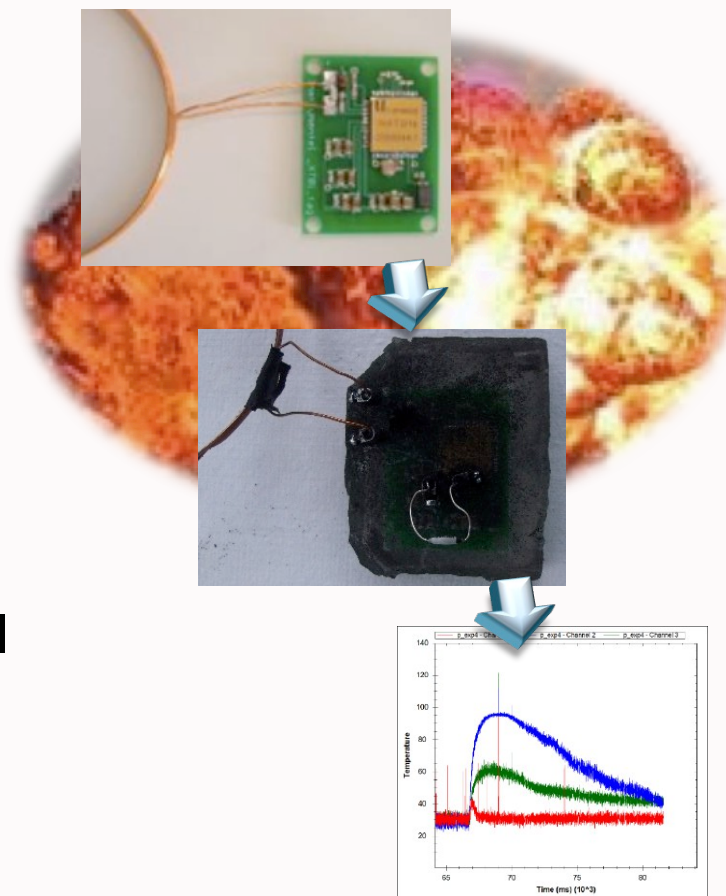


Explosion Metrology

- Developed over 7 years in collaboration with US ONR, DTRA and SWRI
- Proven capability for sampling data during the first 5s ***directly from the target of an explosion***
- Field-deployable system tested at SWRI with equivalent data quality to Dewetron





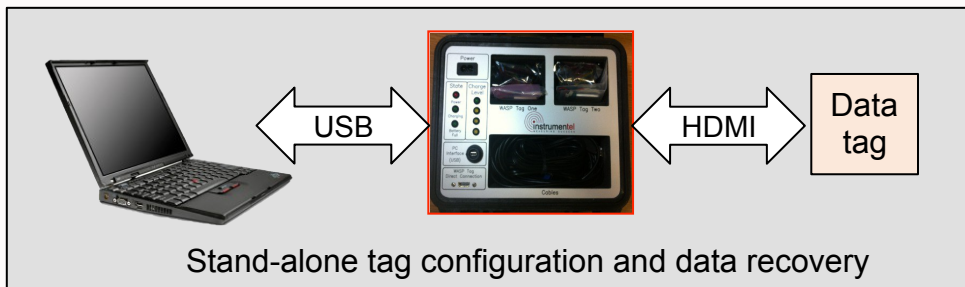
Explosion Metrology - history

- 2004:** First contact with US ONR
- 2005:** DTRA funded program begins to develop rugged, high temperature wireless telemetry tag for explosion metrology
- 2007:** Testing of first generation tag with Instrumentel SOI XT01 transponder chip at SWRI
- 2009:** Testing of second generation tag including microprocessor, multiple data channels and ruggedised packaging
- 2010:** Testing of third generation tag with 20% size reduction, Li-ion batteries, improved triggering and software interface. Sample rate increased to 50ksamples/sec
- 2011:** Testing of field deployable WASP system at SWRI

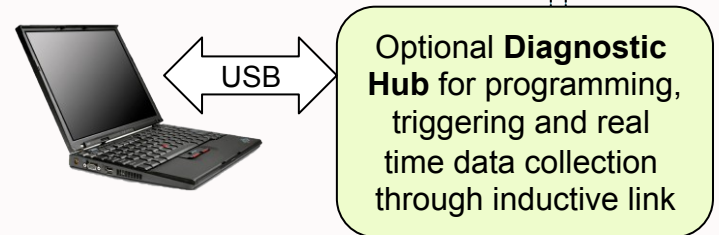
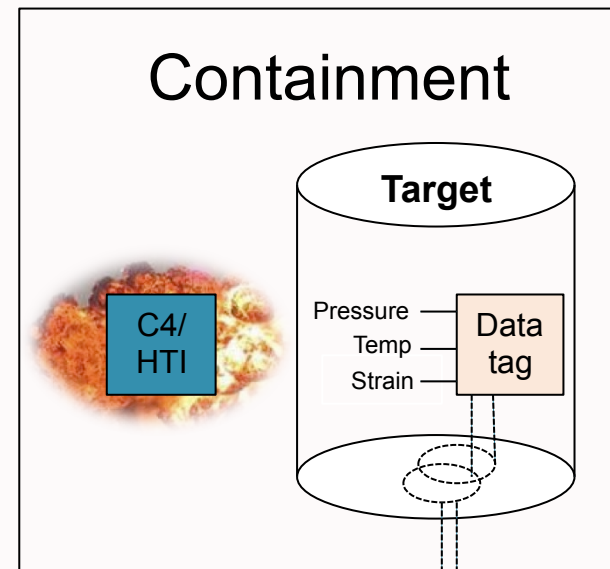
Instrumentel – leaders in electronic data acquisition systems for extreme environments



System Overview



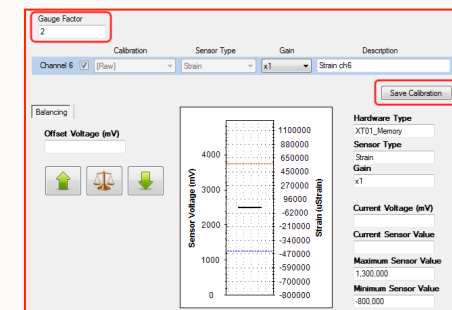
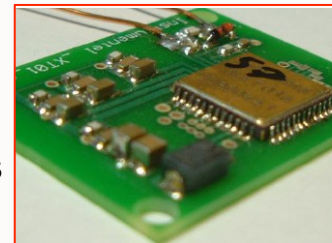
- Stand-alone data acquisition tag is configured for gain, trigger levels and sensor balance before being placed in blast zone
- Each tag collects up to 5s of data at up to 50ksamples/s from three sensor inputs after trigger event
 - Typically: 10ksamples/s for temperature and 20ksamples/s for pressure and strain
- Tags are recovered from blast and data downloaded to PC for immediate analysis
- Optional inductive link allows in-situ programming, triggering and real-time data transfer in first 100ms





System Overview

- Field deployable PELI case containing charge circuits, HDMI interface to data tags and USB interface to PC
- Stand-alone data acquisition tag
 - Up to 10 hour stand-by
 - Three sensor channels with independently programmable trigger levels
 - Constant current and fully regulated voltage supplies allow multiple sensor types
 - Up to 50ksamples/s data rates
 - Li-ion batteries
 - Memory for up to 5s of data
- GUI programming software to set sensor gains, offsets, and trigger levels
- Additional external make and break triggering

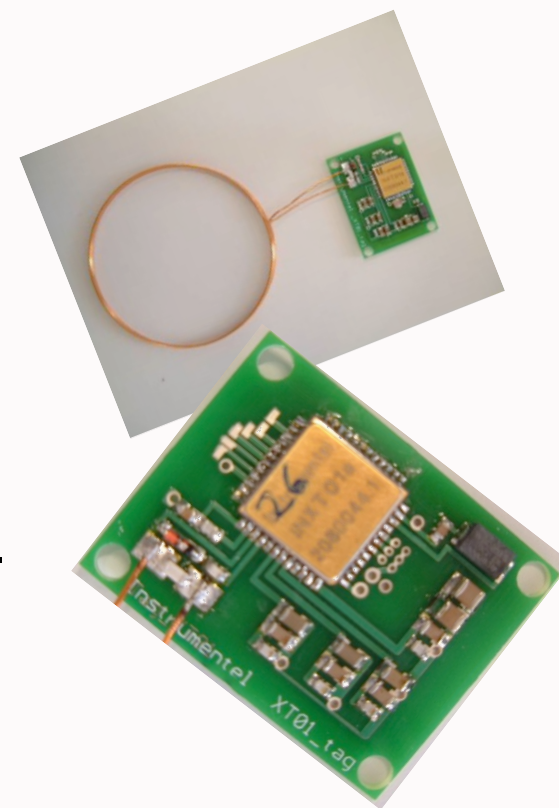


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XTO1 Transponder Chip

- Designed for inductively-coupled wireless telemetry from harsh and extreme environments
- Advanced SOI ASIC
- -40°C to +225°C range
- Outstanding resilience to gamma radiation (tested to 11.5MGy) and mechanical shock.
- Next version intended to incorporate additional capability building on from explosion metrology and nuclear waste monitoring programs

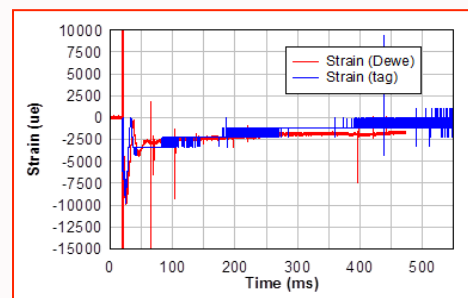
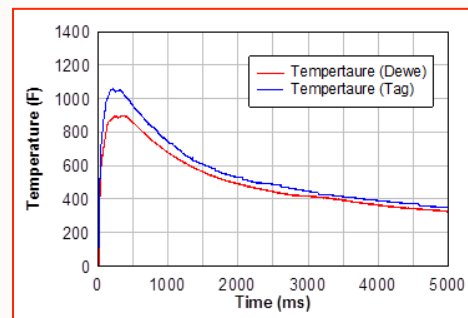
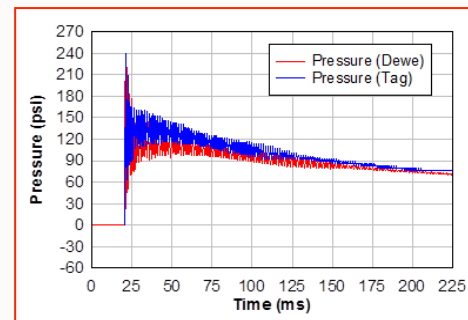


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SWRI Test Results

- Multiple tags placed in canisters with powder or fluid to mimic chemical and biological threats
- Subjected to contained blasts from up to 50g of C4 or C4+HTI
- Temperature, pressure and strain data collected
- Data compares very favourably to that from expensive Dewetron system
- Tests now scheduled for larger-scale blasts at Eglin AFB



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