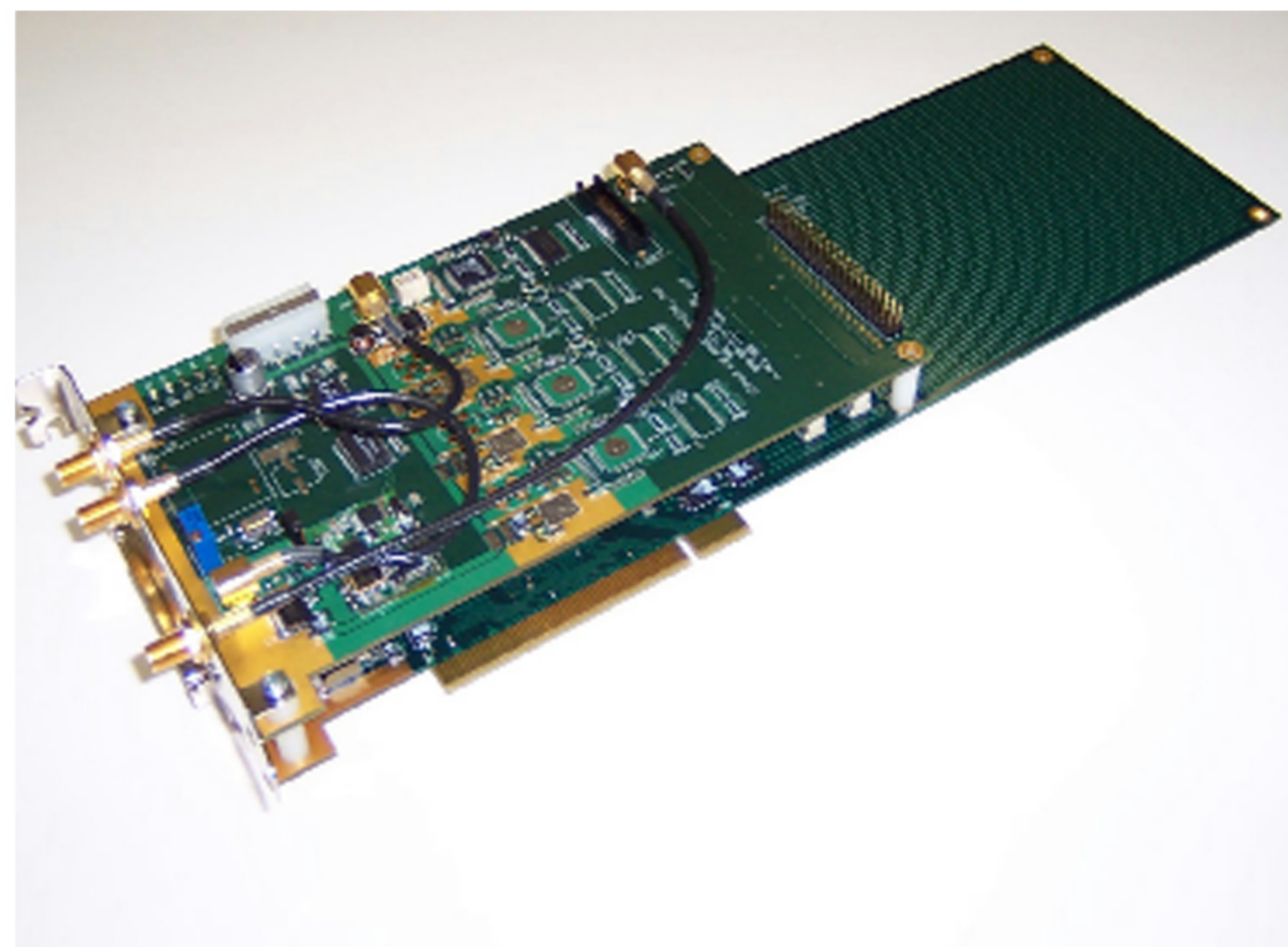## OVERVIEW

CRS offers a family of advanced data acquisition boards that can be used in any standard PC with a PCI slot. Different versions have different sampling speed, number of channels and on-bard memory.

With high sampling rates, large onboard memory and easy to use software, these boards offer a high performance at competitive prices.

FEATURES

- Up to 5 MHz sampling rate (each channel)

- Up to 4 channels

- 16-bit A/D resolution

- 64 MB onboard memory

- External reference clock input

- Flexible triggering (internal/external)

- External triggers: window or edge

- Repetitive triggering for RADAR applications

- 80 MB/s data transfer to system memory (system dependent)

- 12 MB/s data transfer to hard disks (system dependent)

- Software for Windows® 98/NT/2000/XP

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PCI BOARD: DAQ-05-16-X

SAMPLING RATE AND DECIMATION

The DAQ-05-16-X family can be ordered with various sampling frequency options up to a maximum of 5 MHz. The onboard clock synthesis circuit ensures accuracy and longterm stability.

Decimation is the process of reducing the sampling rate by dropping some samples. The user has the option of using decimation to reduce the sampling rate. The decimation rate can be set through software. For example if the sampling clock is 5 MHz and decimation is set to 2, then the effective sampling rate is 2.5 MHz.

The combination of different sampling clock frequency and decimation rates allows the effective sampling rate to be varied from the Hz range to 5 MHz.

EXTRANAL SAMPLING CLOCK

The sampling clock is synthesized from a stable reference oscillator. If a more stable sampling clock is needed, the user can connect to an external 10 MHz reference clock. The reference clock is then used for synthesis of the sampling clock.

SAMPLING CLICK PHASE IITTER

Phase jitter appears on the A/D converter sampling clock as a time uncertainty on the clock as seen by the A/D converter. Since the sampling process in the A/D converter is edge triggered (responds to the rising edge of the clock signal), any jitter on this signal will transfer to the resulting sampled data. This will have the effect of raising the noise floor of the A/D converter, and thereby reducing the available signal-to-noise (S/N) ratio of the A/D converter. The DAQ-05-16-X family of data acquisition boards has been specifically designed to provide a low jitter clock source for the A/D converters. An onboard precision temperature compensated 10 MHz reference oscillator is used in conjunction with a crystal based clock multiplier to provide a stable, low noise, low jitter clock. For more demanding applications, an optional ovenized oscillator that provides enhanced stability and jitter performance is available.

NUMBER OF CHANNELS

Each board can have up to 4 independent channels. A/D sampling and triggering on all the channels is synchronized to reduce the phase errors. Channels can be enabled and disabled through software. The enabled channels use all of the installed onboard memory, hence using less number of channels gives more memory per channel.

The number of channels that can be simultaneously acquired depends on the sampling frequency and data rate to the PC system memory.

RESOLUTION

The DAQ-05-16-X family of boards uses 16-bit A/D converters. The user can select to store a lower number of bits there by reducing the data rate. By reducing the effective data rate, the user can sample at a higher sampling rate. The number of bits to be stored is user selectable via the software.

ONBOARD MEMORY

The DAQ-05-16-X family of boards is available with an onboard memory of up to 64 MB. This memory is equally shared with all the channels that are enabled during acquisition. The onboard memory determines the maximum number of samples that can be stored onboard before being transferred to the PC system memory.

FLEXIBLE TRAIGGERING

The user has the option of choosing an external or internal generated trigger. The external trigger can be selected to be edge triggered or window triggered. For the internal trigger and edge trigger, the number of samples to be acquired at each trigger point can be specified in software. For the window trigger, the data is acquired as long as the trigger is enabled.

REPETITITVE TRIGGERING

Repetitive triggering allows a fixed number of samples to be stored in the onboard memory at each trigger event. This allows the board to be used in RADAR applications.

PCI BOARD: DAQ-05-16-X

FAST DATA TRANSFER TO PC MEMORY

The DAQ-05-16-X card can act as a PCI bus master and transfer data to PD memory without any intervention from the CPU. The bus mastering capability allows the card to transfer data to PC memory at a sustained data rate of up to 80 MB/s under a non-multitasking operating system. Under Windows® the rate is dependent on various external factors, such as load on the PCI bus, architecture of application, etc.

SOFTWARE

Every board is supplied with easy to use and powerful software for data acquisition, storing and display.

SOFTWARE SELECTABLE PARAMETERS

1	Decimation	1 to 16
2	Trigger	External or internal
3	External Trigger Type	Window or edge triggered
4	Resolution	4, 8 and 16 bits
5	Number of samples acquired per trigger in repetitive trigger mode	1 to depth of onboard memory

PCI BOARD: DAQ-05-16-X

TECHNICAL DATA

1	Type of ADC	Texas Instruments ADS1605	
2	Number of bits	16	
3	Number of channels	1, 2, 3 or 4	Model dependent
4	ADC sampling clock	5 MHz	Model dependent
5	Onboard memory	64 MB	
6	Input voltage range	7.5 V p-p	
7	Input coupling	AC (Transformer)*	
8	Input signal bandwidth	0 - 2.45 MHz	
9	Input connector	SMA	
10	External trigger impedance	50 Ohms	
11	External trigger signal	3.3 V TTL	
12	External trigger coupling	DC	
13	External trigger connector	SMA	
14	Internal reference oscillator	10 MHz	
15	Internal reference oscillatory accuracy	2 ppm	
16	External clock frequency	10 MHz	
17	External clock input impedance	50 Ohms	
18	External clock coupling	DC or AC	
19	External clock connector	SMA	

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