

MAXIMIZE EFFICIENCY: TRACKING BATTERY HEALTH FOR LAST MILE DELIVERY TRUCKS

REXGEN AIR LOGGER PROVES EFFICIENCY WITH CRITICAL BATTERY RECORD



CAS DataLoggers provided the data logging solution for an established last-mile delivery vehicle manufacturer as they launched a new fully electric delivery vehicle. The new vehicle is fully electric and the battery supplier required a full record of the battery parameters (state of charge, discharge, hours of operation, etc) to serve as a measure of value at the time the battery lease period ends. Essentially, the battery supplier requires a [Battery Passport](#) which has a complete record of the batteries' life cycle within the vehicle. This is critical to assigning value at the end of the lease period as well as providing critical

performance data to the vehicle manufacturer to assist with support and design of next-generation products.

The manufacturer required the data logger to record CANbus battery and electrical system data on two Canbuses at a down-sampled rate of once per second. Data was broadcast at a much faster rate, but the RexGen was configured to average the subsecond data points and store a once-per-second average. Data was stored on the internal [eMMC](#) flash memory with time/date stamps. Numerous strategies were discussed to determine what was required to provide the battery manufacturer with the information they needed. These strategies included recording triggered events or threshold excursions as well as recording peak and minimum values on parameters over 30-day periods, then storing the minimum, maximum, and average values of

each parameter over the 30-day interval. The decision was finally determined to record the 1 second down-sampled data for a 90 day period. The data can be offloaded during maintenance checks via USB.

INSTALLATION:

The manufacturer installed a modified [Influx RexGen Air](#) into each vehicle. The customer did not require the GPS nor the cellular streaming features of the RexGen Air, so those components were removed to reduce cost resulting in a custom version of the RexGen Air. The RexGen Air features an automotive industry standard Molex connector which connects directly to the vehicle wiring harness. This allows communication on both CANbus networks so the required data and status messages can be recorded. Additionally, the USB connection is also wired to the vehicle harness which allows the technician to unload data without having to physically access the RexGen Air directly.



USAGE:

The RexGen Air offered a flexible and powerful data logging solution for this application. It is also capable of capturing other real-time data from several sources including temperatures, RPM, accelerator pedal position, and speed, so as to evaluate driver performance in addition to the vehicle and battery performance. For other applications, the RexGen Air provides a flexible full-featured tool for engineering data acquisition, vehicle testing in the field, or customer problem investigation. It can simultaneously capture data from up to 4 different CANbus sources plus 1 K-line bus and save up to 64 GB of data to onboard eMMC.

Two analog inputs allow it to acquire data from additional voltage output sensors. The standard RexGen Air features 18 Hz GNSS for inertial and position measurements and an LTE modem for data transfer via FTPs. The compact, robust enclosure is well suited for

the demanding automotive environment and the standard [Molex Mini50](#) connector allows seamless integration into production vehicle harnesses for easy access to the CANbuses as well as to the RexGen Air itself. The onboard backup battery retains the real-time clock setting so that accurate timestamps are applied to the recorded data.

The vehicle engineers found the RexGen Air easy to setup using the freely distributable [RexDesk configuration software](#). The output of RexDesk is standard XML which can be edited using any ASCII text editor making field updates trouble free. The simple, intuitive interface allowed the engineers to construct data logging configurations using the simple graphical interface in a few minutes. Configurations can be uploaded to the logger via USB. RexDesk can import industry standard dbc formats to build a list of available messages. RexDesk exports data to CSV as well as industry standard formats including mf4, blf, and mat.

BENEFITS:

The customer gained multiple benefits from installing the [Influx RexGen Air](#) Vehicle Data Logger for monitoring battery and charging system performance in the electric delivery vehicle. They were able to satisfy the supplier's requirements for monitoring the performance and usage of the battery system as well as provide their design team with valuable information for revisions to vehicle software and insight for the design of the next-generation platforms. The modified RexGen Air provided an economical tool to satisfy the data needs at an economical price.

The ability to connect direct into the vehicle wiring harness and compact size of the RexGen Air made integration into the existing vehicle design a simple exercise. XML configuration allowed for easy configuration and modification during the acceptance phase and required little instruction or training to the engineering team. With a standard RexGen Air, cellular LTE transmission of data files via FTPs allows for remote data analysis at very low cost since no proprietary software or servers are required making the RexGen Air an optimal tool for remote vehicle or system monitoring.

The RexDesk software tool, being freely distributable further reduces costs across engineering teams as no licenses are required regardless of the size of the team.

For more information on the [RexGen Air](#) data logger, or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.