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2.2.4 Digital Waveform Capture Board DS5001

The purpose of the DS5001 is to sample digital waveforms like pwm outputs or position detector signals. These waveforms can be described as a series of rising and falling edges and the corresponding times (timestamps). The capture function of the DS5001 can be seen as an event driven transient recorder, which only stores data when at least one input signal changes. The DSP which controls the DS5001 reads the timestamps and performs any complex signal analysis the user wants to have. So the tasks are clearly separated: The DS5001 does the data acquisition and the host does analysis.

The DS5001 key features are:

- 16 identical comparators / edge detectors featuring
  - sample rate 25 ns
  - rising and/or falling edge detect programmable
  - trigger level programmable from -10V to +10V
  - input FIFO for fast bursts
- Event storage featuring
  - 512 events (timestamp + edge polarity) per input channel
  - 31 bit timestamp, timebase is common for all input channels.
    - Time stamp period is $2^{31} * 25$ ns = 53.68 s
  - Address generator supporting FIFO and LIFO like readout
  - Interrupts can be generated after a predefined number of events
- 3 additional event counters featuring
  - 32 bit width
  - each counter can be assigned to any edge detector output
  - independent from input FIFO and event storage

For more information on the DS5001 Digital Waveform Capture Board see the DS5001 User's Guide [5].

2.2.5 Expansion Box Interface Boards DS811/DS812

From the two Expansion Box Interface Boards [6] one is placed inside the host computer and the other in the expansion box. The expansion box is an extension of the PC/AT bus with its own power supply. The advantages of a separate box is that the dSPACE boards do not need to be powered by the host computer. The two expansion box interface boards provide the interface mechanism for the two busses.

note: The DS811/DS812 extended memory mapping is according to dSPACE gmbh not supported. This implies that system can only be used in the Base Memory Mapping.

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