

BM3 POWERCHAIR

INDOORS and **OUTDOORS** properly!

16mph (26kph) Lithium Powered 45 Volt 3.2kWh Powerchair. For all day, all-purpose, real world outdoor use. Lightweight, agile & compact, for superior indoor performance.

3x the range, 3x the speed, 5x the battery service life of the typical hi-end commercial powerchairs currently available. With greater levels of power & torque and easier more intuitive proportional & true linear control.



This powerchair has moved the goalposts compared to the mobility industries stagnated offerings. It doubles or triples many important technical or performance specifications.

- **BM3 DESIGN SPEED: 15MPH.** (Actual measured GPS = 16.4 MPH, 26.3 KPH) It's actually trivially easy to make a much faster chair than this. But this was designed to be usable all day every day with complete reliability, safety and usability. And to have no compromises or disadvantages because of this speed. It **MUST** do everything indoors and out at **LEAST** as well as the mobility industry's far slower chairs. There is then no downside to this additional speed.

EXISTING CHAIRS: Normally, increasing the speed via gearing as the industry universally does, results in *decreasing* both *range & torque*. So the industry offers a best of just 8.5 mph. Of course you don't have to go fast. But it's nice! But sometimes you need to do so. With multilane highways to cross, no exit ramps (or blocked by traffic or pedestrians). Or when trying to escape from being reversed into by a blind driver in a busy car park. Where there is no footpath available, you often have no choice but to use the roads. Speed can mean a much greater margin of safety outdoors.

- **BM3 RANGE: 45+ Miles Real World. Or up to 7 days use between charges.**

EXISTING CHAIRS: 10 to 25 miles (based on the unrealistic ISO standard "tennis court" test). Real world usable range may be half of this figure. It's inadequate for many & you never know if you will make it home again. It restricts where you dare attempt to travel. Fancy a night out? Not sure if you have enough battery left? Now there's no need to worry, you will always get home! This **FREES** you mentally to get on with your life, instead of worrying about batteries. It really makes a difference!

- **BM3 BATTERY: 300% greater energy storage than Gel or AGM. LiFePO4, 45v, 3,240 Watt/hours of usable energy. With just HALF the weight! 10 to 15 year lifespan.**

EXISTING CHAIRS: Lead (gel/AGM) 700 to 1100 Watt/Hours max usable capacity. 1/3rd the storage capacity but 2x the weight. You can watch performance decline monthly & have to replace the battery yearly. It's staggering that powerchairs use antiquated Lead batteries in the 21st century



- **BM3 CHARGER: FAST charging. Lightweight, PC linked, cell balancing, high powered 550 watt output charger. Charges directly in a car or at home. (Approx. 3.5 hours to 100% to replace 35 miles of discharge). Optionally connects via Blue-Tooth to any PC/Laptop and monitors & logs battery health, displays capacity used, capacity replaced & charge/discharge graphs & cell balance information + more in real time. Charger can also charge any other battery of any chemistry any capacity or cell count up to 50V. On any other device. Lead, Lithium, Nickel based cells. All types.**

EXISTING CHAIRS: 8 Amp, 28.8v, 10 to 16 hours, dumb charger. And only at home, no data-log or testing capability or charging in a vehicle possible. Only one battery type or device.

- **OUTDOOR CAPABILITY: Mud, snow, grass, sand, roads & pavements, hills & real world footpaths in comfort. Has greater level of power & speed & torque for superior control. Plus huge range for real world conditions & improved user confidence.**

EXISTING CHAIRS: Heavily loaded often small casters sink on soft surfaces. Small width & cross section, harsh riding drive tyres also sink and transmit vibration. Causing discomfort, pressure sores & muscle spasm problems. Only work well on solid smooth surfaces e.g. shopping centres. Inadequate speed, torque or accurate control for any practical real world outdoor use. Short battery range, gives no user confidence in going anywhere that is too far or is too difficult type of terrain such a hills or grass.



High floatation tyres, lightly loaded large front casters, tons of power, huge battery capability make this sort of thing easy! Want to walk a dog up the beach? In the forest? Fields? Snow? No problem

- **DRIVE WHEELS/TYRES: SMOOTH RIDE on HIGH FLOATATION (very low pressure) 6 INCH WIDE, PUNCTURE PROOF, KEVLAR REINFORCED & TUBELESS TYRES, ON LIGHTWEIGHT POLISHED 3 PART TUBELESS ALLOY SPLIT RIMS.**

EXISTING CHAIRS: Almost without exception use skinny harsh riding high pressure or foam filled 3.00 x 8 drive tyres. Or smaller. These transmit vibration and cause discomfort & spasm. They sink on soft surfaces, like wet fields, sand, snow. They are either tubed (so suffer many punctures) or solid/foam filled (so called puncture free), which both eat battery power and give an even harsher ride.



- **CASTER WHEELS/TYRES: 9.75 X 3 INCH WIDE TUBE TYPE. Filled with puncture seal fluid. These are lightly loaded with a rear biased powerchair CG position. To ride easily over sand, snow, soft ground. Chair drives safely with a fully deflated caster if required to get home.**
- **CONTROLLED WHEELIES: Rearward CG position (Centre of Gravity or Mass) and instant & precise linear throttle control - For similar agility to a manual sport chair with easy wheelies etc, Useful for curbs, accuracy & control & better feel of chairs steering lightness. This also saves approx. 10 to 15 percent of the battery power.**

- **POWER: 2x 150 AMP@45V ROBOTEQ HDC2450. Running custom code/script, external Hall Effect current sensors, and custom built hall affect joystick controller. (3x more power than existing powerchairs – 13,500 max electrical Watts capability)** [Custom script/code](#) current sensors + full programmability and motor compensation.



Custom built Hall affect pod using APEM Joystick.

- **HIGH POWERED (3.2W RF BOOSTED) ENCRYPTED, frequency hopping, dual channel, 2.4GHZ SAFE RADIO (REMOTE) CONTROL CAPABILITY BUILT RIGHT IN. For moving powerchairs around remotely, for service, cleaning, loading into vans, etc.**



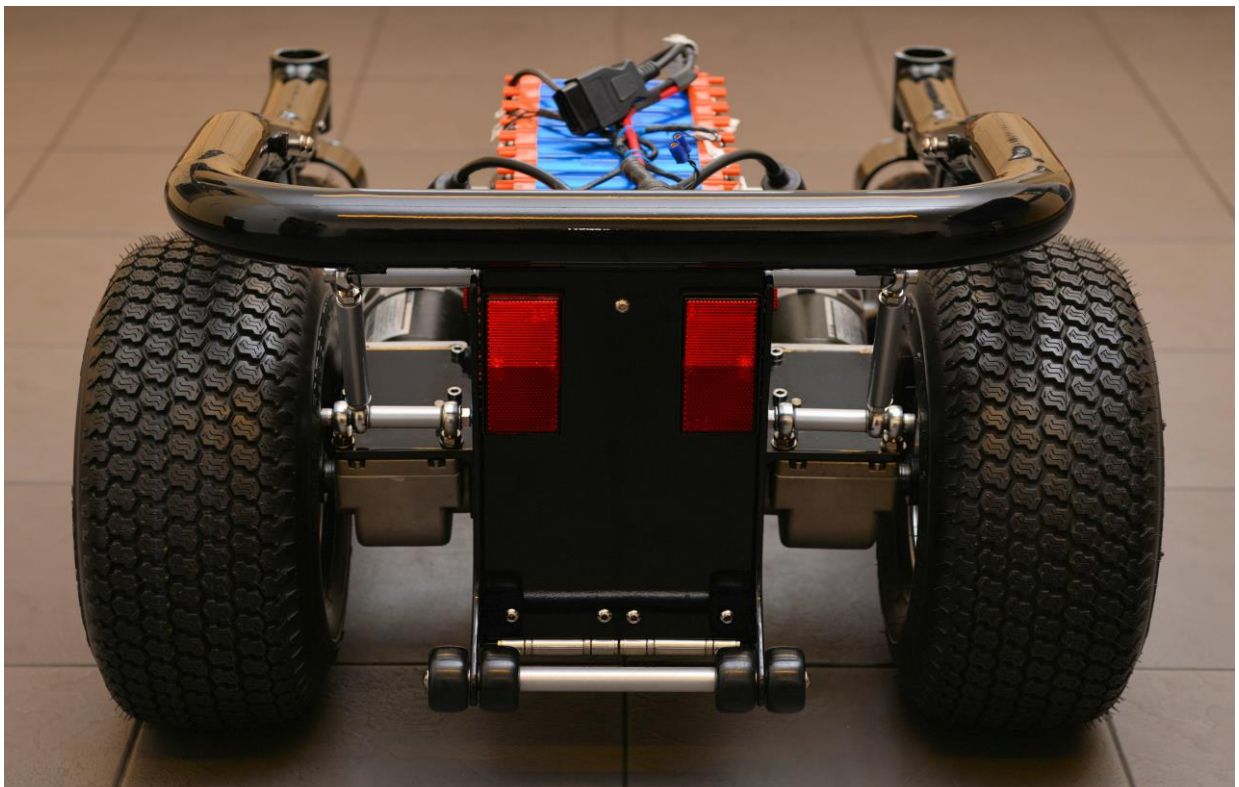
Switch transmitter on & automatically take over remotely!

3.2W boosted 2.4ghz safe encrypted multi link fail safe radio control system built in!

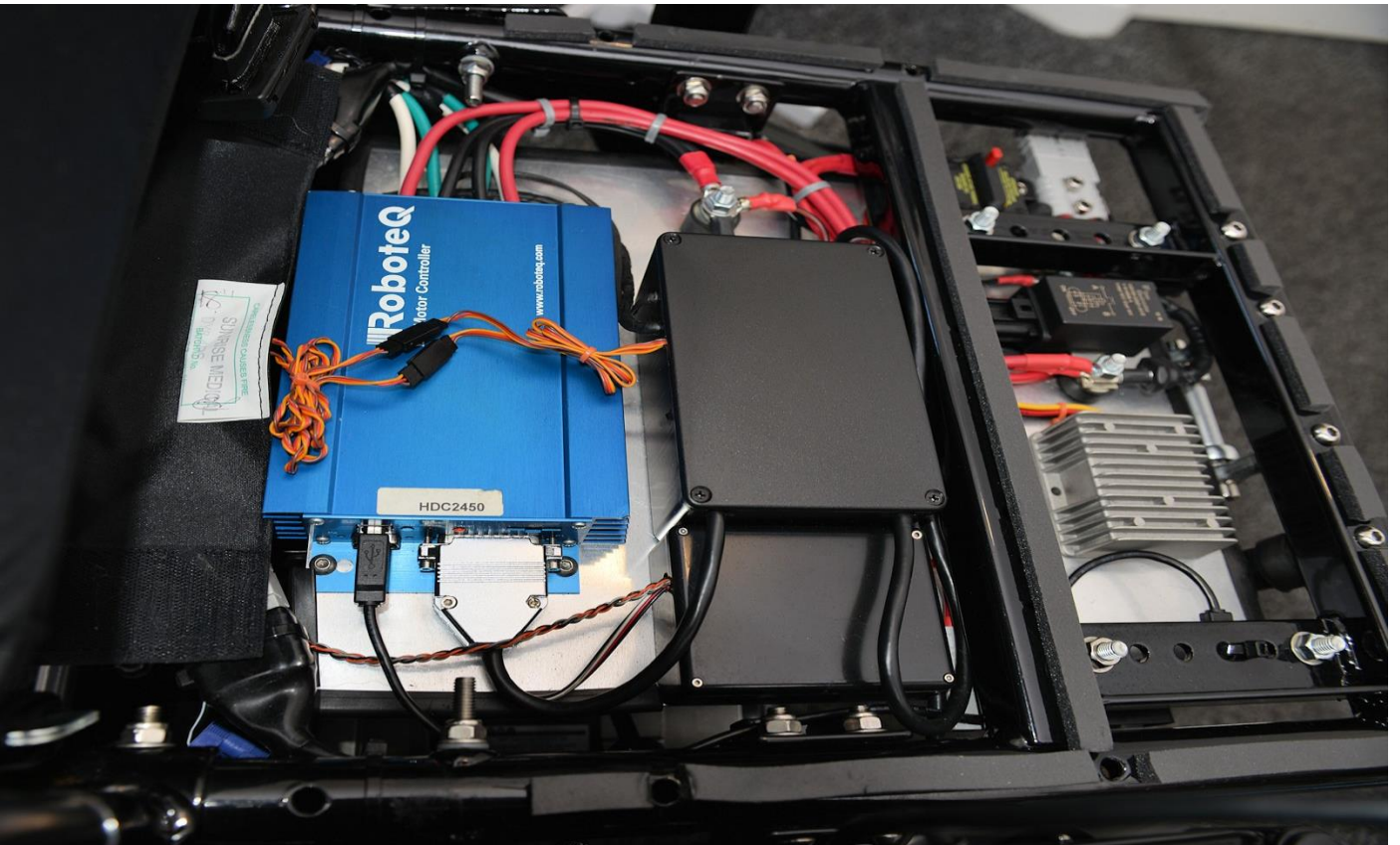
- **ALL CHASSIS BEARINGS, FASTENERS, POLISHED STAINLESS STEEL ALLEN CAP SCREWS. SO NO CORROSION. ALL OTHER PARTS SHOW QUALITY HIGH GLOSS POWDER COATED INC ALL HIDDEN PARTS.**



TOTAL 37inches long including footplate and anti-tips



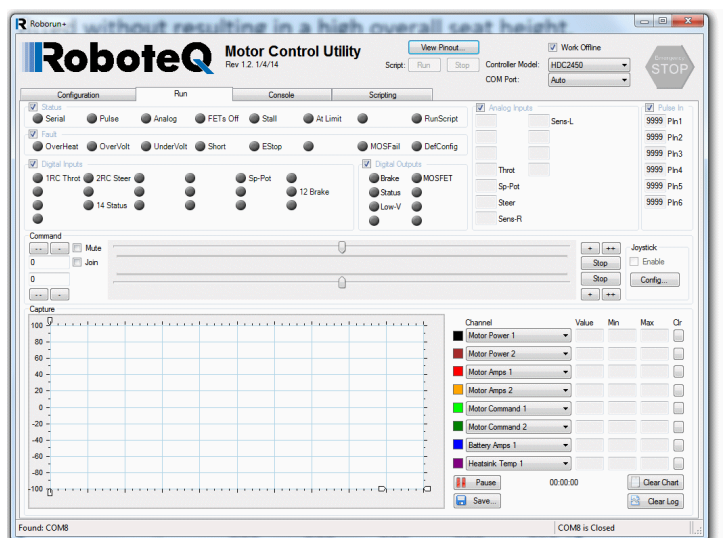
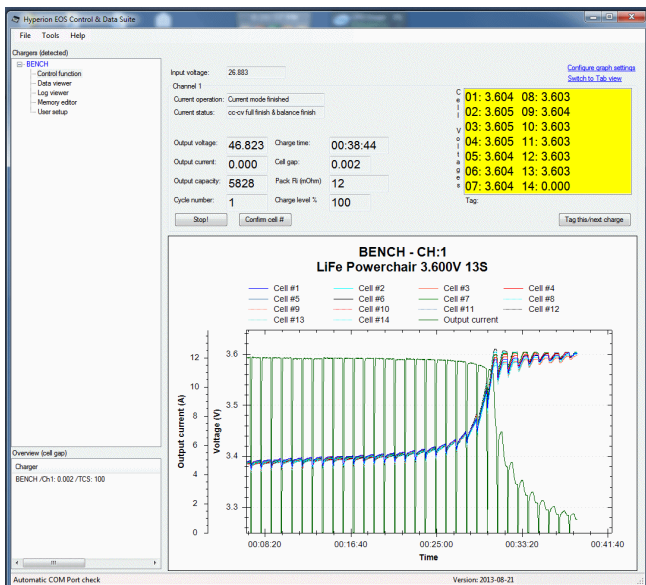
Rear battery door, 4 inches ground clearance, 12 inches of rubber and just 26 inches wide!



Custom 45V high power control system and safety equipment lives below seat tray base



No cushion fitted here. Low seat height. Allows for a thicker 3 or 4 inch deep (high risk) type cushions to be fitted without resulting in a high overall seat height.



Charging, controllable via PC and Bluetooth if you wish. Logs data, shows cell balance, Ah in/out and battery state and much more as it charges. Roboteq software allows for extensive programming and setup, configuration, logging to PC etc. And in real time during use. All way more advanced and more configurable and informative than the typical mobility product and free to download without restrictions or cost.

Specification

Battery: Safe, Lithium ion Phosphate (78 x 12Ah 10C cont. cells in 13x series and 6x parallel configuration). **43v** nominal (**46.8V** charged). 45v nominal running voltage.

With a cycle life of **2000 cycles to 80% DOD**. 1500 cycles even at 100 percent DOD. That's at least 5 times better cycle life than the best conventional gel or AGM lead based battery. **And HALF the weight! Saving some 50lb!** And since you need charge only every few days will last 10 to 15 times longer. (Equivalent usable power to 6x group 24 lead batteries.)

With **3x the usable energy storage capacity @ 3240 Watt/hours** (compared to usable energy in a typical pair of group 24, 70Ah batteries at a high discharge rate).

Control System: Roboteq HDC2450 with **150 Amps per motor at 45V**. Approx. **13,500 Watts electrical power capability for 60 seconds**. Almost **3x the power level of the mobility industries BEST offerings!** Radio Control capability is built in & full comprehensive PC control & data logging, graphing and battery, motor and controller real time monitoring capability + programming via PC and USB. [Custom script/code](#) for powerchair usage includes such things as motor compensation settings and other advanced control user settings. Custom adjustable control algo and motor compensation script.

Custom Control Joystick Pod Uses a Pilot Plus shell, custom switches, LEDs, Speed potentiometer and a replacement Hall Effect Joystick by APEM.

Speed: Nominal 15 MPH or 24 KPH (Actually about 16.4 MPH measured via GPS)

Range: At least 45 Miles or 72 Kilometres real world on footpaths. More if calculated in the same way powerchair manufacturers do things. (The official ISO tennis court test) Or 15 miles+ of very unfriendly steep hills, beaches, off road use etc. About 3x what you will get from other industry standard lead battery (AGM/Gel) powered powerchairs.

Ground clearance: 4 inches or 100mm without tie down bolt.

Seat height: 16 inches at the rear, 17 inches at the front edge. Adjustable dump. Rehab seating also possible. Car style seats or other high/heavy seating not an option as they raise the G of G too high for good stability with the lightweight battery and short wheelbase.

Rear tyres: 145/70 - 6 (14.5 inches x 5.5 inches wide) low pressure tubeless 4 PSI high floatation for sand, off road, and comfort on the streets or off road! 4 ply, treated with off road puncture treatment.

Or: (Preferred option shown above) 15" (6.00 x 6) Kevlar lined puncture proof (turf tyres) for dry summer use. ALL tyres are tubeless, fitted to alloy tubeless polished aircraft rims.

(Tubeless tyres are approx. 20x less prone to puncture deflation). And these Kevlar reinforced and are PUNCTURE PROOF.

Front casters: 3.00 x 4 tyres (9.7 inches x 3 inches) Treated with puncture seal. Powerchair can drive safely with a totally deflated front tyre due to rearward C of G (mass) position.

Width: including a 20 inch cushion, **25.4 to 26.4inches** depending on rear tyres fitted. (All Terrain or Turf).

Length: Including footplate, anti-tips etc. **37.5 inches total!** Shorter than other powerchairs.

Charging: While mobile in a car or from the wall at up to 20 amps and 47v with an ultra-accurate automatic cell balancing Hyperion 1420i computerised 550 watt charger. Includes PC control, graphing, battery capacity measurement and IR resistance testing via PC.

Finish and durability: ALL bolts, nuts, washers, bearings, spacers, axles, from polished stainless steel. All other metal parts including hidden ones are heavy show quality gloss powder coated. Corrosion proof on our salty winter streets. All power and motor cables are high quality 10sq mm heavy gauge crimped and soldered.

Programming: PC based free to download, all possible options. This is a very technical programming tool that allows PC control, several different input control devices (including Radio Control) and logging information options in real time while in use on a laptop.

Motors: AMT 24V 8.5mph, 130Amp stall at 22V. Running on 45V so stall current up around 240 Amps, and RPM doubled to achieve 16mph. Limited to 150A / 45v by Roboteq/software/ [Custom script/code](#) and external current sensors.

Lights: LED rear, LED bright driving lamp front.

Radio Control: JR 12X transmitter, converted to DSMX, and power output increased from RF out of 100mWatt to 3200mWatt. RC receiver is DSMX Spektrum AR10000 with 3 satellite DSMX additional receivers located in rear lights, seat back, seat tray front edge. Approx 4 miles line of sight range or at least half mile in and around vehicles and buildings. RX powered from Roboteq 5v directly, and 3 channels used. One for emergency RC switch to stop the chair via main battery contactor if required. 2 used for control. RX switched on off from control pod. Failsafe on encoded RF signal loss, stops chair fast.

More info: www.wheelchairdriver.com/BM-MK3-lithium-fast-powerchair.htm

Construction: www.wheelchairdriver.com/BM3-construction/

Forum: www.wheelchairdriver.com/board/