

ThunderStruck Motors VCU v3.1.7 Feature List – March 2021

Refer to the Vehicle Control Unit (VCU) Manual on our website for detailed instructions:

http://www.thunderstruck-ev.com/images/companies/1/DD_VCUv3.1R3.pdf

The v3.1.7 VCU release includes the following features:

- Controls UQM, UQM Coda and Nissan Leaf motor inverters (2011-2017 Leaf)
- Software feathered throttle with seamless regenerative braking
- Throttle on start protection
- Throttle mapping for torque slope control
- Forward/Neutral/Reverse feature with in-motion protection against direction change
- 5 volt output for throttle sensor (pot or hall)
- Outputs for pre-charge and main contactors
- Brake light relay control during regenerative braking
- Reverse light relay control option
- Software settable canbus termination resistor (120 Ohm)
- Canbus and status tracing for debugging
- Simple command line user interface for Windows and Mac
- Throttle off/max voltage settings (thw1off/thw1max)
- Configurable torque: maximum (maxtorque), throttle regen (idleregen), brake (brakeregen)
- Acceleration Limiter (accellim) - torque change per second, "jerk" control
- Throttle zero torque position (deadspot) in percent of travel
- Torque taper (maxrpm torque, torquekneerpm) settings limit torque and current at high rpm
- Maximum pack voltage setting (regenmax) limits regenerative braking for charged packs
- Minimum pre-charge voltage setting (prechgminv) tested prior to closing main contactor

Initial Nissan Leaf Configuration Example:

```
show config
```

```
THROTTLE
```

```
  thtype  : hall
```

```
  thw1off : 0.10v  ** set to min throttle voltage **
```

```
  thw1max : 4.70v  ** set to max throttle voltage **
```

```
MAP
```

```
  range1  : 0..100% throttle => 0..100% torque
```

```
  deadspot : 30%  ** this is the throttle range used for variable regeneration **
```

```
BRAKE
```

```
  brtype  : switch
```

```
  brakeregen: 450.0Nm  ** reduce to 50 for bench testing **
```

```
MOTOR/INVERTER
```

```
  inverter : leaf
```

```
  maxtorque : 900.0Nm  ** reduce to 100 for bench testing, 1300 for max torque **
```

```
  maxrpm   : 10000
```

```
  accellim : 2500Nm/100ms  ** 4000 fast response, 500 slow response
```

```
  idleregen : 300.0Nm  ** reduce to 50 for bench testing **
```

```
  maxrpm torque : 150.0Nm  ** reduce to 50 for bench testing, set to 0 for max torque **
```

```
  torquekneerpm: 3000  ** set to 0 for max torque **
```

```
  prechgminv: 310.0V  ** set to minimum pack voltage **
```

```
  regenmax   : 410.0V  ** set to maximum pack voltage **
```

```
OPTIONS
```

```
  FNR      : enabled (Forward/Neutral/Reverse switch)
```

```
  canterm  : enabled (CAN termination resistor)
```

```
vcu>
```