The v3.1.2 VCU release includes the following features:

- Controls UQM and Nissan Leaf motor inverters (2013-2016 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
- 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)
- Throttle zero torque position (deadspot) in percent of travel
- Torque taper (maxrpmtorque, torquekneerpm) settings limit torque and current at high rpm
- Maximum pack voltage option (regenvmax) limits regenerative braking for charged packs
- Minimum pre-charge voltage option (prechgminv) tested prior to closing main contactor

The following user interface output is an example of the initial Nissan Leaf configuration:

```
*******************************************************
*       Vehicle Control Unit v3.1.2               *
*       Thunderstruck Motors / Dilithium Design   *
*******************************************************
show config

THROTTLE
  thtype  : hall
  thw1off : 0.75v
  thw1max : 4.59v

MAP
  range1  : 0..100% throttle => 0..100% torque
  deadspot: 30%

BRAKE
  brtype  : switch
  brakeregen: 450.0Nm

MOTOR/INVERTER
  inverter : leaf
  maxtorque : 900.0Nm
  maxrpm    : 10000
  idleregen : 300.0Nm
  maxrpmtorque : 150.0Nm
  torquekneerpm: 3000
  prechgminv: 310.0V
  regenvmax : 410.0V

OPTIONS
  FNR     : enabled (Forward/Neutral/Reverse switch)
  canterm : enabled (CAN termination resistor)
```