

ChronoLogic DAQ-2500X – USB Data Acquisition Module

- USB-inSync™ Data Acquisition Module
- High-speed USB 2.0
- 16 Analogue inputs, 16 digital I/O and trigger
- Typically ± 1 ns clock synchronization between devices
- Data throughput in excess of 1 MB/s



Overview

The ChronoLogic DAQ-2500X is part of the USB-inSync™ product family which allows you to use multiple modules, combined with software to create a powerful virtual/synthetic instrument offering precision timing and synchronization capability in a distributed platform.

For the first time the USB port is capable of accurately synchronizing multiple devices, providing functionality traditionally associated with high-end rack based platforms, while maintaining the unparalleled flexibility and user-friendliness of the USB platform.

The DAQ-2500X has four independent 16bit resolution 100kS/s simultaneous sampling analog input channels with their own A/D converters. Each channel is also multiplexed to provide a total of 16 analog input channels. Combined with digital triggers and a big 1 Mb FIFO for on board buffering of well over a second worth of data, the DAQ-2500X delivers superior accuracy in a truly multifunction DAQ module.

The DAQ-2500X simultaneously offers continuous sampling rates up to 100 kS/s on each of the four analog channels delivering over 1 MB/s of data to the host PC.

The 16 individually addressable digital I/O lines allow synchronous control of external equipment. Expansion is simple with USB-inSync™. Simply use an off-the-shelf USB hub and multiple DAQ-2500X units to expand your channel count synchronously. This architecture provides an efficient and economical way of scaling channel count whilst maintaining accurate synchronization. Combined with the 16 channel fully programmable digital I/O, the DAQ-2500X can be used for a large and diverse range of instrumentation applications.

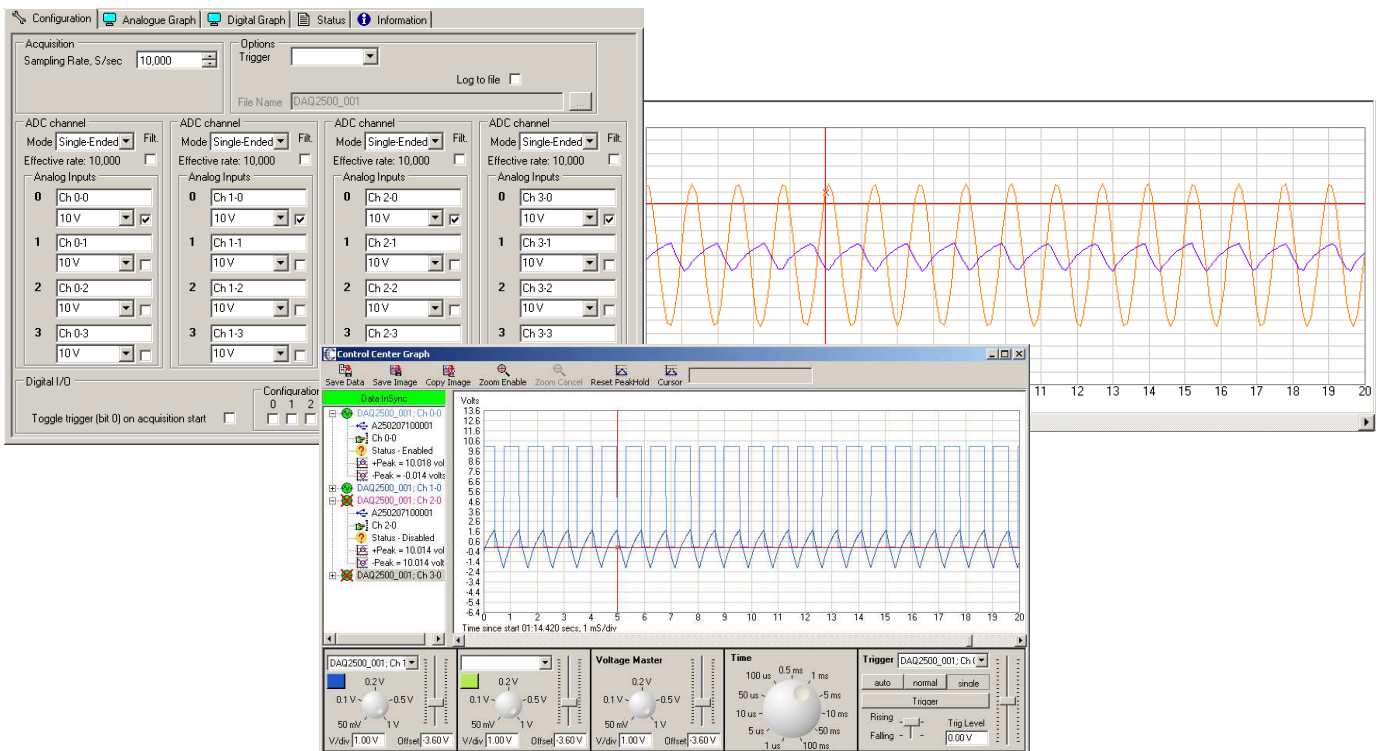


Features and Benefits

- 16 analogue inputs, 16 digital I/O and trigger, Differential signal capability
- 4 discrete 16 bit ADCs
- Data throughput in excess of 1 MBS/s
- Single channel analog signal sampling rate of up to 100 kS/s (software selectable) and multiple channel synchronous analog signal sampling rate of 400 kS/s
- 1 MB FIFO for on board buffering of data
- Typically ± 1 ns clock synchronization between devices
- Operates from mains plug pack or 12V battery power for complete portability
- Galvanic Isolation for protection of PC and experiment
- Plug and Play functionality of USB makes the DAQ-2500X easy to set up and reconfigure
- Easily expandable using off the shelf USB hubs to add additional modules and scale up synchronous channel count
- Supplied with FREE ChronoLogic Control Center software suite with simple to use GUI, COM server and LabVIEW™ drivers

Software

To provide flexibility and easy control, the DAQ-2500X is supplied with ChronoLogic's Control Center software platform, complete with a simple to use Graphical User Interface (GUI). For advanced users, access to extended low-level device functionality is available through our COM Server. This enables interfacing through Windows based software application including MS Office, Visual Studio and National Instruments LabVIEW™. Additional LabVIEW™ device drivers are available so that USB-inSync™ devices can be quickly implemented within an existing test environment.



Detailed Product Specifications

Spec Description	Spec
General	
Operating System (for supplied software)	Windows XP/Vista
Bus Interface	USB 2.0 (480Mb/s)
Clock Synchronization	Typically ± 1 ns between DAQ-2500X modules
Dimensions	200mm(w) x 132mm(d) x 34mm(h)
Weight	< 700g
I/O Connectors	Pluggable Screw Terminals
Operating Temperature	10°C to 45°C non-condensing
Storage Temperature	-10°C to 70°C
Power Supply	
Voltage Range	11.5V – 13.5VDC
Power Consumption	< 6W max
Analog Input Specifications	
Analog Inputs	
Number of discrete ADC's	4 (successive approximation)
Number of Inputs (software selectable)	16 single-ended 8 differential 4 true simultaneous sample
Resolution	16 bits (1 part in 65,536)
Maximum Sample Rate	100kS/s per channel
Input Characteristics	
Input Ranges	± 10 V, ± 5 V, ± 2.5 V, ± 1.25 V (Gain 1, 2, 4, 8 respectively)
Input Coupling	DC
Input Impedance	100m Ω , 12pf (on)
Input Bias Current	± 150 nA
Common Mode Rejection	> 74dB
ESD Input Protection	Protected to 2000V (JESD22)
Over-voltage Protection	Each input should remain within ± 11 V of common
Power on	± 25 V
Power off	± 40 V
Transfer Characteristics	
Relative accuracy	± 2.0 LSB maximum
Differential nonlinearity	± 1.2 LSB maximum
No missing codes	16 Bits, guaranteed
Settling time	< 5 μ s
Total Noise	< 0.9 LSB rms
Crosstalk (DC to 100kHz)	
Adjacent Inputs	-80dB
Adjacent Channels	-90dB
Accuracy	
Offset	
Without auto-calibration	+/- 2mV
With auto-calibration	+/- 200 μ V
Drift	
Zero	(50 μ V x Gain/°C)
Gain	± 300 ppm/°C

Digital I/O Specifications	
I/O Configuration	
Number of Channels	16 input/output
Direction Control	Software configurable
Compatibility	
Inputs	TTL / CMOS
Outputs	Open drain – 50V breakdown
Logic Levels	
Low Input	1.5V
High Input	3.5V
Synchronous Capability	Trigger Sync Output (software configurable)
ESD Protection	Protected to 2000V (JESD22)
Digital Input Trigger	
Purpose	Start Acquisition
Response	Rising, falling edge (software selectable)
Compatibility	5V TTL
Pulse Width	100 ns minimum
Calibration Specifications	
Recommended warm-up	15 minutes
Calibration interval	1 year
Onboard calibration reference	
Absolute level	4.096V ± 0.8mV (across full temperature range) – Values stored in EEPROM
Temperature coeff.	± 1ppm/C (typ)
Long term stability	± 20ppm/1000Hr
Data Handling Specifications	
Data transfer modes	Bulk, isochronous
Data throughput	1Mb/s
Configuration memory	64kbit
FIFO buffer size	10 ⁶ bytes (>1sec of data – four channels sampling at 100kS/s each)

Certifications & Standards

The DAQ-2500X meets the requirements for the following certifications:

Safety

- UL 61010-1 General Requirements
- CSA C22.2 General Requirements
- EN 61010-1 General Requirements

EMC/EMR

- FCC – Part 15, Class A, Title 47 of CFR, Part 15 subpart B for Class A digital device
- VCCI – Class A
 - V-1/93.11
 - V-2/97.04
 - V-3/97.04
 - V-4/97
 - R-1228
 - C-1287
 - As a Class A ITE
- AS/NZS – CISPR 11: 2004 as a Class A Digital Device
- BSMI – CNS 13438: May 1997 for Class A Digital Device
- EN 61326: 1997 + A1: 1998 + A2: 2001 + A3: 2003
 - Emissions (Class A) - Radiated Emissions, Conducted Emissions
 - Immunity (Table A.1) – ESD, Radiated Immunity, EFT/B, Surge, Conducted Immunity, Voltage Interruption / Dips

In addition, the DAQ-2500X meets the Australian C-tick verifications

-  C-tick – ACA C-tick number: N14788