

Centralized Six-Axis Motor Control Using a Single DSP for Humanoid Robot Hand Reference Design



Description

This reference design uses a single TI C2000™ F28P65 microcontroller for industrial Ethernet motor drives with six-axis control. The design uses a printed circuit board (PCB) with less than 420mm² to drive a humanoid robot hand. The design demonstrates a small form factor and integrated platform. This integrated platform uses six DRV8376 three-phase motor drivers with integrated current sensing and FETs. The platform includes real-time control using the F28P65 with two 32-bit C28x Digital Signal Processor (DSP) Central Processing Units (CPU) and one Control Law Accelerator (CLA) CPU, all running at 200MHz. System testing is in progress. The software and full design guide become available soon.

Resources

TIDA-010992	Design Folder
TMS320F28P650DK , TPS650352-Q1	Product Folder
DRV8376 , DP83826A , LMK3C0105	Product Folder
C2000WARE-MOTORCONTROL-SDK	Tool Folder

Features

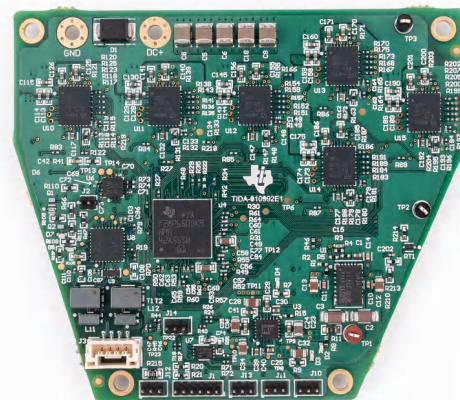
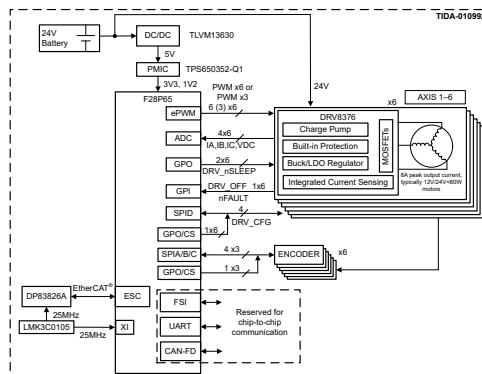
- Compact design with highly integrated circuits (IC) facilitates a PCB size less than 420mm²
- Single real-time microcontroller (MCU) with three CPUs to control six independent closed-loop field-oriented control (FOC) for current, velocity, and position
- High efficiency current monitoring and small form factor of DRV8376 with integrated low-side current-sense amplifier and integrated field-effect transistors (FET)
- Flexible communication interface option for chip-to-chip communication, for example, Fast Serial Interface (FSI), Universal Asynchronous Receiver-Transmitter (UART), and Controller Area Network with Flexible Data-Rate (CAN-FD)

Applications

- [Humanoid robot motor drive](#)
- [Robot communication module](#)



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