

# MICRO LYNX™ 4/7

## INTEGRATED MICROSTEPPING MOTOR DRIVER AND HIGH PERFORMANCE MACHINE/PROCESS CONTROLLER

### FEATURES

- Integrated Driver and Controller 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 expandable programmable controller into a compact panel mounted assembly.

Differential I/O modules give the MicroLYNX 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 the second communicates with an operator interface or additional MicroLYNX.

Available in two output power ranges, MicroLYNX fits 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

Software for the MicroLYNX is upgradeable. Updates are posted on the IMS web site and can be downloaded and installed using the IMS 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

### Power Supply Requirements

#### Voltage<sup>1</sup>

-4 version ..... +12 to +48 VDC  
 -7 version ..... +24 to +75 VDC

<sup>1</sup>Includes Motor Back EMF, Ripple and Hi Line.

#### Current<sup>2</sup>

-4 version ..... 2 Amps typical  
 -7 version ..... 3 Amps typical

<sup>2</sup>Actual requirements depend on application and programmable current settings.

RECOMMENDED SUPPLY: ISP200 (-4/-7)

### Motor Drive

Motor Type ..... 2/4 phase bipolar stepper  
 Motor Current (software programmable)  
 -4 version ..... to 4 Amps peak  
 -7 version ..... to 7 Amps peak  
 Resolution  
 Number of settings ..... 14  
 Steps per Revolution  
 (1.8° Motor) ..... 400, 800, 1000, 1600, 2000,  
 3200, 5000, 6400, 10000,  
 12800, 25000, 25600,  
 50000, 51200

### General Purpose I/O

Number of I/O ..... 6  
 Input Voltage ..... +5 to +24 VDC  
 Output Current Sink ..... 350 mA  
 Input Filter Range ..... 215Hz to 21.5kHz (programmable)  
 Pull-ups ..... 7.5 kOhm individually switchable  
 Pull-up Voltage ..... +5 VDC on-board or externally up  
 to +24 VDC  
 Protection ..... Over Temp, Short Circuit,  
 Inductive Clamp  
 Isolated Ground ..... Common to 6 I/O

## COMMUNICATION

### Asynchronous

Interface Type ..... COMM 1: RS-232  
 COMM 2: RS-485  
 Number of Bits/Character ..... 8  
 Parity ..... none  
 Handshake ..... none  
 Baud Rate ..... 4.8 to 38.4kbps selectable  
 Error Checking ..... 16 bit check sum (binary mode)  
 ASCII Text or Binary Communication Modes

### CAN

CAN Communications replaces Asynchronous Communications in Base System (uses COMM 1 internally)

CAN compliance ..... Version 2.0B Active

2 receive message frames  
 1 transmit frame

Isolated Ground ..... Common to COMM1 and COMM2

## MOTION

### Counters

Type ..... Position, Encoder1, Encoder2: 32 Bits  
 Edge Rate (Max) ..... 5 MHz

### Electronic Gearing<sup>†</sup>

External Clock In  
 Range\* ..... -1 to 1  
 Resolution ..... 32 Bits  
 Secondary Clock Out  
 Range\* ..... -2 to 2  
 Resolution ..... 16 Bits

<sup>†</sup> Requires Differential I/O Expansion Module.

\* Adjusting the microstep resolution of the driver can increase the range.

### Velocity

Range ..... ±5,000,000 steps/sec  
 Resolution ..... 0.005 steps/sec  
 Update Period ..... 25.6 Microseconds

### Acceleration/Deceleration

Range ..... ±1,530,000,000 steps/sec<sup>2</sup>  
 Resolution ..... 0.711 steps/sec<sup>2</sup>  
 Types ..... Linear, triangle s-curve, parabolic,  
 sinusoidal s-curve, user defined

## SOFTWARE

User Program Space ..... 8175 Bytes  
 Number of User Definable  
 Labels, Variables and Flags ... 291  
 Program and Data Storage ... Flash  
 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  
 Acceleration & Deceleration ... Separate Variables and Flags  
 4 Pre-Defined Types and  
 1 User Defined  
 Limit Switch ..... Definable: Deceleration and Type  
 Isolated I/O Line ..... Software Selectable as  
 Dedicated or General Purpose  
 Predefined I/O Functions ..... 25 (Limit, Home, etc.)  
 Program Trip Functions ..... 13 - 4 I/O Input Trips,  
 4 Timer Trips, 4 Position Trips,  
 1 Velocity Trip  
 User Programs ..... 2 Executed Simultaneously -  
 1 Foreground, 1 Background  
 Party Mode Names ..... 62  
 Communication Modes ..... 2 - ASCII, Binary  
 Mechanical Compensation .... Backlash  
 Encoder Functions ..... Stall Detection and  
 Position Maintenance

## ENVIRONMENTAL

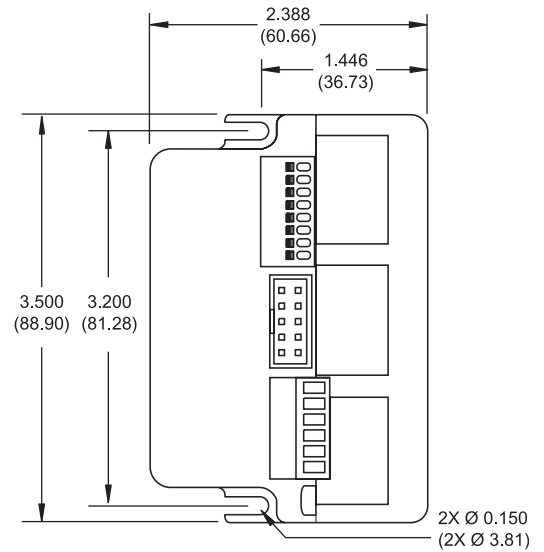
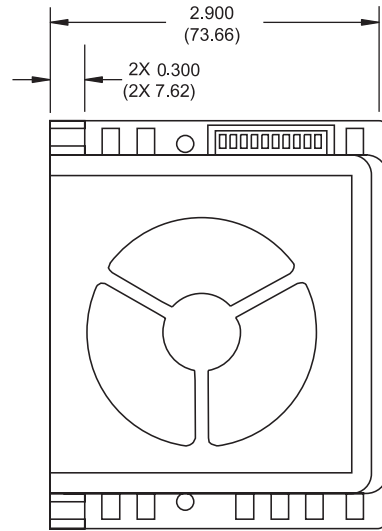
Ambient Operating Temp ..... 0 to 50° C\*  
 Storage Temperature ..... -20 to 70° C  
 Humidity ..... 0 to 90% non-condensing  
 \* Can be duty cycle dependent.

## MECHANICAL

Dimensions ..... (see Mechanical Specs)  
 # of Expansion Modules ..... up to 3  
 Cooling ..... Built-in fan  
 Mounting ..... 2-#6 (or M3.5) machine screws  
 Mounting Screw Torque ..... 5.0 to 7.0 lb-in

## MECHANICAL SPECIFICATIONS

Dimensions in Inches (mm)



## 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	Ground	

### Power and Motor Connections

### Communication –

#### Dual COMM Version

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

PIN	CONNECTOR OPTION	
	TERMINAL BLOCK	PIN HEADER
1	232RX	NO CONNECT
2	232TX	232TX
3	485RX-	232RX
4	485RX+	NO CONNECT
5	485TX-	C GROUND
6	C GROUND	485RX+
7	485TX+	485RX-
8		485TX-
9		485TX+
10		C GROUND

### Asynchronous Communications Connections

### CAN Version

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

PIN	CONNECTOR OPTION	
	TERMINAL BLOCK	PIN HEADER
1	V- (C Ground)	NO CONNECT
2	CAN_L	CAN_L
3	SHIELD	V- (C Ground)
4	CAN_H	SHIELD
5	NC (reserved for V+)	SHIELD
6	/CONFIG	NO CONNECT
7	NO CONNECT	CAN_H
8		NO CONNECT
9		NC (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 pin-header.

PIN	CONNECTOR OPTION	
	TERMINAL BLOCK	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 GROUND	I/O 25
9		I/O GROUND
10		I/O 26

### General Purpose I/O Connections

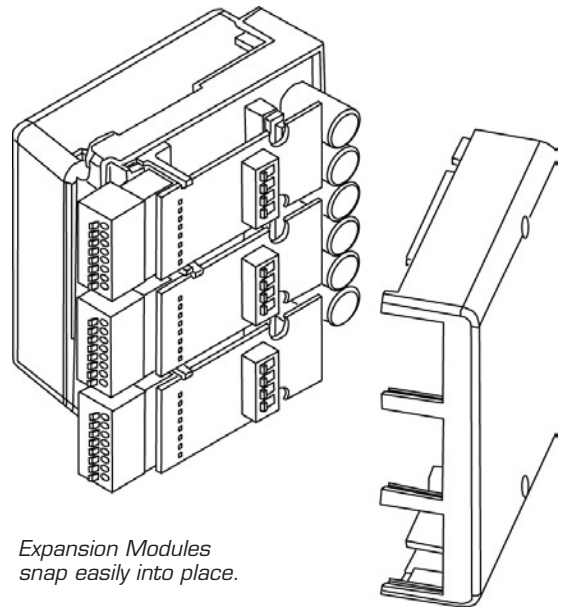
## SWITCHES

SWITCH	SIGNAL 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

## EXPANSION MODULES

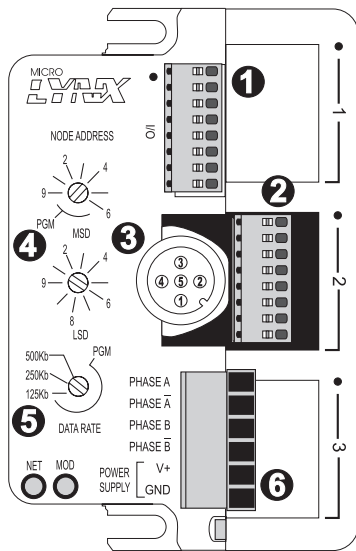
Up to three expansion modules can be added. Modules can be combined to fill the three expansion slots. Module types are limited to 2 Analog Input/Joystick Modules, 2 Analog Output Modules, 1 Twelve Channel I/O Module, up to 2 High-Speed Differential I/O Modules, and up to 3 General Purpose I/O Modules 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 snap easily into place, making even field change quick and easy.



Expansion Modules snap easily into place.

## DEVICENET MicroLYNX



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

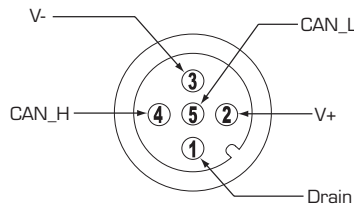
\* High Speed Differential I/O Board Optional for Encoder Functions. Board must be placed in Expansion Slot #2. Note that the High Speed Differential I/O Expansion is the ONLY Expansion Module available for the DeviceNet MicroLYNX.

The DeviceNet MicroLYNX 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.

### Communication

5 Pin DeviceNet Micro, Male



### DeviceNet I/O

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

PIN	CONNECTOR OPTION	
	TERMINAL BLOCK	PIN HEADER
1	VPULLUP	Home Input
2	Home Input	CW Limit Input
3	CW Limit Input	VPULLUP
4	CWW Limit Input	CWW Limit Input
5	Fault Input	NC
6	Brake Output	Fault Input
7	General Purpose	NC
8	I/O Ground	Brake Output
9		I/O Ground
10		General Purpose

DeviceNET I/O Connections

## ORDER INFORMATION

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

**Note:** Terminal Block Mating Connector Supplied.

Pin Header Mating Connector **Not Supplied**, order information at [www.imshome.com/quick.html](http://www.imshome.com/quick.html).

## 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 +24 VDC Isolated I/O, RS-232 and RS-485 Communication, 4 or 7 Amp Motor Drive	Pin Header**	Terminal Block	<b><i>MX-CS100-401</i></b>	<b><i>MX-CS100-701</i></b>
		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 +24 VDC Isolated I/O, CAN Communication, 4 or 7 Amp 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 +24 VDC Isolated I/O, DeviceNet Communication, 4 or 7 Amp 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)	[6] +5 to +24 VDC General Purpose Isolated Digital I/O	<b><i>MX-DI100-000</i></b>	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	<b><i>MX-DD100-000</i></b>	MX-DD200-000
Analog Input/Joystick Module (2)	[2] Channels of 0 to +5 VDC 12 Bit Resolution Analog Input or Single Axis Joystick	<b><i>MX-AJ100-000</i></b>	MX-AJ200-000
Analog Output Module (2)	[2] Channels (Up to 4 total) of 0 to +5 VDC 12 Bit Resolution Analog Output	<b><i>MX-DA100-000</i></b>	MX-DA200-000
RS-232 Communication Module (1)	RS-232 Port 2 Communication Module used <b><i>only</i></b> with CAN Based Control System – <b><i>cannot combine with RS-485 Module</i></b>	MX-CM102-000	<b><i>MX-CM202-000</i></b>
RS-485 Communication Module (1)	RS-485 Port 2 Communication Module used <b><i>only</i></b> with CAN Based Control System – <b><i>cannot combine with RS-232 Module</i></b>	<b><i>MX-CM104-000</i></b>	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	<b><i>MX-DI400-000</i></b> 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	<b><i>LX-HI100-000</i></b>
Communication Cable	10 Pin Pin-Receptacle to 9 Pin Sub D Provides Easy Connection for RS-232 Communication	<b><i>MX-CC100-000</i></b>
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	<b><i>MX-CC200-000</i></b>
Operating Manual	Operating Instruction Manual for MicroLYNX Systems - Paper Version*	<b><i>LX-OM200-000</i></b>
6 Pin Terminal Block	[6] Pin Screw-Type Terminal Block – Motor and Power	<b><i>MX-CN006</i></b>
7 Pin Terminal Block	[7] Pin Spring Clamp Terminal Block 0.1" Center – MicroLYNX Communications	<b><i>MX-CN007</i></b>
8 Pin Terminal Block	[8] Pin Spring Clamp Terminal Block 0.1" Center, MicroLYNX I/O and Expansion Modules	<b><i>MX-CN008</i></b>
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.