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FPGA · USA

Multi-Channel Precision Signal Generator

Custom Digital Design | Programmable Logic Development | Precision Timing Control

CLIENT

A US-based company.

THE PROBLEM

The client needed a controller for their product line that could generate several independent precision timing signals at once — each one needing fine, independent control over both its frequency and the shape of its pulse. A fixed-function chip could do this, but it would lock the design in place; if the client's requirements shifted even slightly — one more channel, a different frequency range — it would mean a hardware respin.

WHAT WE BUILT

We built the controller around reprogrammable digital logic rather than a fixed-function chip, specifically so the client wouldn't be locked into today's exact requirements. Each of the multiple output channels was designed to operate independently — one channel's frequency or pulse-width setting doesn't affect another — with high-resolution control over pulse width on every channel and a wide adjustable range for output frequency. Because the logic itself is reprogrammable, if the client's needs change down the line — more channels, different timing ranges, new behaviours — that's a logic update, not a new circuit board.

WHAT IT DOES

- ✓ Generates multiple independent precision timing signal channels from a single compact controller
- ✓ Each channel supports high-resolution, independent adjustment of pulse width
- ✓ Supports a wide adjustable range of output frequencies across channels
- ✓ Built on reprogrammable digital logic, so functional changes can be made via a logic update rather than a hardware respin
- ✓ Gives the client room to extend or adjust channel behaviour as their product line evolves, without redesigning hardware

OUTCOME

The client got a compact, multi-channel signal generator for their product line that isn't locked to today's exact specification — future changes in channel count, timing ranges, or behaviour can be made through reprogramming rather than a hardware redesign.

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