With the new RapidPro power stage modules, dSPACE offers universal support for electric motors in 12 V and 24 V applications. The modules can be configured via software and support the control of DC motors and stepper motors, as well as brushless motors such as BLDC motors and synchronous motors. Peak currents of up to 60 A and continuous 42 A are possible.

Full Power

Universal RapidPro power stage modules for electric motors

Many Different Application Fields
Electric motors are being used in several fields, from automobiles to commercial vehicles, rail vehicles, wind power plants, and even production machines. To develop and test the relevant electronic control unit (ECU) functions, it is necessary to control the electric motors directly with the prototyping system via power stages. The universal RapidPro power stage modules PS-HCFBD 1/2 (DS1767) and PS-HCHBD 2/2 (DS1768) are the perfect solution.

They quickly and flexibly integrate several types of electric motors (DC motors, step motors, brushless motors such as BLDC motors and synchronous motors, 12 V and 24 V applications) into the dSPACE prototyping environment. Off-the-shelf availability means that users can set up the RapidPro system according to their application's specifications. The cost-intensive, time-consuming task of developing systems on their own is a thing of the past. The development of a vehicle ECU, for example,

clearly demonstrates the RapidPro modules' versatility: Whether in comfort electronics or auxiliary units such as an oil pump or a water pump – with the DS1767 or DS1768, the corresponding components are integrated quickly into the prototyping environment.

Software Configuration
For maximum flexibility in the development process, the RapidPro power stage modules DS1767 and DS1768 can be completely configured by the

configuration software Configuration-Desk. Parameters such as the maximum output current, the polarity of the input signals and digital low-pass filters for current measurement can be set.

Diagnostics

The DS1767 and DS1768 offer extensive diagnostics possibilities. Via ConfigurationDesk, users can have warnings issued for excessively high current and temperature values, as well as error messages for current measurement errors and interruptions in the output signal path.

Highly Precise Current Measurement and Dynamic Control Loops

The newly developed digital current measurement of the DS1767 and DS1768 make it possible to implement dynamic control loops with a high control quality, even in environments in which heavy disturbance

The new RapidPro modules DS1767 and DS1768 are ideal for developing components of a 24 V electric system, such as those used in commercial vehicles.

signals are present due to fast switching of power transistors. Users thus reach their development goals of achieving utmost precision and latency-free current measurement.

AC Motor Control Solution

With the additional FPGA-based AC motor control solution, which can be used in combination with the RapidPro hardware and the DS1768, dSPACE offers a flexible solution to control many diverse electric motors. The solution is based on the DS5202 FPGA Base Board and a special RTI blockset for MATLAB®/Simulink®. It is specially designed for fast current/voltage measurements, connection of diverse position encoders and control of AC motors such as asynchronous motors, brushless DC motors (BLDCs) and permanent magnet synchronous motors (PMSMs). The fast I/O needed for the rapid prototyping of AC motors is achieved by the efficient cooperation between the DS5202 FPGA Base Board, the different piggyback modules, as well as the DS1005 or DS1006 processor boards. ■

The Modules at a Glance

PS-HCFBD 1/2 (DS1767)

- Software-configurable, high-current, full-bridge module
- 12 V and 24 V applications
- Support of DC motors and step motors
- Peak current: 60 A, continuous: 42 A_{RMS} (depending on the temperature)
- Highly precise, galvanically separated phase current measurement and voltage measurement
- Extensive protection from overheating, overcurrent and overvoltage

PS-HCHBD 2/2 (DS1768)

- Software-configurable, high-current, half-bridge module
- 12 V and 24 V applications
- Control of BLDC motors and synchronous motors
- Peak current: 60 A, continuous 42 A_{RMS} (depending on the temperature)
- Highly precise, galvanically separated phase current measurement and voltage measurement
- Extensive protection from overheating, overcurrent and overvoltage
- Low-side or high-side driver mode for controlling actuators such as valves