MATLAB EXPO

Control Two PMSM motors (Dyno) using C2000 Microcontroller Blockset

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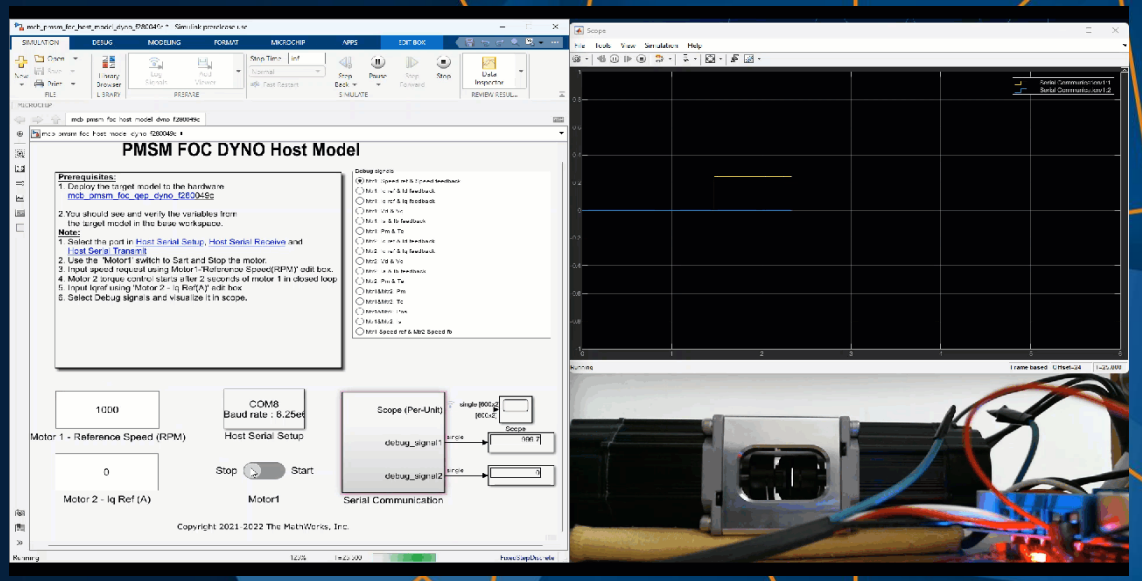
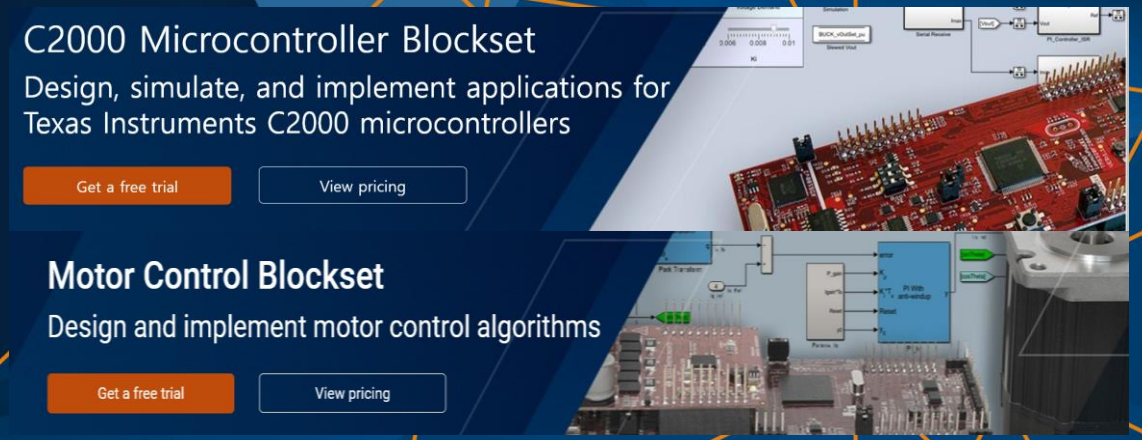
MathWorks





Demo Overview

- Description
  - This demo shows **how to control two three-phase permanent magnet synchronous motors (PMSM) using field-oriented control (FOC) technique**.
  - **Motor 1** runs in the **closed-loop speed control mode**.
  - **Motor 2** runs in the **torque control mode and loads Motor 1** because they are mechanically coupled (**DYNO setup**).
  - This is a classical test setup used by Engineers **to perform load test while developing motor control algorithms to perform in different load conditions**.
- Key takeaways
  - **C2000 Microcontroller Blockset** for **on-target prototyping of motor control applications** by deploying motor control algorithms on hardware and view various diagnostic parameters in real-time while testing the algorithm

Target Application Areas, Industries, and Products

- Application area(s)
  - Electric Vehicles & Motor Control Drives
- Industry(/ies)
  - Automotive
  - IA&M
  - CESSI
- Product(s):
  - C2000 Microcontroller Blockset (New Product launching in 23a),

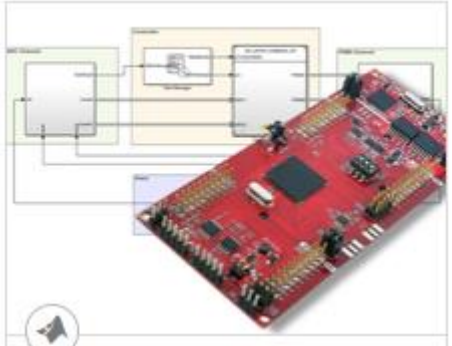
    Motor Control Blockset & Embedded Coder
- Where can we find the demo?
  - Demo with TI C2000 F28379D and F28069M hardware will be available in C2000 Microcontroller Blockset documentation
  - Demo files with TI C2000 F280049C hardware (File Exchange / Git)

C2000 Microcontroller Blockset (Launching in 23a)

Embedded Coder Support Package for Texas Instruments C2000...

Generate code optimized for C2000 MCU.

43.8K Downloads



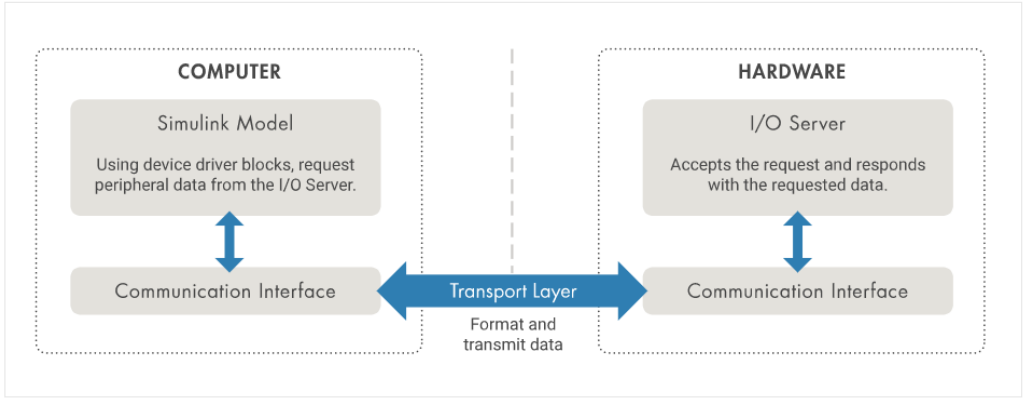
SoC Blockset Support Package for Texas Instruments C2000...

Design, analyze, and prototype for Texas Instruments C2000 microcontrollers

553 Downloads

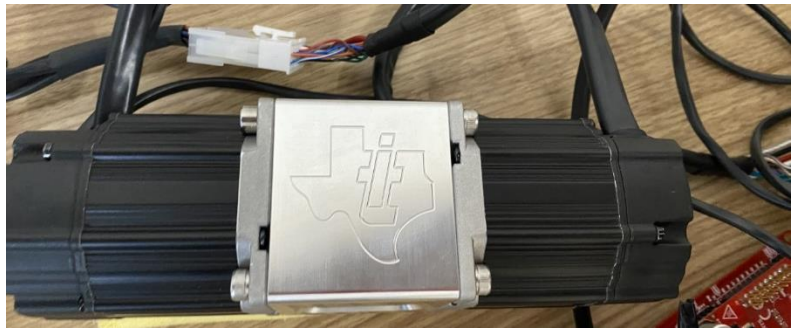
Connected I/O

capabilities

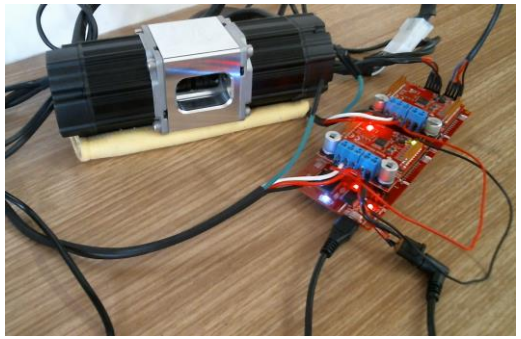


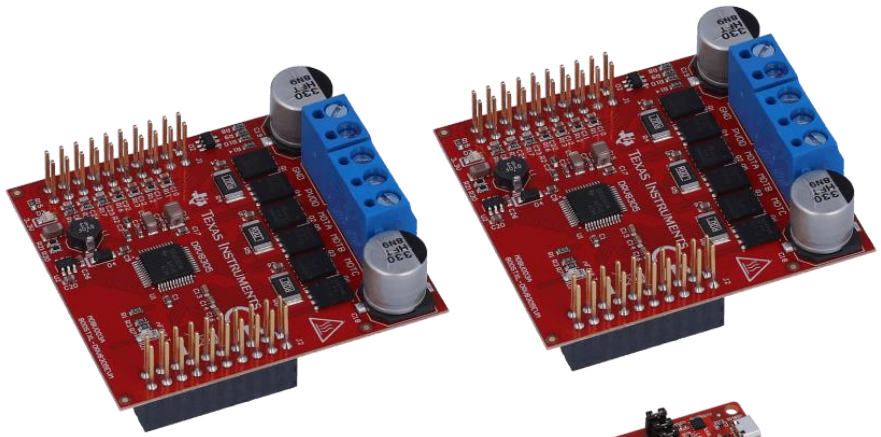
Hardware Used in the Demo

Note:
Refer documentation for detailed wiring connections diagram

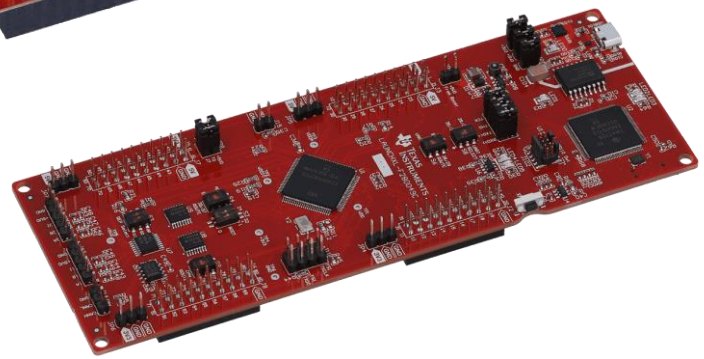


2MTR-DYNO





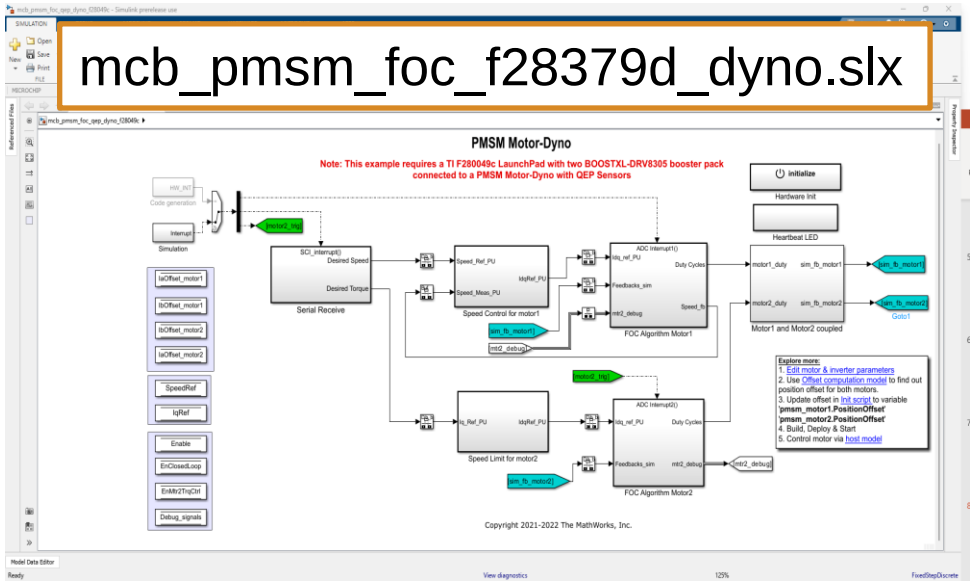
BOOSTXL-DRV8305EVM



C2000 Piccolo MCU F28379D LaunchPad Development Kit

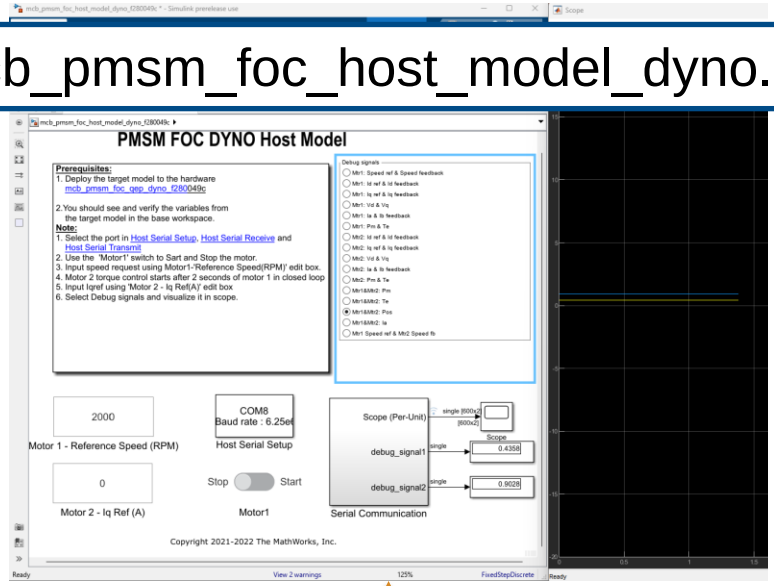
Controller Model

mcb_pmsm_foc_f28379d_dyno.slx

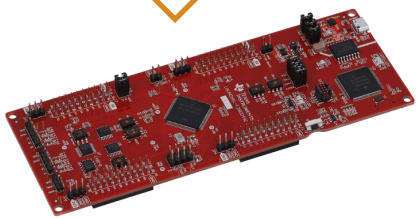


Host Model

mcb_pmsm_foc_host_model_dyno.slx

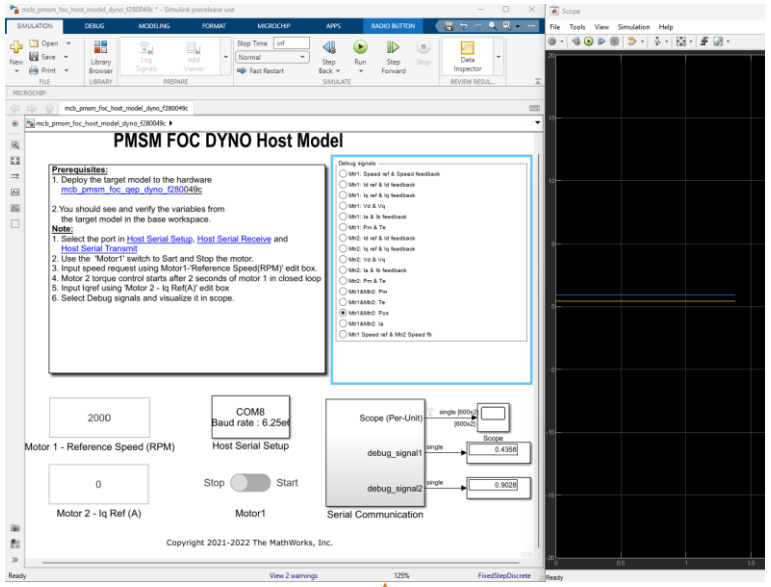


Deployed on hardware

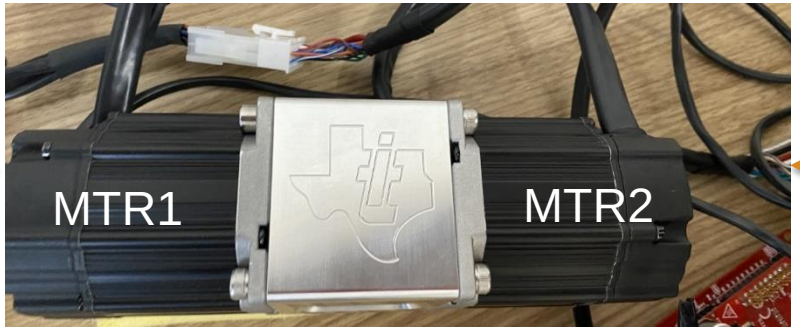


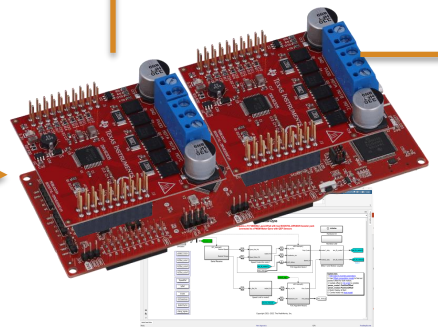
Communication with Host computer over UART

Host Model – Hardware Communication



TI 2MTR-DYNO



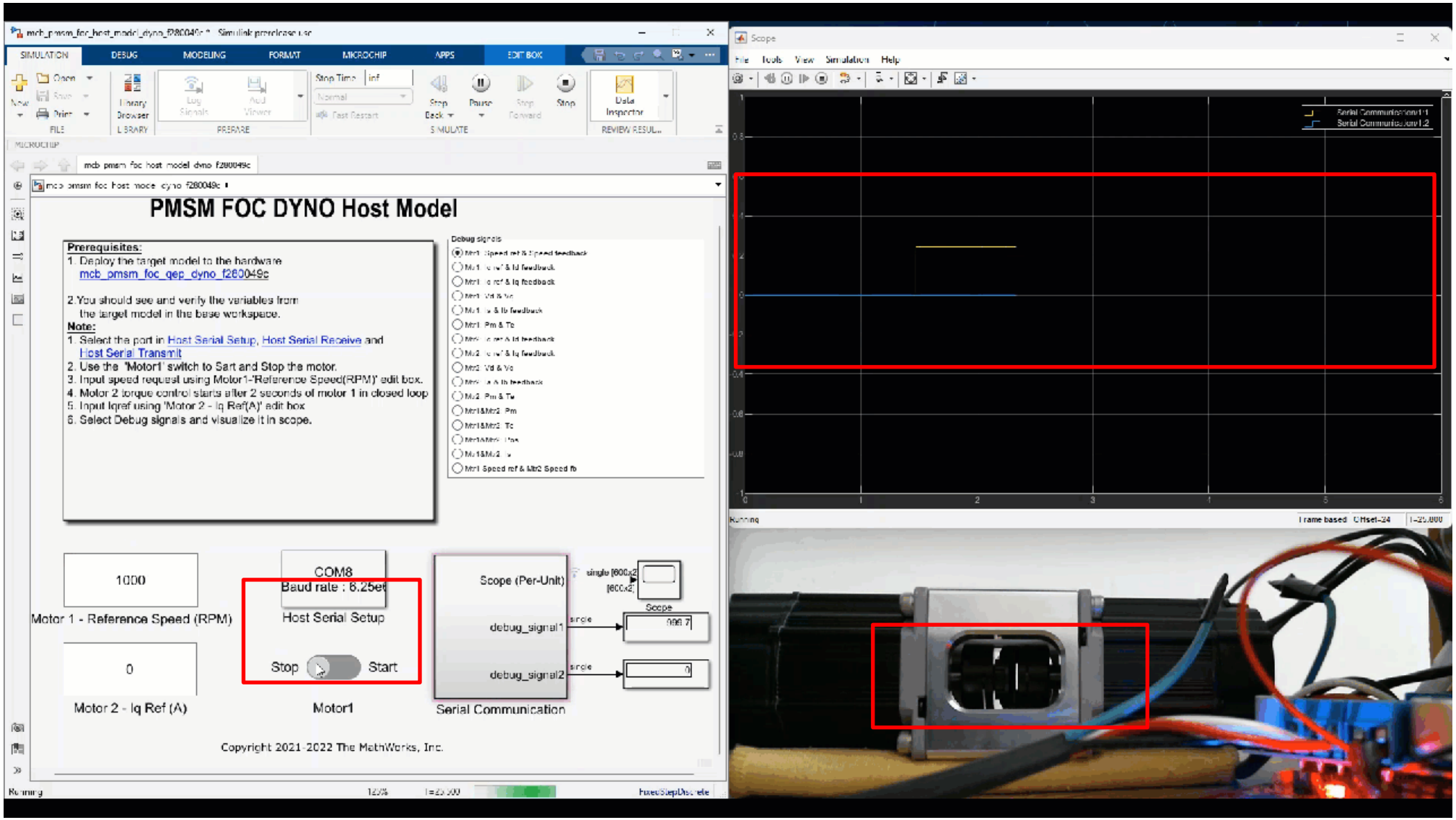


DRV8305 Motor Driver

C2000 LaunchPad running the controller model

Communication with Host computer over UART

On-target prototyping and testing with real-world data



Live data from hardware (Speed, Position, Current, Voltage)

Motor Control