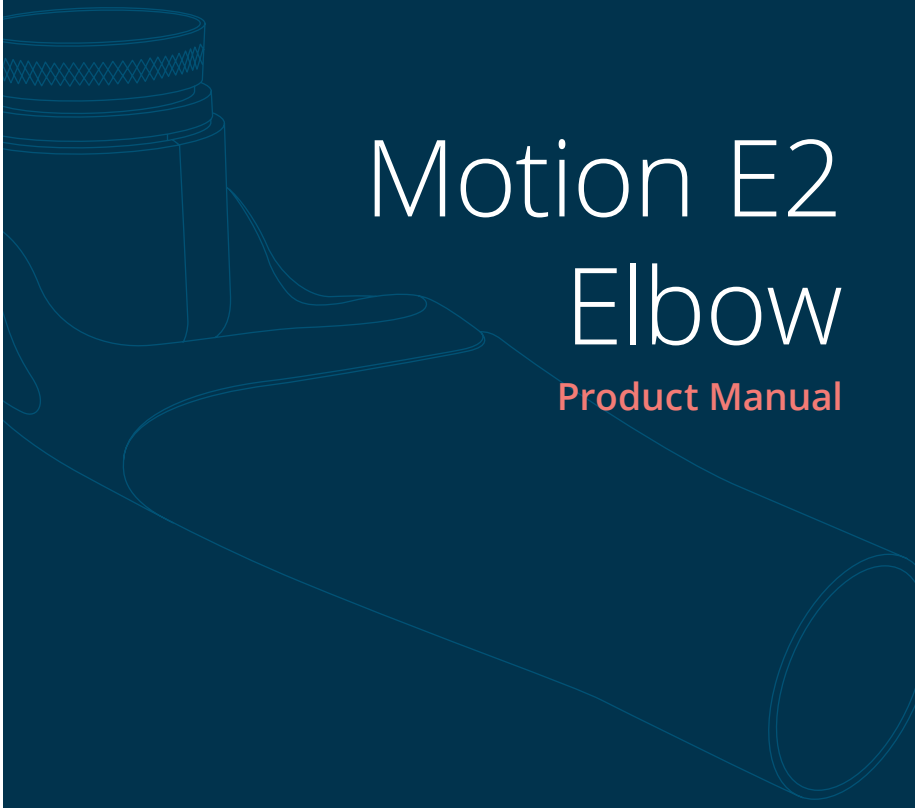

Motion E2 Elbow

Product Manual

Fillauer®

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To see other language options, visit **fillauer.com**.

Intended Use

The Motion E2 Elbow is a lightweight powered elbow for individuals with transhumeral level or higher upper limb amputation. The E2 supports two control methods — simple switch control, myoelectric control, and Coapt Complete Control pattern recognition — using a single, unified hardware platform. All wiring is routed through the interior of the elbow body, entering proximally and exiting distally inside the forearm, eliminating external cable routing regardless of the control method chosen.

Switch control configurations provide a straightforward, low-cost system. Coapt Complete Control configurations provide seamless sequential, intuitive pattern recognition control of the elbow, wrist rotator, and terminal device from a single set of EMG electrodes. Both control methods use the same E2 elbow hardware; the choice of configuration is made at fitting time.

The E2 is compatible with MC ProPlus and in-hand controller terminal devices (TASKA®, Zeus, i-limb®, bebionic®, etc.), and may be used with or without the MC ProWrist or Standard Electric Wrist Rotator.

Storage and Handling

It is recommended that prosthetic devices are stored between -5 – 50 °C in a clean, dry environment away from harsh chemicals (chlorine, acids, acetone, etc.).

Special Precautions

Risk Management

To minimize the risk of device damage or injury to the user while maximizing the functions of this device, follow the instructions for installation and use this device as described in this manual. When using the Coapt Complete Control system, also refer to the Coapt documentation for system-level safety information.

CAUTION: Do not expose the E2 Elbow to water. The device is splash-resistant only; do not submerge or use in sustained wet conditions.

CAUTION: Do not use the device to support forearm loads greater than 19 ft·lb / 25.8 N·m.

CAUTION: Do not operate the device in environments where volatile or explosive agents may be present.

CAUTION: Do not operate the device outside the rated temperature range: -5 – 60 °C (23 – 140 °F). Do not expose to extreme heat or cold beyond these limits.

CAUTION: Do not allow harsh chemicals, abrasives, or solvents to contact the device or its components. See Cleaning and Maintenance for approved cleaning procedures.

CAUTION: Do NOT use acetone, MEK (methyl ethyl ketone), paint thinner, or any strong solvents on the exterior shell. The HP MJF PA12 shell will be permanently damaged by these chemicals. Use only mild soap and water or isopropyl alcohol (70%) for cleaning.

CAUTION: Do NOT sharply bend, kink, or apply excessive force to wires at the conduit exit points on the elbow body. Always disconnect from the battery pack before performing any wiring inspection or connector adjustment.

Shell and Internal Components

There are no field-serviceable parts inside the elbow. The exterior shell may be removed by the prosthetist for access to internal components using the enclosed procedure (Shell Removal and Replacement). Removal of the shell without following this procedure may void the warranty.

CAUTION: The exterior shell is now HP MJF Nylon 12 (PA12) — not laminated composite. Shell attachment and removal procedures differ from prior versions.

Serious Incidents

In the unlikely event a serious incident occurs in relation to the use of the device, users should seek immediate medical help and contact their prosthetist at the earliest possible convenience. Clinicians should contact Fillauer Motion Control immediately in the event of any device failure.

Specifications & Preparations Before Use

Forearm Options

Several options are available for the forearm section of the elbow. Minimum forearm length from elbow center is 250 mm. Shorter forearms may be custom fabricated.

Wiring Architecture

The E2 uses a single through-elbow wiring architecture for all configurations. Six cable circuits enter the elbow proximally and exit distally inside the forearm. The Elbow 2-pin cable terminates at the elbow motor and does not continue distally. Four cables (Channel A, Channel B, Rotate, Digital) pass through the elbow body and are available for connection to the wrist rotator and terminal device.

Connector	Function	Terminates	Used In
Channel A	Control signal for wrist and/or TD	Distal	All
Power	System power supply	Distal	All
Channel B	Control signal for wrist and/or TD	Distal	All
Rotate	Standard wrist rotator control signal	Distal	Coapt
Digital	Digital bus to terminal device	Distal	Coapt
Elbow	2-pin motor command—switch input or Coapt 2-pin output	Elbow	All

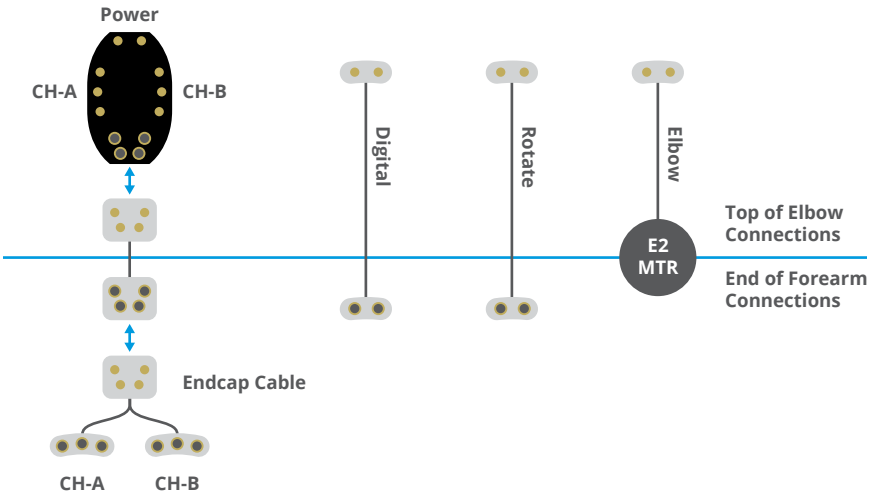


Figure 1 – E2 Through-Elbow Wiring. All six connectors enter proximally (top) and route through the elbow body to distal connections (bottom). The Elbow connector (+/−) terminates at the elbow motor controller only.

Control Method Selection

The E2 supports four configurations across two control methods. Select the appropriate configuration based on the patient's clinical needs:

Config.	Name	Control Method	Best For
1	Switch Elbow / Myo TD	Switch	Switch elbow with ProPlus TD
2	Switch Elbow / Myo Wrist / Myo TD	Switch	Switch elbow + ProWrist + ProPlus TD
3	Coapt Elbow / Myo TD	Coapt	Pattern recognition; no wrist
4	Coapt Elbow / Myo Wrist / Myo TD	Coapt	Pattern recognition + Standard Wrist

Configurations 1–2 use the Elbow 2-pin connector for a switch input. Configurations 3–4 use it for the Coapt 2-pin elbow output. All other through-elbow connectors are wired identically across all configurations.

Single Patient Use

Each amputee is unique. The shape of their residual limb, the control signals they generate, and the tasks performed during the day require specialised design and adjustment of the prosthesis. Motion Control products are manufactured to be fit and adjusted to one individual by a certified prosthetist.

Disposal / Waste Handling

This device, including any associated electronics and batteries, should be disposed of in accordance with applicable local laws and regulations.

Limited Warranty

Seller warrants to Buyer that the equipment delivered hereunder will be free from defects in materials and manufacturing workmanship, that it will be of the kind and quality described and that it will perform as specified in Seller's written quotation. The preceding limited warranties shall apply only to failures to meet said warranties that appear within the effective period of this Agreement. The effective period shall be two years (24 months) from the date of delivery to the fitting center that has purchased the components. Refer to the shipping receipt for the date of shipment.

For more information regarding the limited warranty, see the documentation on our website.

Return Policy

Returns are accepted for a full refund (not including any repairs that may be required) for up to 30 days from date of shipment. Returns 31–60 days from date of shipment will be accepted subject to a 10% restocking fee. Returns 61–90 days from date of shipment will be accepted subject to a 15% restocking fee. Returns must be in re-saleable condition. Beyond 90 days, returns are not accepted. If you have any questions, please call Motion Control at 801.326.3434.

Performance Characteristics

	E2
Excursion Range	120 degrees
Height – Elbow Center to Lamination Collar	2.5 in (64 mm)
Diameter: Turntable	2.7 in (69 mm)
Diameter: Center	3.29 in (84 mm)
Elbow Weight	16.6 oz (472 g)
Forearm 13-inch Weight Forearm 10-inch Weight	6.7 oz (190 g) 5.9 oz (168 g)
Live Lift	2.2 ft·lb (3 N·m)
Lift Time	1.3 – 4.9 seconds
Static Load	19 ft·lb (25.8 N·m)
Internal Cable Routing	6-connector proximal-to-distal through elbow body
Elbow Control Input	2-pin (switch input or Coapt 2-pin output)
Switch Control	Configs. 1, 2 – see Chart 1 for switch options
Coapt Control	Configs. 3, 4 – Coapt Complete Control (see Coapt documentation)

Declaration of Conformity: The product herewith complies with Medical Device Regulation 2017/745 and is registered with the United States Food and Drug Administration.

System Selection

To configure an E2 system, determine: (1) whether the patient will use switch control or Coapt Complete Control pattern recognition for the elbow; (2) the terminal device — any ProPlus-compatible in-hand controller TD such as MC ProPlus, TASKA®, Zeus, i-limb®, etc.; and (3) whether an MC ProWrist or Standard Wrist (for Coapt) is to be included. Follow the configuration index below, then refer to the corresponding wiring page. Contact Fillauer Motion Control at 801-326-3434 or your Coapt representative if assistance is needed.

Configuration Charts

Switch Control Configurations

1. Switch Elbow / Myo TD

Switch Operated E2 Elbow – Myo-Operated ProPlus Terminal Device

- Simple switch operated E2 Elbow
- Compatible with terminal devices with in-hand controllers (MC ProPlus, TASKA®, Zeus, etc.)

2. Switch Elbow / Myo Wrist / Myo TD

Switch Operated E2 Elbow – ProWrist Rotator – ProPlus Terminal Devices

- Simple switch operated E2 Elbow
- Compatible with terminal devices with in-hand controllers (MC ProPlus, TASKA®, Zeus, etc.)
- Allows use of MC ProWrist Rotator

Coapt Complete Control Configurations

3. Coapt Elbow / Myo TD

Coapt Complete Control – E2 Elbow – In-hand Controller Terminal Device

- Coapt pattern recognition simultaneously controls elbow and terminal device
- No separate elbow switch — Coapt issues elbow command via 2-pin Elbow connector
- Compatible with terminal devices with in-hand controllers (MC ProPlus, TASKA®, Zeus, etc.)
- All wiring routed internally through the elbow body

4. Coapt Elbow / Myo Wrist / Myo TD

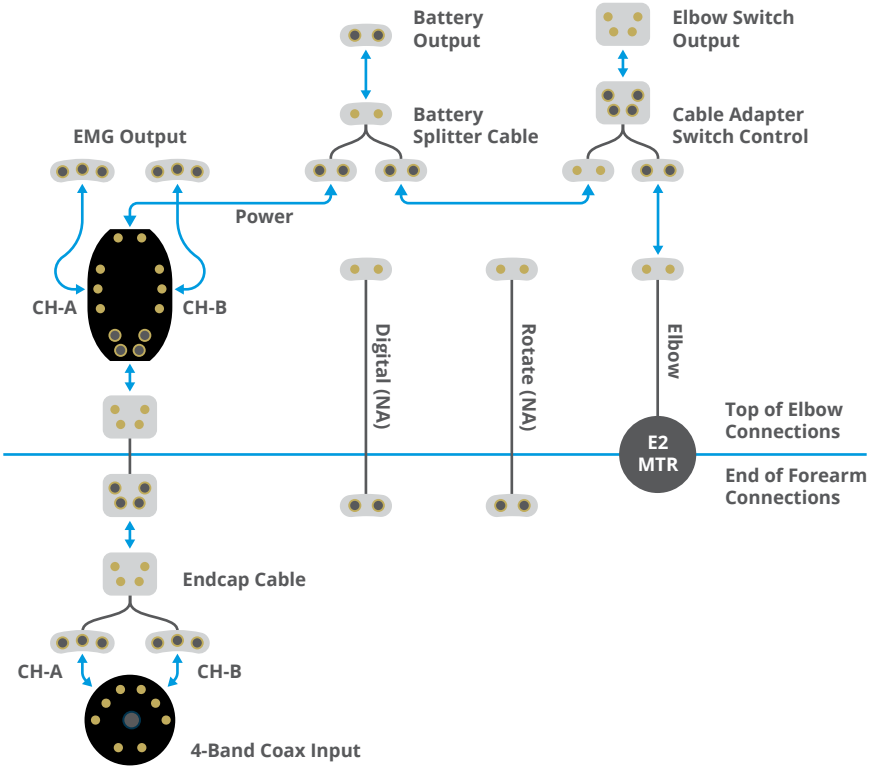
Coapt Complete Control – E2 Elbow – Standard Wrist Rotator – In-hand Controller Terminal Devices

- Coapt pattern recognition simultaneously controls elbow, Standard Wrist, and terminal device
- No separate elbow switch — Coapt issues elbow command via 2-pin Elbow connector
- Compatible with terminal devices with in-hand controllers (MC ProPlus, TASKA®, Zeus, etc.)
- Allows use of MC Standard Wrist Rotator

Configuration 1: Switch Elbow / Myo TD

Switch Operated E2 Elbow – ProPlus TDs

The elbow is operated by a switch connected to the 2-pin Elbow connector. The ProPlus terminal device is controlled myoelectrically. Channel A and B are available for ProPlus TD EMG inputs at the distal end.



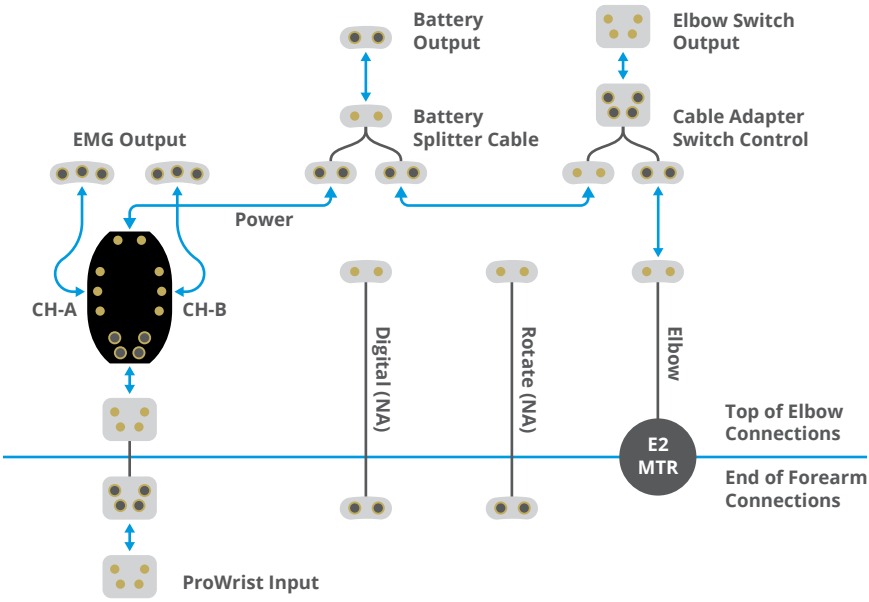
Connector	Function	Terminates	Chart Ref.
Channel A	TD EMG input Ch. A (distal)	Distal (TD or wrist)	Chart 1
Power	System power	Distal (TD or wrist)	Chart 7
Channel B	TD EMG input Ch. B (distal)	Distal (TD or wrist)	Chart 1
Rotate	Not Used	–	–
Digital	Not Used	–	–
Elbow	2-pin – switch input for elbow motor	At Elbow	Chart 1

Refer to Chart 1 for switch and ProPlus TD input options, Chart 3 for adapter cables, Charts 4, 5, and 6 for extension cables, Chart 7 for the battery kit, Chart 8 for the elbow and lamination collar, and Chart 9 for QD wrist parts.

Configuration 2: Switch Elbow / Myo Wrist / Myo TD

Switch Operated E2 Elbow – ProWrist Electric Wrist Rotator – ProPlus TDs

The elbow is operated by a switch. The ProWrist rotator and ProPlus terminal device are controlled myoelectrically. Channel A and B carry EMG signals to both the ProWrist and TD at the distal end.



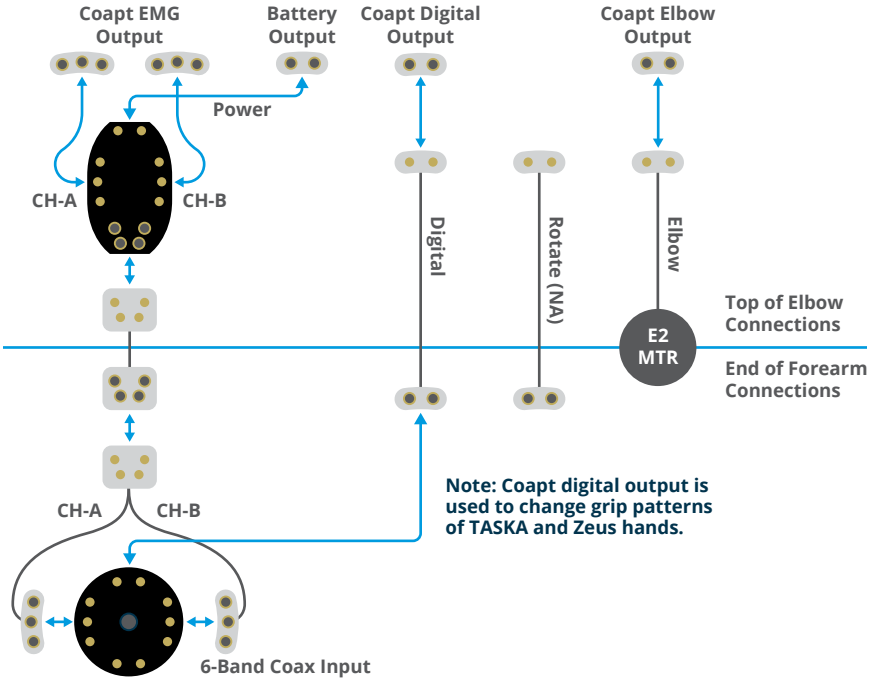
Connector	Function	Terminates	Chart Ref.
Channel A	EMG input Ch. A – ProWrist & TD	Distal (Wrist/TD)	Chart 1
Power	System power	Distal	Chart 7
Channel B	EMG input Ch. B – ProWrist & TD	Distal (Wrist/TD)	Chart 1
Rotate	Not Used	–	–
Digital	Not Used	–	–
Elbow	2-pin – switch input for elbow motor	At Elbow	Chart 1

Refer to Chart 1 for switch and ProWrist/TD input options, Chart 3 for adapter cables, Charts 4, 5, and 6 for extension cables, Chart 7 for the battery kit, Chart 8 for the elbow and lamination collar, and Chart 9 for QD wrist parts.

Configuration 3: Coapt Elbow / Myo TD

Coapt Complete Control – E2 Elbow – ProPlus TDs

The Coapt Complete Control system simultaneously drives the E2 elbow and the ProPlus terminal device via pattern recognition. The 2-pin Elbow connector carries the Coapt elbow motor command. Channel A, Power, Channel B, and Digital pass through the elbow to the terminal device. The Rotate connector is present but unused.



Config. 3 – Coapt drives the Elbow 2-pin connector. Channel A, Power, Channel B, and Digital route through to the ProPlus, TASKA, Zeus, etc. terminal device. Rotate is unused.

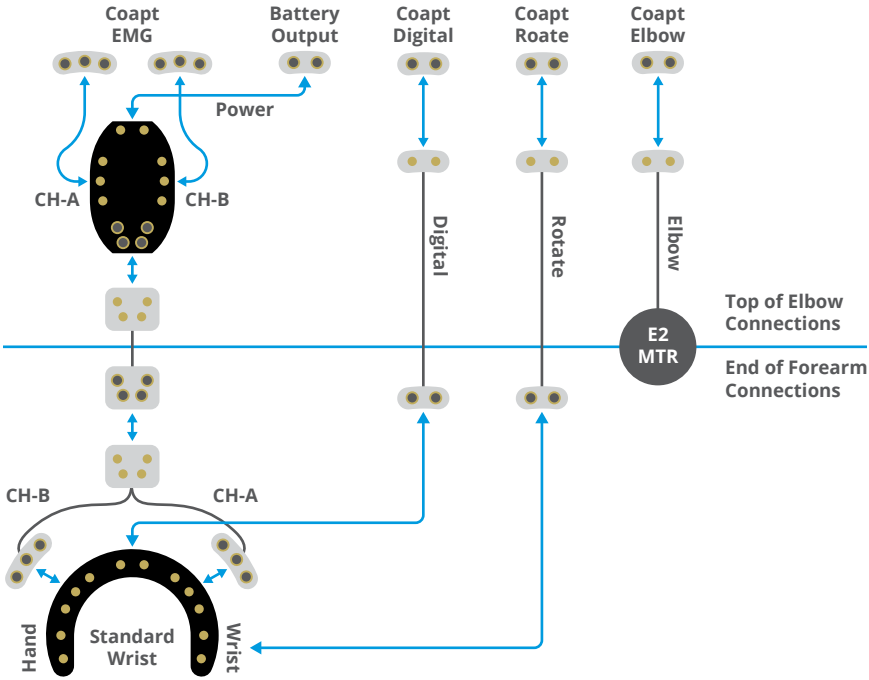
Connector	Function	Terminates	Chart Ref.
Channel A	Coapt EMG/control – elbow & TD	Distal (TD)	Chart 2
Power	System power	Distal (TD)	Chart 7
Channel B	Coapt EMG/control – elbow & TD	Distal (TD)	Chart 2
Rotate	Not Used	–	–
Digital	ProPlus digital bus to TD	Distal (TD)	Chart 2
Elbow	2-pin – Coapt elbow motor command	At Elbow	Chart 2

See Coapt documentation for Coapt system part numbers, Chart 3 for adapter cables, Charts 4, 5, and 6 for extension cables, Chart 7 for the battery kit, Chart 8 for the elbow and lamination collar, and Chart 9 for QD wrist parts.

Configuration 4: Coapt Elbow / Myo Wrist / Myo TD

Coapt Complete Control – E2 Elbow – Standard Wrist Rotator – ProPlus, TASKA, Zeus, etc. TDs

The Coapt Complete Control system simultaneously drives the E2 elbow, the MC Standard Wrist Rotator, and the ProPlus, TASKA, Zeus, etc., terminal device. All six cable connections are used. The 2-pin Elbow connector carries the Coapt elbow motor command. The Rotate connector connects to the Standard Wrist Rotator. Channel A, B, Power, and Digital continue to the terminal device.



Config. 4 – Wiring. All six connectors are active. Coapt drives the Elbow 2-pin. Rotate connects to the Standard Wrist Rotator. Channel A, Power, Channel B, and Digital continue to the terminal device.

Connector	Function	Terminates	Chart Ref.
Channel A	Coapt EMG/control – elbow, wrist & TD	Distal (Wrist/TD)	Chart 2
Power	System power	Distal	Chart 7
Channel B	Coapt EMG/control – elbow, wrist & TD	Distal (Wrist/TD)	Chart 2
Rotate	Wrist rotator control signal	Standard Wrist	Chart 9
Digital	ProPlus digital bus to TD	Distal (TD)	Chart 2
Elbow	2-pin – Coapt elbow motor command	At Elbow	Chart 2

See Coapt documentation for Coapt system part numbers, Chart 3 for adapter cables, Charts 4, 5, and 6 for extension cables, Chart 7 for the battery kit, Chart 8 for the elbow and lamination collar, and Chart 9 for QD wrist parts.

Parts Charts

Chart 1 — Switch Options (Configs. 1, 2)

Description	Cable Length	Part Number
ProPlus / ProWrist EMG Input Options (Configs. 1 and 2)		
Otto Bock Harness Pull Switch	20 in (51 cm)	**1701022**
Otto Bock Rocker Switch 9×25	1.5 in (8 cm)	**1701021**
Motion 2-Button 2-Position Push Switch MC 4-pin	20 in (51 cm)	**3050015**
Motion 2-Position Pull Switch MC 4-pin	14 in (36 cm)	**3050013**
Otto Bock Cable Pull Switch	N/A	**1701023**
Myo/One		
Linear Potentiometer, 3-pin Halfmoon Connector	22 in (56 cm)	**3010988**
Touch Pad – Tan	1 in (2.5 cm)	**3010669**
Touch Pad – Brown	1 in (2.5 cm)	**3010670**
Touch Pad – Black	1 in (2.5 cm)	**3010721**
Touch Pad Cable, Single Channel	20 in (51 cm)	**3010548**
Touch Pad Cable, Dual Channel	20 in (51 cm)	**3010549**

Chart 2 — Coapt & Input Options (Configs. 3, 4)

Description	Cable Length	Part Number
Coapt Complete Control Interface		
Coapt Complete Control System (see Coapt documentation for system part numbers)	N/A	See Coapt

Chart 3 — Adapter Cables

Description	Cable Length	Part Number
Cable Adapter Switch Control w/ Batt. Input	2.25 in (6 cm)	**3010945**
Battery Splitter Cable, 2-Pin Connectors	4 in (8 cm)	**3010946**

Chart 4 — 2-Pin Extension Cables

Description	Cable Length	Part Number
Extension Cable 2-Pin Halfmoon	12 in (30 cm)	**3010951**
Extension Cable 2-Pin Halfmoon	18 in (46 cm)	**3010842**
Extension Cable 2-Pin Halfmoon	24 in (60 cm)	**3010952**

Chart 5 — 3-Pin Extension Cables

Description	Cable Length	Part Number
Extension Cable 3-pin	12 in (30 cm)	**3010989**
Extension Cable 3-pin	18 in (46 cm)	**3010990**
Extension Cable 3-pin	24 in (60 cm)	**3010991**

Chart 6 — 4-Pin Extension Cables

Description	Cable Length	Part Number
Extension Cable 4-pin	12 in (30 cm)	**3010325**
Extension Cable 4-pin	24 in (46 cm)	**3010326**
Extension Cable 4-pin	36 in (60 cm)	**3010304**

Chart 7 — Battery Kit

Description	Color	Part Number
TASKA PowerCore System	Black	**TASKA-21AB31**
TASKA PowerCore System	Sand	**TASKA-21AC31**
Aether Battery System	Black	**AET-BAT-BS1**

Chart 8 — Motion E2 Elbow & Humeral Lamination Collar

Description	Part Number
Motion E2 Elbow, Humeral Lamination Collar	**1072006**

Chart 9 — QD Wrist Parts

Description	Color	Part Number
Lamination Collar	Tan	**1100295**
Lamination Collar	Brown	**1100299**
Lamination Collar	Black	**1100291**
Forearm Endcap	Black	**3010758**
Otto Bock Style Coaxial Plug		**1701009**
Steeper Coax, Plug 6-Band		**1700064**

Installation

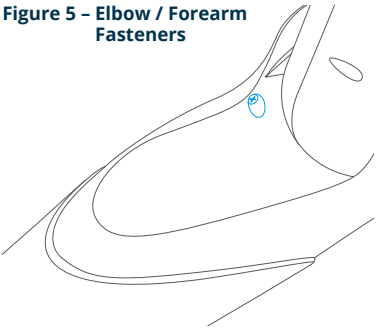


Figure 5 – Elbow / Forearm Fasteners

1. Install the new forearm by inserting the wires through the wire channel in the forearm and pulling distally while assembling.
2. Carefully insert the elbow straps fully into the forearm without damaging the wires.
3. Install the fastener pictured in Figure 5 on both sides of the forearm to complete attachment. Torque screws to 24 in·oz (finger tighten).
4. Assure that the wire connectors are still inserted fully into the forearm and that all signals are still travelling through from the humeral section.
5. Trim forearm to length and install lamination collar (Chart 9) using Fabtech Pluseries™ adhesive.

Cleaning and Maintenance

Cleaning the PA12 MJF Exterior Shell

CAUTION: DO NOT use acetone, MEK, paint thinner, chlorinated solvents, or any strong chemical solvent on the PA12 shell. These will permanently damage or dissolve the shell surface..

Approved cleaning procedure for the exterior shell

1. Wipe the shell surface with a soft cloth dampened with mild soap and water.
2. For stubborn soiling, use isopropyl alcohol (IPA) 70% applied to a soft cloth.
3. Do not immerse the device or allow liquid to enter connector ports or the wiring conduit exit points.

Approved Cleaners	Not approved (will damage PA12 shell):
• Mild soap and water • Isopropyl alcohol 70% (IPA)	• Acetone • MEK (methyl ethyl ketone) • Paint thinner or turpentine • Chlorinated solvents • Abrasive cleaners or scouring pads

Care and Maintenance

Frequency	Task	Performed by
Daily	User inspects prosthesis for changes in performance, noise, or unusual movement	User
As needed	Clean exterior shell per the procedure above	User / Prosthetist
Annually	Full inspection of all mechanical components, cable condition, connector integrity	Certified Prosthetist
Annually	Inspect wiring for wear, kinking, or insulation damage. Test connector continuity by checking all functions of distal devices. Check wire at exit ports for damage or loosening connectors.	Certified Prosthetist
As needed	Contact Motion Control if any performance change, unusual noise, or device failure is noted	User / Prosthetist

Customer Support

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