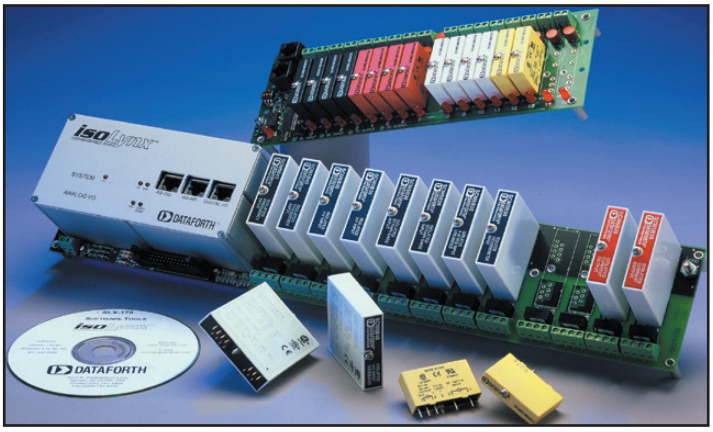
5B isoLynx®

SLX200 Data Acquisition System



DESCRIPTION

The SCM5B isoLynx® SLX200 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. The isoLynx SLX200 implements the industry standard Modbus® RTU and TCP protocols, thereby enabling communication with a wide variety of existing third-party software drivers and HMI/SCADA packages. It is fully certified by Modbus-IDA and compatible with OPC.

All I/O Channel-to-Channel Isolated

The flexible, modular design combines a 6- or 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 unit can operate up to 60 channels of differential analog I/O and 128 channels of digital I/O, using Dataforth's SCM5B analog and SCMD digital modules. The Controller contains a powerful high-speed microcontroller, A/D and D/A subsystem, communication interface, data storage 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 17ms. The D/A converter is also a 16-bit device and can write a maximum 60-channel configuration in 33ms.

Industry's Widest I/O Selection

By selecting from over 250 standard and custom single-channel SCM5B analog I/O modules, the isoLynx SLX200 can interface to a broad spectrum of analog signals, including millivolt, volt, milliamp, amp, linearized and non-linearized thermocouple, RTD, potentiometer, slidewire, strain gauge, AC to True RMS output, frequency, 2-wire transmitter, and transducers requiring DC excitation. Analog output modules are available which 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. Users can mix and match most I/O module types on a per-channel basis, thus reducing wasted I/O channels and saving costs.

FEATURES

- Modbus® RTU Support on RS-232 and RS-485
- Modbus TCP Support (optional)
- 1500Vrms Input-to-Output and Channel-to-Channel Isolation
- 240Vrms Field-side Protection
- 16-bit A/D, D/A
- Up to 6-Pole Analog Input Filtering
- ±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: 250+ Different I/O Modules
- –40°C to +85°C Operating Temperature
- Free Configuration Software
- All Analog I/O Modules Certified to CSA C/US, CE, and ATEX Requirements
- SLX200 & SLX101 CE Compliant
- SLX200 CSA C/US Certified (Class I, Division 2, Groups A, B, C, D)
- Manufactured per RoHS III Directive 2015/863

Interface to digital signals is provided by the dedicated SLX101 digital I/O backpanel. This intelligent backpanel is designed to interface to the SLX200 but can also be used stand-alone for digital I/O-only systems.

The operation and storage temperature range for the SCM5B isoLynx SLX200 is –40°C to +85°C; the relative humidity is 0 to 95% noncondensing. Power requirement is +5VDC, 2.5W base system with no modules installed. The SLX200 and SLX101 are CE Compliant. SLX200 is CSA C/US Certified for Class I, Division 2 Hazardous Locations.

Flexible Communications and Configuration

The SCM5B isoLynx SLX200 communicates on RS-232/RS-485 serial links up to 115.2kbps or 10Mb/s Ethernet. Up to 32 systems can be multidropped on the RS-485 serial link and up to 4 sockets are supported on Ethernet. Optional Ethernet communication boards are available; these can be factory installed or field upgradeable.

The communication protocol is Modbus RTU for RS-232/RS-485 or Modbus TCP for Ethernet. Modbus is an open, industry-standard protocol that defines how devices on a network or bus communicate with each other. Full certification of the SCM5B isoLynx SLX200 by Modbus-IDA ensures the device can be integrated into existing Modbus networks, and most common Modbus function codes are supported. The system is also OPC compatible.

As device configuration is performed using standard Modbus function codes, any third-party software application that supports the Modbus RTU and/or Modbus TCP protocol can be used to configure the device. Configuration parameters are stored in non-volatile memory, so configuration only has to happen once. Free configuration software is provided to ensure configuration is easy and intuitive (see Figure 2 and Figure 3).

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Powerful Firmware Features

The SCM5B isoLynx SLX200 hosts many powerful firmware features. Two analog scan modes are supported: one for general-purpose signal monitoring with running average, maximum, and minimum values available for each analog input; the other with user-configurable scan parameters such as scan list, scan rate, and scan count, used to obtain data with highly accurate time correlation between samples. Configurable default output values ensure output signals get set at safe values when unexpected power outages or brownouts occur. Power-on self-test results can be obtained visually by glancing at a status LED or programatically by reading the appropriate register on the device. A section of memory is set aside for general-purpose user data, some of which is stored in non-volatile memory.

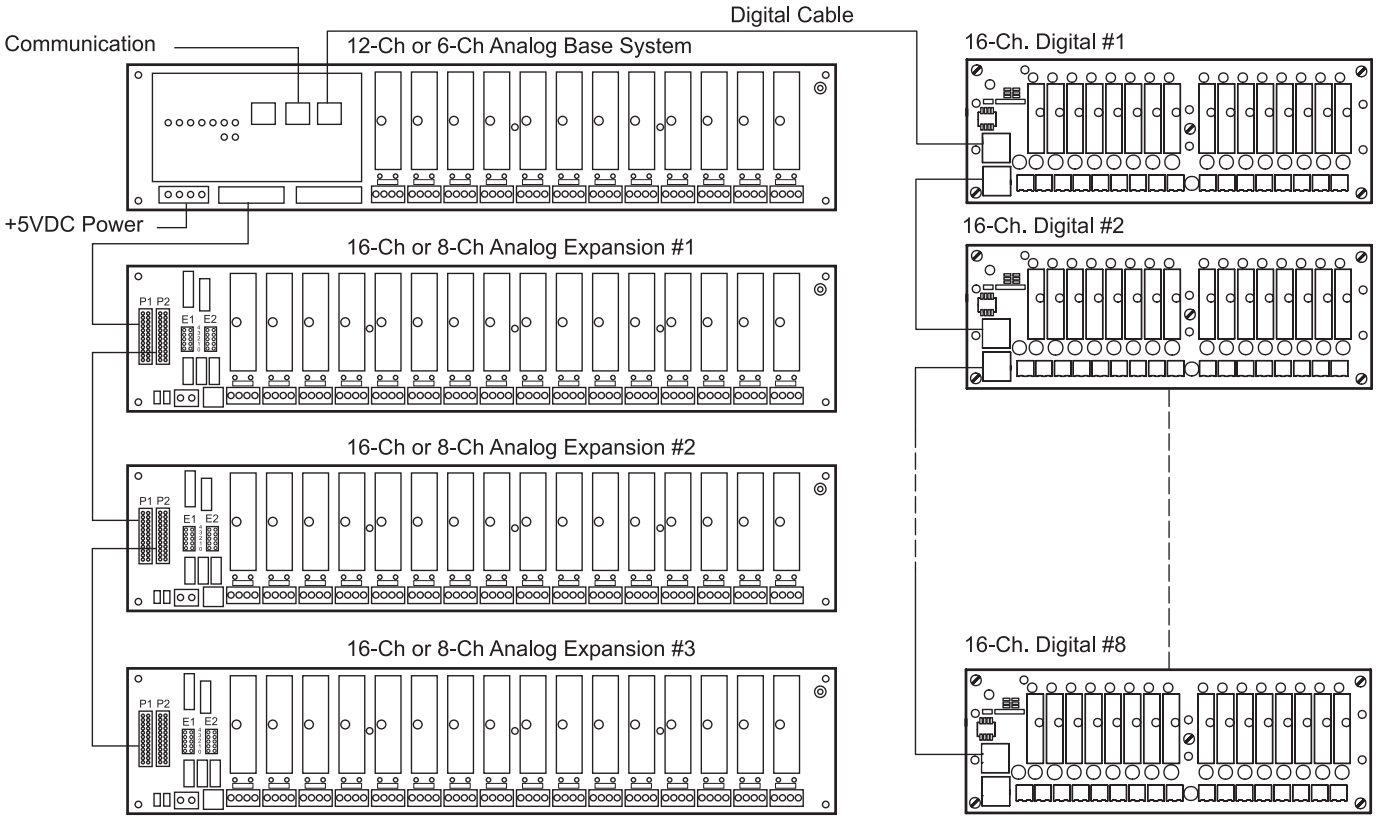


Figure 1: SCM5B isoLynx SLX200 Block Diagram - For Dimensions and Pinouts, See Page 6-39

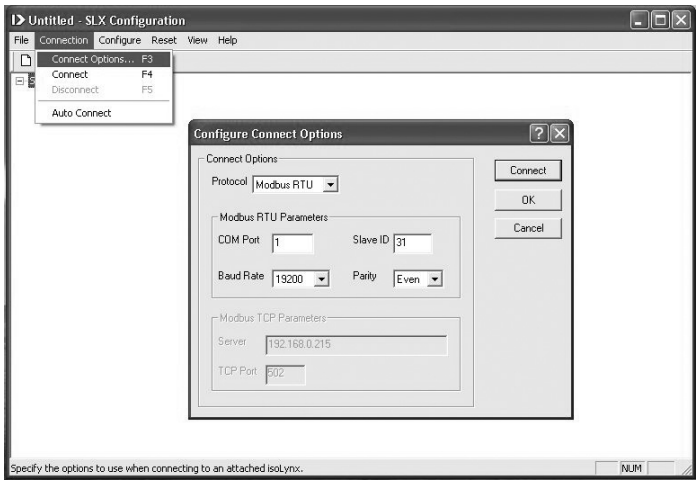


Figure 2: Configuration Utility - Communications Setup

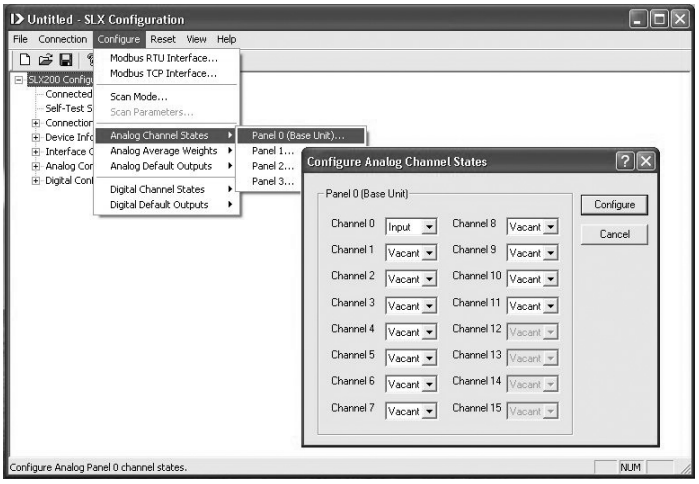


Figure 3: Configuration Utility - Analog Channel Setup

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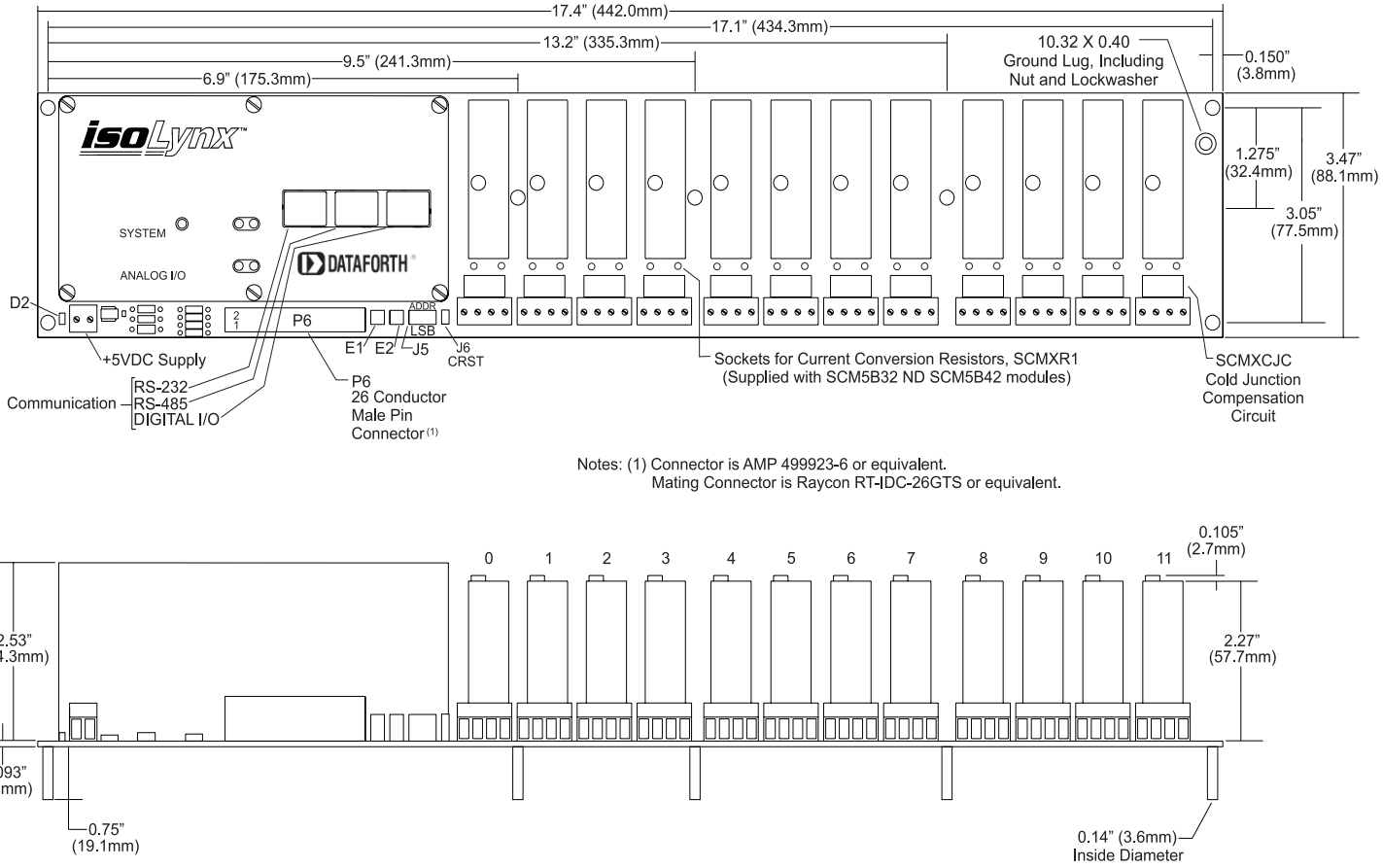


Figure 4: SLX200-xx 12-channel Base System

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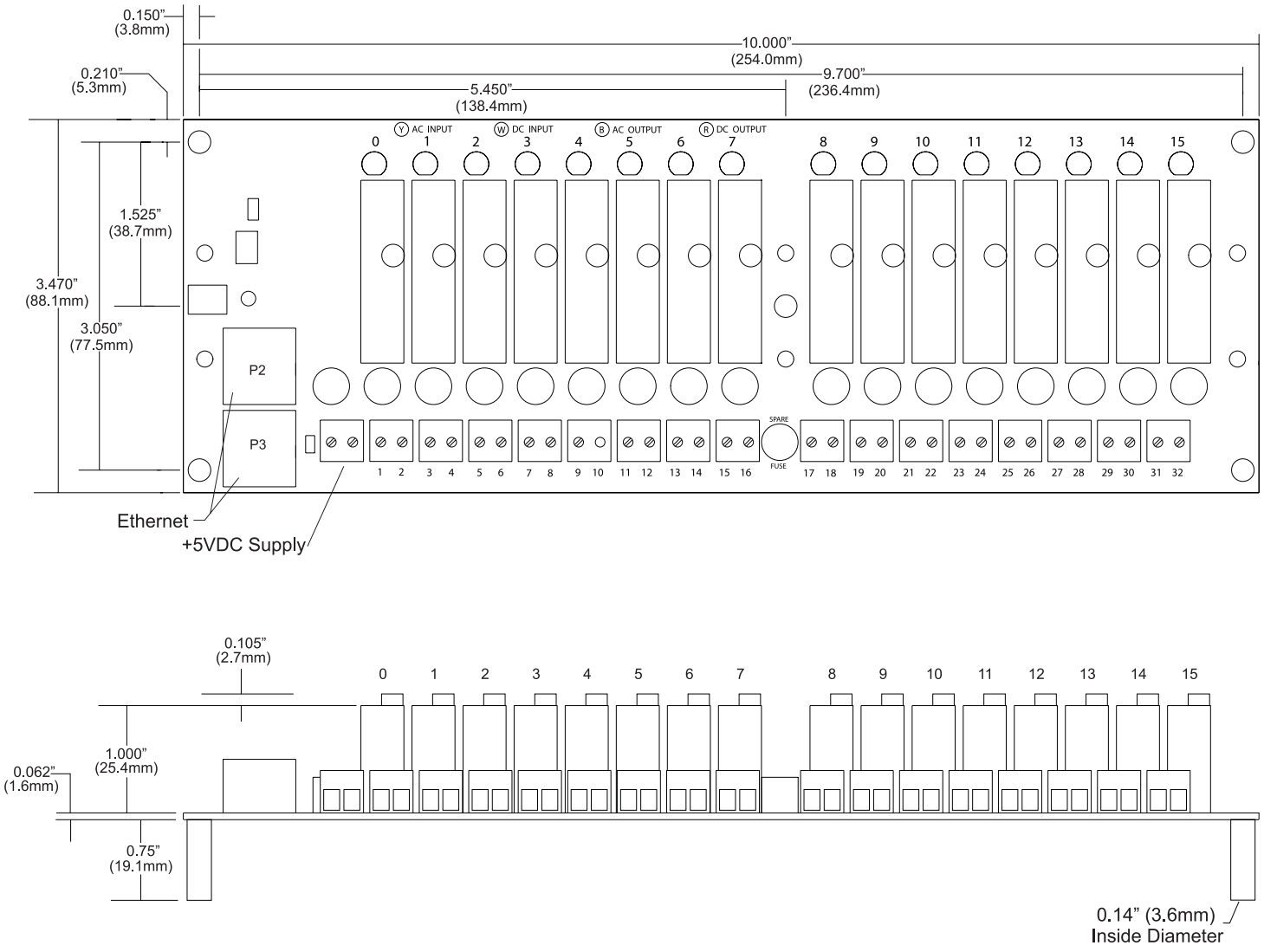


Figure 5: SLX101 Digital I/O Backpanel

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Specifications

Typical* at T_A = +25°C and +5VDC Power

5B isoLynx® SLX200 Analog I/O Base Unit	
General System	
Protocol	Modbus® RTU or TCP, OPC Server Compatible
I/O Capability	One 6-ch or 12-ch Backpanel Minimum; Expandable to 60-ch Analog I/O, 128-ch Digital I/O
Software Tools	Free Configuration Utility, Win32 DLL, LabVIEW™ VI Library
Digital System	
Microcontroller	High-performance RISC
Status LEDs	+5V, System Status, TD/RD (Serial), LNK/ACK (Ethernet)
Failsafe Features	Watchdog Timer and Brownout Detection - Reset to User Defined Configuration
Communication Interface	
Serial I/O	Separate RJ-45 Modular Phone Jacks for RS-232 and RS-485 115.2kbps (max)
Port for SLX101 Digital I/O Panel	RJ-45 Modular Phone Jack, 2-wire RS-485
RS-485	2-wire or 4-wire, 4000 Feet (max) Distance, 32 (max) Multidrops, Non-isolated
	To Isolate, Extend, or Convert RS-232 or RS-485, Use Dataforth LDM and DCP Data Communication Products
Ethernet	RJ-45 Modular Phone Jack, 10Base-T
	Default IP Address 192.168.0.215, Keep-alive Timeout 7200s
Analog I/O	
Channels	Mix and Match I/O Types on a Per Channel Basis(1)
	Maximum 60-ch Differential I/O of SCM5B Modules
	Input Modules Must Have System Output of ±5V or 0 to +5V (±10V or 0 to +10V cannot be used)
Calibration	NIST Traceable Test and Calibration Sheets Ship with Modules
System Accuracy	Analog Input ±0.024%(2), Analog Output ±0.006%(2)
Field Connector	High-density Screw Clamp, 14 AWG (max), 0.5N-M Torque
System Connector	26-pin, Male Header Connector
Ground Network Jumpers	Factory Default R1 100Ω; J1-J4: J1, J2, and J4 Installed; J3 Not Installed. See Hardware User Manual for Recommended Grounding Practices.
A/D Converter	16-bit, ±10V Input, 14-bit (min) Accuracy
	Resolution vs. Input Range: 16-bit at ±10V, 15-bit at ±5V, 14-bit at 0 to +5V
D/A Converter	16-bit, ±10V Output
Isolation	1500Vrms Ch-to-ch or Ch-to-Internal Bus
Input Protection	240VAC Continuous, ESD
Throughput, Analog Input	8ms for 16 Ch (~2000 ch/s) at 115.2kbps Modbus RTU
	17ms for 60 Ch (~3600 ch/s) at 115.2kbps Modbus RTU
Throughput, Analog Output	13ms for 16 Ch (~1230 ch/s) at 115.2kbps Modbus RTU
	33ms for 60 Ch (~1850 ch/s) at 115.2kbps Modbus RTU
Expansion Panels	SCMPB02 (16-ch, can use up to 3), SCMPB06 (8-ch, can use up to 6)
Power Supply Requirements	
SLX200-1xx	+5VDC ±5% at 500mA, No Modules Installed
SLX200-2xx	+5VDC ±5% at 700mA, No Modules Installed
SLX200-3xx	+5VDC ±5% at 900mA, No Modules Installed
Dimensions (l)x(w)x(h)	
SLX200-xx, 12-ch	17.4" x 3.47" x 3.30" (442.0mm x 88.1mm x 83.8mm)
SLX200-xxAx, 6-ch	11.8" x 3.47" x 3.30" (300.7mm x 88.1mm x 83.8mm)
Mounting Options	Panel Mount or DIN-rail Mount
Environmental	
Operating Temp. Range	–40°C to +85°C (–40°C to +70°C for SLX200-2xx,-3xx)
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing
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	Performance B
Certifications	
CE Compliant	
CSA, FM	Class I, Division 2, Groups A, B, C, D Hazardous Locations
Modbus	IDA Conformance Tested

5B isoLynx® SLX101 Digital I/O Backpanel	
General System	
Protocol	Modbus RTU or TCP, OPC Server Compatible Through SLX200. Proprietary as Stand-alone.
I/O Capability	One 16-ch Backpanel Minimum. Expandable to 128-ch Digital I/O.
Digital System	
Microcontroller	High-performance RISC
Status LEDs	+5V, System Status, Channel State
Failsafe Features	Watchdog Timer & Brownout Detection - Reset to User-defined Configuration
Communication Interface	
Serial I/O	Two Rj-45 Modular Phone Jacks for Daisy-chain Connection
RS-485 2W	115.2kbps (max) 4000 Feet (max) Distance, 32 (max) Multidrops, Non-isolated
Digital I/O	
Channels	Mix and Match I/O Types on a Per-channel Basis
Field Connector	High-density Screw Clamp, 14 AWG (max), 0.5N-M Torque
Isolation	1000 Vrms Ch-to-ch or Ch-to-Internal Bus
Throughput	8ms for 16 Ch (~2000 ch/s) at 115.2kbps Modbus RTU
	27ms for 128 Ch (~4740 ch/s) at 115.2kbps Modbus RTU
Power Supply Requirements	+5VDC ±5% at 40mA, No Modules Installed
Dimensions (l)x(w)x(h)	10.0" x 3.47" x 1.95" (254.0mm x 88.1mm x 49.5mm)
Mounting Options	Panel Mount or DIN-rail Mount
Environmental	
Operating Temp. Range	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C
Relative Humidity	0 to 95% Non-condensing
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	Performance B
Certifications	
CE Compliant	
CSA, FM	Not Covered Under the SLX200 Certifications. Must Qualify Separately Based on Source of I/O Modules.

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Modules with system output of ±10V or 0-10V cannot be used in the SLX200 systems. This includes SCM5Bxx-xxD, SCM5B392-13, -14, SCM5B42-02, and SCM5B48-01.
(2) 10V span for analog input, 20V span for analog output. Does not include SCM5B module accuracy.

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Ordering Information

Model	Description
SLX200-10[1]	12-ch, RS-232/485, Panel Mount
SLX200-11[1]	12-ch, RS-232/485, No CJC[2], Panel Mount
SLX200-10D[1]	12-ch, RS-232/485, DIN-rail Mount
SLX200-11A[1]	6-ch, Base Unit, µC and A/D Bds, RS-232/485, No CJC, Panel, Modbus
SLX200-11AD[1]	6-ch, Base Unit, µC and A/D Bds, RS-232/485, No CJC, DIN, Modbus
SLX200-11D[1]	12-ch, RS-232/485, No CJC[2], DIN-rail Mount (For 6-ch. Base Unit, See Note[1])
SLX101	Backpanel Digital: 16-ch
SLX101-D	Backpanel Digital: 16-ch, DIN-rail Mount
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
SLX145	Fuse 4A, Package of 5
SLX270[3]	Software Tools and User Manuals
SLX280[3]	Software and Hardware User Manuals
SCMPB02	Backpanel Analog: 16-ch
SCMPB02-1	Backpanel Analog: 16-ch, No CJC[3]
SCMPB02-2	Backpanel Analog: 16-ch, DIN-rail Mount
SCMPB02-3	Backpanel Analog: 16 Ch, No CJC[3], DIN-rail Mount
SCMPB06	Backpanel Analog: 8-ch
SCMPB06-1	Backpanel Analog: 8-ch, No CJC[3]
SCMPB06-2	Backpanel Analog: 8-ch, DIN-rail Mount
SCMPB06-3	Backpanel Analog: 8-ch, No CJC[3], DIN-rail Mount
SCMXRK-002	Accessory: 19-inch Rack Analog Backpanels
SCM5B30/31[4]	Analog Voltage-input Modules
SCM5B32[4]	Analog Current-input Modules
SCM5B33[4]	Isolated True RMS Input Modules
SCM5B34[4]	Linearized 2- or 3-wire RTD-input Modules
SCM5B35[4]	Linearized 4-wire RTD-input Modules
SCM5B36[4]	Potentiometer-input Modules
SCM5B37[4]	Thermocouple-input Modules
SCM5B38[4]	Strain-gauge Input Modules
SCM5B39	Current-output Modules
SCM5B392[4]	Matched-pair Servo/Motor Controller Modules
SCM5B40/41[4]	Analog Voltage-input Modules, Wide Bandwidth
SCM5B42[4]	2-wire Transmitter Interface Modules
SCM5B43[4]	General-purpose Input Modules, with DC Exc.
SCM5B45[4]	Frequency-input Modules
SCM5B47[4]	Linearized Thermocouple-input Modules
SCM5B49	Voltage-output Modules
SCMD-MIAC5x	Miniature Digital AC-input Modules
SCMD-MIDC5x	Miniature Digital DC-input Modules
SCMD-MOAC5x	Miniature Digital AC-output Modules
SCMD-MODC5x	Miniature Digital DC-output Modules
SCMD-MORx5	Miniature Relay-output Modules
SCMXCA004-xx	System Interface Cable for Both Analog Backpanels
SCMXPRT-001	Power supply, 1A, 5VDC, 120VAC US
SCMXPRE-001	Power supply, 1A, 5VDC, 220VAC European
SCMXPRT-003	Power supply, 3A, 5VDC, 120VAC US
SCMXPRE-003	Power supply, 3A, 5VDC, 220VAC European

NOTES:
(1) SLX200 suffix changes to -xxA or -xxAD for 6-ch base unit.
(2) Cold-junction Compensation. Required for SCM5B37 and SCM5B47.
(3) Downloadable from website.
(4) Modules with system output of ±10V or 0-10V cannot be used in the SLX200 systems.
This includes SCM5Bxx-xxD, SCM5B392-13, -14, SCM5B42-02, and SCM5B48-01.

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