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CONNECTIVITY · USA

Embedded Web Server with Secure Remote Access

Embedded Firmware | Network Connectivity | Web Interface | File System Integration

CLIENT

A US-based technology company.

THE PROBLEM

The client had an embedded web server platform that could serve pages for remote monitoring and control of mechanical systems — a good starting point, but not yet something they could put in front of their own customers. It had no concept of users or access control, so anyone who found the address could control the system; no persistent storage for configuration or logs; and it could only really handle one connection at a time, which wasn't realistic for a product meant to be accessed by multiple people.

WHAT WE BUILT

We treated this as turning a working prototype into a production-ready product. Access control came first — we added a login system so only authorized users could reach the control pages at all. Then persistent storage, using a standard file system on the device itself, so configuration settings and operational logs survived power cycles and could be reviewed later. And then concurrency — reworking the server so it could genuinely handle multiple people connecting and interacting with the system at the same time, rather than queuing or dropping connections. The result still runs entirely on the embedded device itself, reachable from any browser, anywhere with an internet connection.

WHAT IT DOES

- ✓ Serves web pages for remote control and monitoring of a connected mechanical system, reachable from any standard browser
- ✓ Restricts access to authorized users via a login system — the system is no longer open to anyone who finds its address
- ✓ Stores configuration data and operational logs persistently on the device using an onboard file system, surviving power cycles
- ✓ Allows current settings to be downloaded, edited offline, and re-uploaded to take effect immediately
- ✓ Handles multiple users connecting and interacting with the system simultaneously, without dropping or queuing connections

OUTCOME

The client went from a working prototype to a product they could deploy to their own customers — secure, multi-user, and self-contained on the embedded device, with no separate server or additional software for end users to install.

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