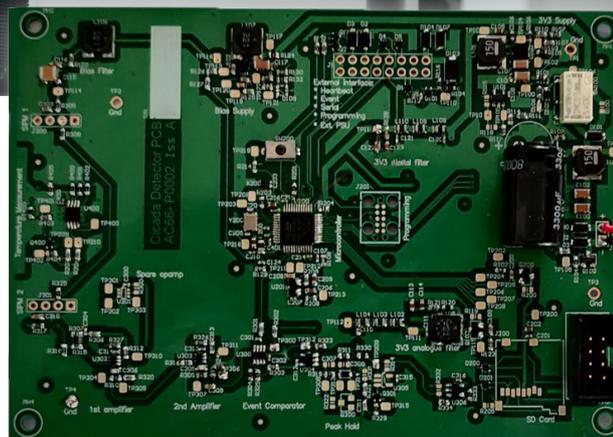




# Low-Power Multi-Channel Analyser

## Electronics For Remote Gamma Ray Spectrometer



“The design is an example of fine circuit engineering and use of the Captec low-power embedded core software stack, to expedite development and exceed customer expectations.”

**Steve Braithwaite,**  
Electronics Team Leader

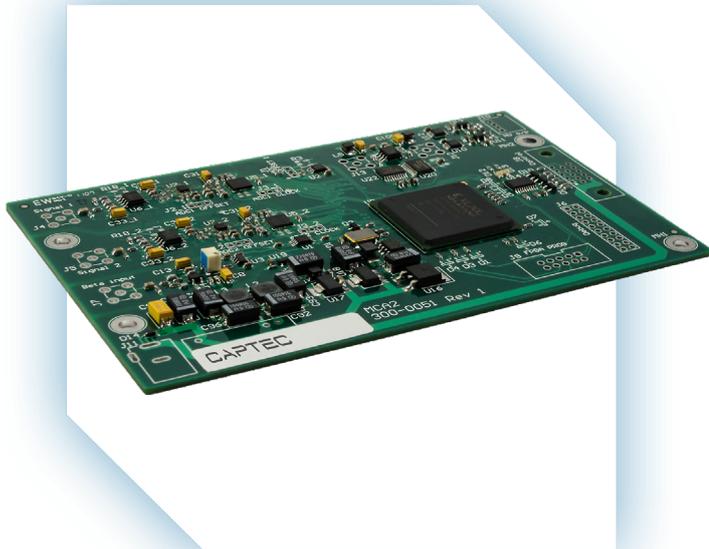
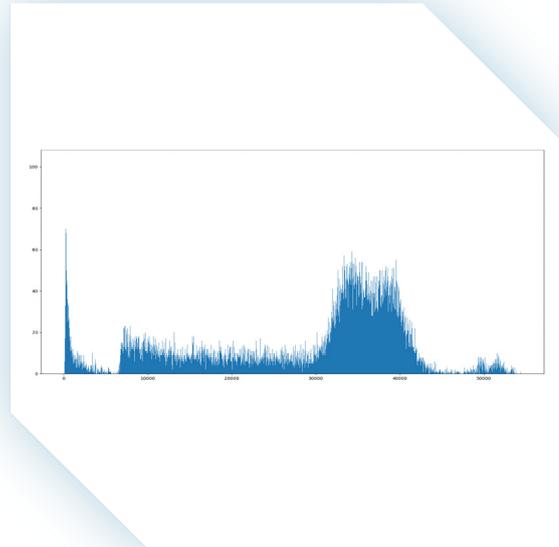
Our customer supports the UK Government’s nuclear defence strategy and the *Continuous at Sea Deterrent*, using their nuclear know-how and technical expertise to provide innovative solutions that support the UK’s counter-terrorism and nuclear threat reduction activities.

### Requirements & Issues

- ▶ Long-life, unattended data logging utilising low-power operation, that was small in size and battery powered
- ▶ Design of electronics for capture-hold scintillator pulses with minimal distortion to optimise MCA accuracy
- ▶ Logging software designed to minimise ‘blind spots’ when pulses are not seen
- ▶ Temperature control software to remove the scintillator and silicon sensor temperature characteristics
- ▶ The need to design a high accuracy peak hold circuit for capturing detector pulses

## The Solution

- ▶ Captec exceeded customer expectations by providing battery operation that lasted over many months, rather than weeks, so the device could be left unattended for longer
- ▶ Our Embedded Core Stack was utilised to provide low-power software, reducing project time and risk, whilst giving an excellent low-power design with minimal blind spots
- ▶ The exceptional circuit design for pulse peak hold circuits allows the fast signal processing to happen in the analogue domain, while the digital electronics sleeps in a micropower state



## The Outcome

- ▶ The creation of new generation low power MCAs for unattended use
- ▶ Longer duration of measurement campaigns when used in battery powered, remote locations
- ▶ Led to a continued relationship in the research of embedded MCAs and increasing their features. There is ongoing work to add customer requested features and improve data accuracy, while preserving the low-power performance
- ▶ Our solution was designed for the defence sector, but we are exploring civilian applications as well



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