DI-710 Series

Low-Cost, Portable, USB/ Ethernet Data Logger System

16 Single-ended, 8 Differential Analog Inputs

Stand-alone Data Logger Option Allows Data to be Saved to SD

Multiple Hardware Options

Front of DI-710

The DATAQ Instruments DI-710 Series of products is a family of instruments for general purpose and stand-alone data logger data acquisition applications. Options include interface type, input voltage range, and PC-connected or stand-alone data logger operation. Interface options are USB or Ethernet. Gain ranges have selectable factors per channel of 1, 2, 4, and 8, or 1, 10, 100, and 1000. Instruments with the stand-alone data logger option feature a built-in multimedia socket that accepts standard Secure Digital (SD) memories to which acquired data may be stored without a connected PC. SD memories are the same commonly available mass storage devices used with digital cameras and MP3 players. Memories ranging in size from 16 MB to 1 GB are supported. Instruments without this option must remain tethered to a PC's USB or Ethernet port during data acquisition and use the PC's own program and memory to store acquired data.

All DI-710 Series products feature 14-bit measurement resolution, sixteen analog input channels that may be configured for single ended or differential operation per channel, and an 8-bit digital bi-directional port. PC-connected instruments stream data to the PC from as low as 0.048 Hz up to as high as 4,800 Hz throughput rate. Stand-alone data loggers store to their SD memory from as low as 0.0017 Hz up to as high as 14,400 samples per second. All DI-710 instruments are supplied with two removable, 16-position screw terminal access connectors.

Features

Stand-alone Data Logger Operation

Use a Secure Digital Card to record and store data—up to 1GB. A FIFO memory configuration allows the DI-710 to record continuously using a circular buffer approach. A push button allows manual start/stop control over the recording process. A multi color LED shows instrument status (Record, Standby, Busy, Error).

Wide Signal Measurement Range

Suitable for use with all types of transducers, the 16-channel single-ended, 8-channel differential DI-710 features a per-channel measurement range of ±10 V over four gain ranges. This allows you to simultaneously measure a wide range of signals with ease.

Flexible Programmability

Channel-by-channel software selection of gain and single-ended/differential operation.

High Throughput Rate

Supports sample throughput rates up to 4800 samples/sec to PC (depending on host computer speed) or up to 14400 samples/sec to memory card (stand-alone data loggers).

High Resolution

14-bit resolution analog to digital conversion provides a responsive instrument capable of registering changes as small as one part in 8.192 (±0.012% of the full scale measurement range).

File Protection

When powered down unexpectedly, the DI-710 Stand-alone model retains all data saved to its memory card.

Easy to Connect & Use

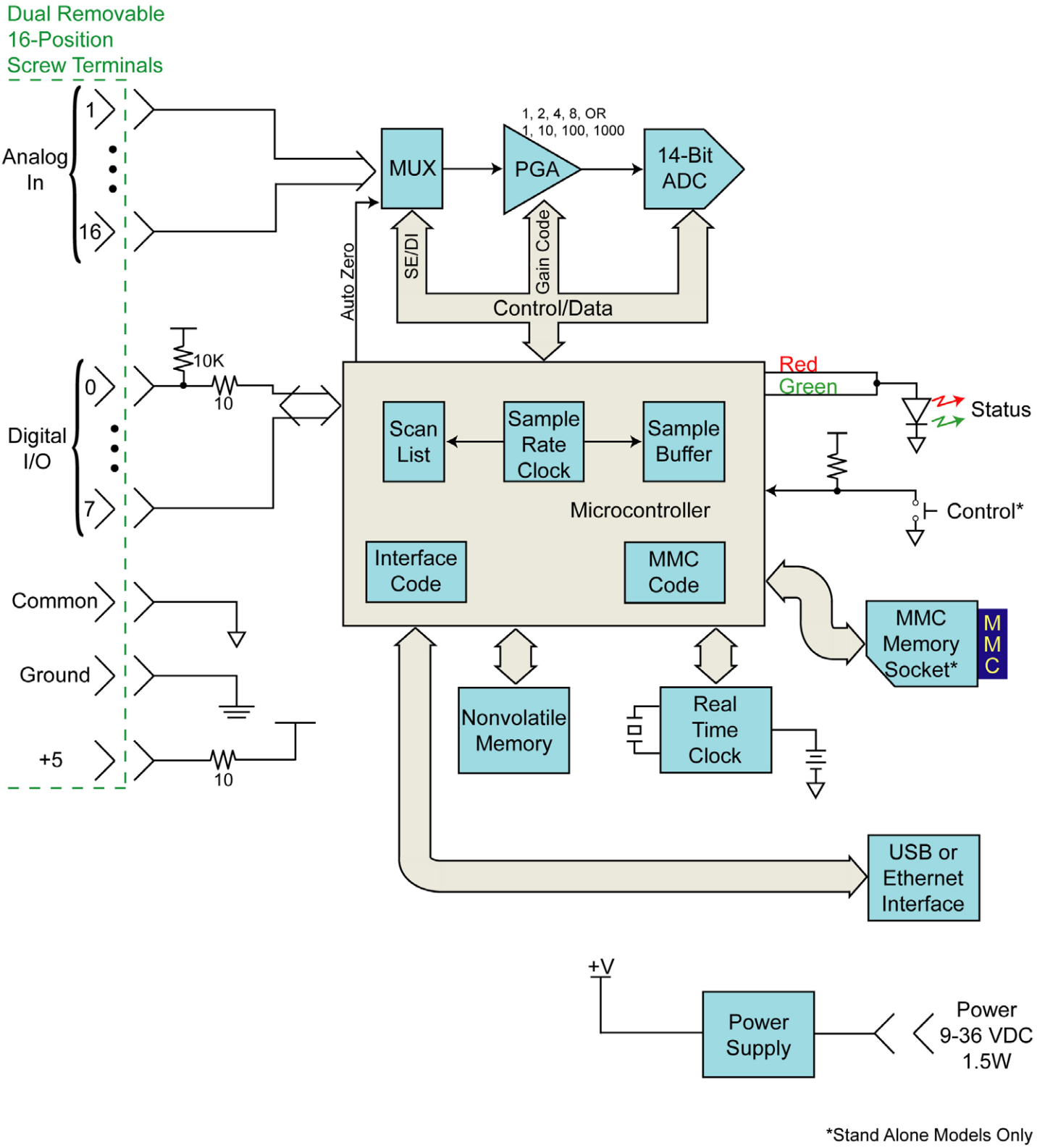
Installs in seconds. Simply connect to your computer's USB port or to an Ethernet port. Connect power, then connect your signals to the provided screw terminal blocks (16 ports each). Stand-alone data loggers just require a Secure Digital Card and power.

Includes Software

Be up and running minutes out of the box with WinDAQ software. WinDAQ/Lite Recording and Playback software is included free with the purchase of every DI-710 instrument. Record at rates up to 1000 Hz using WinDAQ/Lite Acquisition software. WinDAQ/Pro High Speed option allows you to record data as fast as your data acquisition system will allow. Use WinDAQ/Lite Playback software (WWB) to review, measure, and analyze your data during or after a recording session.

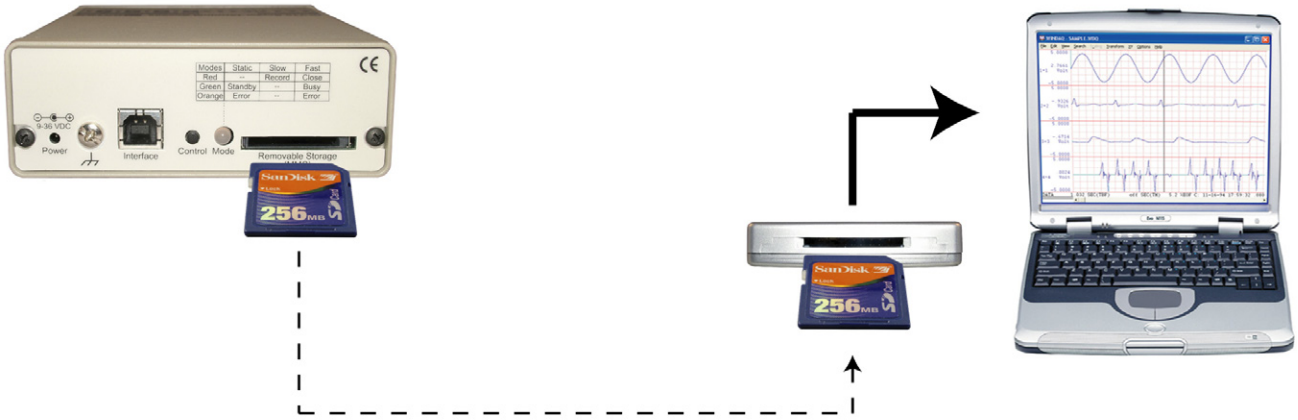
DATAQ Instruments Hardware Manager Software allows you to effectively manage and run multiple units installed to your PC, your network, or even over the Internet. It includes configuration software for stand-alone data loggers allowing a complete data acquisition configuration to be designed and downloaded from any local or remote PC. Upload software allows you to read data stored to an SD card over the DI-710's Ethernet interface.

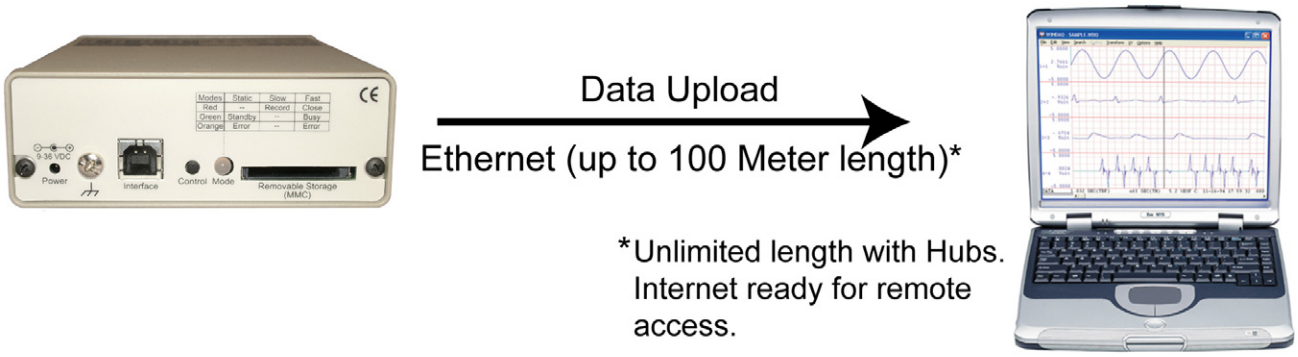
DI-710 Block Diagram



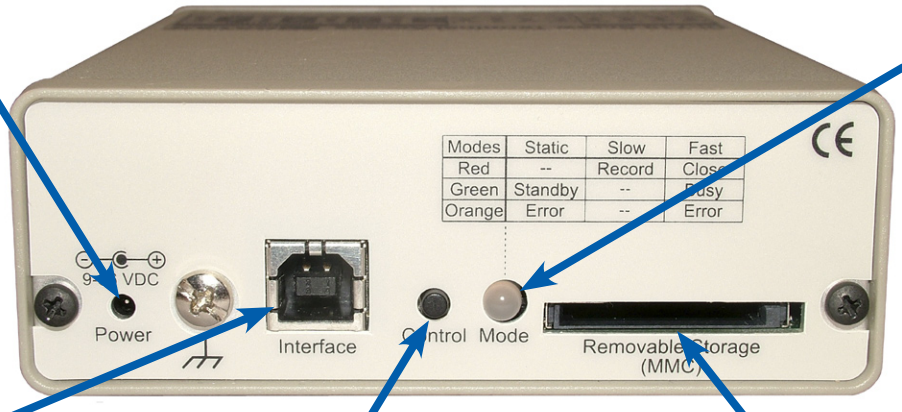
*Stand Alone Models Only

Ways to transfer SD data files





Rear Panel



Power Jack
May be powered by the provided AC adaptor, or from any 9-36 VDC source. Consumes 2 watts.

"Mode" LED
Tri-color LED indicates instrument status: Standby, Recording, Error.

Interface
May be configured with an Ethernet or USB interface.

"Control" Pushbutton
Allows manual start/stop local control over the recording process and instrument configuration.

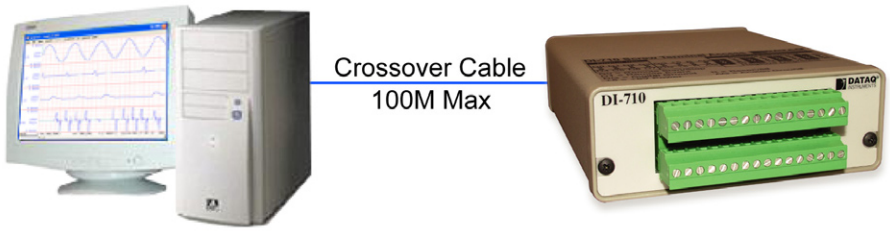
Removable Storage Slot
Accommodates standard and readily available multi-media memory cards for mass storage. These are the same memories used by consumer electronic devices like MP3 players and digital cameras. Accepts memory sizes from 16 MB to 1 GB.

Deployment Methods for Ethernet Models

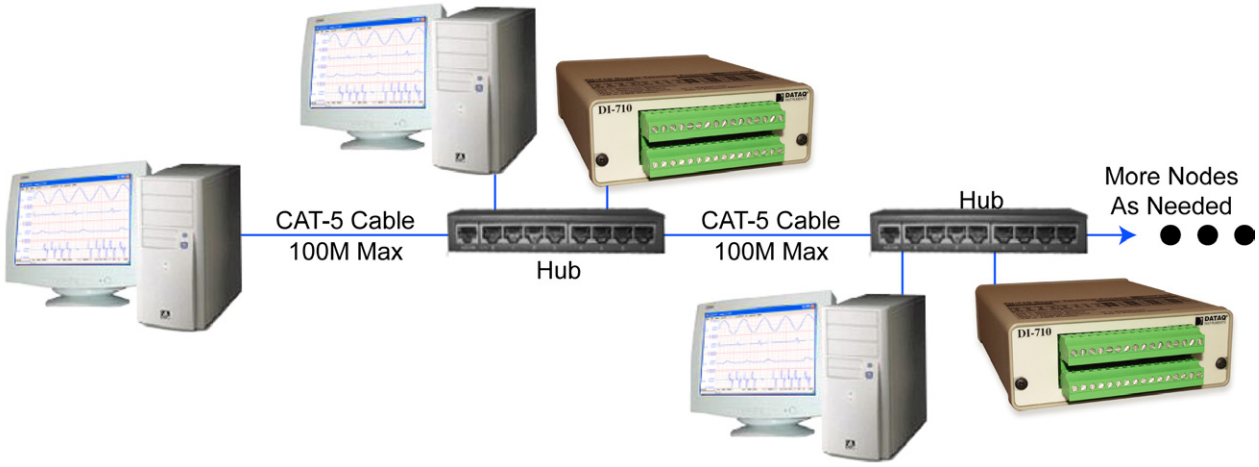
Six Deployment Methods

Ethernet Models add a new dimension to Data Acquisition applications allowing data accesss over a LAN to a PC on the other side of your facility or over the internet to a PC on the other side of the world. For more information view our application note on the internet at: http://www.dataq.com/applicat/articles/data_logger_ethernet02.htm.

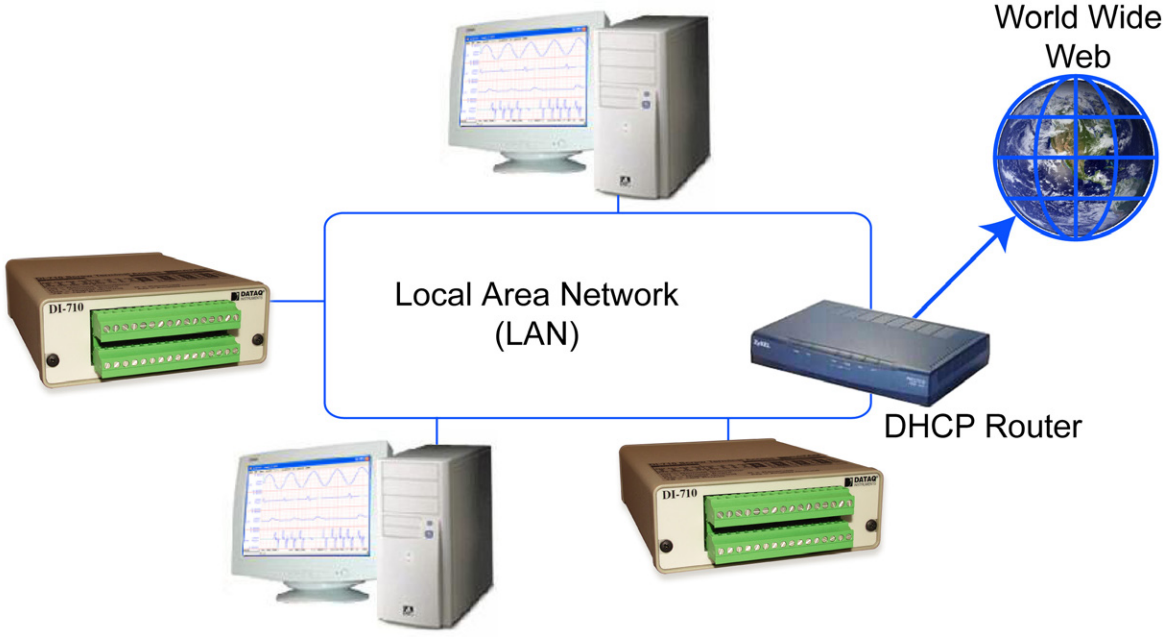
Deployment #1 - One PC directly connected to one DI-710 with a crossover cable.



Deployment #2 - One or more PCs, one or more DI-710s on a Dedicated Network.

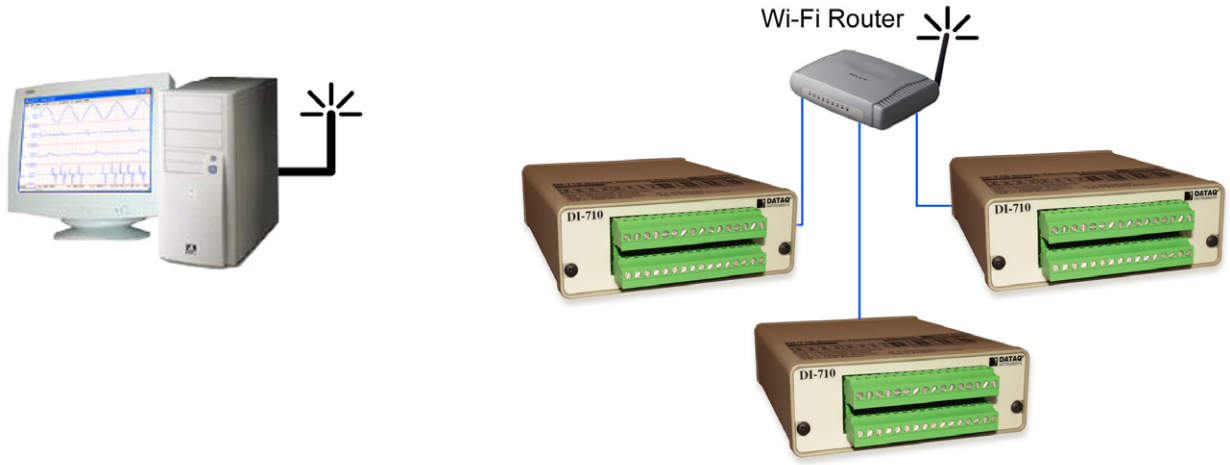


Deployment #3 - One or more PCs, one or more DI-710s on a LAN.

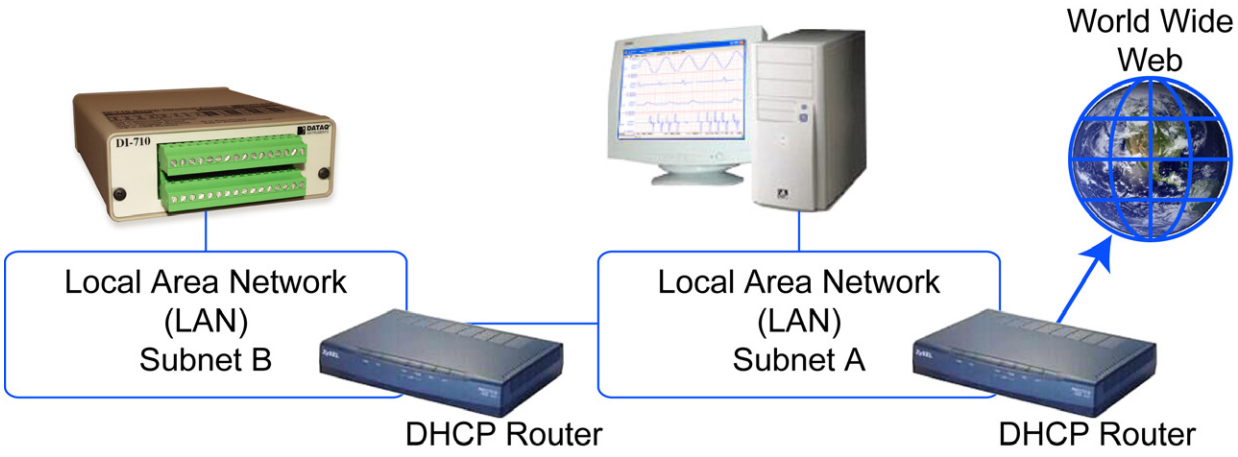


Deployment Methods for Ethernet Models

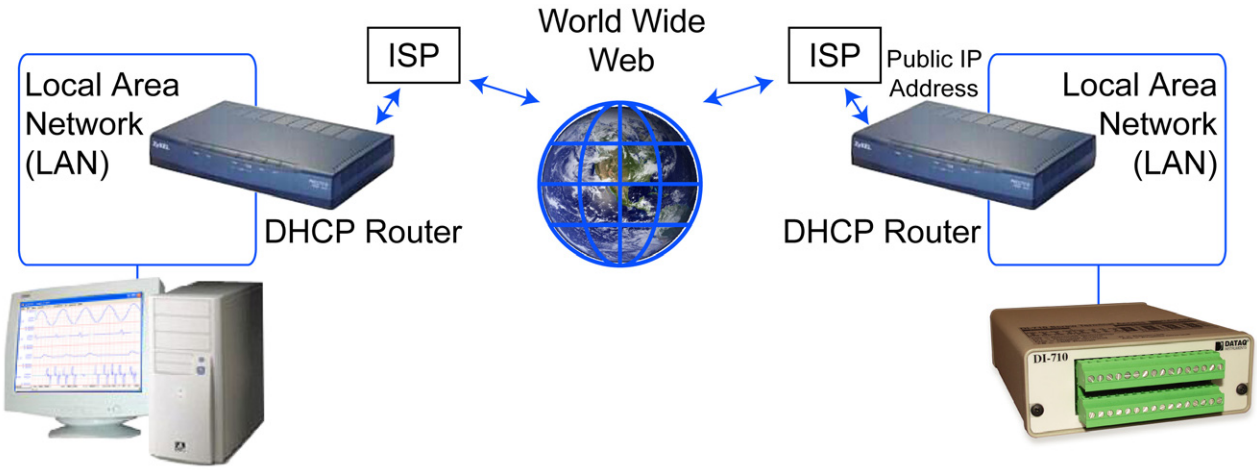
Deployment #4 - One or more PCs, one or more DI-710s on a Wireless Network.



Deployment #5 - One or more PCs, one or more DI-710s remotely to different LAN subnets.



Deployment #6 - One or more PCs, one or more DI-710s remotely over the Internet.



View the Ethernet Resource Page for application notes and demos on Ethernet Data Acquisition with DI-71X products. Go to http://www.dataq.com/applicat/ethernet.htm for more information.

DI-710 Specifications

Analog Inputs

Number of Channels: 16

Channel Configuration: 16 single-ended; 8 differential; programmable per channel

Measurement range, Accuracy, and Resolution

	Gain	Range	Accuracy*	Resolution
PGL Models:	1	±10V	±.05%FSR ±50µV	±1.22mV
	10	±1V	±.05%FSR ±50µV	±122µV
	100	±100mV	±.05%FSR ±50µV	±12.2µV
	1000	±10mV	±.05%FSR ±50µV	±1.22µV
PGH Models	1	±10V	±.05%FSR ±50µV	±1.22mV
	2	±5V	±.05%FSR ±50µV	±610µV
	4	±2.5V	±.05%FSR ±50µV	±305µV
	8	±1.25V	±.05%FSR ±50µV	±153µV

*Test Conditions: Single channel, 100S/s, Averaging mode.

Input Impedance, single-ended: 1MΩ

Input impedance, differential: 1MΩ each input to common

Input bias current: 10µA for a 10V input, single channel

Input offset voltage: Auto-zero

Input offset current: 2nA (single channel)

Max. normal mode voltage: 30V DC or peak AC

Max. common mode voltage: 30V DC or peak AC

Common mode rejection: 80db, gain=1, 1KΩ unbalance

Channel-to-channel crosstalk rejection: -75db @ 100Ω unbalance

Gain temperature coefficient: 50 ppm/°C

Offset temperature coefficient: 0.25µV/°C

Digital filtering: Standard: Conditional over-sampling
Stand-alone: None

A/D Characteristics

Type: Successive approximation

Resolution: 14-bit

Monotonicity: ±2 LSB

Conversion Time: 69µs

Scanning Characteristics

Max. throughput sample rate:* Standard: 4,800 Hz
Stand-alone: 14,400 Hz**

*When acquiring more than one channel at a gain of 100 max throughput is 7200 Hz; When acquiring more than one channel at a gain of 1000 max throughput is 900 Hz.
**Assumes SD memory latencies of 80 milliseconds or less.

Min. throughput sample rate: Standard: 0.0034 Hz
Stand-alone: 0.0017 Hz

Max. scan list size: 17 entries

Sample buffer size: 2kb

Controls (Stand-alone models)

Single push-button: Manual control Record and Standby

Calibration

Calibration cycle: One year

Digital I/O

Bits: 8 bidirectional bits

Configuration: Each bit is programmable as Input or Output

Output voltage levels: Min. "1" 3V @ 2.5mA sourcing
Max. "0" 0.4V @ 2.5mA sinking

Output current: Max. source, -2.5 mA; Max. sink, 2.5mA

Input voltage levels: Min. required "1" 2V; Max allowed "0" 0.8V

Ethernet Interface

Type: 10/100Base-T

Connector: RJ-45

Protocol: TCP/IP

Server Type: DHCP

Removable Memory (Stand-alone models)

Type: SD (Recommended: Lexar Professional 133X)

Capacity: 16 Mb to 1 Gb

Real Time Clock (Stand-alone models)

Type: Date, hour, minute, second

Resolution: 1 second

Accuracy: 20 ppm

Indicators

Stand-alone models: Three-color LED indicating Record, Standby, and Error conditions

Standard models: Power LED

Transfer Rate to PC

Real Time: up to 4,800 samples per second

From Memory Card: up to 2,400 samples per second (Ethernet only)

General

Panel indicators: Mode LED

Panel Controls: Control push button (Stand-alone models)

Panel Slots: Accepts SD-type flash memory

Input connectors: Two, removable sixteen position terminal blocks

Operating Environment: 0°C to 70°C

Enclosure: Aluminum base with steel wrap-around. Aluminum end-panels with plastic bezels.

Dimensions: 5 7/16 "D × 4 1/8 "W × 1 1/2 "H
13.81D × 10.48W × 3.81H cm.

Weight: 14 oz.

Power Requirements: USB: 9 to 36 VDC, 2 watts max
Ethernet: 9 to 36 VDC, 2.5 watts max

Ordering Guide

Description	Order No.	Description	Order No.
DI-710-UH USB Instrument Low cost, portable, USB data logger with programmable gain ranges of 1, 2, 4, and 8.	DI-710-UH	**DI-710-EH Ethernet Instrument** Low cost, portable, Ethernet data logger with programmable gain ranges of 1, 2, 4, and 8.	DI-710-EH
DI-710-UL USB Instrument Same as DI-710-UH but with programmable gain ranges of 1, 10, 100, and 1000.	DI-710-UL	**DI-710-EL Ethernet Instrument** Same as DI-710-EH but with programmable gain ranges of 1, 10, 100, and 1000.	DI-710-EL
DI-710-UHS USB Stand-alone Instrument Same as DI-710-UH but with stand-alone capability .	DI-710-UHS	**DI-710-EHS Ethernet Stand-alone Instrument** Same as DI-710-EH but with stand-alone capability.	DI-710-EHS
DI-710-ULS USB Stand-alone Instrument Same as DI-710-UL but with stand-alone capability .	DI-710-ULS	**DI-710-ELS Ethernet Stand-alone Instrument** Same as DI-710-EL but with stand-alone capability.	DI-710-ELS

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