

ARVIND (Embedded Engineer)

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Profile Summary

Embedded Firmware Engineer with 6 years of industry experience, including 4 years of focused experience in firmware and bootloader development using C/C++ across STM32, PIC, AVR, and Renesas microcontrollers. Strong background in RTOS (ThreadX & FreeRTOS), low-level programming, and hardware-software integration. Proven ability to develop and debug robust embedded solutions across industrial and consumer applications.

Core Skills

Programming Language: Embedded C (MISRA C:2012 compliant), C++

Microcontrollers & Platforms: STM32, PIC, Renesas, AVR, Raspberry Pi.

RTOS: FreeRTOS, ThreadX

Communication Protocols: UART, SPI, I2C, USB.

Wireless & Interfaces: IR (NEC, RC5).

Development Tools & IDEs: STM32CubeIDE, MPLAB X, e2Studio, Arduino IDE, TouchGFX.

Debugging tools & Interfaces: PICKit, J-link, ICSP, JTAG, SWD.

Version Control: Git.

Hardware Skills: PCB Design (Altium), Debugging, Schematic Design

Operating Systems: Ubuntu Linux, Windows.

Professional Experience

Senior Firmware Engineer

ATRI Solutions, Gandhinagar

Oct 2025 – Aug 2026

- Worked on induction charger systems (1-phase & 3-phase) for industrial applications.
- Debugged and resolved critical issues in host MCU ↔ display MCU communication.
- Fixed system hanging issues, RTC synchronization problems, and optimized memory utilization.
- Led 1-phase induction charger development by porting firmware from a 3-phase architecture.
- Designed system architecture using FreeRTOS on a Renesas MCU (EK-RA6M5 DK, e2 studio).
- Developed a POC for a smart screw tightening machine integrating a motor controller, torque sensor, barcode reader, RTC, and RGB PWM control.
- 3-Phase Energy Meter: Developed initial firmware for 3-phase voltage/current RMS and instantaneous measurements, waveform plotting data, and FFT-based fundamental frequency measurement.

Embedded Firmware Engineer

4C Tech Venture, Mohali

May 2024 – July 2025

- Developed end-to-end firmware from concept to production for embedded systems.
- Designed FreeRTOS-based applications on STM32 and ATmega328P

- Integrated LoRa-based wireless communication modules.
- Worked on hardware design, including schematics and PCB design using Altium Designer.

Embedded Engineer

Lipi Data Systems Ltd., Udaipur

Apr 2023 – May 2024

- Developed and debugged firmware and bootloaders for PIC and ARM devices.
- Implemented FreeRTOS-based multitasking systems.
- Performed hardware debugging, memory optimization, and root cause analysis.
- Built diagnostic and testing tools for production systems.

Earlier Experience

Firmware Engineer – Laxmi Remote India Pvt Ltd, Noida (Aug 2022 – Mar 2023)

- Developed IR-based firmware using NEC and RC5 protocols
- Performed validation and testing for consumer electronics products

Embedded Hardware Engineer – Premier Medical Systems, Noida (Jul 2020 – Aug 2022)

- Designed schematics and PCB for medical devices (ventilators, anesthesia systems)
- Performed testing, troubleshooting, and on-site support in hospitals

Key Projects

- **3-Phase Induction Charger.**
Worked on firmware debugging, communication issues, memory optimization, RTC fixes, and system stability.
- **Smart Screw Tightening Machine (POC).**
Designed system using FreeRTOS on Renesas MCU with multiple module integration.
- **Ticket Vending Machine (STM32, FreeRTOS).**
Developed multitasking firmware for monitoring and control operations.
- **Thermal Receipt Printer (STM32).**
Implemented firmware enhancements and resolved critical bugs.
- **Peristaltic Pump System**
Designed control logic with manual and automatic operation modes.
- **Auto Height Adjustment System (PIC).**
Developed control system using sensors and switches for positioning.

Education

- **Dr. APJ Abdul Kalam Technical University – B.Tech (ECE), 67% (2018)**