

TREMEC®

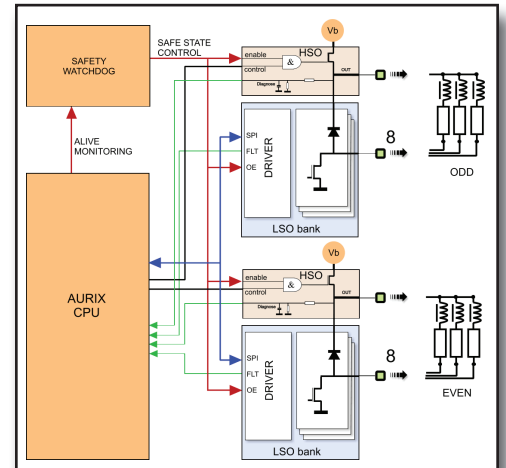
Torque Transfer Solutions™

Transmission Control Unit

Model TR-C75

The TREMEC Model TR-C75 Transmission Control Unit (TCU) integrates electronic controls to achieve better fuel economy, reduced engine emissions and improved shift feel. The module is primarily targeted at high-end dual clutch transmission and automated manual transmission control.

Built around a high-performance multi-core microcontroller, it excels in computationally intensive model-based applications that need advanced safety architecture.



Output architecture application in DCT

The control module's output architecture supports redundant switching of output banks that maximize limp-home capabilities. In addition to standard diagnostic features, current outputs of the control module support detection of solenoid function and provide full control over dithering frequency and amplitude.

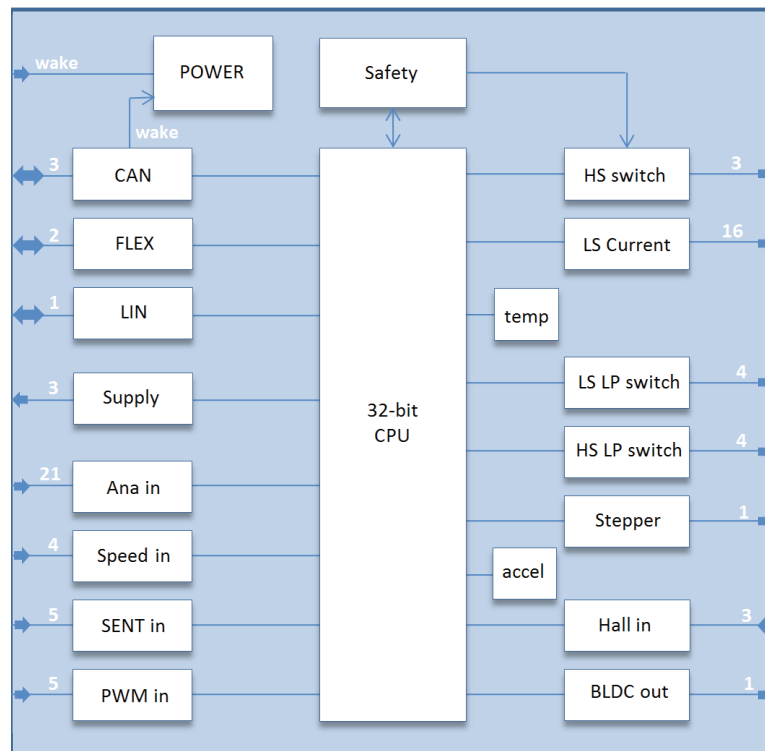
Applications are supported by a software environment that abstracts the low level and communication hardware. The device supports standard communication, on-board diagnostics and diagnostic protocols. Optionally, applications may be supported by AUTOSAR 4.0, the standardized automotive software architecture.

TR-C75 Transmission Control Unit Features at a Glance:

- Multi-core 32-bit CPU with lockstep
- 4 MB Flash, 32 KB EEPROM, 400 KB RAM
- Functional safety targeted at ISO 26262 ASIL D
- Operating voltage range from +7V to +16V
- Output banks with redundant shut down paths
- Robust inputs for voltage, frequency, pulse width and intelligent sensors
- Integrated motor driver for hydraulic pumps
- Full diagnostic capabilities on all Inputs/Outputs
- Internal board temperature sensor
- CAN, FlexRay and LIN communication channels
- High speed calibration and data acquisition link to support development
- Class IV conducted immunity and load dump protection according ISO 7637
- Reverse battery protection
- Operating temperature range from -40°C to +105°C
- Vibration resistance according ISO 16750-3
- Die-cast aluminum housing sealed to IP67 with breather



TREMEC TR-C75 Specifications	
Inputs	21 x 12 bit analog voltage/resistor
	4x speed sensor (current/open collector interface)
	5x SENT
	5x PWM signal (open collector)
	Wakeup
	3x HALL (BLDC)
Outputs	16x configurable low side 0-2A precision current outputs
	3x power high side switches with current sense
	4x low power low side switches
	4x low power high side switches
	1x bipolar stepper motor driver with current detection (peak 1.4A)
	1x BLDC motor driver (25A)
	2x 100mA sensor supply (5V)
	1x 200 mA switched sensor supply (12V)
Communication	3x CAN (1 channel supports wakeup)
	2x FlexRay
	1x LIN
Other	3-axis accelerometer
	Board temperature sensor



Block diagram of the TCU