## NUSolarCANWatcher ReadMe

2/18/2015 7:35 PM

This document describes the NUSolarCANWatcher project contained in this zip file.

### Contents

* **Database.zip**  
  Contains the base NUSolarTelemetry database (.mdf, .ldf) files, table definition script, and stored procedure scripts. The table and stored procedure scripts can be used to re-create the database from an empty database.
* **NUSolarCANWatcher.zip**  
  Contains the shell of the CAN watcher process for the car-side of the system. The code loads the data field definitions from the database and creates a collection of data objects. It then initiates a timer that calls the procedure to obtain CAN values (to be completed) and after a pre-determined interval, calls the procedure to save the values to the database. The save to the database code will be included in a future update. For now, the values that would be saved are displayed in a grid in the application’s main form to assist in debugging the CAN interface.

### Notes

* The specific CAN tags must be defined for each of the fields the program will be watching. Right now they are defined as the same value as the tags that will be used to produce the message packet between the car and the “base station.” The CAN tags will come from the motor controller and BMS documentation as well as from those developers working on driver controls. They are assumed to be up to 8 characters (hex digits, most likely.) I have included a table at the end of this document of the fields to be collected from the CAN bus and the current value of the CAN tag. You will need to communicate with the electrical team to obtain the correct values. Once they have been obtained, we can modify the stored procedure that populates the field definition with the correct tag values. No VB code will be affected changes to the CAN tags as the code is data driven.
* To install, attach the database and load the project. It should run right away, although it is probably a good idea to re-compile the project.
* While you may be tempted, do not use this as the place you do your initial development of working with the CAN bus. That should be done as a small, separate program until you are sure you have the communications figured out. Once that is complete, the logic can be incorporated into this so you can test obtaining a large number of values and verify the saving/averaging work as expected.
* I hope to be able to get down to campus on Saturday, the 21st so we can go over the details of this then. You should be prepared to discuss and I expect there will be questions.

### Data Fields

|  |  |  |
| --- | --- | --- |
| **FieldName** | **Description** | **CANTag** |
| CurrentMotor | Motor Current | CMOT |
| CurrentArray | Array Current | CARR |
| CurrentBattery | Battery Current | CBAT |
| VoltageMax | Maximum Battery Voltage | VMAX |
| VoltageAvg | Average Battery Voltage | VAVG |
| VoltageMin | Minimum Battery Voltage | VMIN |
| TempMax | Maximum Battery Temperature | TMAX |
| TempAvg | Average Battery Temperature | TAVG |
| TempMin | Minimum Battery Temperature | TMIN |
| VoltageCell1 | Cell 1 Voltage | VC01 |
| VoltageCell2 | Cell 2 Voltage | VC02 |
| VoltageCell3 | Cell 3 Voltage | VC03 |
| VoltageCell4 | Cell 4 Voltage | VC04 |
| VoltageCell5 | Cell 5 Voltage | VC05 |
| VoltageCell6 | Cell 6 Voltage | VC06 |
| VoltageCell7 | Cell 7 Voltage | VC07 |
| VoltageCell8 | Cell 8 Voltage | VC08 |
| VoltageCell9 | Cell 9 Voltage | VC09 |
| VoltageCell10 | Cell 10 Voltage | VC10 |
| VoltageCell11 | Cell 11 Voltage | VC11 |
| VoltageCell12 | Cell 12 Voltage | VC12 |
| VoltageCell13 | Cell 13 Voltage | VC13 |
| VoltageCell14 | Cell 14 Voltage | VC14 |
| VoltageCell15 | Cell 15 Voltage | VC15 |
| VoltageCell16 | Cell 16 Voltage | VC16 |
| VoltageCell17 | Cell 17 Voltage | VC17 |
| VoltageCell18 | Cell 18 Voltage | VC18 |
| VoltageCell19 | Cell 19 Voltage | VC19 |
| VoltageCell20 | Cell 20 Voltage | VC20 |
| VoltageCell21 | Cell 21 Voltage | VC21 |
| VoltageCell22 | Cell 22 Voltage | VC22 |
| VoltageCell23 | Cell 23 Voltage | VC23 |
| VoltageCell24 | Cell 24 Voltage | VC24 |
| VoltageCell25 | Cell 25 Voltage | VC25 |
| VoltageCell26 | Cell 26 Voltage | VC26 |
| VoltageCell27 | Cell 27 Voltage | VC27 |
| VoltageCell28 | Cell 28 Voltage | VC28 |
| VoltageCell29 | Cell 29 Voltage | VC29 |
| VoltageCell30 | Cell 30 Voltage | VC30 |
| VoltageCell31 | Cell 31 Voltage | VC31 |
| VoltageCell32 | Cell 32 Voltage | VC32 |
| TemperatureCell1 | Cell 1 Temperature | TC01 |
| TemperatureCell2 | Cell 2 Temperature | TC02 |
| TemperatureCell3 | Cell 3 Temperature | TC03 |
| TemperatureCell4 | Cell 4 Temperature | TC04 |
| TemperatureCell5 | Cell 5 Temperature | TC05 |
| TemperatureCell6 | Cell 6 Temperature | TC06 |
| TemperatureCell7 | Cell 7 Temperature | TC07 |
| TemperatureCell8 | Cell 8 Temperature | TC08 |
| TemperatureCell9 | Cell 9 Temperature | TC09 |
| TemperatureCell10 | Cell 10 Temperature | TC10 |
| TemperatureCell11 | Cell 11 Temperature | TC11 |
| TemperatureCell12 | Cell 12 Temperature | TC12 |
| TemperatureCell13 | Cell 13 Temperature | TC13 |
| TemperatureCell14 | Cell 14 Temperature | TC14 |
| TemperatureCell15 | Cell 15 Temperature | TC15 |
| TemperatureCell16 | Cell 16 Temperature | TC16 |
| TemperatureCell17 | Cell 17 Temperature | TC17 |
| TemperatureCell18 | Cell 18 Temperature | TC18 |
| TemperatureCell19 | Cell 19 Temperature | TC19 |
| TemperatureCell20 | Cell 20 Temperature | TC20 |
| TemperatureCell21 | Cell 21 Temperature | TC21 |
| TemperatureCell22 | Cell 22 Temperature | TC22 |
| TemperatureCell23 | Cell 23 Temperature | TC23 |
| TemperatureCell24 | Cell 24 Temperature | TC24 |
| TemperatureCell25 | Cell 25 Temperature | TC25 |
| TemperatureCell26 | Cell 26 Temperature | TC26 |
| TemperatureCell27 | Cell 27 Temperature | TC27 |
| TemperatureCell28 | Cell 28 Temperature | TC28 |
| TemperatureCell29 | Cell 29 Temperature | TC29 |
| TemperatureCell30 | Cell 30 Temperature | TC30 |
| TemperatureCell31 | Cell 31 Temperature | TC31 |
| TemperatureCell32 | Cell 32 Temperature | TC32 |
| VelocityMotor | Motor Velocity | VELM |
| VelocityVehicle | Vehicle Velocity | VELV |
| CurrentBus | Bus Current | IBUS |
| VoltageBus | Bus Voltage | VBUS |
| CurrentPhaseA | Phase A Current | IPHA |
| CurrentPhaseB | Phase B Current | IPHB |
| VoltageMotorImag | Imaginary Motor Voltage | VMIM |
| VoltageMotorReal | Real Motor Voltage | VMRL |
| CurrentMotorImag | Imaginary Motor Current | IMIM |
| CurrentMotorReal | Real Motor Current | IMRL |
| BackEMFMotorImag | Imaginary Motor Back EMF | EMFI |
| BackEMFMotorReal | Real Motor Back EMF | EMFR |
| VoltageFifteenVSupply | 15 Volt Supply Voltage | 15VS |
| VoltageOnePtSixtyFiveVRef | 1.65 Voltage Reference | 165R |
| VoltageTwoPtFiveVSupply | 2.5 Volt Supply Voltage | 25VS |
| VoltageOnePtTwoVSupply | 1.2 Volt Supply Voltage | 12VS |
| FanDriveRPM | Fan RPM | FRPM |
| FanDrivePercent | Fan Drive Percent | FPER |
| TempHeatsink | Heat Sink Temperature | THTS |
| TempMotor | Motor Temperature | TMOT |
| TempAirInlet | Air Inlet Temperature | TINL |
| TempAirOutlet | Air Outlet Temperature | TOUT |
| TempProcessor | Processor Temperature | TPRO |
| TempCapacitor | Capacitor Temperature | TCAP |
| AmpHoursDCBus | DC Bus Amp Hours | AMPH |
| Odometer | Odometer | ODO |
| EnableCruise | Cruise Control Enabled | CRUS |
| EnableRegen | Regen Enabled | RGEN |
| VelocityCruise | Cruise Control Velocity | CRSP |
| PotBrake | Brake Pedal Position | BRPT |
| PotAccel | Accelerator Position | ACPT |
| Latitude | Latitude | LATI |
| Longitude | Longitude | LONG |
| Speed | GPS Speed | SPEED |
| Course | GPS Course | CORS |
| Altitude | GPS Altitude | ALTI |
| SatellitesSeen | GPS Satellites Seen | SATT |
| UTCTime | UTC Time | UTCT |
| UTCDate | UTC Date | UTCD |
| TripCode | Trip Code | TC |