switch trigger.</p> <p>Quick buzz on vibration when it goes on.</p>
	<p>Double press dorsal button</p> <p>Standby mode, double press to reactivate Myo signals. Slow blue flash.</p> <p>Quick buzz on vibration when it goes on and off.</p>

12.5 Thumb Tap Function

The REBEL Hand features an innovative Thumb Tap mechanism that allows users to switch grips or tables without relying on myoelectric signals. This function is activated by tapping the thumb laterally, triggering a rocker switch at its base.

Depending on the configuration set via the Rebel Bionics App, different thumb tap directions correspond to specific actions:

Pronate (inward) or Supinate (outward) taps can be mapped to:

- Switch to the next or previous grip
- Switch to the next or previous grip table
- Activate specific grip modes

This feature enhances accessibility and control, especially for users with limited muscle signal consistency or during tasks where myoelectric input is impractical. The thumb tap only functions when the hand is fully open.



12.6 Compatibility

The REBEL Bionics Hand is designed to operate exclusively with REBEL Bionics components, including:




- REBEL Bionics Power Supply Unit (COGPSU/3350)
- REBEL Bionics Electrode System (COGDAC/EL2)
- EQD (Electronic Quick Disconnect) wrist interface
- Rebel Bionics App (iOS 14+ / Android 10+)

Use of third-party components may result in reduced performance, signal interference, or damage to the device. Always consult your clinician before integrating new accessories or software. Compatibility updates and approved accessory lists are available in the Technical Manual via the REBEL Bionics Website or upon request.

13.0 Grips

Opposed	<ul style="list-style-type: none"> • Power Grip • Precision Open & Close • Trigger Grip • Tripod Grip • Rock Grip • Glove Grip • Column Grip
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Unopposed	<ul style="list-style-type: none"> • Finger Point Grip • Tap Grip • Mouse Grip • Key/Card Grip • Relaxed Grip • Phone Grip
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RELAXED GRIP UNAPPOSED 	<p>The Relaxed Hand position gives the REBEL hand a natural, lifelike look—perfect for everyday use. With the thumb angled slightly toward the palm and fingers gently bent, it transitions smoothly into a Hook Grip for carrying bowls or plates securely. The hand can also fully open for a flat palm when needed. Slim and practical, it's ideal for dressing tasks—especially when paired with the Column Grip.</p>
PRECISION CLOSED OPPOSED 	<p>The Precision Closed Grip offers a fast, reliable way to handle small items like coins or tissues. With the index finger and thumb working together while the other fingers close into the palm, it's ideal for tight spaces—like working at a desk—where extended fingers might get in the way. The grip activates in stages, giving users full control of the index finger for precise, confident handling.</p>
PRECISION OPEN OPPOSED 	<p>The Precision Open Grip delivers speed and accuracy for handling small objects. With the index finger opposing the thumb and the other fingers extended, users can easily perform tasks like unwrapping a candy bar or zipping a jacket. The thumb moves to a set midpoint, while the index finger remains fully under user control—making this grip ideal for precise, everyday actions.</p>

13.0 Grips

<p>HOOK GRIP UNOPPOSED</p> 	<p>Say goodbye to juggling bags and hello to effortless carrying with the Hook Grip!</p> <p>Designed for convenience and built for strength, the Hook Grip is your go-to solution for carrying everything—from sleek briefcases and stylish handbags to heavy shopping hauls. Its open grip design means you can swap bags on the fly without ever adjusting your fingers. Secure, versatile, and brilliantly simple—the Hook Grip makes carrying easier, smarter, and more comfortable.</p>
<p>ACTIVE INDEX/TRIGGER GRIP UNOPPOSED</p> 	<p>The Active Index (Trigger) Grip gives users precise control for operating tools and appliances with trigger mechanisms.</p> <p>Perfect for hairdryers, spray bottles, and power tools, this grip allows the hand to hold objects securely with the thumb and remaining fingers, while the index finger moves independently to activate the trigger. It's also ideal for typing, offering a natural, functional hand position for keyboard use.</p>
<p>COLUMN GRIP OPOSED</p> 	<p>The Column Grip delivers power and precision for pressing buttons and operating levers with ease.</p> <p>Whether you're driving, using appliances, or buttoning a jacket, this grip forms a secure fist—thumb tucked toward the palm, fingers closing over it—allowing users to push, press, and control larger switches confidently. Slim and practical, it's perfect for everyday tasks at home, work, or on the go.</p>

<p>FINGER POINT GRIP UNOPPOSED</p> 	<p>The Finger Point Grip offers precise control for pressing small buttons and using touchscreens.</p> <p>Ideal for tasks like ringing a doorbell or typing, this grip positions the thumb laterally while the other fingers fold into the palm—allowing the index finger to point and press with accuracy.</p>
<p>MOUSE GRIP UNOPPOSED</p> 	<p>The Mouse Grip is perfect for smooth, accurate computer control—whether at work or play.</p> <p>It allows the user to securely hold a mouse with the thumb and little finger, while the index finger clicks with precision. A simple close signal activates the click, and an open signal releases it—ideal for browsing, gaming, or office tasks.</p>
<p>KEY GRIP UNOPPOSED</p> 	<p>The Key Grip offers precise control for handling slim, flat objects like keys, cards, or plates.</p> <p>With the thumb in a lateral position and fingers partially closed, the thumb presses against the side of the index finger—allowing users to grip, reposition, or release objects with ease. Ideal for tasks like unlocking doors, folding towels, or carrying trays.</p>
<p>COMPLIANT POWER GRIP OPOSED</p> 	<p>The Compliant Power Grip delivers secure, adaptive control for everyday tasks.</p> <p>From shaking hands to using tools or eating fruit, this grip wraps around round or cylindrical objects with stability. All fingers close naturally, followed by a slight thumb delay—creating a strong, responsive hold that adjusts to the object's shape.</p>

13.0 Grips

<p>TRIPOD/PINCH GRIP OPPOSED</p> 	<p>The Tripod Grip offers precise, stable control for handling everyday objects.</p> <p>Ideal for picking up items like keys, coins, jar lids, or pens, this grip brings fingers 1 and 2 to meet the thumb, while the remaining fingers continue to close for added support. It's perfect for tasks like tying shoelaces or lifting lids with confidence and control.</p>
<p>ROCK GRIP OPPOSED</p> 	<p>With the REBEL Hand, you're just one grip away from full Rockstar mode.</p> <p>The Rockstar grip extends the index and little fingers while the middle and ring fingers fold into the palm, secured by the thumb—delivering that iconic rock 'n' roll sign with style and precision. Rock on with confidence and control!</p>

13.1 Changing Grips

The REBEL Hand allows users to switch between multiple grip patterns using a combination of muscle signals and physical inputs. These are called Grip Switch Triggers, and they can be customized in the REBEL Bionics App.

Grip changes can be triggered by:

- Myoelectric signals (e.g., open/open, long hold open, co-contraction)
- Thumb Tap gestures (mapped via the Rebel Bionics App)
- Dorsal button press (short or long press depending on configuration)

13.1 Changing Grips

Grip switching allows users to cycle through pre-configured grip tables or directly activate specific grips. These configurations are managed through the Rebel Bionics App, where users or clinicians can assign grips to tables and map triggers to actions such as:

- Next grip
- Previous grip
- Next table
- Specific grip or table selection

Grip switching is only available when the hand is in the fully open position. For optimal performance, users should practice signal control and consult their clinician for personalized setup.

13.2 Grip Switch Triggers

Grip switch triggers are ways the user can change grips on the Rebel Hand. These triggers respond to muscle signals or physical inputs and allow quick access to different grip patterns.

Here are the main types of grip triggers:

- Open/Open Signal: A quick open signal when the hand is already open. Often used to move to the next grip.
- Long Hold Open Signal: Holding the open signal after the hand is fully open. This can be mapped to specific grip actions.
- Co-Contraction Signal: Activating both muscle sites at the same time. This is an advanced method, often used for switching between devices like hands, wrists, or elbows.
- Dorsal Button: A button on the back of the hand. Pressing it can trigger grip changes. It's easy for one-handed users but may be harder for bilateral users.
- Thumb Tap: Tapping the thumb in a specific direction (inward or outward) activates a rocker switch. This can be set to switch grips or grip tables.

These triggers can be customized in the REBEL Bionics App to suit the user's preferences and needs.

13.3 Grip Activation Logic

When a close signal is applied, the fingers move into the selected grip pattern. If the motor stalls but the signal continues, the hand will retry gripping in short bursts (0.5 seconds on, 0.1 seconds off) to help release a jammed finger.

When an open signal is applied, the fingers return to the fully open position and stop. The hand remains static unless a valid signal above the threshold is received.

13.4 Grip Switchback Mode

If enabled, this feature automatically resets the hand to the first grip in the current grip table after a period of inactivity (configurable between 15 and 60 seconds). This helps maintain consistency and readiness for common tasks.

13.5 Grip Switchback Mode

The REBEL Hand offers two grip strength modes that determine how firmly the hand closes around objects:

- **Proportional Mode:** Grip strength increases in proportion to the strength of the user's muscle signal. The harder the signal, the stronger the grip—up to a configured maximum.
- **Fixed Mode:** Grip strength remains constant at the maximum configured level, regardless of signal strength.

The maximum grip force can be adjusted between 20% and 100% of the hand's available power. In proportional mode, this setting acts as a cap; in fixed mode, it defines the default grip force used every time.

These settings can be customized in the Rebel Bionics App to suit the user's comfort and functional needs.

14.0 Grips

The REBEL Bionics App is available for download on both the Apple App Store and Google Play Store. With a single, streamlined app experience, users and clinicians can access tailored features based on their login credentials. Clinicians benefit from advanced configuration tools and patient management options, while users enjoy intuitive control, grip customization, and performance tracking—all in one place.

The REBEL Bionics App requires Android 10+ or iOS 14+. Ensure your device has Bluetooth 4.0 or higher. User data is encrypted and protected against unauthorized access.

14.1 Downloading & Connecting the App

To begin using the REBEL Bionics App, download it from the Apple App Store or Google Play Store. The app is designed to support both clinicians and users, with access tailored to each role through secure login credentials.

To connect the app to your REBEL Hand:

- Ensure Bluetooth is enabled on your mobile device.
- Power on the Rebel Hand.
- Connect using either:
 - A QR code scan
 - The serial number of the hand

This connection only needs to be completed once per user.

For clinicians adding a new user:

- Use identifiers or customer numbers instead of full names to maintain privacy and comply with data protection standards.
- Once added, a list of all linked users will be visible in your account dashboard.

14.2 Setting Up the Prosthetic Hand

After selecting a user profile, clinicians can:

- Set permissions for app access
- View usage statistics and performance data

Configuration options include:

- Selecting the number of myo-sites
- Reversing input signals if needed
- Enabling or disabling notifications, vibration, and buzzer feedback
- Customizing trigger settings such as hold-open time and open/open signal behaviour

14.3 Diagnostics & Signal Settings

The app provides detailed diagnostics to help monitor and fine-tune the hand's performance.

You can view:

- Motor activity (e.g., thumb, index, middle flexors)
- Sensor feedback (e.g., grip force)

Signal calibration tools allow you to:

- Adjust gain and thresholds for muscle signals
- Use visual indicators:
 - Red lines represent open signals
 - Blue lines represent close signals

Sliders and graphs help filter out unwanted movements and ensure the hand responds accurately to user intent.

15.0 Symbols Used

The following symbols may appear on the REBEL Bionics Electrode, its packaging, or accompanying documentation. These symbols help users identify important safety, regulatory, and usage information.



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

REBEL

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