

# New Product Update

Simplifying Precision Motor Control  
with TI's Motor Control SDK:  
Enhancing Real-Time Industrial  
Communication and Control

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# Agenda

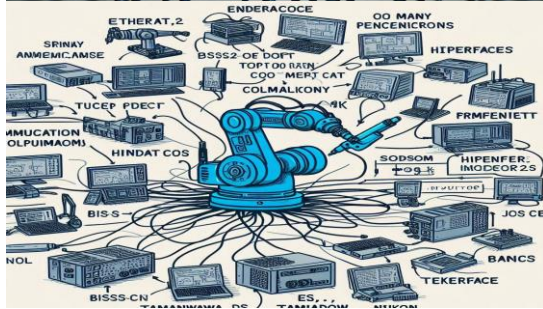
- Introduction
- Modern motor and motion control challenges
- Simple and robust motor-control solutions
- TI Motor Control Software Development Kit (SDK)
- Getting started resources
- Q&A

# Introduction

Pratheesh Gangadhar is a Senior Member of Technical Staff and Engineering Manager in Software Technology ICSS (Industrial Communications Subsystem) R&D Team at Texas Instruments Bengaluru (India). ICSS is a differentiated IP in TI Embedded Processors and MCUs which is enabling Industrial Communications, Motor Control, Configurable IO interfaces. Pratheesh has 22+ years of experience in industrial communications and real time control and embedded systems as software and systems architect and joined TI in 2002.



# Modern motor and motion control challenges



OPC UA

CC-Link IETSN

TSN

EtherCAT

EtherNet/IP

PROFINET

Modbus

ETHERNET POWERLINK

SERCOS interface

RTEX Realtime Express

MECHATROLINK

IO-Link

BISS INTERFACE

HiPERFACE DSL

EnDat

Samagawa

Nikon

1. Diverse Industrial Communications and Encoder protocols requiring specialized hardware
2. Multiple software stack and control algorithm partners
3. Complex Hardware and Software Development cycles
4. Increased development cost, board space and power needs
5. Limited options for scalability
6. Missing high speed serial and time synchronization interfaces

# Simple and robust motor-control solutions



## Entry level

AM2632 microcontrollers

- 4 Cortex®-R5F cores  
➔ **(1,600 DMIPS)**
- 10/100 industrial Ethernet



## Mid range

AM263P4 microcontrollers

- 4 Cortex®-R5F cores  
➔ **(3,200 DMIPS)**
- 10/100 industrial Ethernet



## High end

AM2434 microcontrollers

- 4 Cortex®-R5F cores  
➔ **(6,400 DMIPS)**
- Gigabit industrial Ethernet



## Advanced

AM6442 processor

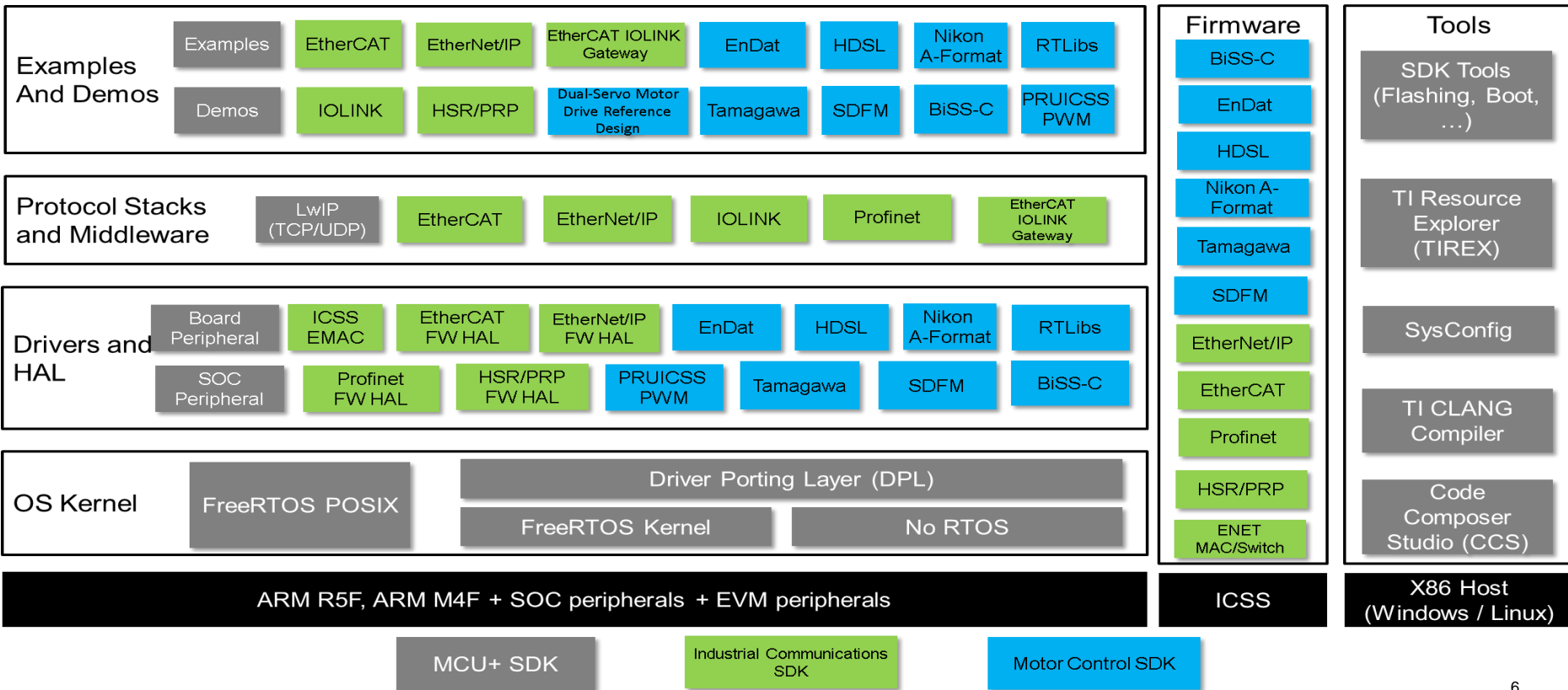
- 4 Cortex®-R5F cores  
➔ **(12,400 DMIPS)**
- **2 Cortex-A53 cores**
- Gigabit industrial Ethernet

## Scalable portfolio

1. Real-time performance
2. Simultaneous communication & control
3. Industrial rated (-40°C to 125°C)
4. Licensed and certified device software stacks
5. Unified software development environment
6. Boot and runtime security



# TI motor control software development kit (SDK)



# Dual-Servo Motor Drive Reference Design

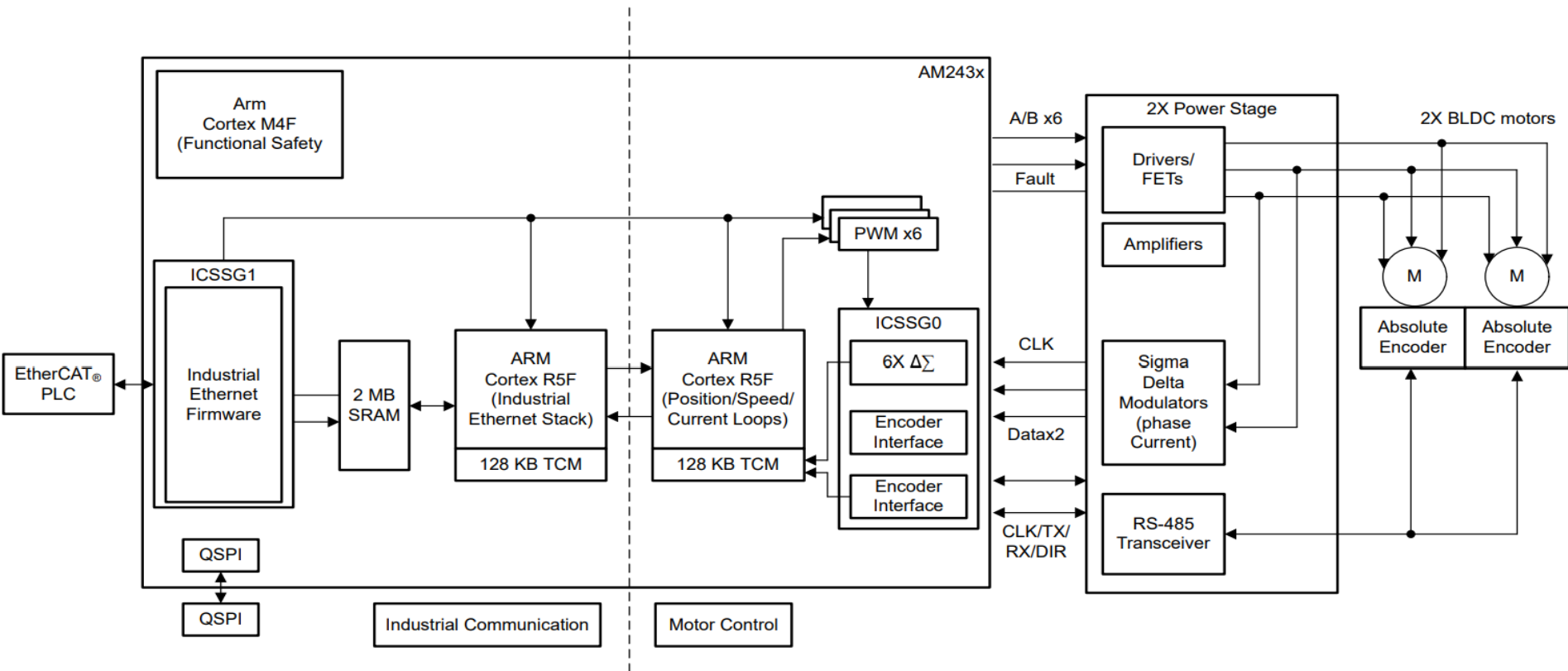
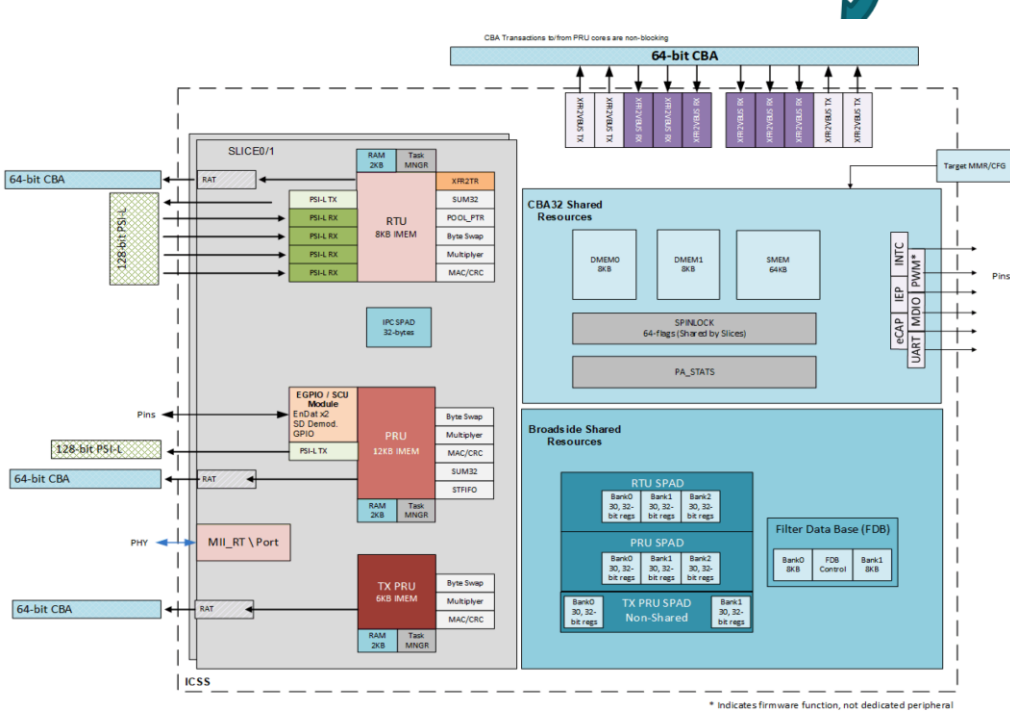


Figure 2-2. TIDEP-01032 Block Diagram

# Programmable real-time unit

PRU—programmable real-time unit

ICSS—Industrial communication subsystem



\* Indicates firmware function, not dedicated peripheral

## Technology features:

- The PRU is a deterministic latency RISC cores with ultra low latency I/O control capabilities
- The ICSS is a proprietary technology from Texas Instruments that is used to implement industrial communications, motor control and configurable I/O interfaces via firmware
- Select devices feature 6 PRUs at (up to 333MHz max.) enabling Gigabit industrial Ethernet.
- Additional options include 2 PRUs (up to 225MHz max.) for 100M industrial Ethernet.



# Question & answer session



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