Application Information

The Speedgoat IO130 and IO131 modules are standard single width 32 bit PMC cards with faceplate I/O. They provide 8 (IO130) or 16 (IO131) channels of isolated, true differential, bipolar, simultaneous sampling, 16-bit analog input and 4 (IO130) or 8 (IO131) channels of isolated, single-ended, uni- or bipolar, simultaneous update, 16-bit analog output. All signals are accessible through a HD50 SCSI-2 type front I/O connector.

The analog inputs offer software selectable ±5 V and ±10 V bipolar input voltage ranges (one setting for all channels). The sampling rate is up to 200 kSPS. There is a software-selectable digital filter through oversampling up to a ratio of 64.

The analog outputs offer software selectable 0-5 V, 0-10 V, ±5 V and ±10 V output voltage ranges (one setting for all channels). The conversion time is typically 10 µs, resulting in a maximum update rate of 100kSPS. The minimal load per output is 2 kΩ, with a capacitance up to 4000 pF allowed. Initialization and reset values can be configured individually for each output.

Every IO130 and IO131 module is factory calibrated. The correction data is stored in an on-board serial EEPROM uniquely to each PMC module. These correction values are used to perform a hardware correction of the analog-to-digital and digital-to-analog conversion.

Direct Memory Access (DMA) can be configured individually for inputs and outputs to reduce CPU usage. The frame size can be selected arbitrarily from 1 to 1'000 samples per channel. If DMA is enabled, conversions are triggered by an internal sample clock with a configurable period, that must be a multiple of 100ns. They minimum conversion periods are 5 µs for the analog inputs and 10 µs for the analog outputs. If DMA is enabled for both inputs and outputs, they can be configured to use the same sample clock.

It is possible to synchronize multiple IO130 or IO131 together via the backplate-connector.

Technical Information

❑ Form Factor: Standard single width 32 bit PMC module with faceplate I/O conforming to IEEE P1386.1
  ❑ Board size: 149 mm x 74 mm
  ❑ PCI 3.0 compatible master/slave interface
  ❑ Universal PCI I/O signaling voltage: 5 V or 3.3 V
❑ 16/8 channels 16-bit isolated analog input
  ❑ Simultaneous sampling
  ❑ Programmable input voltage (one setting for all channels): ±5 V, ±10 V
  ❑ True differential inputs
  ❑ Sampling rate: 200 kSPS
  ❑ Input Impedance: 1 MΩ
  ❑ Linearity error: ±0.75 LSB DNL / ±3 LSB INL
  ❑ Overvoltage protection up to ±16.5 V, 7 kV ESD rating
❑ 8/4 channels single-ended 16-bit isolated analog output
  ❑ Simultaneous update
  ❑ Programmable output voltage (one setting for all channels): 0-5 V, 0-10 V, ±5 V, ±10 V
  ❑ Conversion time: typ.10 µs
  ❑ Min.2 kΩ resistive, max. 4000 pF capacitive load
  ❑ Linearity error: ±1 LSB DNL / ±16 LSB INL
  ❑ Overcurrent protection: 20mA
  ❑ 3.5 kV ESD rating
❑ 1024 sample FIFO for both ADC & DAC
❑ Scatter-gather DMA for both ADC & DAC
❑ Internal correction using factory calibration data stored in EEPROM
❑ Operating temperature -40°C to +85°C
❑ MTBF (MIL-HDBK217F/FN2 GB 20°C) 544.000 h
❑ Power Requirements: 330 mA typical @ +5V DC
❑ Weight: 78g