

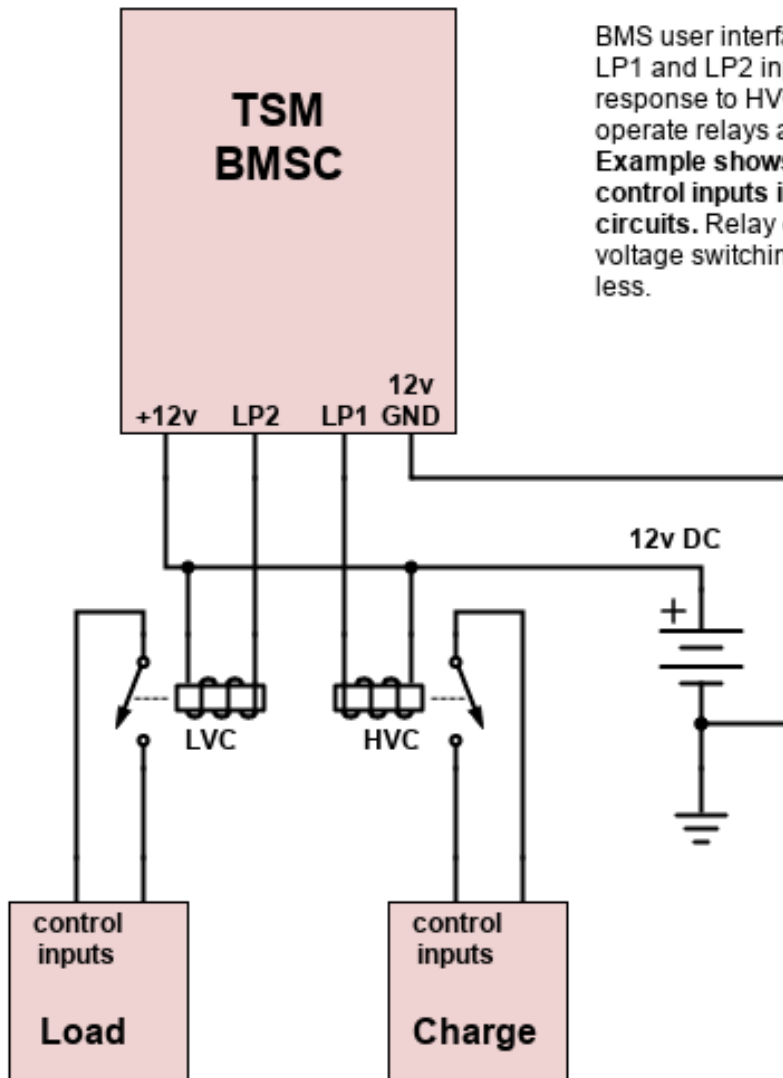
# ThunderStruck Motors BMS External Switching

Notes for customers with external charge switching requirements - July 2022

## BMS Loop Controls

BMS user interface: "enable loopoc" This turns the LP1 and LP2 inputs into switches to ground in response to HVC and LVC conditions, and can operate relays as shown.

**Example shows relays switching low voltage control inputs in the charge and discharge circuits.** Relay contacts rated for low current low voltage switching. 12v coils rated for 200 ma or less.



## BMS Settings

Putty Interface:

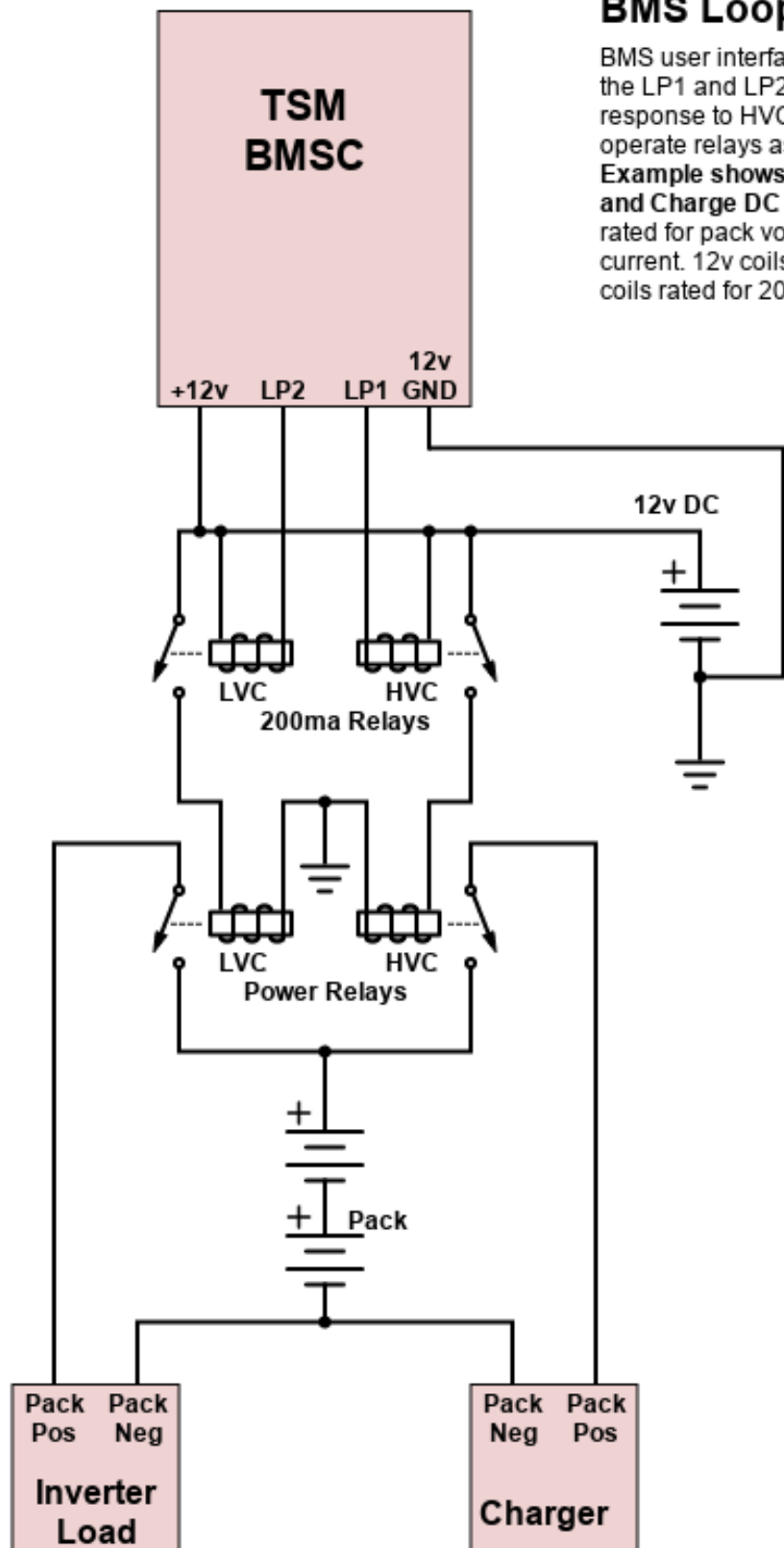
```
enable loopoc  
set hvc x.xxx  
set lvc y.yyy
```

```
set hvcc x.xxx - 0.1  
set lvcc y.yyy + 0.1  
(these prevent relay  
cycling)
```

## BMS Loop Power Interrupts

BMS user interface: "enable loopoc" This turns the LP1 and LP2 inputs into switches to ground in response to HVC and LVC conditions, and can operate relays as shown.

**Example shows direct control of pack Load and Charge DC circuits.** Power relay contacts rated for pack voltage and charge or load current. 12v coils. Relays controlled by BMS have coils rated for 200 ma or less.



## BMS Settings

Putty Interface:

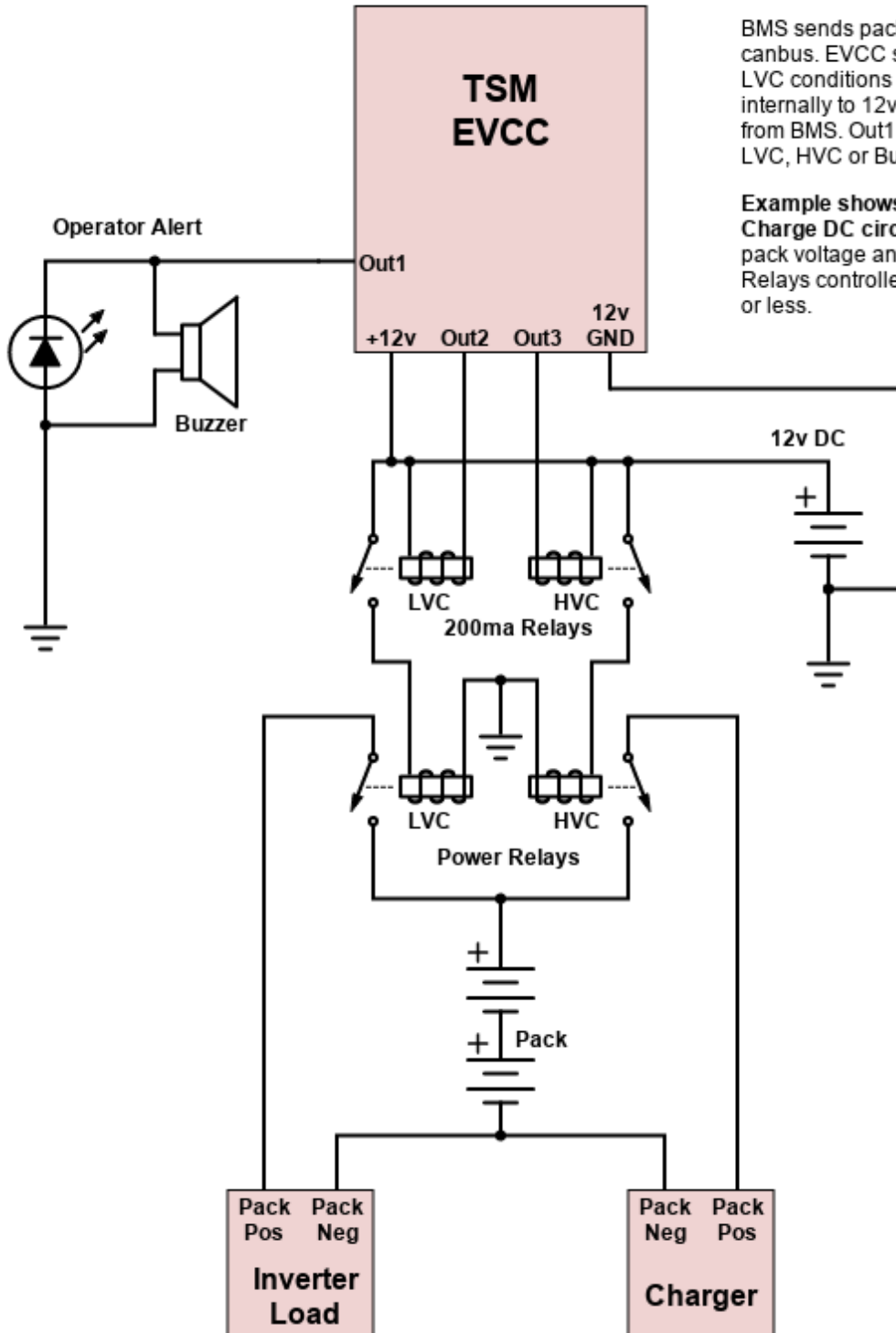
```
enable loopoc
set hvc x.xxx
set lvc y.yyy
```

```
set hvcc x.xxx - 0.1
set lvcc y.yyy + 0.1
(these prevent relay cycling)
```

### EVCC Output Power Interrupts

BMS sends pack status messages to EVCC via canbus. EVCC set to control outputs for HVC and LVC conditions using Out2 and Out3 which connect internally to 12v ground on LVC and HVC reports from BMS. Out1 is an optional operator alert set to LVC, HVC or Buzzer.

Example shows direct control of pack Load and Charge DC circuits. Power relay contacts rated for pack voltage and charge or load current. 12v coils. Relays controlled by the EVCC are rated for 200 ma or less.



### EVCC Settings

Putty Interface:

- set bms bmsc
- set out1 buzzer
- set out2 lvc
- set out3 hvc