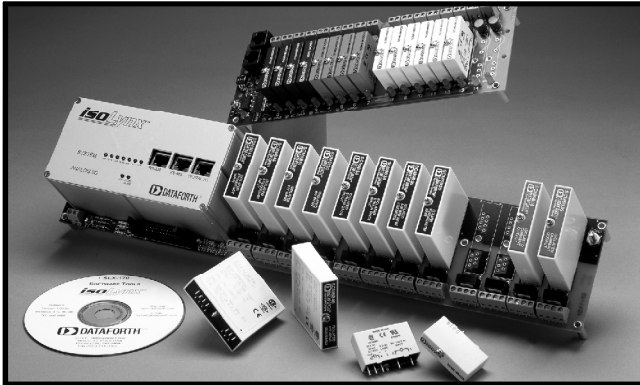# DATAFORTH®

isoLynx®

SLX100 Data Acquisition System

Description

Faulty thousand-dollar data acquisition systems can shut down billion-dollar operations. Our new isoLynx® SLX100 is a fast, intelligent, fully isolated data acquisition system providing superior reliability, accuracy, and isolation for a wide range of rugged industrial applications. It offers maximum flexibility of analog and digital I/O selection at competitive prices for a broad range of factory automation, process control, test and measurement, machine control, and data acquisition applications.

All I/O is channel-to-channel isolated. The flexible, modular design combines a 12-channel I/O Controller base system and optional 8- or 16-channel expansion backplanes, which can be either panel or DIN rail mounted (see Figure 1.)

One I/O Controller module can operate up to 60 channels of differential analog I/O and 128 channels of digital I/O, using Dataforth's popular SCM5B analog and SCMD digital modules. The Controller contains a powerful high-speed microcontroller, A/D and D/A subsystem, communication interface, and associated memory and status LEDs. The A/D system is built around a 16-bit, successive approximation converter and can convert a maximum 60-channel configuration in 30msec. The D/A converter is also a 16-bit device and can write a maximum 60-channel configuration in 60msec.

Industry's Widest Signal Conditioning Selection

By selecting from over 650 standard and custom single-channel SCM5B analog I/O modules, the isoLynx® SLX100 can interface to a broad spectrum of analog signals, including millivolt, volt, milliamp, amp, linearized and non-linearized thermocouple, RTD, potentiometer, slidewire, strain gage, AC-to-true-RMS output, frequency, two-wire transmitter, and transducers requiring DC excitation. Analog output modules are available that provide a wide selection of current or voltage output ranges. Industry standard miniature digital I/O modules are used for digital AC/DC input and output requirements. The user can mix and match any I/O module type on a per-channel basis thus reducing wasted I/O channels and saving costs.

The isoLynx® SLX100 operation and storage temperature is -40°C to +85°C, and relative humidity range is zero to 95% non-condensing. Power requirement is +5VDC, 2.5W base system with no modules installed. The system is designed to meet the requirements of EN61000-6-4 (radiated/conducted emissions) and EN61000-6-2 (ESD/RF/EFT immunity).

▶ Features

- Input Protection: 240VAC Continuous, 5kV Peak

- Channel-to-Channel and Channel-to-Bus Isolation: 1500Vrms Analog I/O, 4000VDC Digital I/O

- 16-Bit A/D, D/A

- Analog Input Filtering: Up to 6 Poles

- ±0.012% Base System Accuracy, No Modules

- ±0.005% Base System Linearity, No Modules

- ±0.03% Module Accuracy

- ±0.005% Module Linearity

- Best I/O Selection: 650+ Different I/O Modules

- Industrial Operating Temperature: -40°C to +85°C (-40°F to +185°F)

- All Modules Certified to CSA, FM, CE, and ATEX Requirements

- System CE Compliant, CSA, FM, and ATEX Approvals Pending

- Free Software Examples

Flexible, Powerful Programming and Communications

The isoLynx® SLX100 communicates on RS-232/485 non-isolated serial links up to 115.2kbps and Ethernet. In the near future, other popular fieldbus protocols will be available. Standard communication is RS-232/485 and up to 16 systems can be multi-dropped on the RS-485 serial link. Optional fieldbus protocol communication boards are factory installed, but are field replaceable or upgradeable without processor re-configuration.

The easy-to-use isoLynx® Application Programming Interface (API) defines a platform-independent, run-time function library used to program Dataforth's isoLynx® SLX100 hardware system under Windows XP/2000/NT/9X. High-level functions are included to encapsulate the transmission and reception of isoLynx® commands and responses over the installed communications interface (e.g. RS-232/485). The isoLynx® API simplifies the creation of data acquisition and control applications by providing intuitive function calls that hide the complexity of formatting and parsing isoLynx® command and response packets. A platform-independent, common API eases application migration from one operating system and/or programming language to another. In addition, the API is based on an open architecture, utilizing "plug-in" communications and I/O processor libraries (i.e. DLLs), allowing for simple API extension and application program deployment.

The isoLynx® API includes a suite of sample programs which can be customized to build powerful data acquisition and control applications in Visual C++ and Visual Basic. Instrument driver samples are included to demonstrate how the isoLynx® API can be used as a foundation for creating sophisticated Virtual Instruments with National Instruments' LabVIEW™ application development environment.
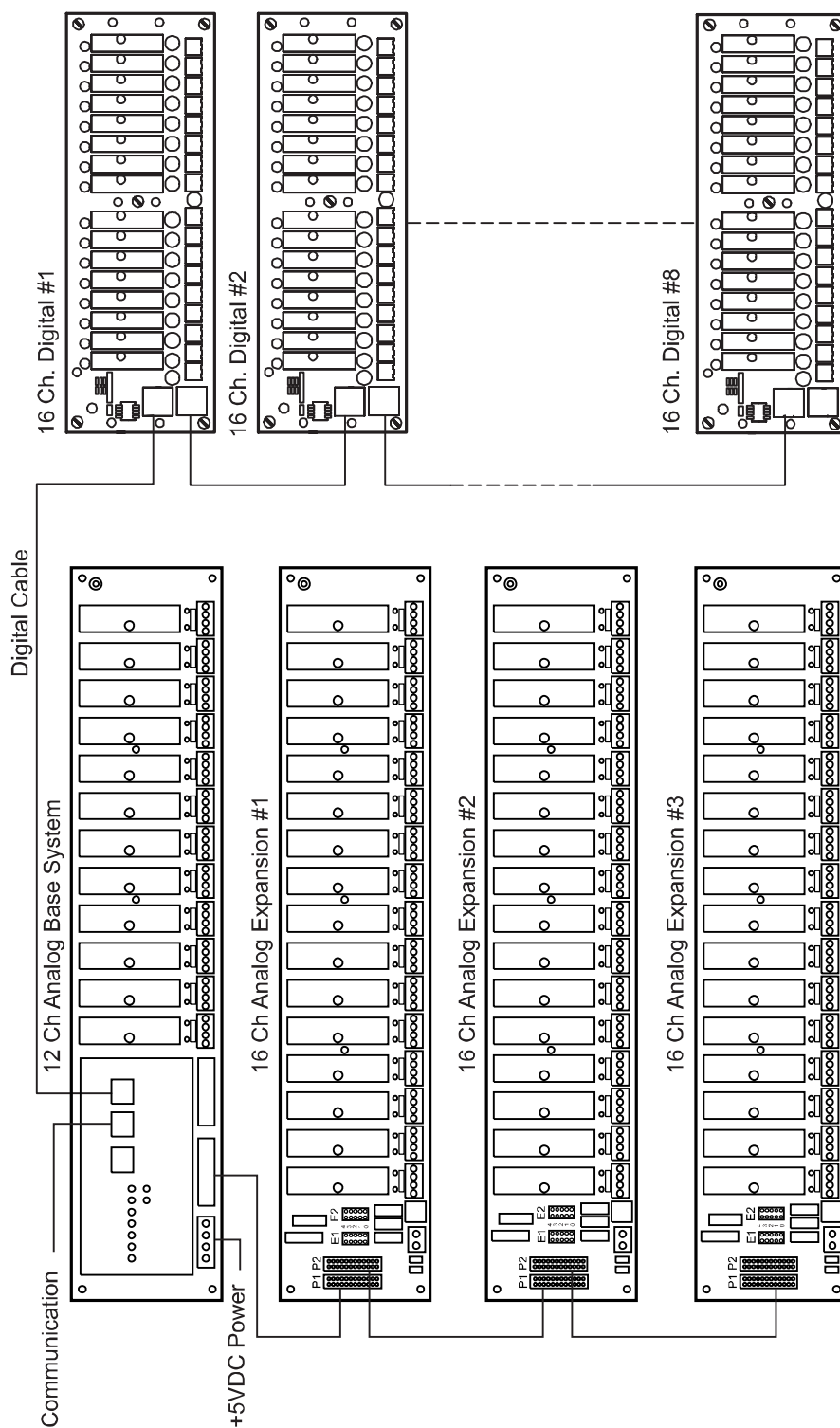
Figure 1: isoLynx® Block Diagram

16 Ch. Digital #1
16 Ch. Digital #2
16 Ch. Digital #8

Digital Cable

12 Ch Analog Base System
16 Ch Analog Expansion #1
16 Ch Analog Expansion #2
16 Ch Analog Expansion #3

Communication

+5VDC Power

Specifications

General System	One Analog Board
	One System Board
	One Communication Board
	One Backpanel minimum (12 channel)
Analog Input Accuracy	±0.012%[1]
Analog Input Linearity	±0.005%[1]
Analog Output Accuracy	±0.006%[1]
Analog Output Linearity	±0.006%[1]
Digital System	
Microcontroller	High Performance RISC
Status LEDs	2 on Analog Board; +5V, A/D status
	3 on System Board; +5V, TD, RD
Comm Interface	3 RJ-45 Connectors; RS-232, RS-485 (115.2kb max), and Digital I/O Serial Link[2]. Compatible with DCP/LDM/RML products. Modular addition of Ethernet
Network	Multidrop operation on RS-485, 16 isoLynx™ systems max
Failsafe	Watchdog timer, brown-out reset to user defined configuration
Analog I/O	
Channels	Mix and match I/O types on a per channel basis Maximum 60 channels differential I/O of SCM5B modules with standard system output of ±5V, ±10V, 0-5V, 0-10V
A/D Converter	16-bit, ±10V input, successive approximation 16-bit resolution, 14-bit accuracy minimum Resolution vs input range; 16/±10V, 15/±5V, 14/0-5V
D/A Converter	16-bit, analog output
Isolation	1500Vrms ch-to-ch or ch-to-internal bus
Input Protection	240VAC continuous 5kV peak per ANSI/IEEE C37.90.1
Throughput[3]	8ms for 16 chs analog in (~2000 ch/sec) w/115.2kbps RS-232/485 16ms for 16 chs analog out (~1000 ch/sec) w/115.2kbps RS-232/485
Calibration	NIST traceable test and calibration sheets with modules
Digital I/O	
Interface	115.2kb maximum serial link to digital panels[2]
Channels	Maximum 128 channels I/O
Module Type	Industry standard Opto-22 miniature style
Throughput[3]	5ms for 16chs digital in or out (~3200 ch/sec) w/115.2kbps RS-232/485
Physical	
Operating Temp	-40°C to +85°C (Ethernet Version -40°C to +70°C)
Storage Temp	-40°C to +85°C
Relative Humidity	0-95% non-condensing
Enclosure	Rugged metal box for System, Analog, & Communication boards
Power	+5VDC, 2.5W base system, no modules installed (3.5W w/Ethernet)
Mounting	Panel or DIN rail mount
Dimensions	17.4" x 3.47" x 3.30"
(l)(w)(h)	442.0mm x 88.1mm x 83.8mm
Weight	1lb 9.4oz (720.1 grams)
Emissions EN61000-6-4	ISM, Group 1
Radiated, Conducted	Class A
Immunity EN61000-6-2	ISM, Group 1
RF	Performance A ±0.5% Span Error
ESD,EFT,Surge,Volt. Dips	Performance B
Certifications	CE Compliant, CSA, FM and ATEX Approvals Pending
Software	
Protocol	RS-232/485, proprietary protocol derived from Opto-22 Mistic
Tools	Free DLL drivers for Windows 95/98/NT/2000, supports Visual C/C++, Visual Basic, and LabView version 6 and higher
OPC Server	OLE for Process Control (OPC) Windows server drivers.

NOTES:
(1) 20V Span. Does not include SCM5B module accuracy.   (3) Protected to RS485 voltage potentials.
(2) Channel per second throughput varies with System I/O configuration.

Ordering Information

Model	Description
SLX100-10	12ch Base Unit, µC & A/D Bds, RS-232/485
SLX100-20	12ch Base Unit, µC & A/D Bds, RS-232 & Ethernet
SLX100-11	12ch Base Unit, µC & A/D Bds, RS-232/485, No CJC
SLX100-21	12ch Base Unit, µC & A/D Bds, RS-232 & Ethernet, No CJC
SLX100-10D	12ch Base Unit, µC & A/D Bds, RS-232/485, DIN
SLX100-20D	12ch Base Unit, µC & A/D Bds, RS-232 & Ethernet, DIN
SLX100-11D	12ch Base Unit, µC & A/D Bds, RS-232/485, No CJC, DIN
SLX100-21D	12ch Base Unit, µC & A/D Bds, RS-232 & Ethernet, No CJC, DIN
SLX101	Backpanel Digital: 16 Ch
SLX101-D	Backpanel Digital: 16 Ch, DIN
SLX141-01, -02,-07	Ethernet and Serial Cable Options
SLX141-X01, -X02,-X07	Ethernet Crossover Cable Options
SLX142,143	RJ45 to DB9 Adapters
SLX144	RJ45 RS-485 Multidrop Adapter
SLX170	Software Tools - VB, VC++, Virtual Instrument
SLX180	Software and Hardware User Manuals
SCMPB02	Backpanel Analog: 16 Ch, Mux
SCMPB02-1	Backpanel Analog: 16 Ch, Mux, No CJC
SCMPB02-2	Backpanel Analog: 16 Ch, Mux, DIN Mount
SCMPB02-3	Backpanel Analog: 16 Ch, Mux, No CJC, DIN Mount
SCMPB06	Backpanel Analog: 8 Ch, Mux
SCMPB06-1	Backpanel Analog: 8 Ch, Mux, No CJC
SCMPB06-2	Backpanel Analog: 8 Ch, Mux, DIN Mount
SCMPB06-3	Backpanel Analog: 8 Ch, Mux, No CJC, DIN Mount
SCMXRK-002	Accessory: 19 Inch Rack Analog Backpanels
SCM5B30/31	Analog Voltage Input Modules
SCM5B32	Analog Current Input Modules
SCM5B33	Isolated True RMS Input Modules
SCM5B34	Linearized 2- or 3- Wire RTD Input Modules
SCM5B35	Linearized 4-Wire RTD Input Modules
SCM5B36	Potentiometer Input Modules
SCM5B37	Thermocouple Input Modules
SCM5B38	Strain Gage Input Modules
SCM5B39	Current Output Modules
SCM5B392	Matched-Pair Servo/Motor Controller Modules
SCM5B40/41	Analog Voltage Input Modules, Wide Bandwidth
SCM5B42	2-Wire Transmitter Interface Modules
SCM5B43	General Purpose Input Modules, with DC Excitation
SCM5B45	Frequency Input Modules
SCM5B47	Linearized Thermocouple Input Modules
SCMPB49	Voltage Output Modules
SCMD-MIAC	Miniature Digital AC Input Modules
SCMD-MIDC	Miniature Digital DC Input Modules
SCMD-MOAC	Miniature Digital AC Output Modules
SCMD-MODC	Miniature Digital DC Output Modules
SCMD-MORO/C	Miniature Relay Output Modules