

Case Study: Anechoic Chamber

Client: The University of Greenwich

NI Products Used: cRIO, NI 9512 Motion Control Module, NI 9401 Digital I/O

Application Area: RF Testing and Test Automation

Key Benefits:

- **Utilised existing technology:** By embedding existing hardware into the new system it was possible to lower upfront cost, reduce re-training time for staff and maintain test accuracy and data repeatability of the test system.
- **Allows future upgrades:** The architecture and design of the new system allows fast integration of future hardware upgrades and signal processing software.



UNIVERSITY
of
GREENWICH

The Challenge

The University of Greenwich approached Austin Consultants to design and develop a new control system for its anechoic chamber. In the past, single components of the older existing system were updated but the software and control part of the rig were lagging behind these changes. It was fundamental that as many parts of the test rig were re-integrated as possible into the update project. Independent components had to be connected with suitable signal connections and suitable communication protocols had to be chosen in order to establish a functioning unit. One of the main challenges was to architect the system so that all the different components could be easily synchronized and work together effectively. In addition to this it was imperative to achieve and maintain the required accuracy levels. Some of the components mentioned above include:

- Agilent RF analyser
- Two axis-rotating platform for the antenna test
- Transmitter with RF switch
- Real-time control platform provided by Austin Consultants and PC interface design.



The Solution

Austin Consultants' engineers worked in close partnership with trusted suppliers who assembled and wired the mechanical enclosure for the control system and built up the new external cabling. The design and build phases were characterised by constant quality control and review processes in close correspondence with the client. The chosen software architecture follows a modular approach which offers the necessary long term flexibility to replace and upgrade any components of the rig. Our knowledge of National Instruments products made it easier for us to identify the many advantages of its use in this project, and the integration of third party hardware was accelerated by using NI hardware. A particular example is the NI GPIB-USB convertor which maintained consistency in software-hardware interaction and also increased the overall interoperability between components.

NI Modules / Toolkits:

- cRIO 9068
- NI 9512 motion control modules / NI Softmotion toolkit
- NI 9401 digital I/O.

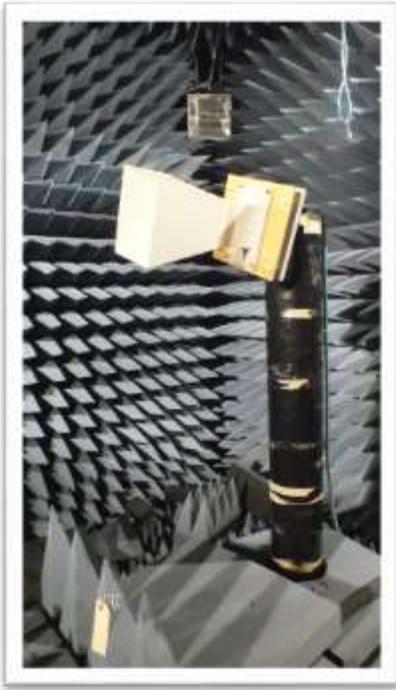
Other Hardware:

- Enclosure and enclosure interior including cabling, switching and rails
- Amplifiers for stepper drive module.

Key LabVIEW Features:

- FPGA control including NI Softmotion components for high accuracy motion of two axis stepper motors
- Customised polar plot for live and history data display
Customised drivers for third party hardware to integrate the existing hardware into the new system.





Client Feedback

“Our initial contact with Austin was made at the recommendation of representatives of National Instruments a world leading test, measurement & control company” We were able to discuss an initial scope of works by telephone conferencing and subsequent conversations enabled a clear definition of the project to be developed with a range of options tailored to the limitations of our budget and timescales. I was totally satisfied with the outcome and I continue to consider Austin Consultants as a provider of solutions within this area of expertise.”

Ian Cakebread, Support Services Manager, Faculty of Engineering and Science, University of Greenwich