



This new DSP-based system has been specially designed to meet the Scanning Probe Microscopy (SPM) application requirements:

- 8 analog I/O capable of operating at up to 150 kHz with a $\pm 10V$ dynamic range
- Low noise and very high DC stability
- Very low input-output group-delay
- Free complete SPM software (see <http://gxsm.sourceforge.net>)
- 5502 DSP from Texas Instrument running at 300 MHz
- SPARTAN 3 FPGA from Xilinx
- High Speed USB interface controller

Advanced SPM features can be implemented using the 16 individually configurable GPIOs and the two 16-bit counters. These counters are synchronized with the analog sampling and can be used as simple pulse counters or Quadrature Encoder Pulse (QEP) counters.

With all these features, the kit SR2-A810 + SR-Mk2 has the best performance/price ratio on the market for a SPM control system.

TECHNICAL DATA

Inputs

- Number of Inputs: 8
- Resolution: 16 bits
- Noise: 1 bit RMS = 150 μV RMS on $\pm 5V$ range
1 bit RMS = 300 μV RMS on $\pm 10V$ range
- Sampling Rate: 11.4 Hz to 150 kHz
- Analog input bandwidth: 0 to 10 MHz (includes DC)
- Input type: Single Ended
- Dynamic range: $\pm 5V$, $\pm 10V$
- Input leakage: $\pm 1 \mu A$ max
- Anti-aliasing filter: None
- Group-delay: 2 samples (includes all hardware and software FIFO delay)

Outputs:

- Number of Outputs: 8
- Resolution: 16 bits
- Noise: 20 MHz bandwidth: up to 55mV pk-pk on 0xFFFF(-1) to 0x0000 (0) alternating code sequence.
20 kHz bandwidth: <25µV RMS
- Offset drift with temp.: ±2 ppm FSR / °C
- Gain drift with temp.: ±2 ppm FSR / °C
- Offset drift with Time: ±13ppm FSR / 500 hours
- Sampling Rate: 11.4 kHz to 150 kHz
- Analog output bandwidth: 0 to >80 kHz (includes DC)
- Output type: Single Ended
- Dynamic Range: ±10V
- Source/Sink ability: 4 mA
- Anti-aliasing filter: None

GPIOs:

- Number of IOs: 16
- Configurability: All IOs individually configurable as input or output.
- IO level: 3.3V CMOS (5V-tolerant inputs)

Counters:

- Number of counters: 2
- Counter width: 16-bit (can be increased to any width in software)
- Inputs: Two Quadrature Encoder Pulse (QEP) inputs and one general-purpose pulse input per counter
- IO level: 3.3V CMOS (5V-tolerant inputs)
- Max count frequency: 50 MHz
- Min pulse width: 20 ns (to be reliably counted the high and low states on the counter inputs must be at least 20ns wide)

OPTIONAL ENCLOSURE:

SPM Open Source Controller
Model MK2-A810



SR-mk2+SR2-A810 mounted inside a rack-mount
8 inputs, 8 outputs and 2 pulse counters inputs.

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