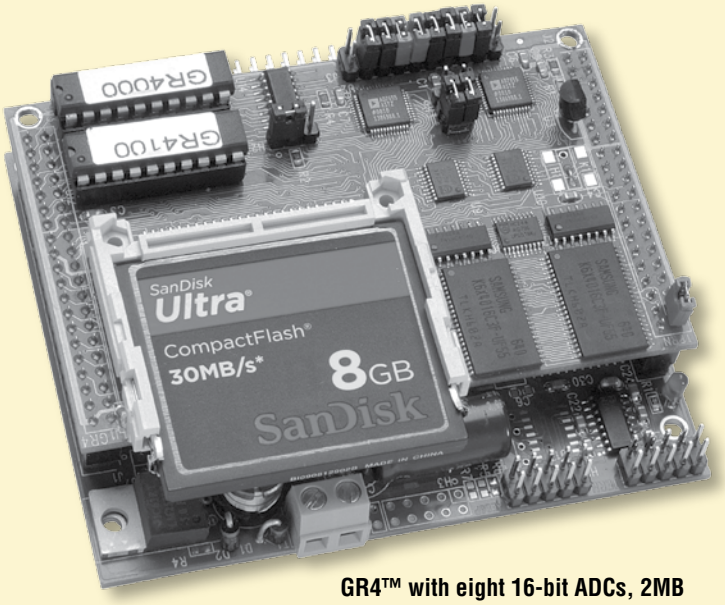
GR4™

Multi-Channel, High Speed, Simultaneous Sampling 16-bit ADCs

NEW!



GR4™ with eight 16-bit ADCs, 2MB FIFO, and 8GB CF

Features and Options:

- 2.3 x 3.6 x 0.5 inches. Operates with 5V DC power.
- 8 channels of 16-bit ADCs (two AD7655) per board.
- Multi-channel simultaneous sampling by hardware.
- One million samples per second on each pair of ADC inputs.
- Hardware automatic sampling to FIFO, reduce host CPU load.
- Maximum 32MB/s data into FIFO on a stack of 4 GR4s.
- User configurable sample rate and FIFO size (2 MB or 4 MB).
- Stackable multi units sharing the same Clock and Trigger.
- Support CompactFlash card (8- 32 GB) as mass data storage.

Summary

Often, the bottleneck in high speed data acquisition applications comes from CPU overhead. Typical sampling software needs to initiate ADC conversion, read back samples, and then store data into memory. Due to software latency involved in the process, it becomes impossible to implement simultaneous acquisition and recording across multiple analog signals.

The **GR4™** is a multi-channel high speed 16-bit analog signal acquisition board, designed as an expansion for TERN programmable controllers, is intended to solve these challenges. A demo of the 4 GR4 units can, in real-time, continuously acquire and store 8 analog signals into CampactFlash cards for hours at 8MB data per second.

The **GR4™** implements multi-channel data acquisition in hardware. It can start conversions across multiple channels of ADC simultaneously, pushing 16-bit data into FIFO memory, and then stopping as soon as the FIFO buffer is full. Sampling on a second pair of ADC can be triggered upon completion of sampling on the first chip. Thus, while the hardware is sampling on one ADC chip to its FIFO, the host CPU can start moving data from the other ADC FIFO buffer into CompactFlash card.

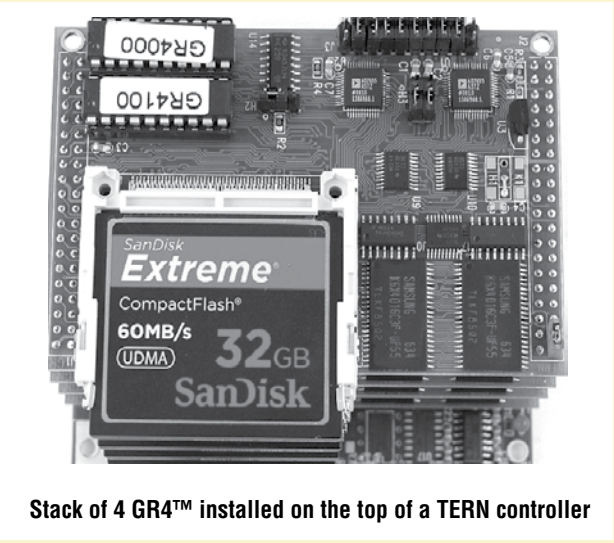
Hardware

Up to two AD7655 chips can be installed on each board. Each AD7655 provides four 0-5V analog input channels at 16-bit resolution. Two of the four analog inputs can be digitized simultaneous, and the resulting data are recorded into FIFO automatically. Each ADC has two FIFOs, with a size of 512 KB or 1 MB. A software programmable MUX signal is used to switch between the two pairs of analog inputs.

The sample rate is based on a "conversion" clock which can be from on-board oscillator or external clock. The maximum conversion clock is 500 KHz. Each conversion clock can record up to 4 channels of 16-bit ADC data from 2 AD7655 chips on each GR4 board. The stack of 4 GR4s can share the same external conversion clock.

The **GR4™** is driven by a host TERN 16-bit controller which can provide Ethernet, USB, RS232, and CompactFlash, such as EE™ or RC™. Using one single I/O select line, four GR4s can be stacked on one TERN controller. It is possible to stack more than four GR4s with specially configuration.

TERN offers similar data acquisition expansion boards: **Grabber™** (80MHz, 8-bit ADC) and **GR16™** (10MHz, 16-bit ADC).



Stack of 4 GR4™ installed on the top of a TERN controller

Ordering Information

GR4 $129 Qty 1

Includes one AD7655 with 4 analog inputs, two 512KB FIFO RAM (55ns), and CompactFlash card receptacle.

NOT including add-on options. NOT including CompactFlash card

Add-on Options:

1) 2nd AD7655 and two 512KB FIFOs.....$50 each
2) 1MB FIFO, up to 4 .....$20 each

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