Texas Instruments LAUNCHXL-F28379D – C2000 Delfino MCU LaunchPad Development Kit

The **Texas Instruments LAUNCHXL-F28379D LaunchPad Development Kit** is a high-performance evaluation platform built around the **TMS320F28379D dual-core C2000 Delfino MCU**. Designed for real-time control, digital power, and high-precision industrial applications, this board provides engineers and embedded developers with a robust and efficient environment to develop, prototype, and evaluate advanced control systems.

Offering powerful computational performance, flexible connectivity, and compatibility with TI's ecosystem of software tools, the LAUNCHXL-F28379D board is an essential development kit for motor control, digital power conversion, and real-time signal processing applications.

⚙ **Powerful Dual-Core C2000 Delfino MCU**

At the core of the LAUNCHXL-F28379D is the **TMS320F28379D microcontroller**, part of Texas Instruments' high-end **C2000 Delfino** family. It features **two 32-bit floating-point C28x CPUs**, each running at up to **200 MHz**, delivering exceptional performance for real-time applications. The device also includes **two CLA (Control Law Accelerators)** for parallel processing, enabling deterministic control loops and precise timing — perfect for industrial automation, robotics, and digital signal control.

Key hardware specifications include:

- **200 MHz dual-core C28x CPUs** with floating-point units
- **1 MB Flash memory** and **204 KB SRAM**
- **Dual CLA co-processors** for real-time parallel control
- **16-bit and 12-bit ADCs** for high-speed, high-resolution analog data acquisition
- **PWM modules**, **QEP**, and **SPI/I2C/CAN/UART** interfaces

This combination allows the board to perform complex mathematical computations while maintaining ultra-low latency and deterministic response.

🔌 Comprehensive Connectivity and Expansion

The LAUNCHXL-F28379D is designed for flexibility and expandability. It provides multiple onboard interfaces and headers that make it easy to connect sensors, actuators, communication modules, and custom circuits.

Connectivity highlights:

- **Dual BoosterPack connectors** for expansion and modular prototyping
- **High-resolution PWM outputs** for precision motor control and power applications
- **Analog inputs** with dual 16-bit ADCs capable of simultaneous sampling
- **Onboard XDS100v2 JTAG emulator** for direct programming and debugging
- **CAN, SPI, I2C, and UART** communication interfaces for industrial and embedded networking

With support for **BoosterPack plug-in modules**, developers can rapidly prototype with additional hardware such as wireless transceivers, sensor modules, and display interfaces.

⚡ Optimized for Real-Time Control Applications

The C2000 Delfino architecture is purpose-built for real-time control tasks that demand speed and accuracy. The **dual-core design** allows simultaneous execution of independent control algorithms or concurrent processing and communication tasks.

Each core can handle motor control loops, digital signal processing, or data acquisition independently, while the CLA units offload control logic to maintain consistent timing performance.

Typical applications include:

- Field-oriented motor control (FOC)
- Digital power converters and inverters
- Industrial drives and automation systems

- Electric vehicle (EV) subsystems
- Renewable energy systems (solar/wind)
- Robotics and motion control

This makes the LAUNCHXL-F28379D ideal for professional engineers, researchers, and students working on high-performance embedded control systems.

💻 Software Ecosystem and Development Tools

Texas Instruments provides a robust and user-friendly development environment for the C2000 family. The **LAUNCHXL-F28379D** is fully compatible with:

- **Code Composer Studio™ (CCS IDE)** – TI's integrated development environment with advanced debugging and real-time analysis tools.
- **C2000Ware™ Software Package** – Includes peripheral drivers, example code, and libraries for rapid development.
- **MathWorks MATLAB® & Simulink® Support** – Enables model-based design and direct code generation for control algorithms.
- **TI Motor Control SDK and Digital Power SDK** – Streamlined software frameworks for quick prototyping of control applications.

Developers can program, debug, and monitor system performance directly through the **onboard XDS100v2 emulator** without any external programmer.

🧰 Board Features and Design

The LAUNCHXL-F28379D offers a compact yet powerful design suitable for bench-top experimentation or integration into prototypes.

Key features include:

- **Onboard LEDs** for status and debugging
- **User pushbuttons** for input testing
- **Micro-USB port** for power and data communication
- **BoosterPack connectors** for peripheral expansion
- **Onboard 3.3V voltage regulation**

The board can be powered through **USB** or an **external supply**, providing flexibility for both low-power and high-current applications.

Educational and Professional Applications

The TI LAUNCHXL-F28379D is widely used in universities, research labs, and industrial R&D facilities for its reliability and ease of integration. Whether used for teaching advanced control theory, testing motor algorithms, or deploying real-time embedded systems, it provides a practical and powerful platform for hands-on development.

What's Included

- 1× **Texas Instruments LAUNCHXL-F28379D LaunchPad Board**
- Pre-installed firmware and sample projects
- USB cable for power and programming
- Quick start guide and documentation