embin

TEST & MEASUREMENT · USA

Test Instrument Redesign & Modernization

Hardware Redesign | Embedded Firmware | USB Connectivity | PC Driver Development | Regulatory Compliance

CLIENT

A US-based manufacturer of precision photonic test and measurement instruments.

THE PROBLEM

The client had a high-performance instrument with a loyal customer base, but it was built around components that were becoming difficult and expensive to source, and the design predated current regulatory compliance standards. The client's choices were essentially: stop selling a product their customers still wanted, or take on a redesign — but a redesign that changed the instrument's specifications even slightly risked alienating the customers who'd chosen it for exactly those specifications.

WHAT WE BUILT

We treated "preserve the original specifications" as the hard constraint and worked everything else around it. The internal electronics were redesigned around newer, more readily available components — chosen specifically because they could replicate the original's performance characteristics rather than just being "close enough." That redesign also happened to bring the instrument into compliance with current regulatory standards, which the original design predated. On top of the core redesign, we added modern USB connectivity for PC communication and control — something the original design never had — redeveloped the front-panel interface for better usability, and wrote updated PC driver software so the client's customers could integrate the instrument into their own systems.

WHAT IT DOES

- ✓ Preserves the original instrument's performance specifications, using newer components chosen to replicate those characteristics rather than approximate them
- ✓ Brings the instrument into compliance with current regulatory standards as a result of the component redesign
- ✓ Adds modern USB connectivity for PC-based communication and control, which the original design lacked
- ✓ Redeveloped front-panel interface for improved day-to-day usability
- ✓ Includes updated PC driver software so customers can integrate the instrument into their own test and measurement systems

OUTCOME

The client could keep selling an instrument their customers already trusted — same performance, same reasons to buy it — while solving the sourcing problem on the old components, meeting current regulatory standards, and adding USB connectivity that opens the door to system integrations the original design never supported.

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