

APPLICATIONS

Electric Motors (Railroad systems)

The 108A-6 equipped with (Option03) 6 analog inputs, 2 digital inputs and 12 outputs perform all required measurements for motor testing. The analog inputs can be used for torque-, temperature and vibration measurements. The TTL inputs for speed or torque, and the external synchronization input per phase from an encoder to synchronize to the pole position.

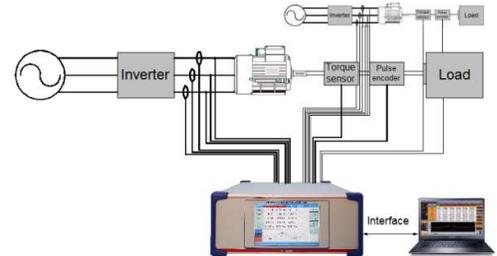
The 108A-6 can measure 2 motors simultaneously: input power, output power, torque, slip, speed, and efficiency of every motor, as well as all harmonics of current, voltage, power, impedance, and phase angle. For none sinusoidal signals (trapezoidal wave-forms or frequency inverters), we recommend to use the fundamental of impedance and fundamental of phase. From these values the motor inductances L, Ld, Lq and the motor resistances R = Rm + Rdc can be determined.

The motor DC-resistance is obtained by applying a DC-current: $R_{dc} = P_{dc} / I^2_{dc}$. Rm is a magnetization dependent loss.

Simultaneous Measurement of 2 Synchronous Motors (PMSM, BLDC)

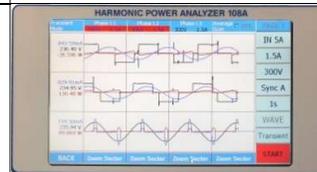
A wide range of synchronous motors are on the market (PMSM, IPMSM, BLDC). The power consumption ranges from mW to 500kW. Many different constructions are in use. They all have in common that the magnetic field rotation (2 phase or 3 phase) is electronically generated. A wide range of speeds (rpm) are available.

See also the Infratek documentation: [Electric Motor Testing](#) (PDF).



Inverter drive systems

Using the 108A-6 to test the efficiency of an inverter drive, simultaneous measurement of all electrical parameters is essential. By visually inspecting the current waveform, we should see three individual currents all producing an alternating positive/negative pattern waveform. All three phases should be symmetrical. The 108A-6 measures very precisely total input power, total output power and inverter efficiency!



108A switched to transient mode to view inverter U, I, and P wave forms; expand to view details.

Automotive

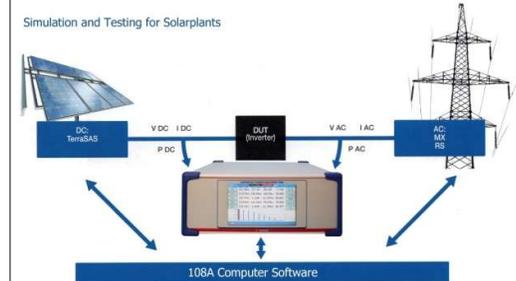
Testing fuel pumps is crucial for proper and reliable vehicle operation and long lasting product quality. Individual fuel pump tests like Start-Stop, Low-Speed/Full-Speed are used; the 108A delivers all important electrical parameters. The 108A in the power-speed measure mode measures the start performance of an electric car. In 20ms intervals current, voltage, power, energy, and speed of the vehicle are measured. Data are plotted versus speed.



Solar/Wind energy

Decisive for an effective technical implementation of solar plants and wind farms are various simulations and correlations for each location. In these tests, exactly defined levels are simulated. All relevant electrical parameters like frequency, voltage, current, power, efficiency, power factor and energies are measured by the 108A and can be read via computer software.

A dedicated high speed data acquisition software is available to read data from several 108A. Data are combined in a single file for simple analysis.



Power electronics / Appliance

Wide bandwidth guarantees precise power measurement of switching power supplies or other electronically switched devices.

Some electronic devices consume power when they appear to be turned off. This power consumption is known as standby power and can be a significant contribution to product energy use. The 108A Power Analyzer precisely measure standby power on all kind of appliances like ovens, ceramic hobs, washers, dryers etc. This can be done using the 1.5mA/5mA/15mA current ranges.



108A Computer Software for Production Testing

For efficient production testing of 12 (or more) single phase apparatus, a dedicated high speed data acquisition software is available. It reads the data of 12 apparatus (or more) in less than 100ms and combines data in a single file for storage or analysis.



