Industry: Automobile, ECU, Electrical equipment; Category: R&D, Testing

Automotive Electrical Equipment and ECU Current Measurement

Multi-range Current Probe Capable of Measuring from 1 mA to 50 A

Current Testing of Automobiles:
In the development of automotive electrical control systems, it is important to measure and validate a diverse array of current levels among components such as:

- Drive current of various motors in the order of several amperes
- Inrush current, for example at motor start, in the order of several tens of amperes
- Minute control signals of about 1 mA
- Standby current

The need to measure such a wide range, from micro standby currents to inrush currents that can reach tens of amperes traditionally necessitate the use of separate sensors equipped with the appropriate range so that resolution and accuracy are not sacrificed. Using a higher range current sensor to measure low standby current will reveal no meaningful result, while sensors with a low range will not be able to handle high currents safely.

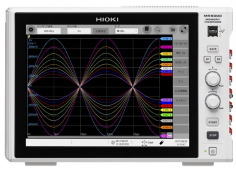
A Solution in 3-Range Hioki Current Sensors:
Hioki provides a solution for this particular application with the CT6710 (50MHz bandwidth) and CT6711 (120MHz bandwidth) current probes, both of which offer three separate ranges to an expansive range of measurements in a single unit. In the 30 A range, inrush current of up to 50 A peak can be measured, and in the 0.5 A range, 1 mA current can be accurately observed without concern of the signal being buried in noise - all while maintaining ±3.0% accuracy in all 3 ranges.

Measurement safety is a critical issue especially when high currents are present, and this is especially true for the electrical vehicle development environment. The CT6710 and CT6711 improve work efficiency and take the guess-work out of selecting the right range by offering a built-in function that protects against excessive current input. With these sensors, if you accidentally measure a current beyond the set range (0.5 A or 5 A), the sensors are designed not to fail.

Besides motor current, Engine Control Units (ECU) that output a large number of signals also need to be measured and verified for their ability to communicate with one another to ensure the proper operation of instrumentation and other automotive components. This can easily be achieved with high-speed data acquisition equipment such as a Memory HiCorder.

Dark currents
Standby currents
ECU control signals
Relay drive currents

Relay flyback currents
Motor inrush currents
(Power windows)
(Power seats)



MR6000

CT6710, CT6711

Products used

- CURRENT PROBE: CT6710, CT6711 (100 µA res., DC to 50 MHz, 120 MHz)
- MEMORY HiCORDER: MR6000
  ※Main unit cannot operate alone. You must install one or more optional input models in the unit.
- SSD UNIT: U8332
- 4ch ANALOG UNIT: U8978 (DC to 2 MHz)
- PROBE POWER UNIT: Z5021