

Lawson Labs, Inc.

3217 Phoenixville Pike
Malvern, PA 19355 USA

Phone: 610 725-8800

800 321-5355

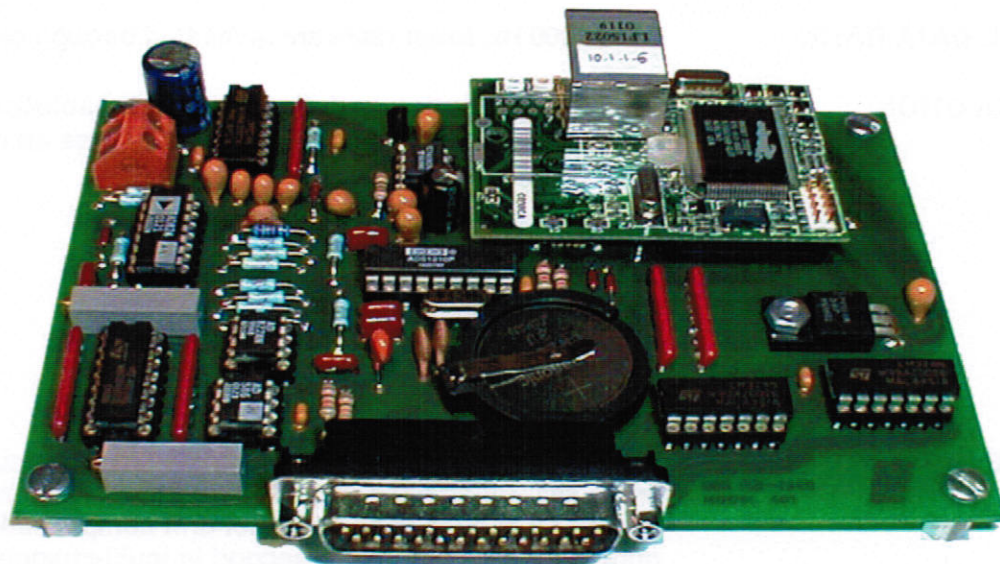
FAX: 610 725-9344

e-mail lawsonlab@netaxs.com

web www.lawsonlabs.com

HIGH RESOLUTION
DATA ACQUISITION
SINCE 1981

Model 401 TCP / IP - Interfaced 24-Bit Data Acquisition System



The Model 401 is a complete, high resolution Delta-Sigma data acquisition system with a TCP/IP interface. It uses an extremely capable microcontroller with substantial RAM and program memory available. This processing power will allow future versions to have greatly extended functionality. The battery-backed RAM and non-volatile flash memory available will make stand-alone data acquisition practical for many applications. The connector pinout is identical to the Model 301 and the programming interface is very similar. That makes it easy to support both USB and TCP/IP from the same application.

Lawson Labs has been designing and building high-resolution Delta-Sigma Data Acquisition Systems since 1991. The Model 401 represents our seventh generation of Delta-Sigma design. It incorporates the electrical isolation and input protection that have long allowed our high resolution systems to function reliably in the industrial environment.

The analog input range is ± 5 volts, true differential. The maximum single-channel data rate is 1000 Hz at 20 bits effective resolution. Both channels can be scanned at 100 Hz with effective resolution of 20 bits. As the unit is slowed down, it quickly gains effective bits to 22 bits at 200 Hz and 22.5 at 50 Hz for single-channel operation. The input impedance is 10^{13} and the DC common mode rejection is typically -100 dB. The isolated portion of the Model 401 operates from a single unregulated power supply.

Drivers are available with VC and VB sample application code. Multiple A/Ds can be added using inexpensive 10Base-T Ethernet hubs. Units can be dynamically connected or disconnected without interrupting other ongoing acquisition.



Model 401 SPECIFICATIONS

A/D TYPE:	24-bit Delta-Sigma converter with microcontroller supervisor and electrical isolation
MONOTONICITY:	23 bits
LINEARITY:	+/-0.002% of full scale
DIFFERENTIAL INPUT RANGE:	+/-5 volts, Custom Ranges Available
DC COMMON MODE INPUT RANGE:	+/-6.5 volts
DC COMMON MODE REJECTION:	-100 dB typical
ANALOG INPUTS:	2, multiplexed true differential protected to +/- 60 volts.
INPUT IMPEDANCE:	10 ¹³ ohms typical, 10 ¹⁵ optional
PROGRAMMABLE DATA RATE:	10 to 1000 Hz, lower rates are generated through digital averaging

EFFECTIVE RESOLUTION: Effective resolution is defined as total resolution in bits minus RMS noise in bits. Figures below use an oversampling ratio of four.

Rate	Effective Resolution in Bits
1000	20
500	21
200	22
50	22.5

SCANNING MODE: Three scan types are available, single-channel, multi-channel, and a calibration scan that adds a reading of the zero channel at the end of each scan for offset drift compensation. The max. number of data points per second in multi-channel scanning mode is 200. A digital input is added into the data stream after each conversion. That feature allows excellent timing accuracy for digital events.

DIGITAL INPUTS:	8 bits, contact closure or 5 volt logic compatible
DIGITAL OUTPUTS:	8 latched, ruggedized, double-buffered 5V outputs
POWER INPUT:	14 to 24 VDC, regulated or unregulated, for isolated circuitry

TYPICAL POWER CONSUMPTION: The Model 401 requires 120 MA (add drive current for active digital outputs, up to 20 MA each.)

SIZE: Board only, 5.5 x 3.7 x 1.4 inches

SINGLE-PIECE PRICE: \$495 board with disk, wall mount power supply, and manual

OPTIONS:

Custom Input Range. Consult factory for available ranges.	\$ 25
25 Pin Screw Terminal Adapter	\$ 25
10 ¹⁵ input impedance (no charge). Expect one extra bit of RMS noise.	
A standard enclosure will be available in the second quarter of 2003.	