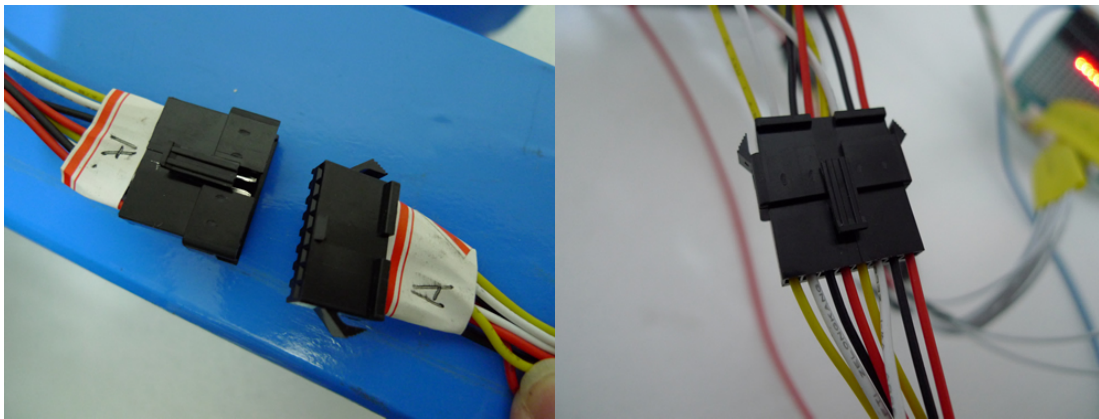


Guide for V2.5 Packs

From Jan 2010, we added external connectors for balance/sense wires between the cells and the BMS like the picture below.

First, please plug all of the matched pairs of multi-pin connectors together before charging or discharging it!
If your battery pack is made split into two or more parts, please go to Appendix in Page 7 first!



Wiring of Charger Plug (10A or lower output)

From August 2009, we started to use 3 prong XLR connectors as follows. The male connector on the left hand is from the charger. The female connector on the right hand is from the battery pack.



Polarities of the Connector (face to the connector):

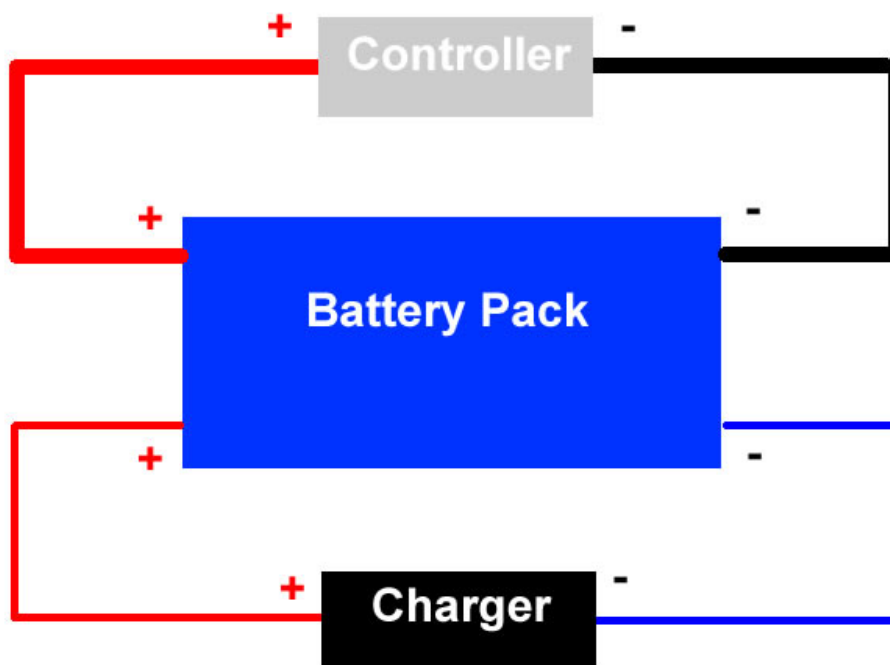
- Pin 1 “+”
- Pin 2 “-”
- Pin 3 Empty

Caution: Please make sure the polarity of the charger connector is corresponding to your battery box or battery pack, positive to charging positive, negative to charging negative. Any mistakes might destroy the battery pack.

Wiring of Battery Output

- Large RED Wire : "+" for discharge
- Large Black Wire: "-" for discharge
- Small RED Wire: "+" for charge
- Small Blue wire: "-" for charge

Wiring



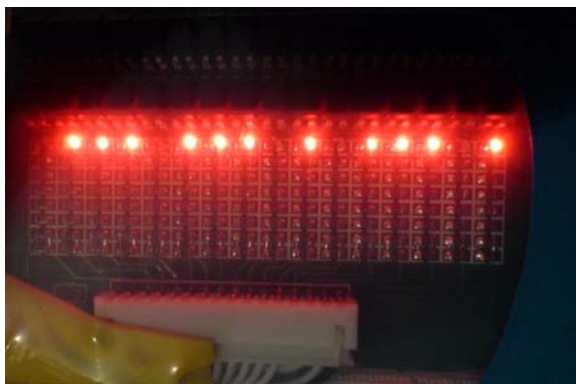
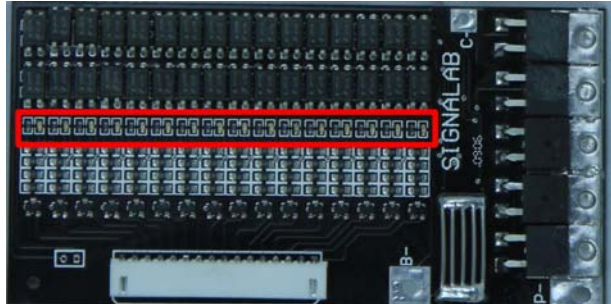
Caution: Please be very careful when connecting these wires to your battery box or electric vehicle. If you don't understand how to connect them, please send mail to pingping227@hotmail.com. Any mistakes in this progress might destroy the battery pack.

Balance

There're some red LEDs (lights) on the BMS.

Numbers of red LEDs on the BMS:

- 12V pack – 4 red LEDs
- 24V pack – 8 red LEDs
- 36V pack – 12 red LEDs
- 48V pack – 16 red LEDs
- 60V pack – 20 red LEDs



When the pack is being charged and nearly full, the LEDs on the BMS will light up one by one randomly. At that time they're being balanced.

When all of them light up, the pack is fully charged and balanced. After that, if you disconnect the charger, the LEDs could be still on or blinking. That's normal. You don't need to wait for them to be off

and can use the pack immediately.

Sometimes, one or two LEDs couldn't light up at same time as the rest, because the cells cannot be fully matched. That's also why we need the BMS to balance the cells. If you charge the pack longer, the LED could light up finally like others. If it doesn't light yet, please just use the pack as usually. If you don't lose any capacity from the pack, please don't worry about the LED. The cell group with the LED could just have higher capacity than the rest.

Those LEDs only light up when the battery pack is nearly fully charged. None of them can light up at the beginning of the charge if the pack is not full.

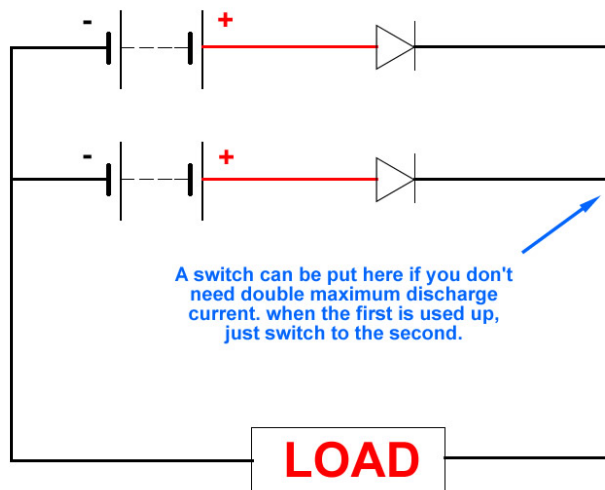
Caution: If any of the LEDs on the BMS light up permanently (charger is not connected) and never go off, the BMS should have problem. Please disconnect the black multi-pin connectors immediately (in this way, the problematic LED will be turn off) and then send email to pingping227@hotmail.com.

How to connect multiple battery packs in parallel

Diodes need to be added in the circuit to avoid current between the battery packs, because one pack could charge the other if there's voltage difference.

- Current rating of each diode = maximum current of the individual battery pack.

Connections in parallel



Diodes in this scenario will consume power when the battery packs are working.

PingBattery supplies suitable diodes. Just contact pingping227@hotmail.com.

If you don't want to use the diodes, it's feasible.

However, please make sure these two packs are in same charge level when you connecting them in parallel.

For example, if one pack is 50% charged and the other is 90% charged, the 90% charged pack will charge the other pack when you connecting them in parallel. The charging current in a short period of time could be huge and harmful to cells in both packs.

The easiest way to avoid it is to fully charge both packs before connecting them.

Also, please disconnect the packs when they're charged, although they're charged through a separate pair of wires, because one pack could be charged higher than the other. If they're connected together in parallel, the higher pack will charge the lower through discharge wires. Furthermore, if some of the cells in the lower pack have been full, they could be over-charged by the higher pack, because there's no over-charge protection on the discharge wires.

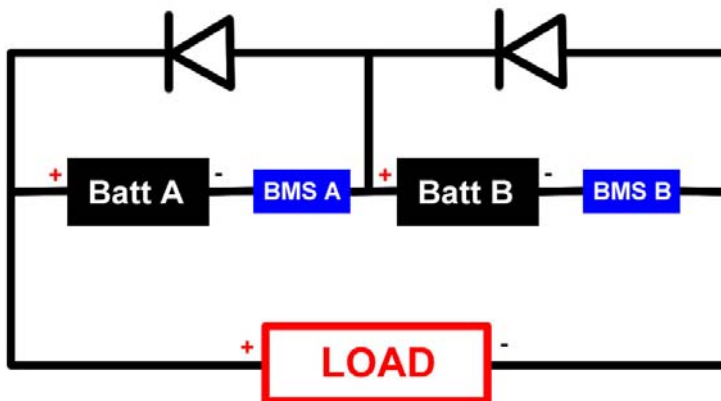
How to connect multiple battery packs in series

Diodes need to be added in the circuit to protect the BMS

- Voltage rating of each diode = maximum voltage of the battery pack
- Current rating of each diode = maximum current of the system

Diodes for Packs in Series

PingBattery.com



Diodes in this scenario don't consume power when the system is working.

PingBattery supplies suitable diodes. Just contact pingping227@hotmail.com.

Care

Charge Temperature Range	0~45°C
Discharge Temperature Range	-20~60°C
Short Period Storage Temperature	-10~45°C
Long Period Storage Temperature	0~30°C (1 month)

The battery cells inside the pack are foil pouches. Vibrations or shocks could affect them. We recommend pad some soft materials under the battery pack in the battery compartment, case or bag against vibrations.

Storage

If the battery pack won't be used for longer than one month, please charge it before storing it. The best charge level for storage is around 50%. However, it's hard to control if you don't have suitable monitoring equipment. If you don't have a Cycle Analyst or Amp Hour meter to monitor the charge level when charging the battery pack, we recommend you fully charge it or charge it until some of the red LEDs on the BMS light up.

We recommend check its voltage at least one time every month. If voltage is lower than its nominal voltage, please charge it.

Nominal voltages:

12V pack – 12.8V	24V pack – 25.6V	36V pack – 38.4V
48V pack – 51.2V	60V pack – 64.0V	

Caution: If you don't have the chance to check its voltage every month, please disconnect the black multi-pin connectors before storing it.

Caution: In order to keep the best chemical condition of the battery pack, we recommend charge and discharge it for at least one full cycle every month if it's not used. If it's not convenient, please do that every 3 months. Or, the performance of the battery pack will be significantly reduced permanently.

Regenerative Brake Controller

The battery pack can be connected to a Regenerative Brake Controller directly.

A regenerative brake controller usually charges the battery pack through the discharge wires. However, there's no over-charge protection on the discharge wires. Actually, it's not a problem. Just don't ride the bike downhill for long time right after a full charge. Or, the cells could be over-charged.

Actually, it also makes sense to other battery technology, even if that battery has over-charge protection on discharge wires, unless the regenerative brake controller has protection function to switch off the regenerative power for a full battery. If you ride downhill for long time with a fully charged battery and if the regenerative power cannot be turned off, either the battery or the controller would be damaged by the regenerative power.

Tips

- It could take more than 10 hours for the first charge. Red light of the charger turns to green, and then turns to red again after a while, again and again. It's normal. The charger is balancing the battery cells in that period of time. If the battery pack works properly, please ignore the light on the charger. You just need to check the LEDs on the BMS to see if the battery pack has been fully charged.
- The battery pack's capacity will be activated to its full capacity after 3 to 5 cycles. Before being activated, it seems to have around 90% of its full capacity.

Appendix: Guide for Split Packs

September 2011

By default, our 36V30Ah, 48V20Ah, 48V30Ah packs, some 60V packs are made into two parts or more for safe shipping, because they're too big and 60V voltage is not very safe during the shipping and handling.

Also, some customers prefer making the battery pack into two or more parts for special mounting, such as balancing the weight or putting the battery into two or more compartments. We have made many such two part packs on other voltages, such as 12V, 24V, 36V and 48V.

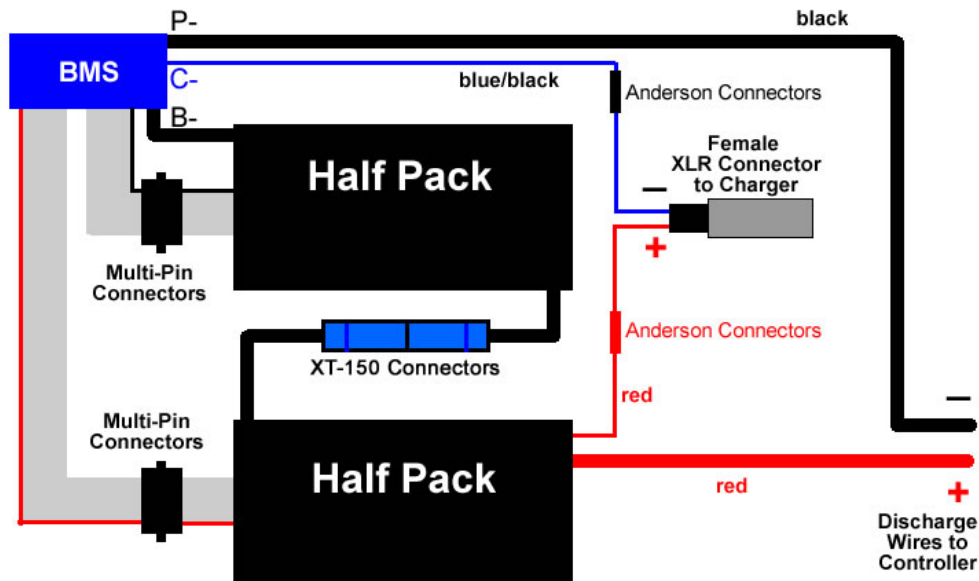
For those battery packs that are made into two parts, this is a very important guide for users to wire them and maintain them to avoid potential problems, since the structure of this kind of battery packs is a little different.

Please pay attention that the two halves of the battery pack are not two battery packs. Logically and electrically, they're one standalone battery pack, because there's only one BMS that controls both parts.

Please don't discharge them separately or charge them separately.

Any questions or problems with the battery pack, please feel free to contact us at pingping227@hotmail.com.

Wiring of Split Packs 2011Q3



When you open the package, you can see the following parts to combine a complete battery pack.

- Half Pack with BMS. There's a big wire between the half pack and the BMS. There're a bunch of small sense wires with black female multi-pin connector and a big black wire with big XT-150 single pole connector coming out from this half. There're two black male multi-pin connectors coming out from the BMS. There're also one big black wire without any connector and one small blue/black wire with small 45A single pole Anderson connector coming out from the BMS.
- Half Pack without BMS. There're a bunch of small sense wires with black female multi-pin connector and a big black wire with big XT-150 single pole connector coming out from this half. There're also a big red wire without any connector and a small red wire with small 45A single pole Anderson connector coming out from this half pack.
- Charger Cable. A pair of small red and blue wires. One end of the cable is a female 3 prong XLR connector. The other end is a pair of small red and black 45A single pole Anderson connectors.

Before connecting them, please make sure they're not connected to anything else.

Here're the order we recommend to connect them together,

1. Plug the big XT-150 connectors on the two big wires from the two half packs. Please make sure they're connected tightly. We recommend you cut off these big XT-150 connectors to completely solder these two wires if you won't take the two

halves apart frequently. In this way, many potential problems would be eliminated. If you prefer these XT-150 connectors, we recommend you wrap them together tightly with straps or other stuff.

2. Plug the black multi-pin connector (Marked "B") from the half pack with BMS to the corresponding black connector from the BMS.
3. Plug the black multi-pin connector (Marked "A") from the half pack without BMS to the corresponding black connector from the BMS.
4. Regarding the charge cable, it's not important when to connect it. It's just a convert cable between the battery pack and the charger.

If you want to take the two parts apart and disconnect all the wires and connectors, here's recommended order,

1. Unplug the black multi-pin connectors marked "A".
2. Unplug the black multi-pin connectors marked "B".
3. Unplug the big XT-150 connectors between the two half packs or de-solder the two big black wires between the two half packs.

Important Notices for Split Packs

- When the whole battery pack is connected to the charger, motor controller or other load, please don't disconnect the big XT-150 connectors or the two big black wires between the two half packs.
- Even if the whole battery pack is not connected to anything, we still don't recommend disconnect the big XT-150 connectors or the two big black wires between the two half packs when all the black multi-pin connectors are connected.
- Please don't discharge the two half packs separately or charge them separately.
- If there's any red LEDs on the BMS always lighting (lighting for more than 2 hours after charger is disconnected), please disconnect all the black multi-pin connectors and contact us immediately.

E-mail address: pingping227@hotmail.com