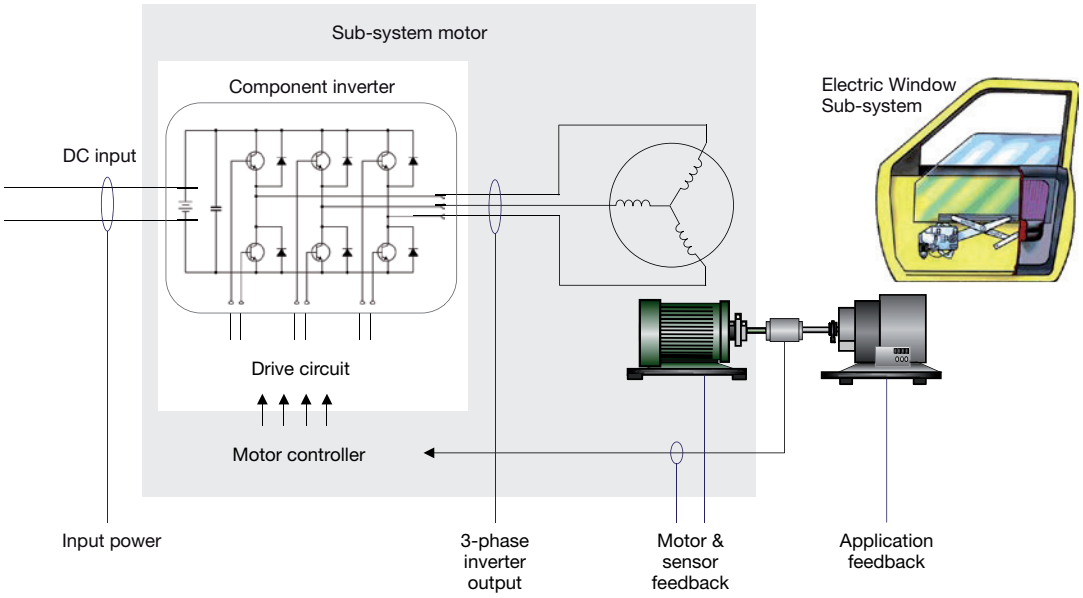
Application note

Brushless DC motors



Overview

With the increased demand in electric-hybrid vehicles, the electromechanical designs of in-vehicle systems are becoming more sophisticated and there has been shift to high efficiency brushless direct current (BLDC) motors that offer better speed vs torque characteristics, dynamic response and lifespan.

Key requirements

- DC Input power –two channels (U and I)
- Three-phase inverter output
- Motor & sensor feedback – vibration, RPM, angle and temperature
- Application feedback –multiple digital channels (position switches, control buttons)

Depending on the development goals, tests may need to be performed on single components (e.g. inverter), subsystems (e.g. motor including electronics) and/or systems (e.g. electric windows).

Recommended Solutions

Mixed signal oscilloscopes help engineers analyze individual component behavior and waveforms while scopecorders offer greater signal conditioning and electromechanical analysis. for inter-component relationships at system and subsystem levels . Powerscopes are ideal for transient analysis while precision power analyzers offer motor and harmonic analyses.

Electromechanical Interrelationships
Scopecorders offer flexible modular inputs to combine electrical and physical (sensor) measurements and troubleshooting. Includes measurements of frequency, temperature, distortion, acceleration, and other signals.

Power & transient analysis
PowerScopes can captures transient phenomena of motors with great detail and offers power measurement accuracy comparable to precision power analysers.

Harmonics analysis & comparisons
Precision power analyzers such as the WT5000, feature motor evaluation and harmonic analysis capabilities at various rotation speeds even as low as 0.5Hz without using an external sampling clock.