Design & Development of Micro-Controller for Probe Deployment in Space

VERTICAL:
AEROSPACE & DEFENCE

SERVICE:
DESIGN OPTIMIZATION

TECHNOLOGY:
CONTROLS & DYNAMICS

Our customer is an agency that is involved in basic & applied research in Atmospheric & Space Physics. For their high altitude balloon experiments, they engaged Zeus Numerix for design & supply of retractable type booms (5 booms, each 2.5m long) and associated mechanisms. For in-flight deployment, a servo motor based system was required to ensure smooth & controlled initiation of unlocking mechanism.

Zeus Numerix developed a micro-controller based servo controller board and related firmware which controlled 5 servo motors that actuate the lock-release mechanism of each boom. On-board micro switch allow selection from four pre-programmed deployment sequences. The system was built to handle wide variety of input voltages and had a simple trigger interface that made system integration simple. For firmware updates, in-system re-programming of micro-controller is possible and appropriate headers were provided.

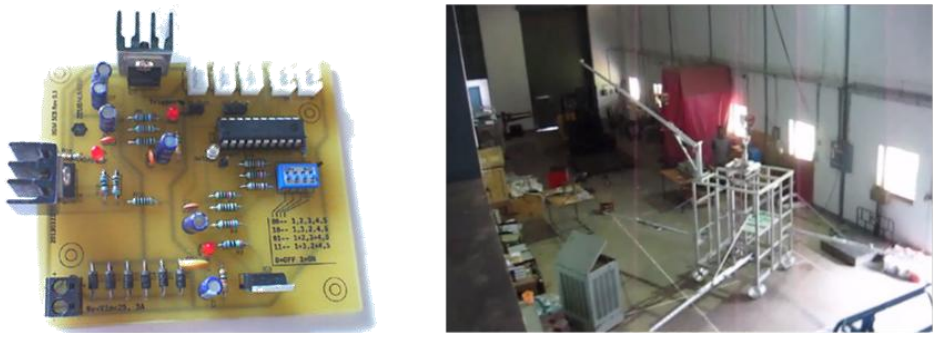

Figure 14: (a) Servo-controller board (b) Balloon gondola with deployed booms

The customer was delivered with the controller board that was readily integrated with the booms & balloon gondola. This integrated probe deployment mechanism is being successfully used by the customer for atmosphere experiments. Due to the integrated & in-house design approach adopted by Zeus Numerix, customer's objectives were realized with minimum cost & time.

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