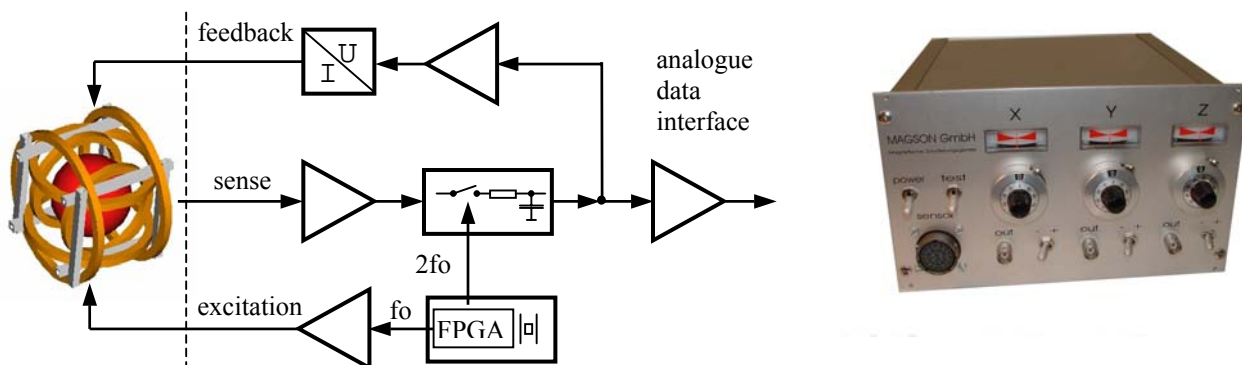


Magson Fluxgate Electronics

Magson offers two kinds of fluxgate electronics. Both versions are available from commercial up to radiation hard qualification levels. Both can be applied for all types of sensors.

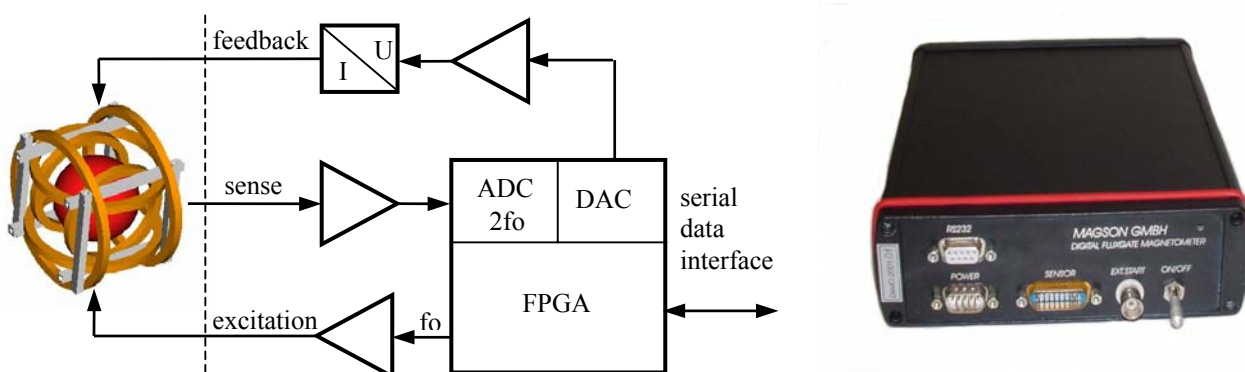
The classical analogue fluxgate electronics

The block diagram of a classical fluxgate electronics with preamplifier, phase-sensitive detector and DC amplification is shown in the following Figure. The clocks for excitation and phase sensitive detector are generated in a FPGA. The feedback current is driven by a voltage to current converter to avoid the influence of the temperature dependent resistance of the feedback coils. The design was improved step by step during the last 20 years by selecting of the most suitable electrical circuits and by long period tests in the Magson test facilities as well as in Geomagnetic Observatories.



The digital fluxgate electronics

For scientific measurements, analogue-to-digital conversion close to the sensor has become more and more important. It reduces the amount of analogue parts, which often cause drift problems or show deviations in the component values, and it highly increases the robustness against environmental influences (e.g. temperature change and electromagnetic disturbances). These considerations led to the design of a mainly digital sensor electronics shown in the block diagram. First, the sensor output signal is amplified by an instrumentation amplifier. Next, it is digitised by a 16-bit analogue-to-digital converter exactly in the minimum and maximum of the second harmonic of the excitation frequency which holds the magnetic field information. All further signal processing is done digitally in the field programmable gate array (FPGA), which also handles the interface. Magson is the only company world wide which provides this technology.



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