

# Instrumentation Technologies

## DESIGN CONSULTING FOR XYLON



Designed by **XYLON**



**INSTRUMENTATION  
TECHNOLOGIES**

## OVERVIEW

Instrumentation Technologies helped the Xylon team solve design issues on their data logging product, allowing them to deliver to their end customer on time. Our team identified the core problem and proposed the solution within one day.

## CUSTOMER VISION

Xylon is an electronics company that specializes in the designing of flexible automotive data logging solutions, intellectual property and design services based on programmable FPGA and SoC/MPSoC devices. The company was established in 1995, and since then it has delivered many FPGA designs used in production automotive systems. Xylon's all-in-one logiRECORDER Automotive Video Data Logger enables non-invasive and simultaneous recording of multi-channel video and network data, data analysis, and playback of all logged data in realistic HIL simulations. It replicates the test-vehicle's entire video and network systems on the developer's desk, thus reducing time-consuming and costly road tests.

“ The client needed a quick solution and with the help of simulations we were able to find the solution in one day. It wasn't an easy task, but we have a good range of technical knowledge within the team and are therefore able to work together efficiently. ”

*Instrumentation Technologies Solutions Architect*

## THE CHALLENGE

Xylon had developed a data logging product and were just about to start production when they realized that the communication between the external camera, transceiver and FPGA was not reliable. Their R&D team invested a significant amount of time and conducted several retrials without success. Consequently, the delivery of the product was delayed and they had to work fast to discover a solution for their waiting end customers.

Xylon's CEO clarified their needs. They needed a flexible engineering team with the right RF and signal integrity knowledge and the right equipment for designing, developing and debugging assembled PCBs. They specifically needed someone who could solve the problem quickly, and our team's agile approach was the right fit.

## APPROACH

We collected all the required development documentation and made some speculations about the root cause. The underlying problem was in the parasitics of the component footprint and PCBtrack impedance between the input connector, the transceiver and the FPGA.

In the first step, we provided assistance via email, and the client followed our instructions to modify the ground layers under the connector. This improved the reliability and confirmed that the issue was indeed in the signal integrity around the connector and further in the signal line towards the FPGA.

In the second step, we used the HyperLynx tool to conduct signal integrity simulations over the entire chain, from the input connector to the FPGA. The results showed that improvements needed to be made in the grounding and coupling around the connector as well as in matching the impedance on the line between the connector and the FPGA.

In the last step we organized a joint hackathon between both development teams in order to verify our assumptions and simulations and propose possible solutions. The product was attached to a VNA (vector network analyzer) with a TDR (time domain reflectometer) to measure the impedance of the entire line. We measured the impedance of every segment in order to identify the part that was showing a 50 ohm mismatch. After that we suggested, prototyped and tested improvements in the signal routing from the connector to the transceiver unit and overall PCB layout, especially around the input connector.

## COMMUNICATION

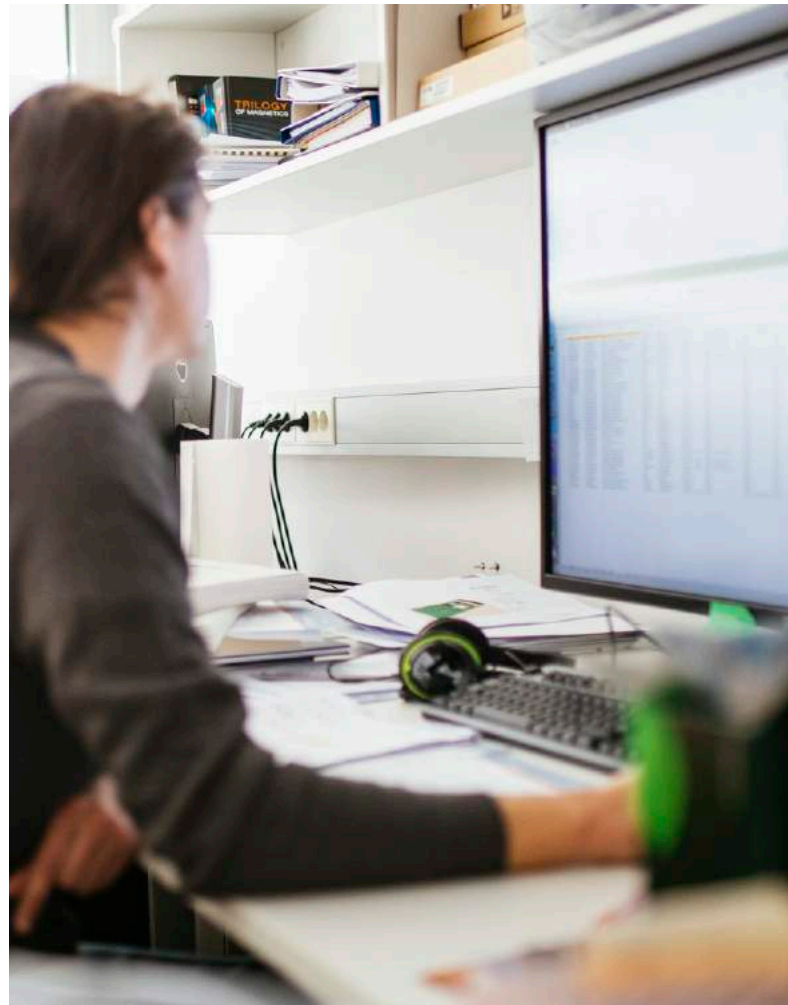
The client was searching for a reliable partner who could provide an extremely quick solution to their problem. Since this issue was delaying the delivery of the product it was crucial to be quick and agile in solving the problem.

“*Instrumentation Technologies' engineers had the right knowledge and tools to quickly identify and solve our problem with the signal integrity and RF design details of the high-end automotive interface on our data-logger unit. They have saved us a tremendous amount of time!*”

Davor Kovacec, XLYON CEO

## CONCLUSION

With our customized and modular approach, we were able to meet the Xylon's requirements and deliver a product that behaves as expected. The customer was able to satisfy its end customers and transition into high-volume production.



## ABOUT US

Instrumentation Technologies is a well-experienced, high-tech company, able to provide cutting-edge solutions for your needs. Our flexible team is comprised of curious and innovative, yet reliable and well-experienced, engineers, who work to excel at every solution they develop.

We started 20 years ago in the field of particle accelerators, where we now offer diverse high-performance instruments, under the name Libera. Utilizing the knowledge, we have gained in the demanding field of particle accelerators, we are also able to offer consultation expertise in other technologically demanding fields, such as MedTech, IoT, smart cities, telecommunications, aerospace, and university research. Our solutions include hardware and embedded software design, rapid prototyping, product development, and certification assistance.