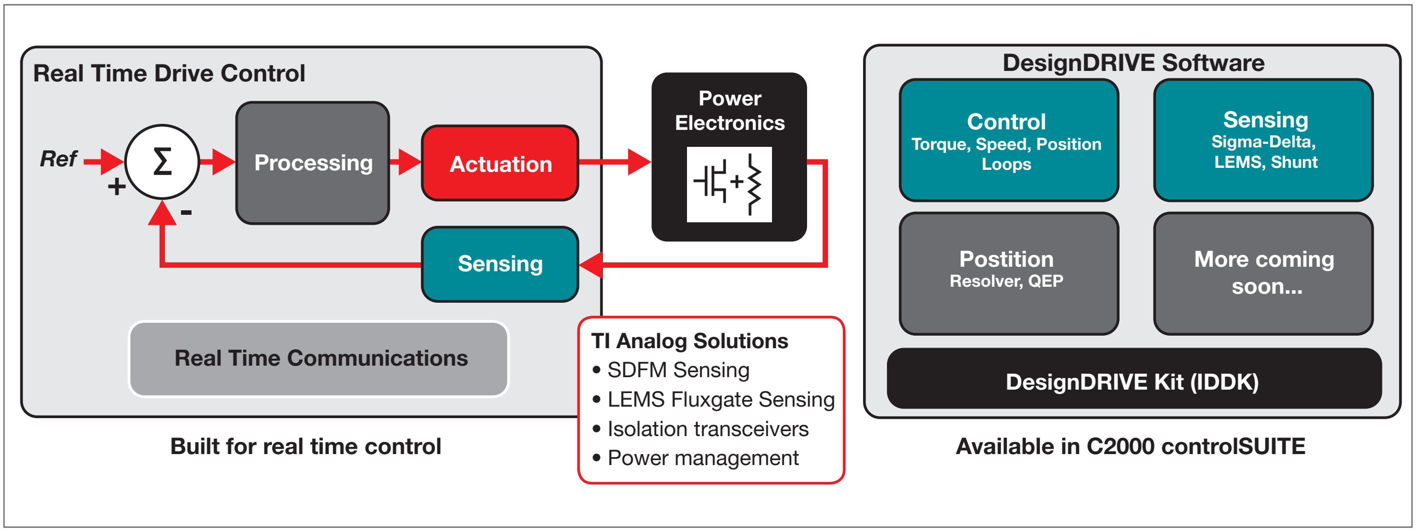
DesignDRIVE Kit

The ONE place to create MANY designs for Industrial Drives

Texas Instruments

Integrated Drive Controller – Delfino™ TMS320F2837x C2000™ MCU

Processing	Actuation	Feedback Interface Circuits
• Up to 800 MIPS (Dual Core) • Trigonometric Math Unit • Up to 1MB flash • Up to 204KB SRAM	• Up to 24 ch Flexible PWM • 3 phase to multil-level • Programmable Trip Zones • Safety diagnostics	• Quad 16 bit/12 bit ADCs • Sinc Filters with compare • AMC130x, AMC120x compliant • LEMS, Shunt topologies



Real Time Drive Control

Ref + Σ - Processing Actuation Sensing

Real Time Communications

Built for real time control

Power Electronics

TI Analog Solutions
- SDFM Sensing
- LEMS Fluxgate Sensing
- Isolation transceivers
- Power management

DesignDRIVE Software

Control Torque, Speed, Position Loops

Sensing Sigma-Delta, LEMS, Shunt

Postition Resolver, QEP

More coming soon...

DesignDRIVE Kit (IDDK)

Available in C2000 controlSUITE

Flexible System Expansion Support

Industrial Connectivity	Functional Safety	Position Encoder Feedback
• Expansion slot for future enhancements	• Expansion slot for future enhancements	• EnDat • SinCos • BiSS • QEP • Resolver

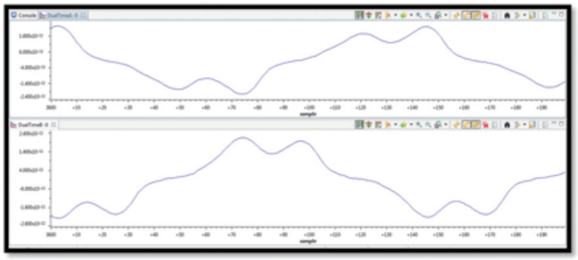
Getting Started

DesignDRIVE Kit: www.ti.com/tool/tmdxiddk377
Delfino™ MCU: www.ti.com/tool/tmdxdock28377d
DeltaSigma Mod: http://www.ti.com/tool/TIDA-00171

TMDXIDDK377	$ 999
TMDXIDDK377D-MTR-BNDL	$1,199

Current Measurement Topology Comparison and Real-time Control Performance Evaluation

SDFM Current Sense

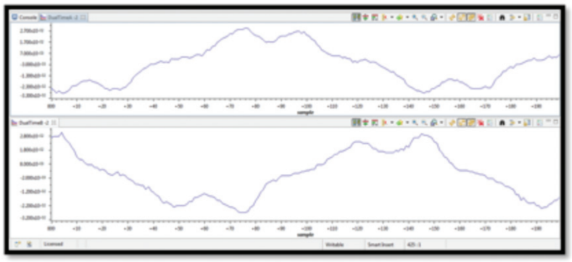


Park Transform cycles

$$\text{Park}\quad \begin{bmatrix} i_d \\ i_q \\ i_o \end{bmatrix} = \begin{bmatrix} \cos(\theta) & \sin(\theta) & 0 \\ -\sin(\theta) & \cos(\theta) & 0 \\ 0 & 0 & 1 \end{bmatrix} X \begin{bmatrix} i_\alpha \\ i_\beta \\ i_o \end{bmatrix}$$

Coding Format	C28-TMU	Competition
Inline C Macro	19	150-250
C Function Call	29	150-250

LEM Current Sense

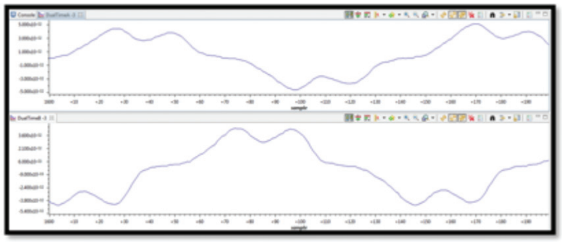


Resolver Angular Position Calculation cycles

(Using ATAN2 operation)

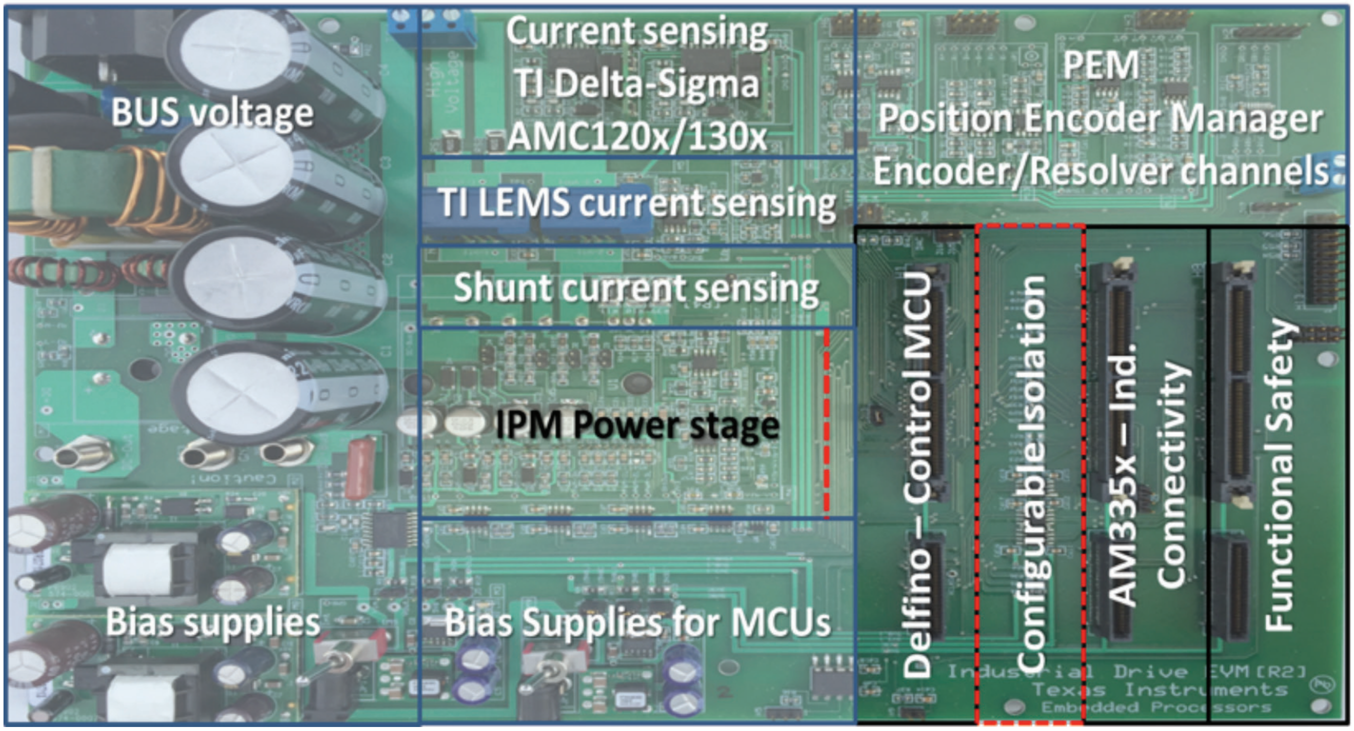
Coding Format	C28-TMU	Competition
Inline C Macro	14	100+
C Function Call	24	100+

Shunt Current Sense



Field Oriented Control Loop cycles

Motor Type	C28-TMU Min cyc Max		Competition Min cyc Max	
PMSM	547	592	1096	1208
ACInduction	593	670	1260	1387



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