

MICRO LYNX™ 4/7

INTEGRATED MICROSTEPPING MOTOR
DRIVE AND HIGH-PERFORMANCE
MACHINE/PROCESS CONTROLLER



FEATURES

- Integrated Drive and Control in One Package
- Low Cost
- Ultra Small Size (2.4 x 3.5 x 2.9 inches) (60.96 x 88.9 x 73.66 mm)
- 2 Drive Output Selections:
+12 to +48 VDC, 3A rms - 4A peak
+24 to +75 VDC, 5A rms - 7A peak
- Single Supply Operation
- No Minimum Motor Inductance
- Microstep Resolution up to 51,200 Steps per Rev. (1.8° Motor)
- Programmable Current Settings Boost Acceleration and Allow Motor to Run Cooler
- Electronic Gearing*
- Open or Closed Loop* Control
- Motion Values Scalable to any Units
- Six +5 to +24 VDC Isolated I/O Lines (Expandable to 24)
- Programmable Digital Filtering for Inputs
- 32 Bit Floating Point Math, Logic and Conditional Functions
- Simple 2 to 5 Letter Programming Instructions Similar to Basic
- 7 Hardware and 62 Software Addresses for Multi-Drop Communications
- Isolated Independent RS-232 and RS-485 with Selectable BAUD Rate to 38.4K, Full or Half Duplex or CAN Bus†
- 0 to 5MHz Step Clock Rate, Selectable in 0.005Hz Increments
- 4 Pre-Defined and 1 User Defined Acceleration/Deceleration Curves
- Easy to Wire Removable Terminal Strips or Optional Pin Headers‡
- 3 Expansion Slots for Optional Accessory Modules
- Short Circuit and Over Temp Protection
- Power and Fault LED

* Requires High-Speed Differential I/O Module

† RS-232 or RS-485 Available on Port 2 with Optional Expansion Module

‡ I/O, Communication and Expansion Modules Only



ACTUAL SIZE

DESCRIPTION

The MicroLynx is a powerful machine control system integrating a bipolar microstepping driver and an expandable programmable controller into a compact panel mounted assembly.

With the addition of differential I/O modules, the MicroLynx has the capability of driving two additional axes sequentially or allowing electronic gearing by following a rotary or linear axis or outputting a second clock at an electronically controlled ratio.

The MicroLynx provides for two fully independent communication ports. It will accept commands from either port and direct output to either as well. A system could be configured to use COMM port one to communicate to a host PC or PLC while using the second to communicate with an operator interface or additional MicroLynx.

The MicroLynx comes in two output power ranges to fit a variety of motor sizes. Features such as +5 to +24 VDC isolated I/O,

multiple communication types and numerous expansion options make the MicroLynx an effective and powerful machine control solution.

EXPANDABILITY

The MicroLynx can be used to control systems both simple and complex. With plug-on accessory modules OEM's have the option of only purchasing the features they need for any given system design, reducing overall cost of the system. The MicroLynx can be field upgraded. By simply removing the side cover an expansion module can be added or changed, keeping system downtime to a minimum.

UPGRADABILITY

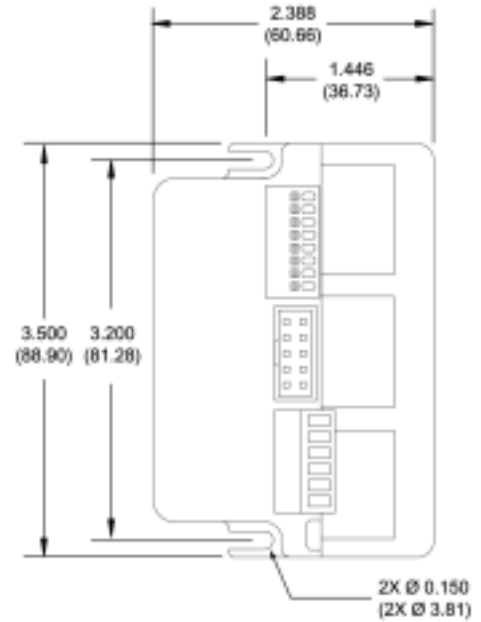
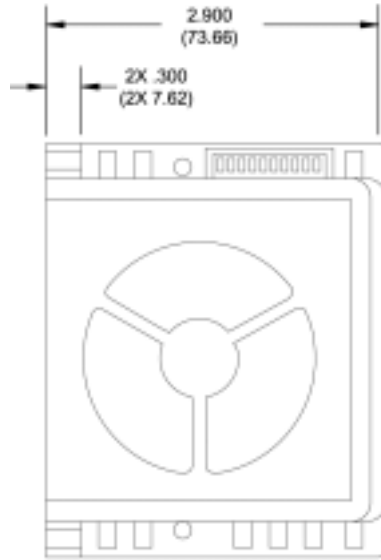
The MicroLynx software is upgradeable. Updates are posted on the IMS web site and can be downloaded and installed using the Terminal/Upgrade software provided with the MicroLynx. This allows older units to use new features and expansion modules as they become available.

GENERAL SPECIFICATIONS

ELECTRICAL	MOTION
<p>Power Supply Requirements</p> <p>Voltage*</p> <p>-4 version +12 to +48 VDC</p> <p>-7 version +24 to +75 VDC</p> <p>*Includes Motor Back EMF, Ripple, Hi Line</p> <p>Current (actual requirements depend on application and programmable current settings)</p> <p>-4 version 2 amps typical</p> <p>-7 version 3 amps typical</p> <p>RECOMMENDED SUPPLY: ISP200 (-4/-7)</p> <p>Motor Drive</p> <p>Motor Type 2/4 phase bipolar stepper</p> <p>Motor Current (software programmable)</p> <p>-4 version to 4 amps peak</p> <p>-7 version to 7 amps peak</p> <p>Resolution</p> <p># of settings 14</p> <p>Steps per Revolution (1.8° Motor)</p> <p>400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 25000, 25600, 50000, 51200</p> <p>General Purpose I/O</p> <p>Number of I/O 6</p> <p>Input Voltage +5 to +24 VDC</p> <p>Output Current Sink 350 mA</p> <p>Input Filter Range 215Hz to 21.5Khz (programmable)</p> <p>Pull-ups 7.5 Kohm individually switchable</p> <p>Pull-up Voltage +5 VDC on-board or externally up to +24 VDC</p> <p>Protection Over Temp, Short Circuit, Inductive Clamp</p> <p>Isolated ground Common to 6 I/O</p>	<p>Counters</p> <p>Type Position, Encoder #1, Encoder #2: 32 Bits</p> <p>Edge Rate (Max) 5 MHz</p> <p>Electronic Gearing[†]</p> <p>Range* (External Clock In): -1 to 1</p> <p>Resolution 32 Bits</p> <p>Range* (Secondary Clock Out): -2 to 2</p> <p>Resolution 16 Bits</p> <p>*Adjusting the microstep resolution of the drive can increase the range</p> <p>†Requires Differential I/O Expansion Module</p> <p>Velocity</p> <p>Range ±5,000,000 steps/sec</p> <p>Resolution 0.005 steps/sec</p> <p>Update Period 25.6 Microseconds</p> <p>Acceleration/Deceleration</p> <p>Range ±1,530,000,000 steps/sec²</p> <p>Resolution 0.711 steps/sec²</p> <p>Types: Linear, triangle s-curve, parabolic, sinusoidal s-curve, user defined</p>
<p>COMMUNICATION</p> <p>Asynchronous</p> <p>Interface Type COMM 1: RS-232 COMM 2: RS-485</p> <p># of Bits/Character 8</p> <p>Parity none</p> <p>Handshake none</p> <p>Baud Rate 4800 to 38.4K</p> <p>Error Checking 16 bit check sum (binary mode)</p> <p>ASCII Text or Binary Communication Modes</p> <p>CAN</p> <p>CAN Communications replaces Asynchronous Communications in Base System (uses COMM 1 internally)</p> <p>CAN compliance Version 2.0B Active</p> <p>2 receive message frames</p> <p>1 transmit frame</p> <p>Isolated Ground Common to COMM1 and COMM2</p>	<p style="background-color: #cccccc;">SOFTWARE</p> <p>User Program Space 8175 Bytes</p> <p>Number of User Definable Labels, Variables and Flags 291</p> <p>Program and Data Storage Flash</p> <p>Math, Logic and Conditional Functions (32 Bit Floating Point Math IEEE Format) Add, Subtract, Multiply, Divide, Sine, Cosine, Tangent, Arc Sine, Arc Cosine, Arc Tangent, AND, OR, XOR, NOT, Less Than, Greater Than, Equal, Square Root, Absolute, Integer Part, Fractional Part</p> <p>Acceleration & Deceleration Separate Variables and Flags 4 Pre-Defined Types and 1 User Defined</p> <p>Limit Switch Definable: Deceleration and Type</p> <p>Isolated I/O Line Software Selectable as Dedicated or General Purpose</p> <p>Predefined I/O Functions 25 (Limit, Home, etc.)</p> <p>Program Trip Functions 13: 4 I/O Input Trips, 4 Timer Trips, 4 Position Trips, 1 Velocity Trip</p> <p>User Programs 2 Executed Simultaneously: 1 Foreground, 1 Background</p> <p>Party Mode Names 62</p> <p>Communication Modes 2: ASCII, Binary</p> <p>Mechanical Compensation Backlash</p> <p>Encoder Functions Stall Detection and Position Maintenance</p>
	<p style="background-color: #cccccc;">ENVIRONMENTAL</p> <p>Operating Temperature 0 to 50°C</p> <p>Storage Temperature -20 to 70°C</p> <p>Humidity 0 to 90% non-condensing</p>
	<p style="background-color: #cccccc;">MECHANICAL</p> <p>Dimensions (see Mechanical Specs)</p> <p># of Expansion Modules up to 3</p> <p>Cooling Built-in fan</p> <p>Mounting 2 #6 (or M3.5) machine screws</p> <p>Mounting Screw Torque 5.0 to 7.0 lb-in</p>

MECHANICAL SPECIFICATIONS

Dimensions in Inches (mm)



SWITCHES

Switch #	Switch Name	Function
1-6	I/O 21-26	Pull-up on/off Switches for I/O Lines 21-26
7-9	Address 2-0	Multi-drop Communication Address (also settable by software)
10	Upgrade	Firmware Upgrade

CONNECTORS

Power and Motor

6 position pluggable terminal block connector.

Pin #	Signal Name	Function
1	Phase A	Motor Connections
2	Phase /A	
3	Phase B	
4	Phase /B	
5	+V	Input Power
6	GND	

Power and Motor Connections

Communication

Dual COMM Version

7 position pluggable terminal block connector or optional 10 pin header.

Pin #	Connector Option	
	Terminal Block	10 Pin Header
1	232RX	N.C.
2	232TX	232TX
3	485RX-	232RX
4	485RX+	N.C.
5	485TX-	C GND
6	C GND	485RX+
7	485TX+	485RX-
8		485TX-
9		485TX+
10		C GND

Asynchronous Communications Connections

CAN Version

7 position pluggable terminal block connector or optional 10 pin header.

Pin #	Connector Option	
	Terminal Block	10 Pin Header
1	V- (C GND)	N.C.
2	CAN_L	CAN_L
3	SHIELD	V- (C GND)
4	CAN_H	SHIELD
5	N.C. (reserved for V+)	SHIELD
6	/CONFIG	N.C.
7	N.C.	CAN_H
8		N.C.
9		N.C. (reserved for V+)
10		/CONFIG

CAN Comm1 Communications Connections
(Comm2 Available with Expansion Modules)

General Purpose I/O

8 position pluggable terminal block connector or optional 10 pin header.

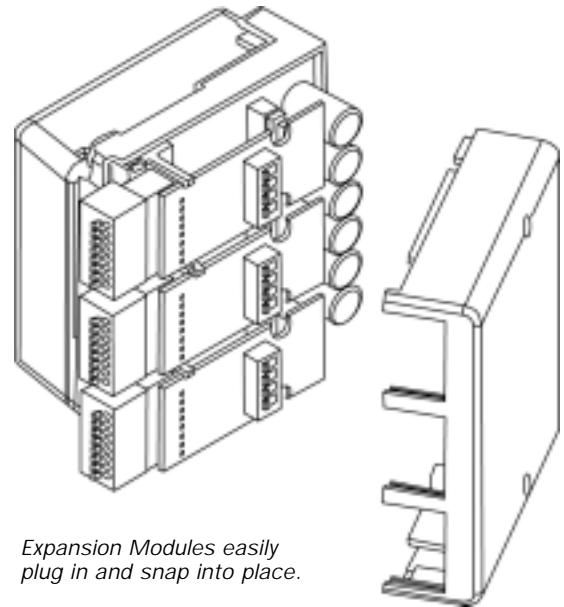
Pin #	Connector Option	
	Terminal Block	10 Pin Header
1	VPULLUP	I/O 21
2	I/O 21	I/O 22
3	I/O 22	VPULLUP
4	I/O 23	I/O 23
5	I/O 24	FAULT INPUT +
6	I/O 25	I/O 24
7	I/O 26	FAULT INPUT -
8	I/O GND	I/O 25
9		I/O GND
10		I/O 26

General Purpose I/O Connections

EXPANSION MODULES

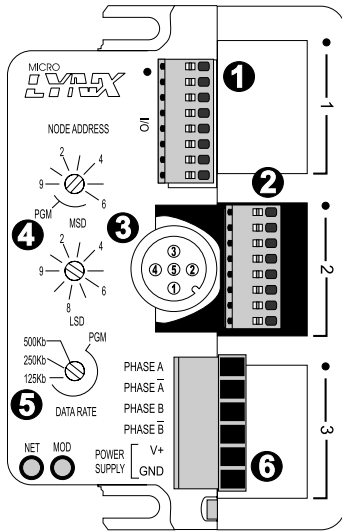
Up to three expansion modules can be added. Modules can be combined to fill the three expansion slots. Module types are limited to 2 Analog Input/Joystick Modules, 2 Analog Output Modules, 1 Twelve Channel I/O Module, up to 2 High-Speed Differential I/O Modules, and up to 3 General Purpose I/O Modules per system.

By simply removing two screws on the side cover, expansion modules can be added, removed or reconfigured. No additional hardware is required. Modules simply plug in and snap into place making even field change quick and easy.



Expansion Modules easily plug in and snap into place.

DEVICENET Version



- ❶ I/O Connector
- ❷ Encoder Connector*
- ❸ DeviceNet Connector
- ❹ Address Select Switches
- ❺ Data Rate Select Switch
- ❻ Motor/Power

* High Speed Differential I/O Board Optional for Encoder Functions. Board must be placed in Expansion Slot #2. Note that the High Speed Differential I/O Expansion is the ONLY Expansion Module available for the DeviceNet MicroLYNX.

The MicroLYNX DeviceNet is specifically designed to conform with ODVA Volume II, Release 2.0 Errata 3 as a Position Controller (Device Type 16).

- Node Address MSD and LSD switch-selectable on front panel.
- Data Rate switch-selectable on front panel.
- Conforms to the Predefined Master/Slave Connection Set as a group 2 Slave.
- Supports Poll IO and Explicit Messaging.
- Included GUI to aid in configuration and EDS file.
- No support for UCMM.

DeviceNet I/O

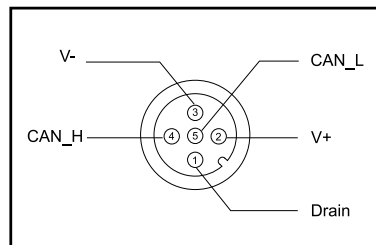
8 position pluggable terminal block connector or optional 10 pin header.

Pin #	Connector Option	
	Terminal Block	10 Pin Header
1	VPULLUP	Home Input
2	Home Input	CW Limit Input
3	CW Limit Input	VPULLUP
4	CCW Limit Input	CCW Limit Input
5	Fault Input	NC
6	Brake Output	Fault Input
7	General Purpose	NC
8	I/O GND	Brake Output
9		I/O GND
10		General Purpose

DeviceNET I/O Connections

Communication

5 Pin DeviceNet Micro, Male



ORDERING INFORMATION

Standard Product Shown in Bold Italics. Longer Lead Times May Apply to Other Versions.

Note: Terminal Block Connectors Supplied with Mating Connector.

Pin Header Mating Connector (**Not Supplied**) Type T & B 636-1030 or Equivalent.

MICROLYNX CONTROL SYSTEMS

TYPE	DESCRIPTION	CONNECTOR TYPE		PART NUMBER	
		COMMUNICATION	I/O	4 AMP DRIVER	7 AMP DRIVER
Control System with Asynchronous Communication	6 5 to 24VDC Isolated I/O, RS-232 and RS-485 Communication, 4 or 7A Motor Drive	Pin Header**	Terminal Block	<i>MX-CS100-401</i>	<i>MX-CS100-701</i>
		Terminal Block	Terminal Block	MX-CS101-401	MX-CS101-701
		Pin Header**	Pin Header	MX-CS102-401	MX-CS102-701
		Terminal Block	Pin Header	MX-CS103-401	MX-CS103-701
Control System with CAN Communication	6 5 to 24VDC Isolated I/O, CAN Communication, 4 or 7A Motor Drive	Pin Header	Terminal Block	MX-CS200-401	MX-CS200-701
		Terminal Block	Terminal Block	MX-CS201-401	MX-CS201-701
		Pin Header	Pin Header	MX-CS202-401	MX-CS202-701
		Terminal Block	Pin Header	MX-CS203-401	MX-CS203-701
Control System with DeviceNet Communication	6 5 to 24VDC Isolated I/O, DeviceNet Communication, 4 or 7A Motor Drive	DeviceNet Micro, Male	Terminal Block	MX-CS300-401	MX-CS300-701
			Pin Header	MX-CS302-401	MX-CS302-701

**Communication cable accessory recommended with first order.

EXPANSION MODULES

TYPE (max # per system)	DESCRIPTION	PART NUMBER	
		TERMINAL BLOCK	PIN HEADER
Isolated Digital I/O Module (3)	Six 5 to 24 VDC General Purpose Isolated Digital I/O	<i>MX-DI100-000</i>	MX-DI200-000
High-Speed Differential I/O Module (2)	3 High-Speed Differential (or Single Ended) Lines for General Purpose I/O, Encoder Feedback, Electronic Gearing, or Driving an Additional Axis Sequentially	<i>MX-DD100-000</i>	MX-DD200-000
Analog Input/Joystick Module (2)	2 Channels of 0 to 5 VDC 12 bit Resolution Analog Input or Single Axis Joystick	<i>MX-AJ100-000</i>	MX-AJ200-000
Analog Output Module (2)	2 Channels (Up to 4 total) of 0 to 5 VDC 12 bit Resolution Analog Output	<i>MX-DA100-000</i>	MX-DA200-000
RS-232 Communication Module (1)	RS-232 Port 2 Communication Module used only with CAN Based Control System — <i>cannot combine with RS-485 Module</i>	MX-CM102-000	<i>MX-CM202-000</i>
RS-485 Communication Module (1)	RS-485 Port 2 Communication Module used only with CAN Based Control System — <i>cannot combine with R-232 Module</i>	<i>MX-CM104-000</i>	MX-CM204-000
12 Channel I/O Module (1)	General Purpose I/O Module with Twelve 5 to 24 VDC Isolated Digital I/O	Not Available	<i>MX-DI400-000</i>
			PIN & RECEPTACLE MX-DI401-000†

†Refer to 12 Channel I/O page for details.

ACCESSORIES

TYPE	DESCRIPTION	PART NUMBER
Human Machine Interface (HMI)	A Programmable User Interface with 20 Character by 4 Line Display, 6 Function Keys, Numeric Keypad	<i>LX-HI100-000</i>
Communication Cable	10 Pin Pin-Receptacle to 9 Pin Sub D Provides Easy Connection for RS-232 Communication	<i>MX-CC100-000</i>
Communication Cable (For Party Line)	2 10 Pin Pin-Receptacle to 9 Pin Sub D (For Party Line Communication with Two MicroLYNX) Provides Easy Connection for RS-232 Communication to First MicroLYNX and RS-485 Communication from First to Second MicroLYNX	<i>MX-CC200-000</i>
Operating Manual	Operating Instruction Manual for MicroLYNX (& LYNX) Systems - Paper Version*	<i>LX-OM200-000</i>
6 Pin Terminal Block	6 Pin Screw-Type Terminal Block - Motor and Power	<i>MX-CN006</i>
7 Pin Terminal Block	7 Pin Spring Clamp Terminal Block 0.1" Center - MicroLYNX Communications	<i>MX-CN007</i>
8 Pin Terminal Block	8 Pin Spring Clamp Terminal Block 0.1" Center - MicroLYNX I/O and Expansion Modules	<i>MX-CN008</i>
CAN Dongle	Communication Cable for MicroLYNX CAN Version	MX-CC500-000
DeviceNet Programmer	Cable for use in Upgrading MicroLYNX DeviceNet Firmware	MX-CC600-000

*Manual on CD provided with system shipment.
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