

The background features a series of vertical stripes in shades of green and blue on the left side, transitioning into a clear blue underwater scene with sunlight filtering through the water on the right side.

BionX

Intelligent Mobility™

Technical Training

Trouble Shooting: Procedure, Tips and FAQ

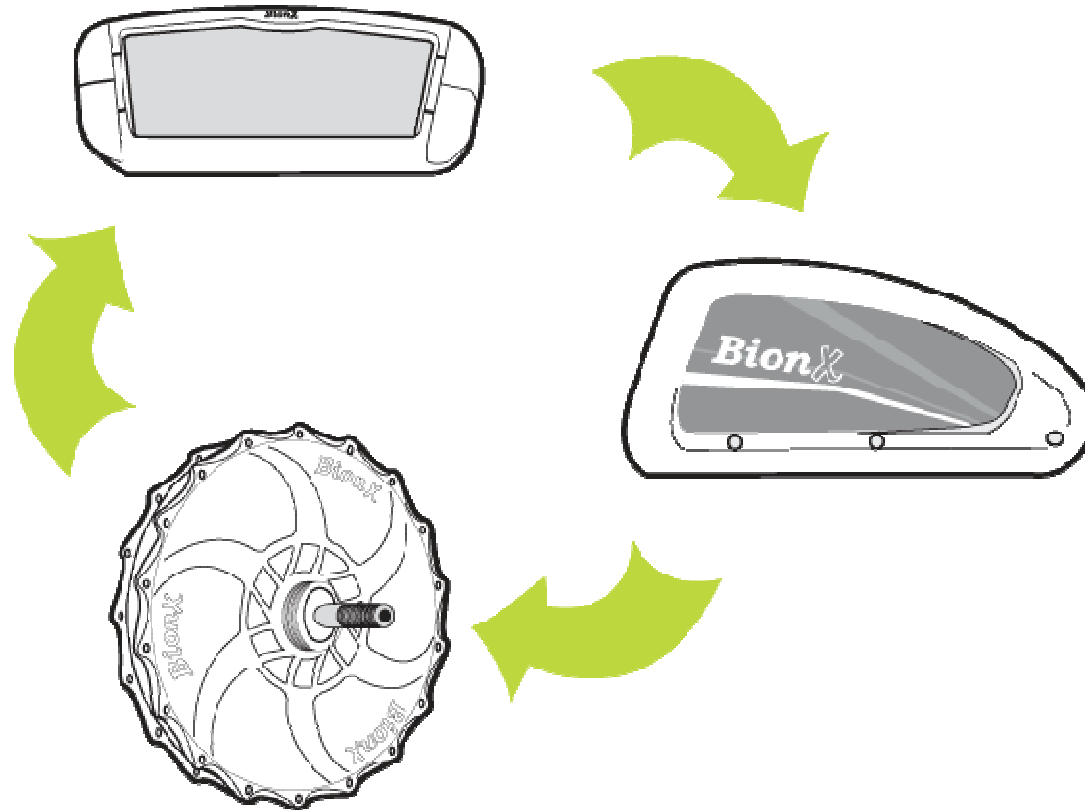
Agenda

1. Trouble Shooting Overview
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 2. Console Diagnostic Mode and Error codes
 3. Multi Tester
 4. Battery Wake-Up Tool
3. Solutions
 1. Console Programming Codes
 2. Battery Recovery
 3. Charger Reset
 4. Compatibility Info
 5. DC Out Parameters
4. FAQ

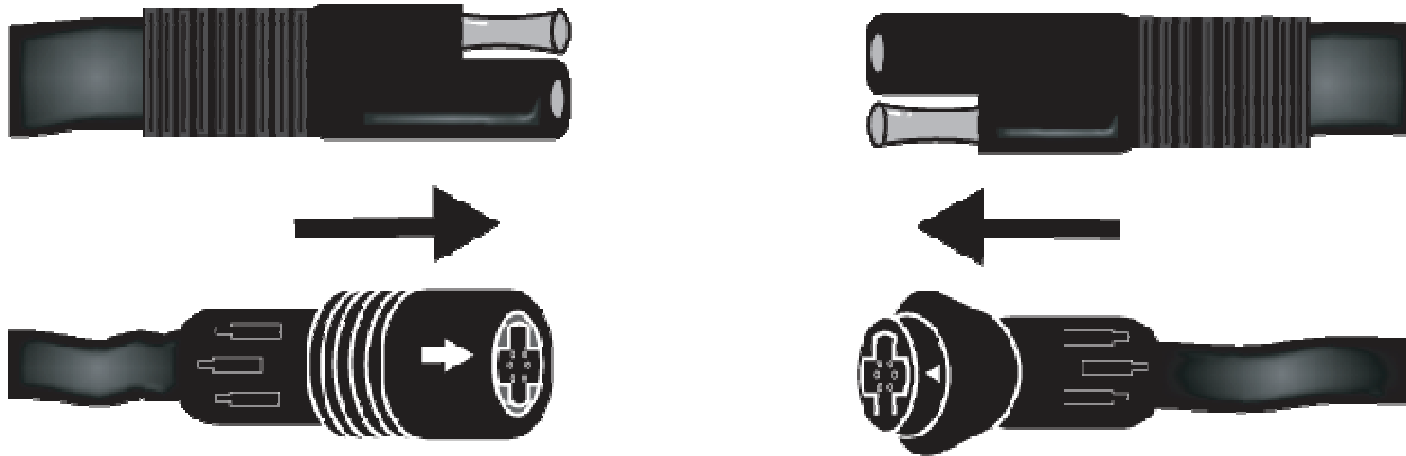


Overview

Troubleshooting



- ☑ Our simple 3 part system makes troubleshooting easy.



Always check, and double check all connections before troubleshooting.

- Motor power and communication
- Console communication
- DB7 battery connector
- Console pins

Console Pins

Initial Production



RHB (right hand brake)

Current Production



LHB (left hand brake)

The G2 console was manufactured with 2 different connector pin configurations, so be aware that they are not all directly interchangeable.

Console mount #01-3328 is available for order seperately, but only in LHB.

Basic Troubleshooting

- ☑ Does the system turn on?

If not, it is likely that there is a battery/console problem. You will not be able to use the BBI unless the system powers up.

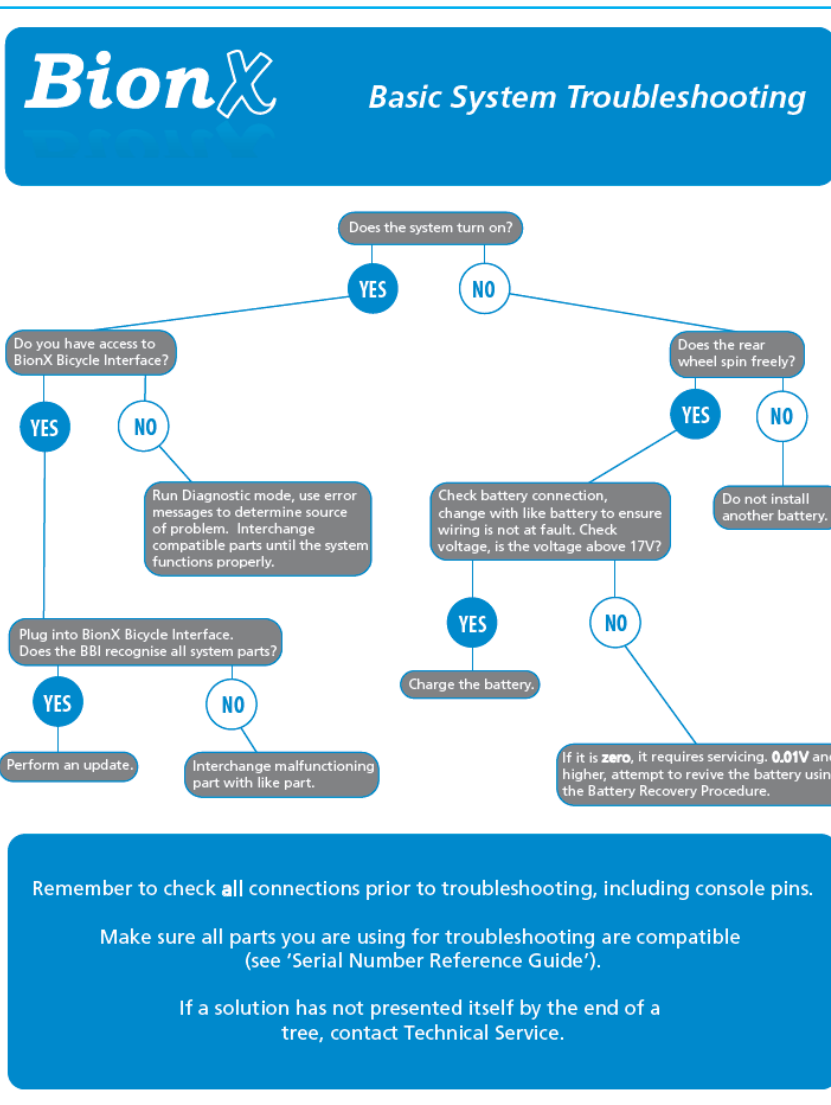
Does the rear wheel spin freely?

- ☑ If not, the motor could be the cause of the battery problem.

Do not install another battery.

Even without the BBI, you can simply interchange parts to troubleshoot the system.

Basic Troubleshooting



This flow is the best for quickly getting to the root of any BionX issue.

You can find this chart in the Tech document library in a printer friendly version.



Tools

BionX Bicycle Interface

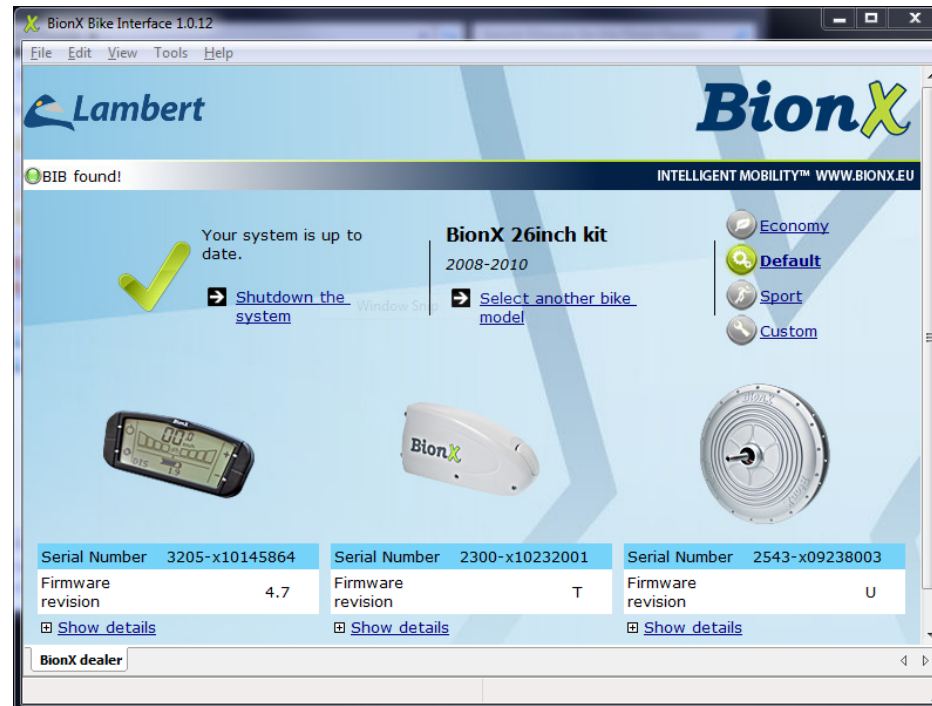
- ☑ The BBI is a useful troubleshooting tool.

Not only do firmware updates solve software issues, but the BBI also helps you determine when a specific part is not communicating properly.

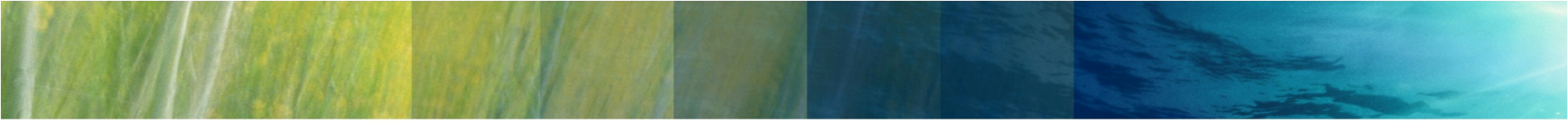
BBI only functions with CANbus systems.



BBI Troubleshooting



- ✓ When the BionX Bicycle Interface (BBI) is unable to communicate with a part, it will indicate that part is missing.
- ✓ Attempt to interchange the part with a like part. If the system functions normally, you know the part you removed is defective.



If you can't use diagnostic mode or the BBI to help you,
start with swapping what is easy:

- Console
- Battery
- Harness (no need to install on the bike)
- Motor (again no need to install)

Diagnostic Mode



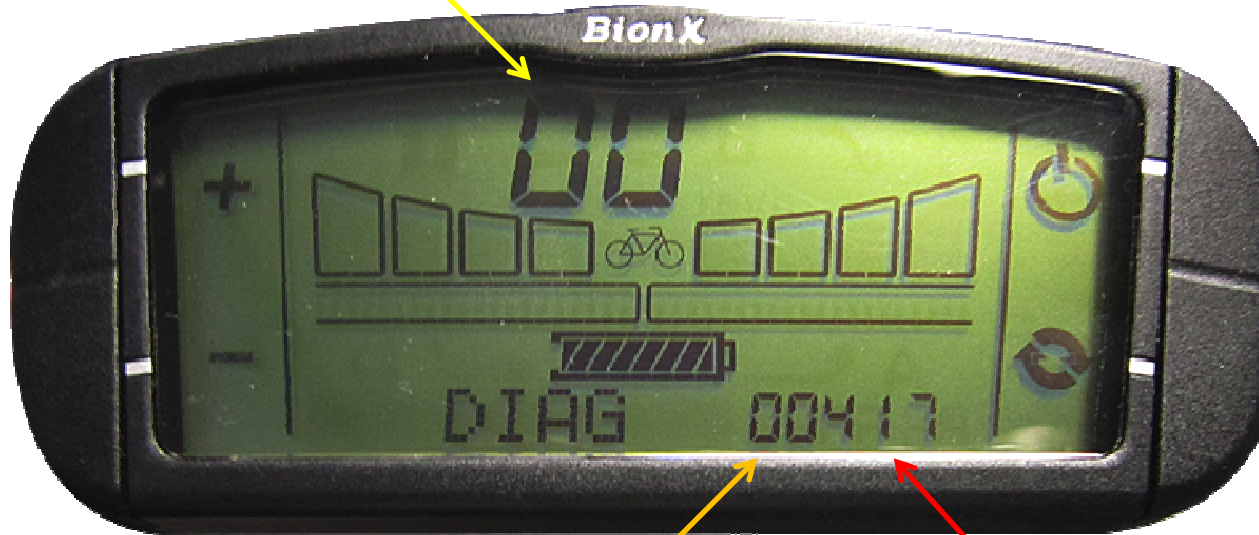
To open diagnostic mode, enter code '**3772**'.

Turn off the system or re-enter the code to exit diagnostic mode.

Occasionally, when the system is turned off in diagnostic mode, the battery will beep intermittently. Simply enter and exit diagnostic mode once again.

Diagnostic Mode Readings

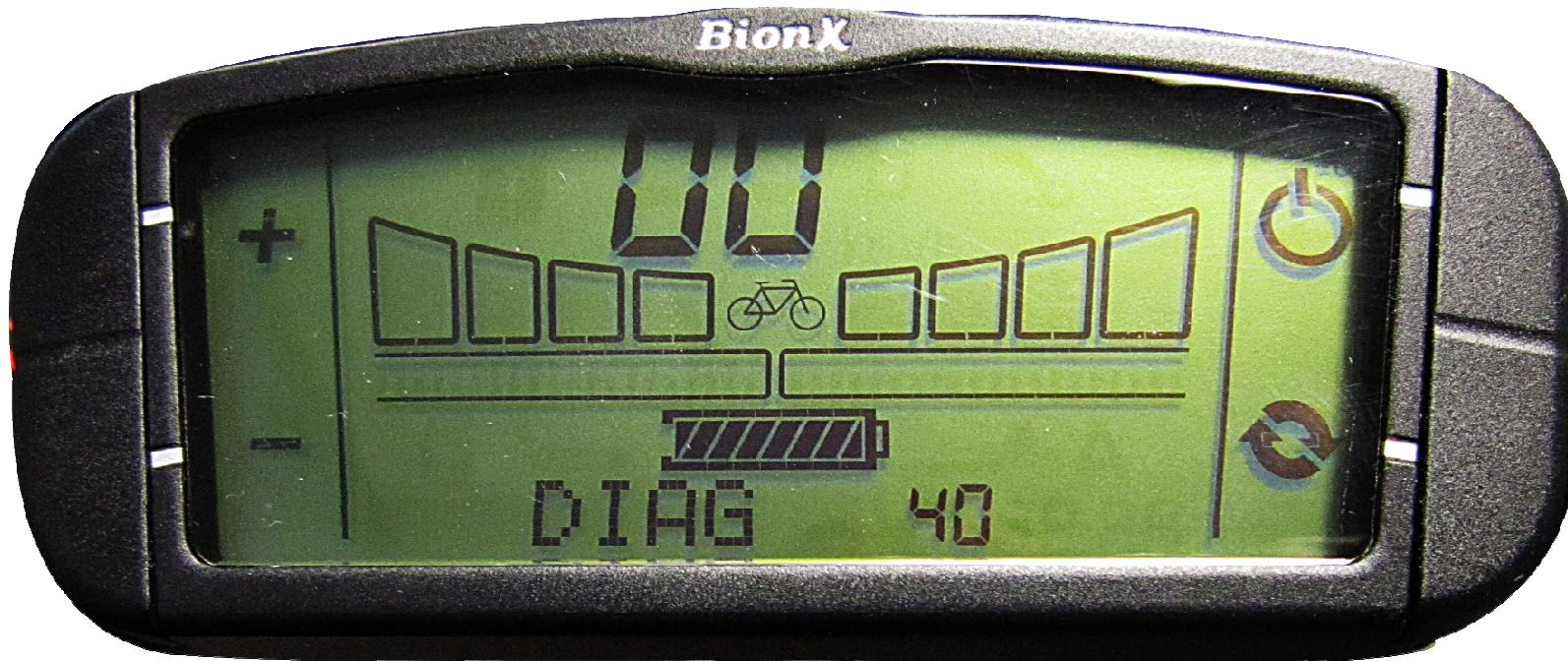
Gen Mode Setting
(when brake lever is pulled)



Strain Gauge Reading
(apply pressure to pedal)

Battery Voltage
(currently 41.7V)

Error



Error messages will automatically display (in this case no motor communication).

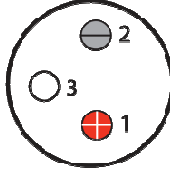
These messages can be used to identify a loose connection or a malfunctioning part.

BionX Error Messages

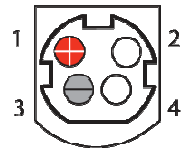
Code	Description
20	Battery_ERROR_VCTRL - smc cannot power motor
21	Battery_VPRCH - smc precharge failed
22	Battery_ERROR_RELAY - mosfets/relay not working, does not apply to smc 5
23	Battery_ERROR_BMS -Battery management system - battery overheated/voltage too low/high
25	Battery_ERROR_LOWBATT - voltage low
26	battery_ERROR_NOTPRESENT - no communication between console and battery
27	Battery_ERROR_REAL_TIME_CLK - RTC not detected
28	Battery_ERROR_DC-DC/Accessory Output - not connected
40	MOT_NOT_PRESENT - no communication between motor and console
55	MOT_NOT_PRESENT - no communication between motor and console

Measuring Battery Voltage

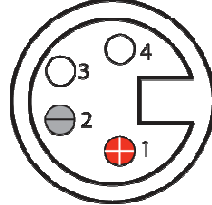
Charger Ports



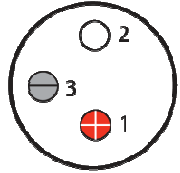
24V NiMh XLR
Max. 27V



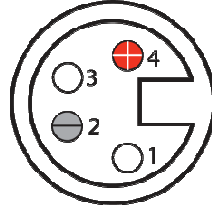
22.2V Li-Mn Kycon
Max. 25.2V




26V Li-Mn XLR
Max. 29.4V




36V NiMh XLR
Max. 40.5V



37V Li-Mn XLR
Max. 42V

Positive (Red) probe: 

Negative (Black) probe: 

Set Voltmeter to: \bar{V} (direct current DC)



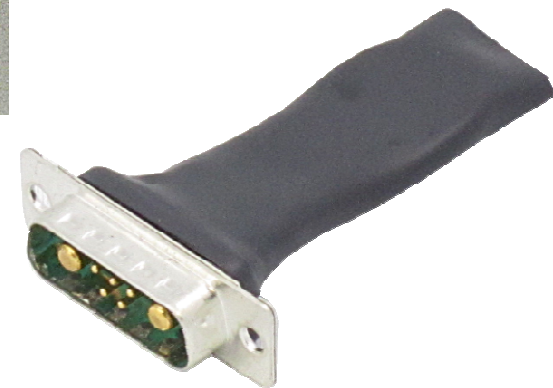
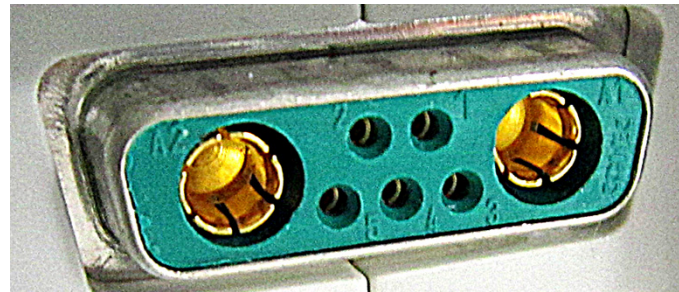
Charger Ports shown female side as if battery were placed on level surface.

To measure voltage from 22.2V Li-Mn battery with Kycon Port, XLR to Kycon adaptor part #01-3266 is strongly recommended



Battery “Wake Up” Tool

- ✓ The battery wake up tool is used to check if the battery fuse and board are working. When functioning normally, the battery will sound 4 beeps, just like a regular regular startup. Use this, rather than a multimeter, to check if a 48V battery is functioning.

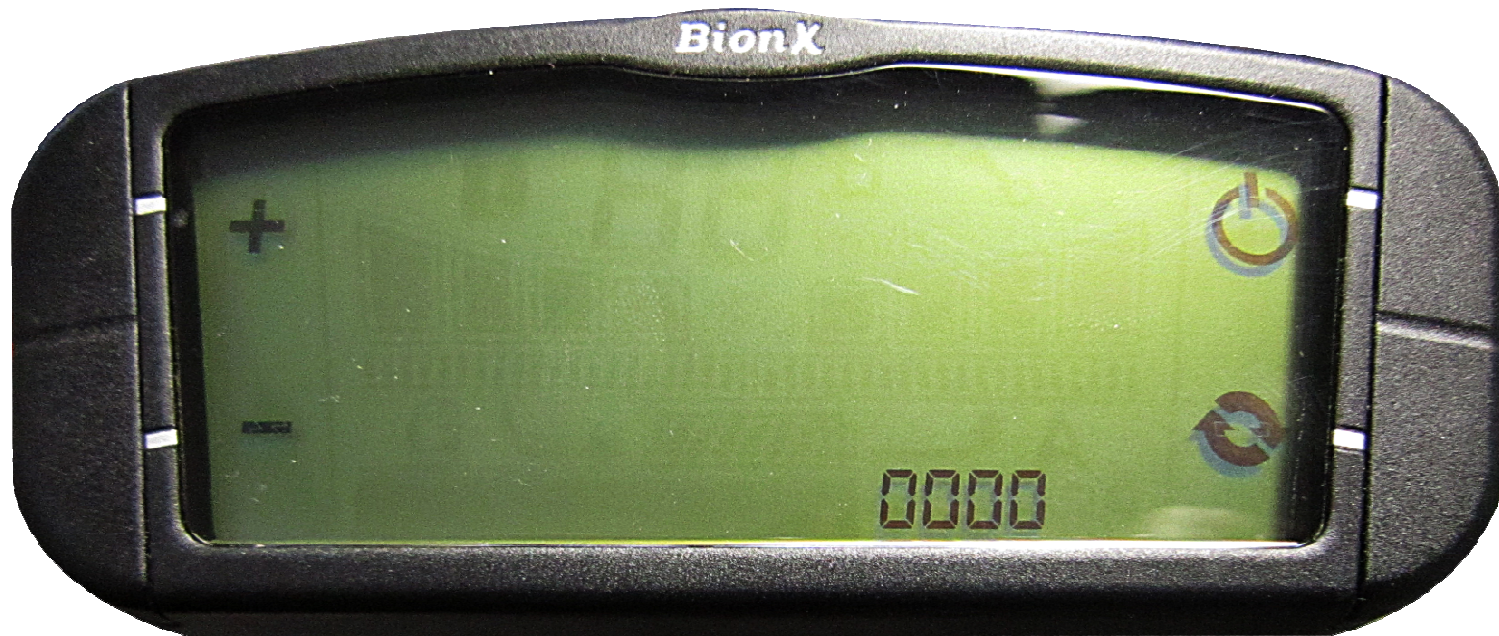




Solutions: not all problems are faulty parts

Codes

Press '**Power**' and '**Cycle**' simultaneously for 3 seconds.



To change entry, press '+' or '-'. To move between numbers, press '**Power**' to move right, '**Cycle**' to move left.

Codes

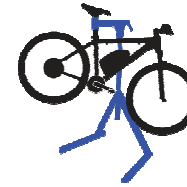
Code	Description
0001	Console Firmware Version / Serial Number
0002	Battery Firmware Version / Serial Number
0003	Motor Firmware Version / Serial Number
0007	Strain Gauge Gain (amplifies assist at all times) 1.0 low to 4.0 high
0008	Gain Assist A: amplifies assist from dead stop -1.0 low to 4.0 high, only up to B Gain Assist B: speed up to which A applies.
0009	Strain Gauge Sensitivity, eliminates ghost noises, 0 = Low to 11 = High
1234	Strain Gauge Filter 1=slow response 5=fast
1976	Motor Direction 1 = Forward 0 = Reverse
2001	Select unit of measurement KM or Miles
2002	Generative Braking Scale (for reed switch) 0 - 64 (set 30 to 40)
2004	Clock Adjust
2005	Set Wheel Size (millimeters)
2006	Toggle Brake Sensor On or Off (NC=Normal Closed ((functioning)) NO=OFF)
2009	Reverses (flip) Mode/Cycle and Plus/Minus 0= mode left side 1= mode right side
3771	Set Wheel Size (same as 2005)
3772	Enter diagnostic mode, (check voltage, strain gauge and display error msgs)
3773	Display Max Speed
3775	Throttle Configuration, stops throttle engagement at certain speed
3776	Minimum speed motor will start (default is 0.5km/h)
5000	Full system reset, entering this will render console useless DO NOT USE

Recovering A Battery

BionX batteries must be charged at minimum every 3 months.
A BionX charger will fail to recognise a battery that has fallen below 17V.
This method defines the process to recover a 'deeply discharged battery':

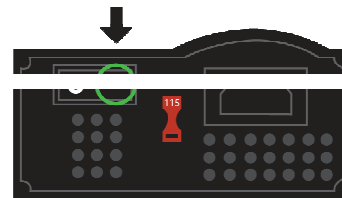
1.

Begin by loading the bicycle with battery installed onto a bicycle repair stand.



2.

Plug the appropriate charger into the battery, then into wall outlet.
Turn on the charger.



3.

Hand pedal the bicycle crank, you will notice the console flicker, a few battery beeps, then the yellow LED on the charger will light.
Allow the charger to complete its normal charging cycle.



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Resetting a charger

To reset the charger, first ensure it is turned off. Then, disconnect the charger from the battery and the wall outlet, wait ten seconds, then reconnect.

Turn the charger back on, and watch for the yellow light to turn on, this should happen within 15 seconds after the red light turns on. The charger is now functioning and has been reset.



DC Output

DC output ports are available on the new flush docks, and come standard with all RR systems. RR systems are 6 Volt DC only.

6 Volts DC

Max. Output: 2 amps

Maximum Power Output: 12 watts

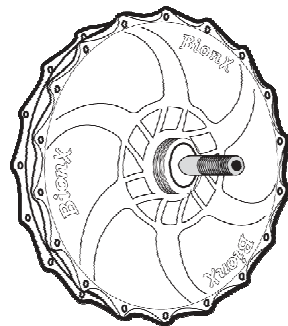
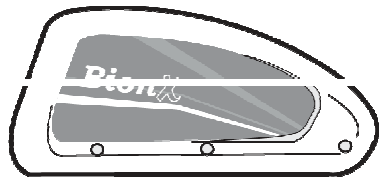
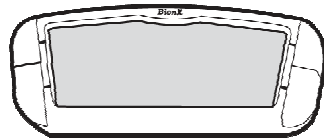
12 Volts DC

Max. Output: 2 amps

Maximum Power Output : 24 watts

Serial Number Compatibility

The first four digits of a serial number typically represent these part numbers.



CAN-bus

I²C

2331 to 3721	2040 and earlier
2295 to 3092 and 3350 to 3900	1060 to 2245 and 3093 to 3116
2274 to 2293 2529, 2531 to 3554	1501 to 2112 and 2512 to 2530 except 2529

Motor/Battery Compatibility

- ✓ **22.2V** and **26V** batteries are only compatible with **250** watt motors.
- ✓ **37V** batteries are compatible with **350** watt and **500** watt motors.
- ✓ **48V** batteries are only compatible with **350** watt **G2** motors.

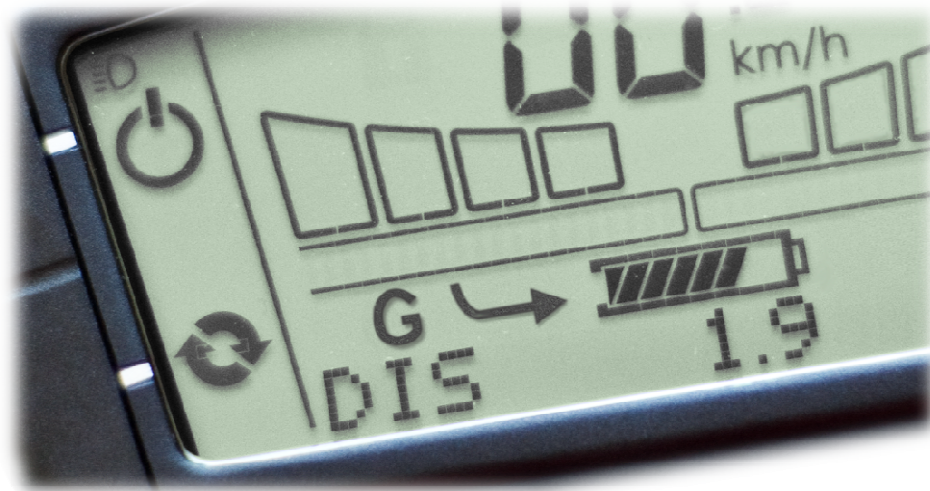
Any CANbus battery can be substituted for another for troubleshooting purposes. Riding with the wrong battery can damage the system.

G2 Consoles and throttles are completely interchangeable with CANbus systems.



FAQ: Top Ten

Top Ten Troubleshooting FAQ



- ✓ *Why is my BionX console stuck in “generate” mode?*
The sensor is too far away from the magnet. Move it just close enough to the magnet, (approx. 5mm) so that it doesn't turn on generate mode unless the brake lever is pulled slightly. If this does not solve the problem, the reed switch can be unplugged anytime on a ride, and should be replaced as soon as possible.



Is it possible for the battery to seriously hurt me if I work on it?

The warranty from BionX will be voided if a battery is opened without permission from our technical service department.

Even though BionX Li-Mn batteries, at 48V or less, are known to be one of the safest chemistries available, BionX prohibits unauthorised altering or repair of BionX batteries.

FAQ



✓ *Why does my battery beep intermittently?*

It is most likely stuck in diagnostic mode, even after a shut off this can occur. Simply enter diagnostic mode, then re-enter the code to exit. Longer beeps may indicate the battery needs a charge.

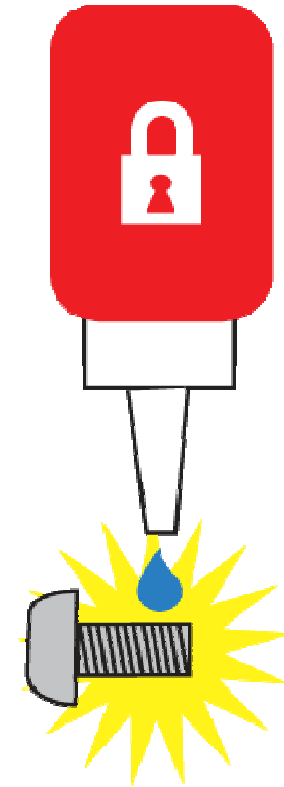
FAQ

- ☑ *I try to remove a downtube battery and it won't come off, what's the problem?*

It's possible that the bolts that secure the battery harness to the frame have come loose over time.

BionX strongly recommends the use of thread locking compound on these bolts when installing.

To remove the battery, with permission of the technical service department, you can open the battery case and it will be freed.



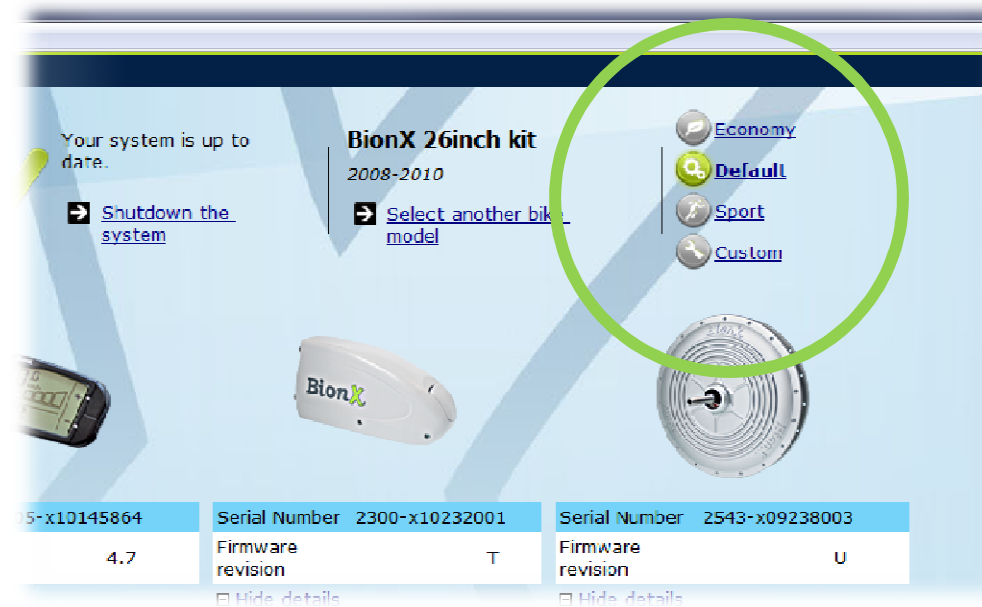
FAQ



✓ *The charger is installed correctly, why won't my battery charge?*

Check the battery voltage. If the system will turn on, enter diagnostic mode. Alternatively, use a voltmeter. If it is below 17V, you have a deeply discharged battery that requires use of the battery recovery tool. If it reads zero, a fuse is blown and there may be further issues with your motor or battery. Check to see if the wheel spins freely, if not there is a problem with the motor as well.

FAQ



✓ Why doesn't my system give a lot of assistance?

First use diagnostic mode to check and make sure you have optimum battery voltage. Check to ensure the axle notch is facing towards 6 o'clock, and the axle nuts are tightened to 40Nm (30 lb-ft).

Another option would be to use the BionX Bicycle Interface to set the system to 'sport' mode for more assistance, or manually increase the strain gauge sensitivity.

FAQ

☑ *I've had a kit for years, taken care of the battery and barely used it. Why don't I get the same range?*

Whether a battery is used or not, its capacity will be depleted over time. Our new 48V battery has a revolutionary new battery management system (BMS) that will keep our batteries performing longer than ever.



BionX

FAQ



✓ *Can I alter my BionX kit in order to go faster than 32 Kph (20mph)?*

Legally we cannot allow customers to use our product beyond what legislation dictates as safe.

For the future of the electric bicycle's reputation as a safe and respected form of transportation, our systems can not be altered after they are shipped from our factory.

FAQ

- ☑ *Why don't I see a countdown when I turn on my system/why am I not getting any assistance at all?*

This is typically a sign that there is no communication/power between the motor and the rest of the system. Check to see if your communication and power cables are connected properly.



FAQ



- ✓ *Can I replace the axle in my BionX hub?*
The motor must be returned to BionX for any type of service involving the axle or bearings.

FAQ



- ☑ *The battery reads full voltage (and/or the charger light is green), but the gauge on the console does not read full.*

BionX batteries need to be fully cycled on occasion, chances are this user has had a lot of partial charges and the sensor has lost track. A discharge/recharge will reset the digital circuit in the battery. Try fully depleting the battery and then charging, let it cool down for an hour, and then charging again.

This is the preferred method of repair, but as a last resort you can manually reset by holding the mode button for 30 seconds. The console backlight will flash on and off slowly, then very quickly and the gauge will reset. **Do this only after attempting the drain**, holding mode will only temporarily solve the problem if the drain is not attempted.



Thanks