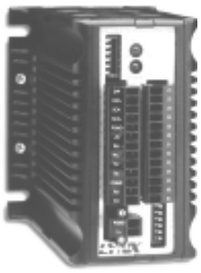
LYNX LX-CM200-000

HIGH-PERFORMANCE MACHINE/PROCESS COMBINATION CONTROLLER

QUICK REFERENCE



LYNX Combo Control Quick Reference Guide

The primary function of this guide is to acquaint the user with the specifications, basic wiring and configuration of the LYNX Combination Controller. The full product manual is available in Acrobat PDF format on the IMS Product CD. It also may be downloaded from the IMS web site at www.imshome.com.

Notes And Warnings

Please observe the following when handling, connecting and using your LYNX Combination Controller. Failure to observe these points may result in damage. All warranty and disclaimer information is located in the full product manual and should be referenced for more information.

The LYNX Combination Controller components are sensitive to Electrostatic Discharge (ESD). All handling should be done at an ESD protected workstation.

Hazardous Voltage Levels may be present if using an open frame power supply to power the LYNX Controller.

The Power Supply output voltage must not exceed the maximum input voltage of the LYNX Controller.

Do not connect or disconnect the AC power or the motor leads with the AC power on.

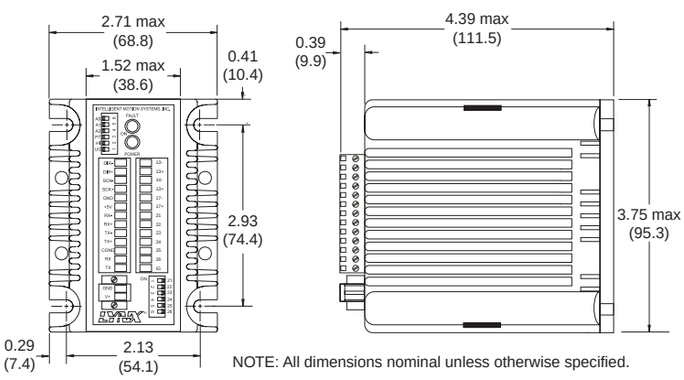
WARNING! The Power Input (+12 to +75 VDC on Connector P1, Pins 1 and 2) and the (+5V on Connector P2, Pins 5 and 6), are an either / or configuration. You **CANNOT** connect a Power Input to both Connectors at the same time.

Thermal Specifications

	Range
Ambient Temperature	0 to +50°C
Storage Temperature	-20 to +70°C
Humidity	0 to 90% non-condensing

LYNX Combo Control Mechanical Specifications

Dimensions in Inches (mm)



NOTE: All dimensions nominal unless otherwise specified.

For More Information:
See the complete LYNX Product Family Operating Manual

Electrical Specifications

Power

Input Voltage ..... +12 to +75 VDC, or +5 VDC ±5%
Output Voltage* .....+5 VDC current limited to 150mA
Input Current
+5 VDC Input 250mA
+12 VDC Input** 165mA
+48 VDC Input** 95.0mA
+75 VDC Input** 85.5mA

** Only available with +12 to +75 VDC Input.*
*** I/O and +5 VDC output unloaded (Control Module Only).*

General Purpose I/O

Number of I/O 6
Input Voltage ..... +5 to +24 VDC
Output Current Sink..... 350mA
Input Filter Range..... 215Hz to 21.5kHz (programmable)
Pull-ups ..... 7.5 kΩ individually switchable
Pull-up Volatge .....+5 VDC on-board
Protection .. Over Temperature, Short Circuit, Inductive Clamp
Isolated Ground ..... Common to 12 I/O

Communication (Asynchronous)

Interface Type .....Comm 1: RS-232
Comm 2: RS-485
Bits / Character 8
Parity .....None
Handshake .....None
Baud Rate ..... 4.8 to 38.8 kbps (selectable)
Error Checking ..... 16 bit check sum (binary mode)
ASCII Text or
Binary Communication Modes .....Isolated Ground
Common to COMM 1 and COMM 2

Pin Descriptions

P1 Connector
Input Power Connection

Pin #	Function	Description
1	Power Ground	Power ground for the unregulated power supply.
2	Unregulated Power Supply Input (V+)	+12 to +75 VDC unregulated power input if an external power supply is to be used.

P2 Connector
Motion Signals, Power And Communication

Pin #	Function	Description
1	Direction- (I/O 11)	Pins 1 and 2 are the differentially buffered signal for group 1, #1 or I/O 11. The default for this signal is the direction output for the primary motor drive of the controller. If desired, this signal may be programmed as a quadrature or up/down clock type or a user output. This I/O may not be programmed as an input.
2	Direction+ (I/O 11)	See description above.
3	Step Clock- (I/O 12)	Pins 3 and 4 are the differentially buffered signal for group 1, #2 or I/O 12. The default for this signal is the step clock output for the primary motor drive of the controller. If desired, this signal may be programmed as a quadrature or up/down clock type or a user output. This I/O may not be programmed as an input.
4	Step Clock+ (I/O 12)	See description above.
5	Ground (GND)	Common to the power ground on pin 1 of connector P1. This is provided as a signal return for the motion control signals and the power return for the 5VDC in/out on pin 6.
6	+5VDC	This can be 5 volts in or out. When the control module is powered via connector P1, this terminal provides up to 150 ma of regulated 5VDC for user circuits such as encoders. If desired, however, this terminal may be used as a power input connection. It should be noted that a fully configured LYNX system may require up to 800 ma current from this 5 VDC supply.
7	RS-485 RX- Input	Pins 7 and 8 are the differential receive inputs for the RS-485 communications interface. They should be left disconnected if they are not used.
8	RS-485 RX+ Input	See description above.
9	RS-485 TX- Output	Pins 9 and 10 are the differential transmit outputs for the RS-485 communications interface. They should be left disconnected if they are not used.
10	RS-485 TX+ Output	See description above.
11	Communications Ground (CGND)	Isolated communications ground signal for both RS-485 and RS-232.
12	RS-232 RX Input	Receive input from the host computer.
13	RS-232 TX Output	Transmit output to the host computer.

P3 Connector
Differential I/O And Group 20 I/O

Pin #	Function	Description
1	I/O 13-	Pins 1 and 2 are the differentially buffered signal for group 10, I/O 13.This channel is configured by means of the IOS Instruction.
2	I/O 13+	See description above.
3	I/O 14-	Pins 3 and 4 are the differentially buffered signal for group 10, I/O 14. This channel is configured by means of the IOS Instruction.
4	I/O 14+	See description above.
5	I/O 17-	Pins 5 and 6 are the differentially buffered signal for group 10, I/O 17. This channel is configured by means of the IOS Instruction.
6	I/O 17+	See description above.
7 - 12	I/O Group 20 Lines 21 - 26	Signals are individually programmable as inputs or outputs. Inputs are CMOS logic level compatible and can accept inputs to 24 volts. Noise rejection is available via digital filtering. Outputs are open drain. I/Os each have individually switchable 7.5 Kohm pull up resistors to 5VDC. Outputs can switch inductive, resistive or incandescent loads.
13	Isolated Ground For Group 20 I/O	Isolated common signal return for group 20 I/O. Isolated from the power and communication grounds.

Switch Assignments

Configuration Switches

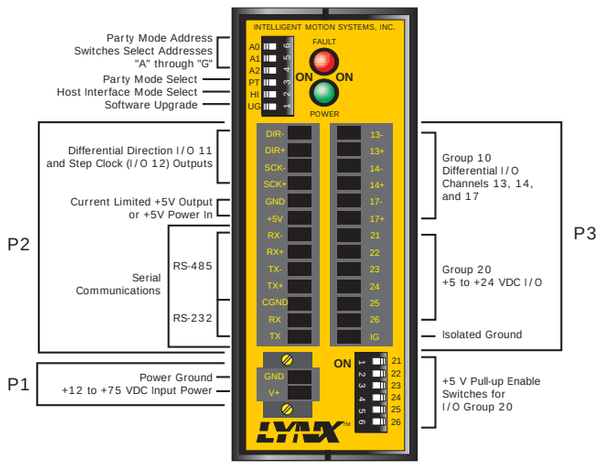
Switch #	Function	Description
1	Firmware Upgrade	When this switch is on, the controller firmware may be upgraded using the IMS upgrade program.
2	Host Interface	When this switch is on, the controller will act as the Host Interface Controller for communications in a multiple controller system. When it is off, the controller is a slave in the system and will not act as the host interface. This switch may be overridden in software by the HOST flag.
3	Party Mode	When this switch is on, party mode communications is selected. When it is off, single mode communications is selected.
4	Party Mode Address Bit 0 - A0	Sets party mode communications node address. Also see DN instruction in the Software Reference
5	Party Mode Address Bit 1 - A1	
6	Party Mode Address Bit 2 - A2	

A2	A1	A0	Address
OFF	OFF	OFF	None
OFF	OFF	ON	"A"
OFF	ON	OFF	"B"
OFF	ON	ON	"C"
ON	OFF	OFF	"D"
ON	OFF	ON	"E"
ON	ON	OFF	"F"
ON	ON	ON	"G"

Group 20 I/O Pull-Up Switches

Switch #	Function	Description
1 - 6	Individual Switches for I/O Group 20 Pull-Ups.	When this switch is on, the I/O is pulled up through an internal 7.5 Kohm resistor to 5VDC. Can be used to simulate the activation of an input while testing system software.

Connector And Switch Locations



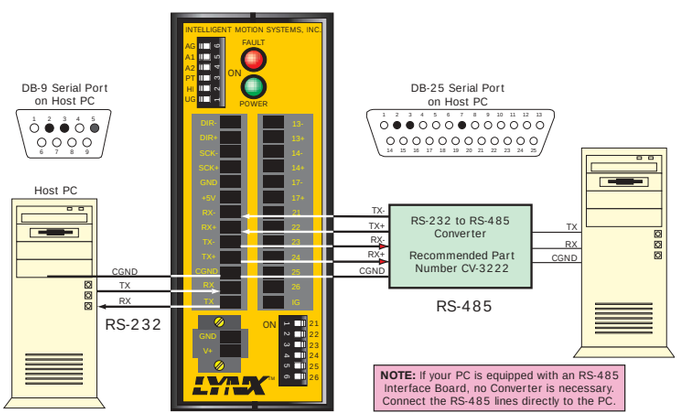
Communications

RS-232

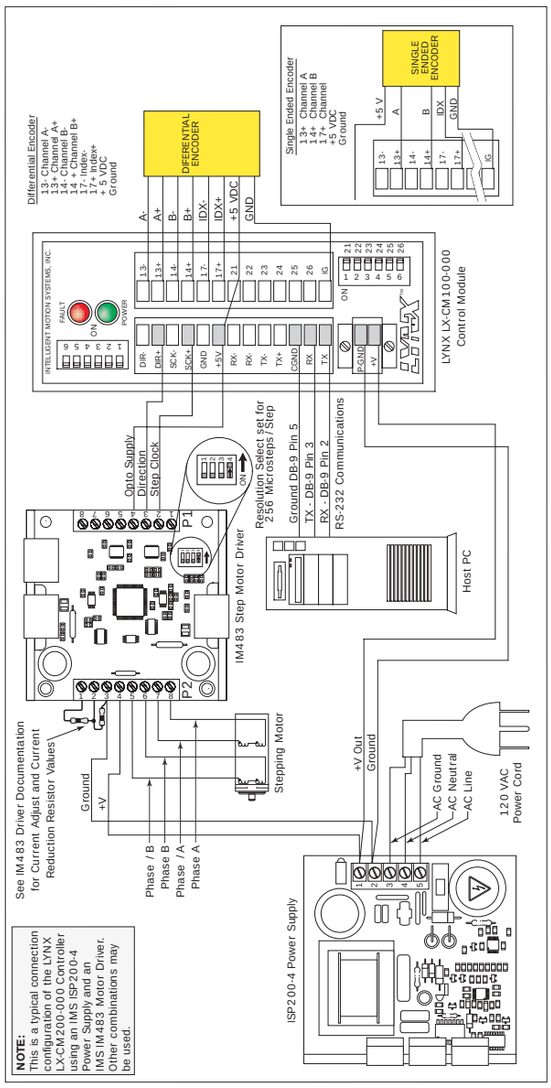
LYNX Combination Controller Module		25 Pin Serial Port on PC		9 Pin Serial Port on PC	
Receive Data (RX)	Pin 12	Transmit Data (TX)	Pin 2	Transmit Data (TX)	Pin 3
Transmit Data (TX)	Pin 13	Receive Data (RX)	Pin 3	Receive Data (RX)	Pin 2
Communications Ground	Pin 11	Communications Ground	Pin 7	Communications Ground	Pin 5

RS-485

RS-485 Board or RS232 to RS-485 Converter	LYNX Combination Controller Module	
Receive Data (RX-)	Transmit Data (TX-)	Pin 9
Receive Data (RX+)	Transmit Data (TX+)	Pin 10
Transmit Data (TX-)	Receive Data (RX-)	Pin 7
Transmit Data (TX+)	Receive Data (RX+)	Pin 8
Communications Ground	Communications Ground	Pin 11



Typical Connections



Start-up And Test

1) Connect the Power Supply.
2) Connect the Stepping Motor.
3) Connect the Communications.
4) Install the IMS Terminal.
   a] Insert the IMS CD into the CD Drive on the Host PC.
   b] The CD will autostart to the IMS CD Interface, Click the MicroLYNX icon to jump to the LYNX Product Family portion of the program. *Note: If CD fails to autostart, click Start>Run and enter [Drive Letter]:\IMS.exe*
   c] Click the IMS Terminal Install button appropriate for your PC's operating system.
   d] Follow the on-screen prompts to complete installation.
5) Establish Communications.
   a] Open IMS Terminal from Start>Programs>IMS Terminal.
   b] Select Edit>Preferences from the menu, on the dialog that opens select the tab labeled "Comm Settings".
   c] Select the COM port you are using on your PC. All other settings are left as is.
   d] Click OK.
6) Apply Power to the LYNX.
   a] Upon power up the LYNX sign-on message should appear in the Terminal Window (right-hand window of the IMS Terminal screen). *Note: If sign-on message does not appear, in the bottom lower right of the program screen is the Connected/Disconnected status indicator. If this indicator reads "Disconnected" double-click "Disconnected" to connect. Hit CTRL+C (See Step b). If not, verify power to the LYNX, consult the product manual if needed.*
   b] CTRL+C will also reset the LYNX and cause the sign-on message to appear.
7) Test the LYNX Setup.
   a] Click anywhere in the edit window to activate it.
   b] Enter the following sample program. It will move the motor a couple of times and report its position each time it stops. It is not necessary to type the comments shown in the shaded area.

```
PGM 1                       'Enter program mode at line #1
LBL TstPgm                  'Label the program TstPgm
POS = 0                     'Set present position to zero
MUNIT = 51200               'Set Motor Units to 51,200 Steps/User Unit
MSEL = 256                  'Motor resolution = 256 µSteps/Full Step
VM = 1                      'Set Velocity Max. to 1 rev/sec.
ACCL = 50                   'Set Acceleration to 50 revs/sec
DECL =50                    'Set Deceleration to 50 revs/sec
MOVR 3                      'Move Relative 3 Revs from current pos.
HOLD 2                      'Hold prog. exec. until motion complete
DELAY 250                   'Delay 1/4 second
PRINT "position = ", POS    'Print the present position
MOVA 0                      'Move absolute to the zero position
HOLD 2                      'Hold prog. exec. until motion complete
PRINT "position = ", POS    'Print the present position
END                         'End the program
PGM                         'Exit the program mode
```

   c] Click the terminal window to activate it.
   d] Click the "down arrow" on the menu bar to download the program to the LYNX.
   e] The "LYNX Download dialog box" should appear.
   f] In the "Source Type" section click the "Edit Window" radio button then click the "Download" button.
   g] A message box should appear indicating that the program is being downloaded. The program should appear line by line in the terminal window as it is being transmitted to the LYNX.
   h] When the transmission is complete, the "downloading" message box should disappear and the prompt (>) and the blinking cursor should reappear.
   i] Type TstPgm <enter> to run the program.
   j] The program should move the motor and print the following data to the terminal window each time the motor stops:

```
position = 0.000
position = 3.000
position = 0.000
```