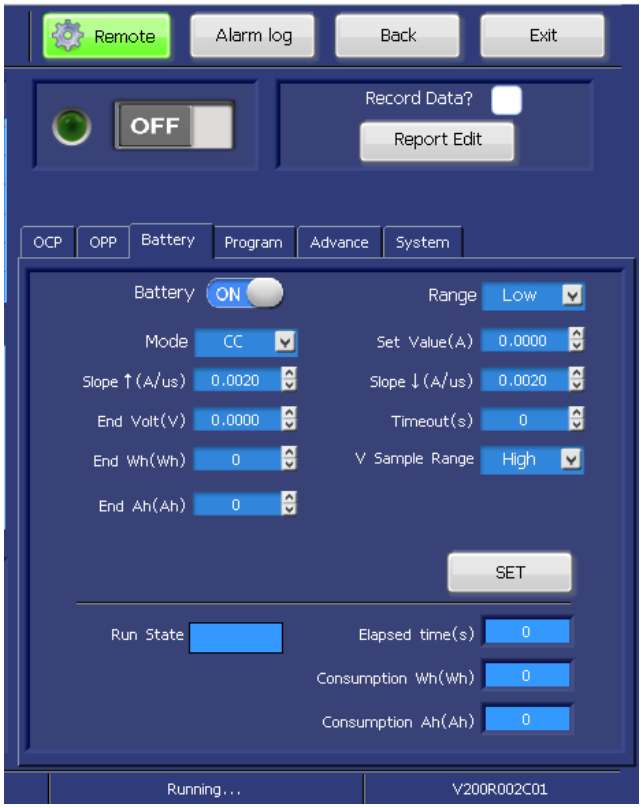
Application test of APM electronic load in new energy vehicles

At the moment when the new energy vehicle industry is developing rapidly, the entire industry is making every effort to promote innovation and breakthroughs in automotive technology. Key areas such as battery management systems and motor drive systems of new energy vehicles are constantly experiencing technological innovation and upgrades. APM electronic load products play an indispensable role in the R&D and production testing of new energy vehicles with their excellent performance and diverse functions.

1. Battery testing:

The battery performance of new energy vehicles is directly related to the vehicle's range, safety and stability. APM electronic load can simulate the discharge process of batteries under different working conditions. For example, by setting multiple modes such as constant current (CC), constant voltage (CV), and constant power (CP), the current, voltage and power changes of the battery under vehicle start-up, acceleration, steady-speed driving and braking energy recovery can be accurately simulated. Taking the battery management system test as an example, the APM electronic load can accurately set the discharge current in CC mode to test the discharge efficiency and performance stability of the battery under a specific current.

As shown in Figure 1, the interface of the APM electronic load when performing a discharge test on the battery in CC mode is shown. The set current value, real-time voltage and power display can be clearly seen, which is convenient for engineers to monitor the test process. In CV mode, the battery's capacity retention and voltage change under constant voltage are detected. This helps engineers to gain a deeper understanding of battery characteristics, optimize battery management strategies, and improve the overall performance and service life of the battery.



2. Motor controller testing:

The motor controller is one of the core components of the power system of new energy vehicles. Its performance determines the operating efficiency and reliability of the motor. The APM electronic load can simulate the back electromotive force of the motor under different load conditions, and test the response speed and control accuracy of the motor controller under complex working conditions through dynamic current (DC) and dynamic voltage (DV) modes.

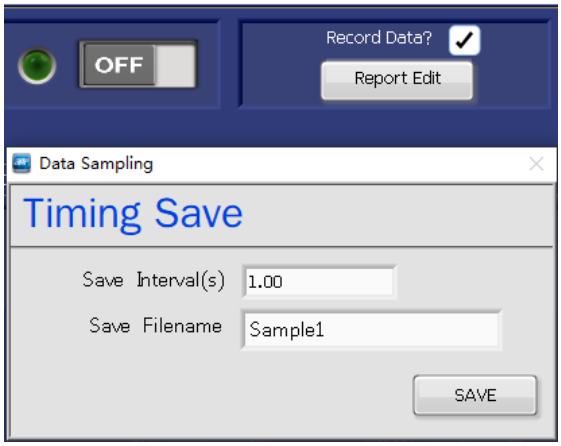
(1) In the development of the motor controller of the automobile, the DC mode of the APM electronic load is used to set different current change slopes and time parameters to simulate the current demand of the motor under frequent start-stop, acceleration and deceleration conditions, and to verify whether the motor controller can respond quickly and accurately to achieve stable control of the motor.

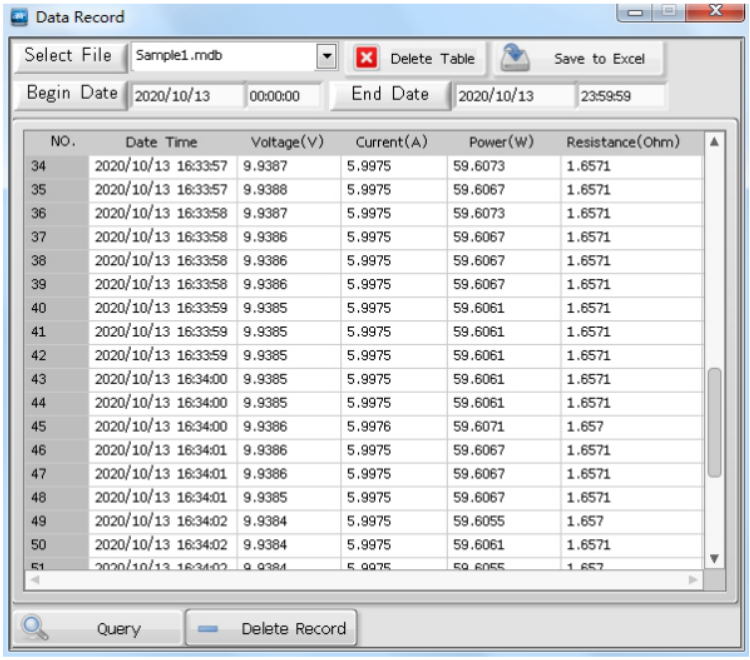
(2) As shown in Figure 2, in the dynamic current mode, parameters such as current A, current B, rising slope, and falling slope can be set, which intuitively demonstrates the ability of the APM electronic load to simulate complex current conditions and provides an effective means for testing motor controllers.

3.Other advantages:

The high-precision measurement function of the APM electronic load can monitor the current, voltage, power and other parameters in real time during the test, providing accurate data support for new energy vehicles and helping them to perform product performance analysis and fault diagnosis. Its data recording function can also save the data during the test in full, which is convenient for subsequent in-depth research and comparison.

For example, in the data recording interface (see Figure 3), the sampling time interval and save file name can be set. After the test is completed, the test data can be analyzed in detail through operations such as query and export of data to further optimize product performance.





NO.	Date Time	Voltage(V)	Current(A)	Power(W)	Resistance(Ohm)
34	2020/10/13 16:33:57	9.9387	5.9975	59.6073	1.6571
35	2020/10/13 16:33:57	9.9388	5.9975	59.6067	1.6571
36	2020/10/13 16:33:58	9.9387	5.9975	59.6073	1.6571
37	2020/10/13 16:33:58	9.9386	5.9975	59.6067	1.6571
38	2020/10/13 16:33:58	9.9386	5.9975	59.6067	1.6571
39	2020/10/13 16:33:58	9.9386	5.9975	59.6067	1.6571
40	2020/10/13 16:33:59	9.9385	5.9975	59.6061	1.6571
41	2020/10/13 16:33:59	9.9385	5.9975	59.6061	1.6571
42	2020/10/13 16:33:59	9.9385	5.9975	59.6061	1.6571
43	2020/10/13 16:34:00	9.9385	5.9975	59.6061	1.6571
44	2020/10/13 16:34:00	9.9385	5.9975	59.6061	1.6571
45	2020/10/13 16:34:00	9.9386	5.9976	59.6071	1.657
46	2020/10/13 16:34:01	9.9386	5.9975	59.6067	1.6571
47	2020/10/13 16:34:01	9.9386	5.9975	59.6067	1.6571
48	2020/10/13 16:34:01	9.9385	5.9975	59.6067	1.6571
49	2020/10/13 16:34:02	9.9384	5.9975	59.6055	1.657
50	2020/10/13 16:34:02	9.9384	5.9975	59.6061	1.6571

In summary, the APM electronic load provides strong support for product development, quality control and performance optimization through its diverse functions and high-precision performance in the testing of key components such as batteries and motor controllers of Valeo new energy vehicles, and promotes the continuous advancement of new energy vehicle technology.