

Deepika Kuppireddi

Embedded Firmware Driver Development

✉ deepikareddy5586@gmail.com ☎ 7032926077

Profile Summary

Embedded Firmware Engineer with **1+ year of Exp** developing and testing low-level firmware and drivers for SoC peripherals.

Professional Experience

- I specialize in writing and debugging firmware for I2C, SPI, UART, and USB 2.0 interfaces on ARM Cortex-M4 & A53 platforms using Embedded C.
- I have hands-on experience with both bare-metal and RTOS-based systems.
- My work includes board bring-up, peripheral driver development, and close collaboration with hardware teams.
- I'm skilled with tools like oscilloscopes, logic analyzers, and JTAG/SWD, and known for writing clean, maintainable code under tight deadlines.
- Including testing and debugging of legacy firmware code.
- Proficient in C and Embedded C, with a focus on bare-metal programming and hardware-level debugging.
- Familiar with GNU toolchain: GCC, GDB for cross-compilation and debugging.
- Experienced with debugging tools such as oscilloscopes, digital multimeters (DMMs), and logic analyzers.
- Used version control systems including GIT and GitHub for source code management and collaboration.
- Strong skills in validation, debugging, root cause analysis, and reporting, with an emphasis on writing efficient C code.
- Worked extensively with bug tracking tools such as JIRA for issue tracking and resolution.
- Practical experience with peripheral devices like LEDs, Seven-Segment Displays, RTC, EEPROM, and LCDs.
- Strong understanding of the Software Development Life Cycle (SDLC), including design, development, testing, and implementation phases.

Work Experience

1+ year of hands-on experience in developing embedded firmware drivers for peripherals with practical exposure to writing and debugging Linux kernel device drivers.
Currently working as a Firmware Driver Developer at Azonik Solutions Pvt Ltd

Skills

Programming Languages:

C, Embedded C, Assembly

Platforms:

ARM Cortex-M, Cortex-A

Debug Tools:

JTAG, Serial console, Lauterbach

Protocols:

I2C, SPI, UART, USB(2.0)

Tools:

Oscilloscope, Logic Analyzer, Protocol Analyzer

Lab Equipment:

Multimeter, Power supply, Bench tools

Education

BTech in Electrical and Electronics Engineering, <i>Lakireddy Balireddy College of Engineering</i> CGPA:- 7.57	2020 – 2024
MPC, Vikas Junior College CGPA:- 7.7	2018 – 2020
SSC, Geethanjili High School CGPA:- 9.5	2017 – 2018

Projects

Project #03: USB(2.0) Controller Diagnostics Execution

Environment: Embedded C, ARM SoC, LeCroy 310C Analyzer, JIRA

Description: Developed and integrated USB diagnostic firmware on a new ARM-based SoC, targeting full coverage across all ports and speed modes. Focused on low-level USB functionality, including endpoint handling.

Responsibilities:

- Created and maintained a USB diagnostics tracker covering all ports and speed modes (LS/FS/HS/SS).
- Developed and executed firmware-level test plans for production use cases using LeCroy protocol analyzer.
- Performed regression testing, including simultaneous multi-device traffic and wake-on-connect/disconnect scenarios.
- Validated USB endpoints (Isochronous, Bulk, Control) through data transfer and hot plug tests.
- Logged issues in JIRA and collaborated with hardware, firmware, and LeCroy teams to resolve diagnostic challenges.

Project #02: Firmware Development – I2C Controller

Environment: Embedded C, ARM Cortex-M, I2C, T32 Debugger, JTAG, Logic Analyzer, DSO

Description: Worked on writing and validating firmware for the I2C peripheral block of a System-on-Chip (SoC). Focused on ensuring protocol compliance, reliable communication, and correct operation under low-power conditions.

Responsibilities:

- Developed and executed test plans to verify I2C features using Embedded C.
- Used logic analyzers and oscilloscopes to validate signal timing and data correctness.
- Debugged low-level firmware bugs with Trace32 Debugger and JTAG interface.
- Verified I2C functionality in various low-power modes (sleep, power-down).
- Collaborated with hardware and design teams during chip bring-up and early validation stages.

Project #01: Firmware Development – UART and SPI Controller

Environment: Embedded C, ARM Cortex-M, UART, SPI, Logic Analyzer, JTAG, DSO

Description: Developed and validated firmware drivers for UART and SPI communication interfaces on an ARM-based embedded platform. Focused on creating reliable, protocol-compliant drivers and validating them using hardware tools.

Responsibilities:

- Developed bare-metal SPI drivers supporting both master and slave modes, with configurable parameters (CPOL, CPHA, bit order).
- Created test cases for full-duplex SPI data transfer, chip select logic, and interrupt handling.
- Designed and performed UART loopback and communication tests with various configurations (baud rate, parity, stop bits).
- Used JTAG, logic analyzers, and oscilloscopes to debug register-level issues and signal behavior.
- Documented driver APIs and integration steps to support application teams and testing workflows.