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.

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
**GENERAL SPECIFICATIONS**

### ELECTRICAL

**Power Supply Requirements**
- **Voltage**
  - ~4 version: +12 to +48 VDC
  - ~7 version: +24 to +75 VDC
- **Current**
  - ~4 version: 2 Amps typical
  - ~7 version: 3 Amps typical

1 Includes Motor Back EMF, Ripple and Hi Line.

2 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**
  - ~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 21.5 kHz (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 38.4kpbs 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

### 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, Sin, Cosine, Tangent, Arc Sin, Arc Cosine, Arc Tangent, AND, OR, XOR, NOT, Less Than, Greater Than, Equal, Square Root, Absolute, Integer Part, Fractional Part
- **Limit Switch**
  - Definable: Deceleration and Type
  - Software Selectable as Dedicated or General Purpose
- **Predefined I/O Line**
  - 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

### MOTION

**Counters**
- **Type**
  - Position, Encoder1, Encoder2: 32 Bits
- **Edge Rate (Max)**
  - 5 MHz

**Electronic Gearing**
- **External Clock In**
  - Range: -1 to 1
  - Resolution: 32 Bits
- **Secondary Clock Out**
  - Range: -2 to 2
  - Resolution: 16 Bits

**Acceleration/Deceleration**
- **Range**
  - ±5,000,000 steps/sec
  - 0.005 steps/sec
  - Update Period: 25.6 Microseconds

**Velocity**
- **Range**
  - ±1,530,000,000 steps/sec
  - 0.711 steps/sec

**SOFTWARE**
- 32 Bit Floating Point Math IEEE
- Format: Add, Subtract, Multiply, Divide, Sin, Cosine, Tangent, Arc Sin, Arc Cosine, Arc Tangent, AND, OR, XOR, NOT, Less Than, Greater Than, Equal, Square Root, Absolute, Integer Part, Fractional Part
- **Limit Switch**
  - Definable: Deceleration and Type
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  - 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

**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:

<table>
<thead>
<tr>
<th>PIN</th>
<th>SIGNAL NAME</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phase A</td>
<td>Motor Connections</td>
</tr>
<tr>
<td>2</td>
<td>Phase A</td>
<td>Motor Connections</td>
</tr>
<tr>
<td>3</td>
<td>Phase B</td>
<td>Motor Connections</td>
</tr>
<tr>
<td>4</td>
<td>Phase B</td>
<td>Motor Connections</td>
</tr>
<tr>
<td>5</td>
<td>+V</td>
<td>Input Power</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
<td></td>
</tr>
</tbody>
</table>

Communication –
Dual COMM Version
7 position pluggable terminal block connector
or optional 10 pin pin-header:

<table>
<thead>
<tr>
<th>PIN</th>
<th>CONNECTOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V– (C Ground)</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
</tr>
<tr>
<td>3</td>
<td>SHIELD</td>
</tr>
<tr>
<td>4</td>
<td>CAN_H</td>
</tr>
<tr>
<td>5</td>
<td>NC (reserved for V+)</td>
</tr>
<tr>
<td>6</td>
<td>/CONFIG</td>
</tr>
<tr>
<td>7</td>
<td>NO CONNECT</td>
</tr>
<tr>
<td>8</td>
<td>NO CONNECT</td>
</tr>
<tr>
<td>9</td>
<td>NC (reserved for V+)</td>
</tr>
<tr>
<td>10</td>
<td>/CONFIG</td>
</tr>
</tbody>
</table>

Asynchronous Communications Connections

SWITCHES

<table>
<thead>
<tr>
<th>SWITCH</th>
<th>SIGNAL NAME</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6</td>
<td>I/O 21-26</td>
<td>Pull-up on/off Switches for I/O Lines 21–26</td>
</tr>
<tr>
<td>7-9</td>
<td>Address 2-0</td>
<td>Multi-drop Communication Address (also settable by software)</td>
</tr>
<tr>
<td>10</td>
<td>Upgrade</td>
<td>Firmware Upgrade</td>
</tr>
</tbody>
</table>

CAN Version
7 position pluggable terminal block connector
or optional 10 pin pin-header:

<table>
<thead>
<tr>
<th>PIN</th>
<th>CONNECTOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V– (C Ground)</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
</tr>
<tr>
<td>3</td>
<td>SHIELD</td>
</tr>
<tr>
<td>4</td>
<td>CAN_H</td>
</tr>
<tr>
<td>5</td>
<td>NC (reserved for V+)</td>
</tr>
<tr>
<td>6</td>
<td>/CONFIG</td>
</tr>
<tr>
<td>7</td>
<td>NO CONNECT</td>
</tr>
<tr>
<td>8</td>
<td>NO CONNECT</td>
</tr>
<tr>
<td>9</td>
<td>NC (reserved for V+)</td>
</tr>
<tr>
<td>10</td>
<td>/CONFIG</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PIN</th>
<th>CONNECTOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VPULLUP</td>
</tr>
<tr>
<td>2</td>
<td>I/O 21</td>
</tr>
<tr>
<td>3</td>
<td>I/O 22</td>
</tr>
<tr>
<td>4</td>
<td>I/O 23</td>
</tr>
<tr>
<td>5</td>
<td>I/O 24</td>
</tr>
<tr>
<td>6</td>
<td>I/O 25</td>
</tr>
<tr>
<td>7</td>
<td>I/O 26</td>
</tr>
<tr>
<td>8</td>
<td>I/O GROUND</td>
</tr>
<tr>
<td>9</td>
<td>I/O GROUND</td>
</tr>
</tbody>
</table>

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 snap easily into place, making even field change quick and easy.

**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.

**DeviceNet I/O**

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

<table>
<thead>
<tr>
<th>PIN</th>
<th>CONNECTOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VPULLUP  Home Input</td>
</tr>
<tr>
<td>2</td>
<td>Home Input  CW Limit Input</td>
</tr>
<tr>
<td>3</td>
<td>CW Limit Input VPULLUP</td>
</tr>
<tr>
<td>4</td>
<td>CWW Limit Input CWW Limit Input</td>
</tr>
<tr>
<td>5</td>
<td>Fault Input NC</td>
</tr>
<tr>
<td>6</td>
<td>Brake Output Fault Input</td>
</tr>
<tr>
<td>7</td>
<td>General Purpose NC</td>
</tr>
<tr>
<td>8</td>
<td>I/O Ground Brake Output</td>
</tr>
<tr>
<td>9</td>
<td>I/O Ground</td>
</tr>
<tr>
<td>10</td>
<td>General Purpose</td>
</tr>
</tbody>
</table>

**Communication**

5 Pin DeviceNet Micro, Male

```
CAN_H 3 2 1
VPULLUP CAN_L
Fault Input
Brake Output
General Purpose
I/O Ground
I/O Ground
```

```
DeviceNET I/O Connections
```
<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL SYSTEMS</td>
<td>CONNECTOR TYPE</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>Control System with Asynchronous Communication</td>
<td>[6] +5 to +24 VDC Isolated I/O, RS-232 and RS-485 Communication, 4 or 7 Amp Motor Drive</td>
<td>Pin Header** Terminal Block MX-CS100-401 MX-CS100-701</td>
</tr>
<tr>
<td>Control System with CAN Communication</td>
<td>[6] +5 to +24 VDC Isolated I/O, CAN Communication, 4 or 7 Amp Motor Drive</td>
<td>Pin Header Terminal Block MX-CS200-401 MX-CS200-701</td>
</tr>
<tr>
<td>Control System with DeviceNet Communication</td>
<td>[6] +5 to +24 VDC Isolated I/O, DeviceNet Communication, 4 or 7 Amp Motor Drive</td>
<td>DeviceNet Micro, Male MX-CS300-401 MX-CS300-701</td>
</tr>
</tbody>
</table>

**Communication cable accessory recommended with first order.

<table>
<thead>
<tr>
<th>EXPANSION MODULES</th>
<th>TYPE (max # per system)</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated Digital I/O Module (3)</td>
<td>[6] +5 to +24 VDC General Purpose Isolated Digital I/O</td>
<td>MX-D100-000 MX-D102-000</td>
<td></td>
</tr>
<tr>
<td>High-Speed Differential I/O Module (2)</td>
<td>[3] High-Speed Differential (or Single Ended) Lines for General Purpose I/O, Encoder Feedback, Electronic Gearing, or Driving an Additional Axis Sequentially</td>
<td>MX-DD100-000 MX-DD200-000</td>
<td></td>
</tr>
<tr>
<td>Analog Input/Joystick Module (2)</td>
<td>[2] Channels of 0 to +5 VDC 12 Bit Resolution Analog Input or Single Axis Joystick</td>
<td>MX-AJ100-000 MX-AJ200-000</td>
<td></td>
</tr>
<tr>
<td>Analog Output Module (2)</td>
<td>[2] Channels (Up to 4 total) of 0 to +5 VDC 12 Bit Resolution Analog Output</td>
<td>MX-DA100-000 MX-DA200-000</td>
<td></td>
</tr>
<tr>
<td>RS-232 Communication Module (1)</td>
<td>RS-232 Port 2 Communication Module used only with CAN Based Control System – cannot combine with RS-485 Module</td>
<td>MX-CM102-000 MX-CM202-000</td>
<td></td>
</tr>
<tr>
<td>RS-485 Communication Module (1)</td>
<td>RS-485 Port 2 Communication Module used only with CAN Based Control System – cannot combine with RS-232 Module</td>
<td>MX-CM104-000 MX-CM204-000</td>
<td></td>
</tr>
<tr>
<td>12 Channel I/O Module (1)</td>
<td>General Purpose I/O Module with Twelve +5 to +24 VDC Isolated Digital I/O</td>
<td>Not Available PIN &amp; RECEPTACLE MX-D400-000</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>ACCESSORIES</th>
<th>TYPE</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Machine Interface (HMI)</td>
<td>A Programmable User Interface with 20 Character by 4 Line Display, 6 Function Keys, Numeric Keypad</td>
<td>LX-HI100-000</td>
<td></td>
</tr>
<tr>
<td>Communication Cable</td>
<td>10 Pin Pin-Receptacle to 9 Pin Sub D Provides Easy Connection for RS-232 Communication</td>
<td>MX-CC100-000</td>
<td></td>
</tr>
<tr>
<td>Communication Cable (For Party Line)</td>
<td>[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</td>
<td>MX-CC200-000</td>
<td></td>
</tr>
<tr>
<td>6 Pin Terminal Block</td>
<td>[6] Pin Screw-Type Terminal Block – Motor and Power</td>
<td>MX-CN006</td>
<td></td>
</tr>
<tr>
<td>7 Pin Terminal Block</td>
<td>[7] Pin Spring Clamp Terminal Block 0.1” Center – MicroLYNX Communications</td>
<td>MX-CN007</td>
<td></td>
</tr>
<tr>
<td>8 Pin Terminal Block</td>
<td>[8] Pin Spring Clamp Terminal Block 0.1” Center, MicroLYNX I/O and Expansion Modules</td>
<td>MX-CN008</td>
<td></td>
</tr>
<tr>
<td>CAN Dongle</td>
<td>Communication Cable for MicroLYNX CAN Version</td>
<td>MX-C500-000</td>
<td></td>
</tr>
<tr>
<td>DeviceNet Programmer</td>
<td>Cable for use in Upgrading MicroLYNX DeviceNet Firmware</td>
<td>MX-C600-000</td>
<td></td>
</tr>
</tbody>
</table>

*Manual on CD provided with system shipment.