16 AXIS MOTION CONTROLLER WITH ETHERNET

INSTRUCTION BOOK

INDUSTRIAL INDEXING SYSTEMS, INC.

Revision - A
Approved By: AW 6/26/08

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INTRODUCTION

This device is a single board motion controller based upon Industrial Indexing Emerald Series products and herein will be referred to as the EMC (Emerald Motion Controller).

The EMC incorporates a Local PCI buss to support dual processor architecture. The on board MIPS Processor's primary function is to control motion of up to 16 Axis over the SERCOS Interface^{TM}. A second processor of type ARM has the task of supporting TCP/IP over Ethernet.

The EMC embodies a blend of open architecture features with a true real-time operating system. The result is a state-of-the art performance and superior connectivity to other systems and network components.

The controller is programmed using our friendly **E**merald **M**otion **P**rogramming **L**anguage (EML) and powerful new **E**merald **D**evelopment **E**nvironment (EDE) software tools for the PC. The EML incorporates easy to use motion commands to allow fast development of a servo application. The language has commands which accommodate PLS's (Programmable Limit Switches) from I/O, master/slave with Camming, and much more motion and I/O control.

SECTION 1 - OVERVIEW

This manual is organized so that information is easy to find and easy to use. It begins by detailing how to identify the EMC Controller and its options. This section is followed by a general description of the product and its components. Next, a comprehensive hardware specification is provided followed by connector wiring diagrams. The section that follows documents the controller status displays. Sections on EMC installation guidelines and cables drawings round out the manual.

SECTION 2 - DESCRIPTION

The Emerald EMC product is a SERCOS Master servo motion controller, with the ability to command up to 16 SERCOS Slave Devices. The application program that operates the controller is created on a PC using the EDE software tools and sent to the controller via an RS-232 link or Ethernet.

> **NOTE**
> **All commands used by the EMC are part of the Emerald Motion Language (EML). Refer to the Emerald Development Environment (EDE) PC tools online help for detailed information on the commands and their proper usage.**

The external connections that exist on the EMC are shown in **Figure 2.1**, and consist of 2 RS-232 ports, Ethernet, SERCOS Transmitter and Receiver, Digital I/O, as well as a Hardware Watchdog and power connections.
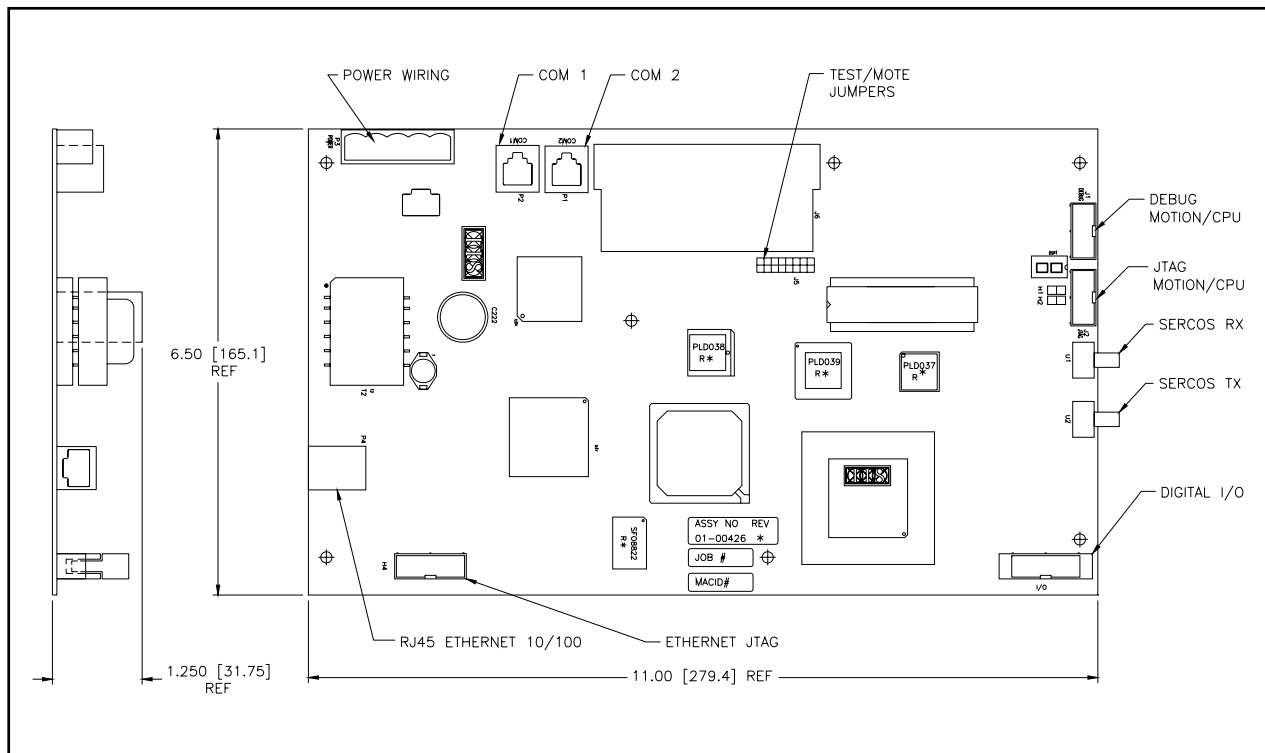
Figure 2.1 - EMC Layout

2.1 COMPONENTS

2.1.1 STATUS INDICATORS

> # NOTE
> **For indicator status information, refer to Section 5 - Status & Error Codes.**

1. Controller Status Display - This single seven-segment LED display with decimal point provides status information of various operating conditions.

2. SERCOS Phase LEDs - This group of 4 LEDs indicates the status of the SERCOS Interface^{TM}.

3. SERCOS - Error LED - This LED indicates poor Fiber Optic reception.

4. Ethernet Status LEDs - Functional indicators for Ethernet.

2.1.2 CONNECTORS

> # NOTE
> **For proper pinouts for each connector refer to Section 4 - Emerald Wiring.**

1. COM 1 - This 6-pin RJ-11 connector is an RS-232 serial communication port. It uses a custom protocol to communicate with the EDE software tools on a PC. This port also facilitates firmware download.

2. COM 2 - This 6-pin RJ-11 connector is an RS-232 serial communication port. It can be used to communicate with the IIS OPI-50 or similar RS-232 type device. The protocol is selectable through the EML programming language. This port does default to the custom protocol for communicating with the EDE software tools on a PC.

3. P4 - This 8-pin RJ-45 connector is for Ethernet.

4. J4 - This 10-pin header is a high-speed master encoder pulse input.

5. P3 - This connector is used to connect the required 24VDC external power supply. This connector also provides a normally open hardware watchdog output for external monitoring of the EMC operation. The watchdog output contact will be closed when the Motion Application is executing.

6. RX - This SMA style interface port is the SERCOS Fiber Optic Receiver. This is return connection for SERCOS Interface Ring.

7. TX - This SMA style interface port is the SERCOS Fiber Optic Transmitter. This connection is the start of the SERCOS Interface Ring.

2.2　HANDLING

This is a static sensitive product. While handling this unit you should were a static discharge device such as a wrist strap, foot straps, or other static discharge device approved within your facility. Remember to always handle the product only when required.

2.3　MOUNTING

In **Figure 2.2** there are seven locations for mounting the EMC. The mounting base should tie back to earth ground of the system as the mounting points on the EMC are electrically tied to the earth connection on the 24V input connector.

Hardware requirement:
Standoffs　-　Type M3 or #4 with a minimum of 10mm or 0.375" length.
Screws　　-　Type M3 or #4 with a maximum head diameter of 6mm or 0.25".
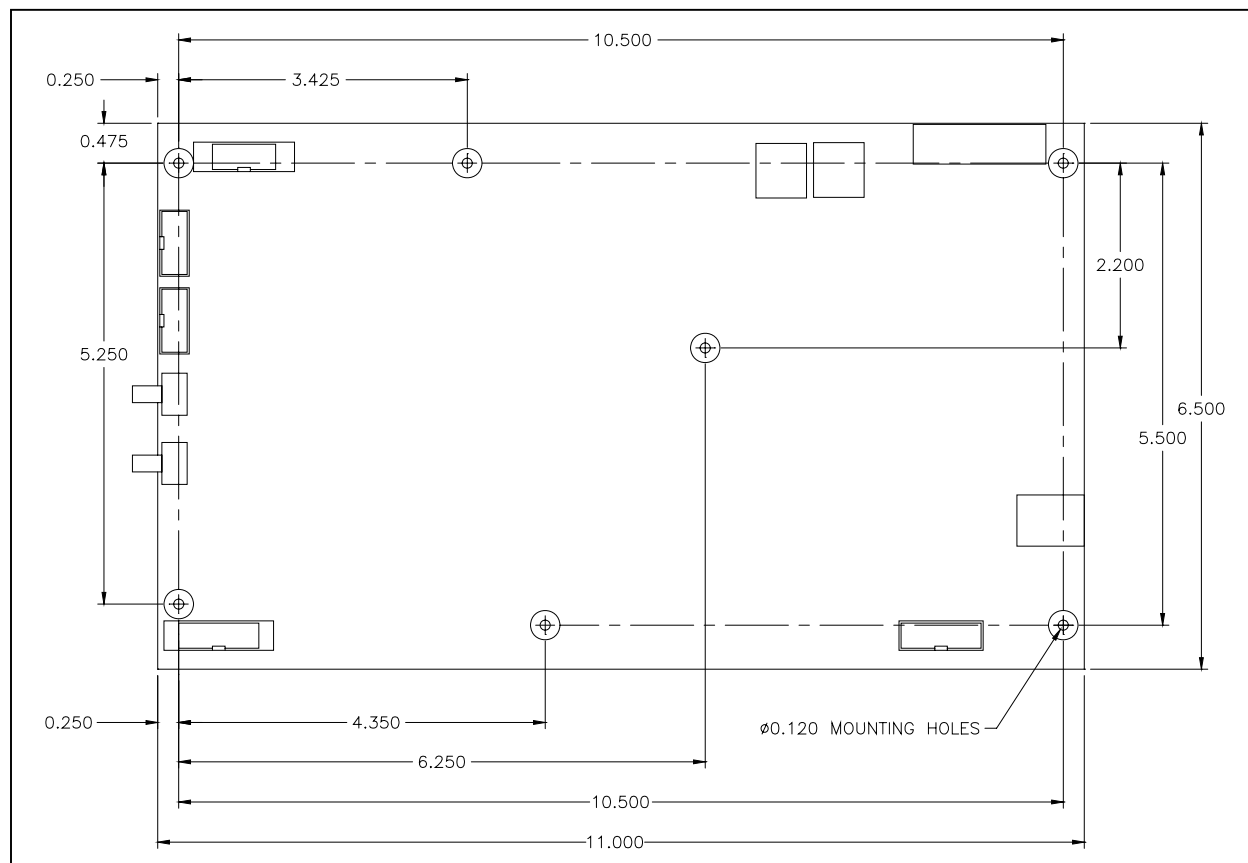Washers　-　Maximum diameter of 6mm or 0.25".

Figure 2.2 - Mounting

SECTION 3 - EMERALD SPECIFICATIONS

3.1 GENERAL

Weight	5.8 lbs / 2.2 Kgs	
Dimensions	Width	12.0 in (304.8 mm)
	Height	6.5 in (165.1 mm)
	Thickness	1.25 in (20.32 mm)

3.2 POWER REQUIREMENT

Supply Voltage	24 volts DC $\pm$ 10%, Class 2 power supply
Supply Current	1.0 amps max.

3.3 SERCOS INTERFACE

Interface Version	V01.02
Topology	Multi drop fiber optic ring
Transmission Rates	2, 4, 8 and 16 MB/second

3.4 ENVIRONMENT

Storage Temperature	-10 to 70°C/14-158°F
Operating Temperature	0 to 55°C/32-131°F
Humidity	35 to 90% Relative Humidity, non-condensing
Shock and Vibration	1 G or less
Operating Conditions	Free of dust, liquids, metallic particles and corrosive gases. Use in a pollution degree 2 environment.

3.5 COMMUNICATION PORTS

COM 1	Classification: RS-232 Data Transfer: EMC Packet protocol Protocol: 38400 baud, 1 stop bit, 8 data bits, No parity
COM 2	Classification: RS-232 Data Transfer: EMC Packet protocol (default), Programmable Protocol: Configurable
P4	Classification: Ethernet (CAT5) Data Rate: 10/100MHz Protocol: TCP/IP
Fiber Optic Transmitter/ Receiver	Classification: SMA style - SERCOS compatible Fiber Optics SERCOS: Data Transfer and Protocol are define by the SERCOS Specification (IEC-61491 or EN-61491).

3.6 5 VOLT DIGITAL I/O (J3)

Outputs	Four optical Isolated sinking outputs. Internal pull-ups to 5V I/O Supply. Sink current capability 100 mA.
Inputs	2 optically Isolated inputs. 5V ± 10% @ 15 mA max.

3.7 WATCHDOG PROTECTION

Contact Type	Relay normally open dry contact
Rating	Up to 28 VAC/VDC, 0.5 Amp Maximum

SECTION 4 - EMERALD WIRING

This section details the pinouts of the external connectors on the EMERALD controller.

4.1   COM 1 & COM 2

The ports are used for communication and use RJ-11 connectors to interface to respective devices. The port 1 & port 2 pinouts are shown in **Figure 4.1**.
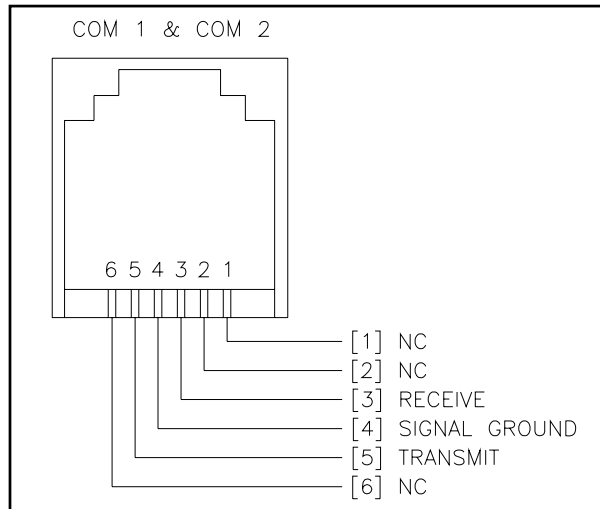

Figure 4.1 - COM 1 & COM 2

4.2   ETHERNET

The RJ-45 connector (shown in **Figure 4.2** with an RJ-45 plug) is used to connect workstations, hubs, and switches through unshielded twisted pair cable. The RJ-45 connector accepts four-pair Category 3 or Category 5 UTP cable. Only two pairs are used for 10BASE-T wiring.
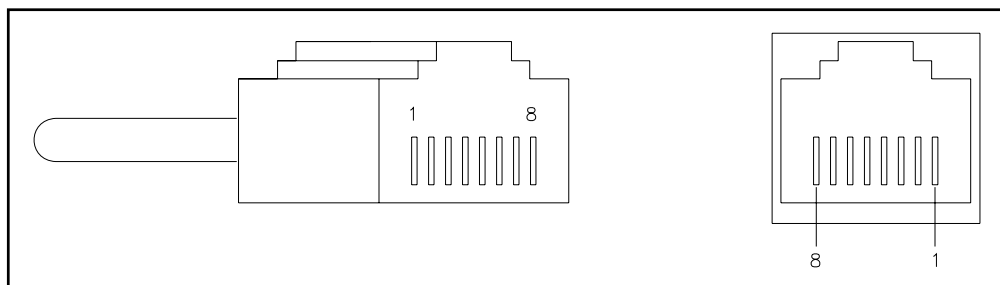

Figure 4.2 - Ethernet

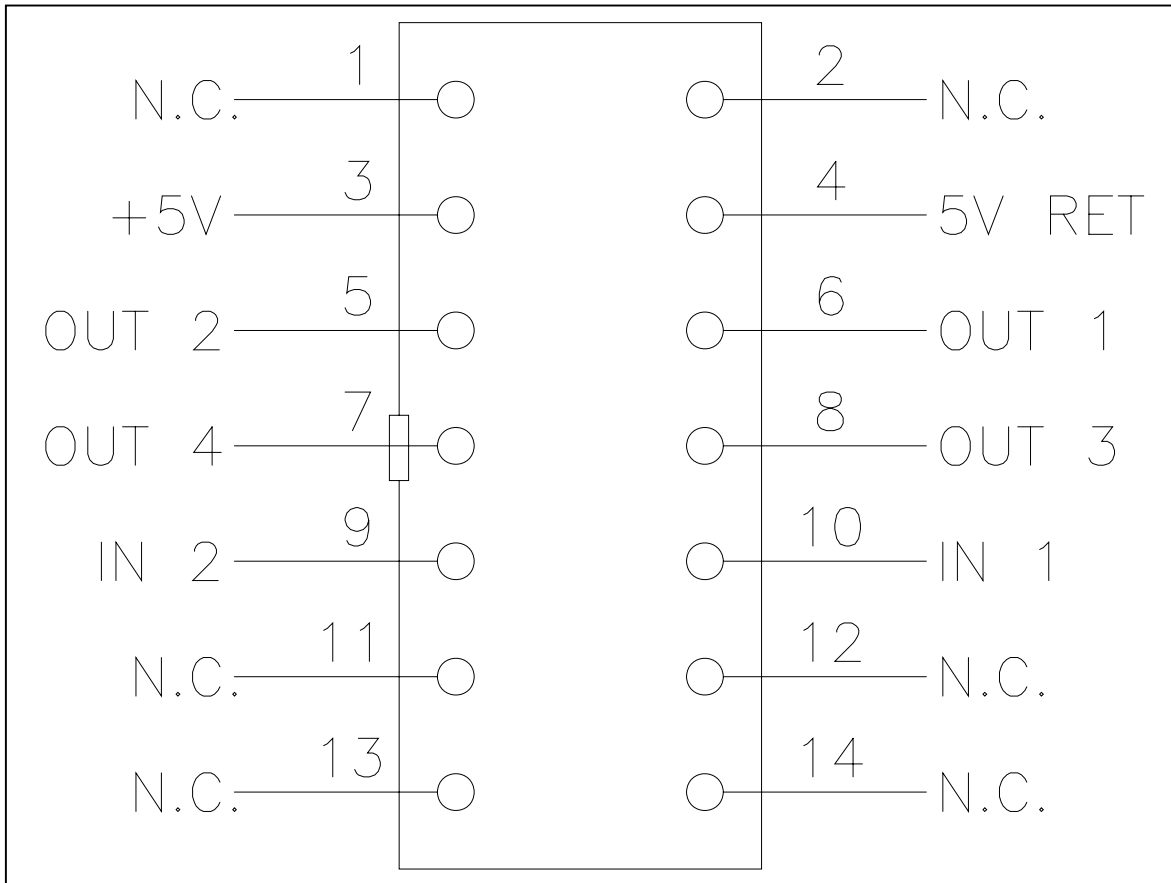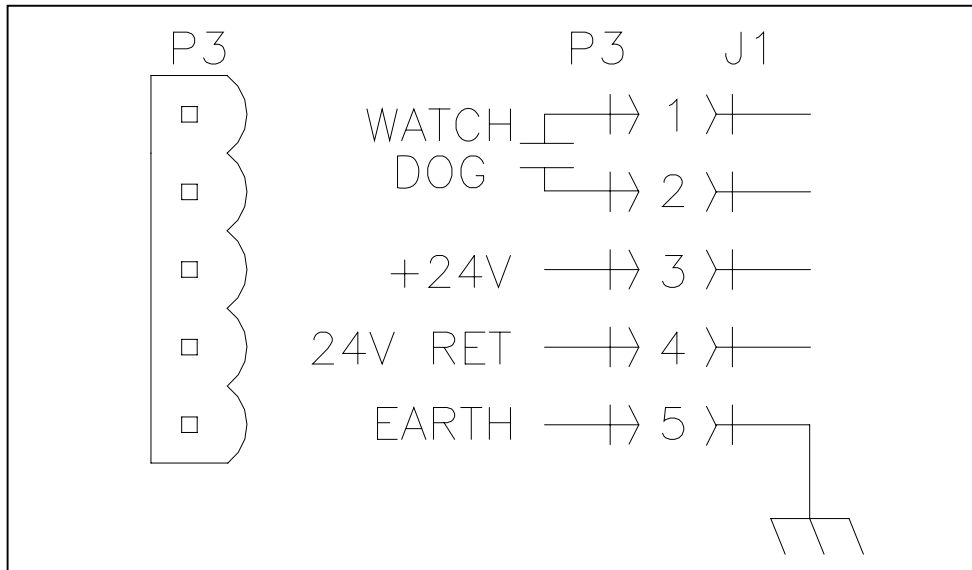| PIN ASSIGNMENT OF P4	
1	Output Transmit Data +
2	Output Transmit Data -
3	Input Receive Data +
6	Input Receive Data -
4,5,7,8	Not used

4.3   5V DIGITAL I/O

Figure 4.3 - Digital I/O Connector

4.4   POWER AND WATCHDOG CONNECTER

The 24-volt, Class 2 power supply is to be used to power this device.

The pinouts of the WD/24V connector are shown in **Figure 4.4**.

Figure 4.4 - Power and Watchdog Connection

4.5 SERCOS INTERFACE TX/RX

The SERCOS Interface^{TM} is a multi-drop fiber-optic ring with 1 Master Controller command multiple Slave devices. The EMC acts as the Master Controller in this arrangement.
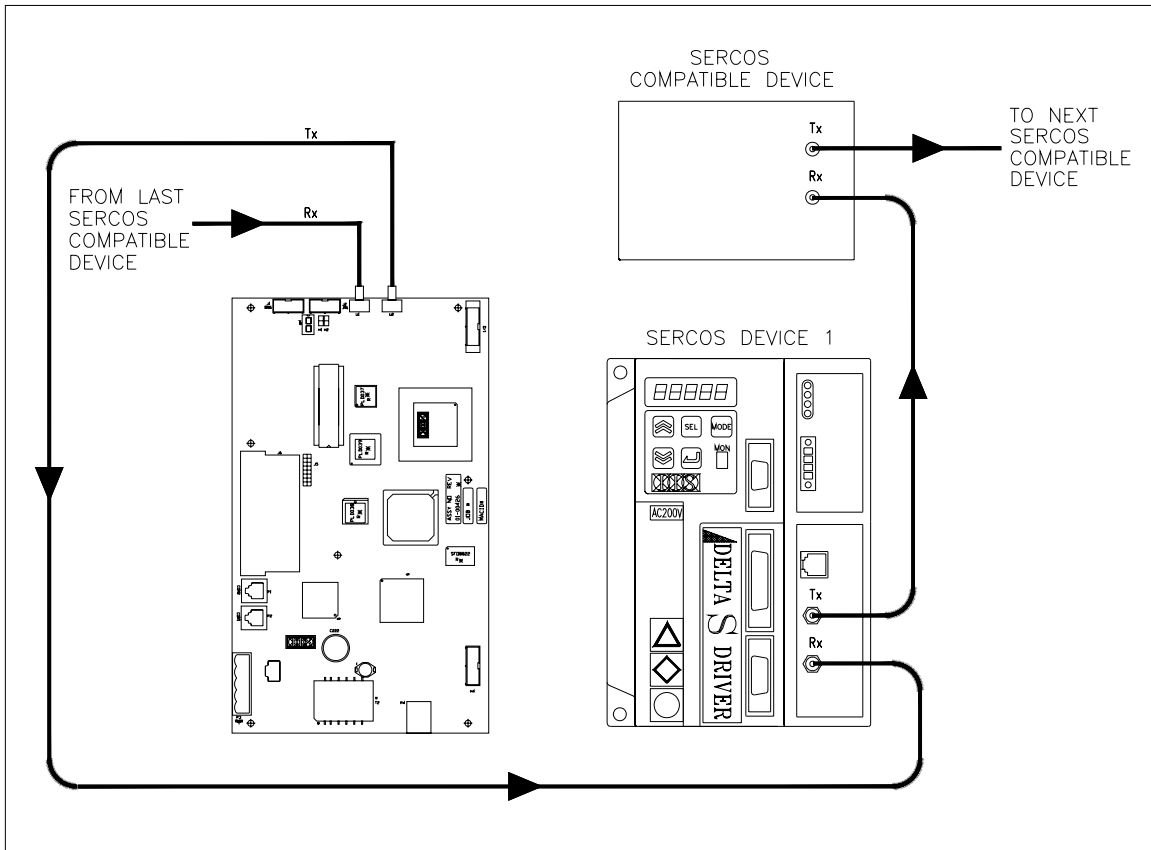

Figure 4.5 - Typical SERCOS Ring

SECTION 5 - STATUS & ERROR CODES

5.1   CONTROLLER STATUS

SYSTEM STATUS

l	PROGRAM LOADED
A	PROGRAM RUNNING "A" W/FLASHING DOT= AT LEAST ONE DRIVE DISABLED
A	PROGRAM RUNNING "A" W/SOLID DOT= ALL DRIVES ENABLED
C	SYSTEM RESET (NO APPLICATION)
F	LOSS OF PROGRAM/FLASH FAILURE
c	CLEARING FLASH
$-$	LOW POWER
b	SYSTEM BOOTING
n	NOV RAM FAILURE
E	CACHE ERROR
r	SYSTEM RESET (NO O.S.)

PROGRAM ERRORS

$P + 0$	DIVIDE BY ZERO
$P + 1$	ILLEGAL ARGUMENT
$P + 2$	SERCOS DEVICE WRONG STATE
$P + 3$	STACK OVERFLOW
$P + 4$	STACK UNDERFLOW
$P + 5$	DNET DEVICE WRONG STATE
$P + 6$	DNET QUE FULL
$P + 7$	RESERVED
$P + 8$	RESERVED
$P + 9$	ENCOUNTERED AN END_PROGRAM STATEMENT
$P + n$	APPLICATION MEMORY ERROR
$P + c$	EXCESSIVE CAM ELEMENTS PER INTERRUPT

SYSTEM ERRORS

$E + 0$	SERCOS TIMING CALC ERROR
$E + 1$	BAD OPCODE
$E + 2$	TRIED TO LOAD PROGAM WHILE NOT RESET
$E + 3$	TRIED TO SET A READ ONLY FLAG
$E + 4$	SET DNET SCANNER WITHOUT SOFTWARE
$E + 5$	DNET SCANNER INIT FAIL
$E + P$	DNET PARAMETER ERROR
$E + o$	OPCODE NOT COMPLETED
$E + c$	CONFIG SPACE FAIL
$E + E$	EXCEEDED AVAILABLE TIMERS

SERCOS ERRORS

| $o + 0$ | RING FAULT |
| $o + 1$ | SERVICE CHANNEL FAULT |

COMM PORT ERRORS

$c + 0$	PORT 1/PORT 2 PACKET TIMEOUT
$c + 1$	PORT 1 HANDSHAKE ERROR
$c + 2$	PORT 2 HANDSHAKE ERROR
$c + 3$	RESERVED
$c + 4$	BAD PACKET SENT TO PORT 1
$c + 5$	BAD PACKET SENT TO PORT 2
$c + 6$	PRINT Q FULL
$c + 7$	ETHERNET PACKET ERROR

CPU EXCEPTION ERRORS

$P + 0 + 1$	TLB MODIFICATIONS
$P + 0 + 2$	TLB EXCEPTION LOAD/FETCH
$P + 0 + 3$	TLB EXCEPTION STORE
$P + 0 + 4$	ADDRESS ERROR EXCEPTION LOAD/FETCH
$P + 0 + 5$	ADDRESS ERROR EXCEPTION STORE
$P + 0 + 6$	BUS ERROR EXCEPTION FETCH
$P + 0 + 7$	BUS ERROR LOAD OR STORE
$P + 0 + 8$	SYSCALL
$P + 0 + 9$	BREAK POINT EXCEPTION

$P + 1 + 0$	RESERVED INSTRUCTION
$P + 1 + 1$	COPRESSOR UNSTABLE
$P + 1 + 2$	ARITHMETIC OVERFLOW
$P + 1 + 3$	TRAP EXCEPTION
$P + 1 + 4$	RESERVED
$P + 1 + 5$	FLOATING POINT EXCEPTION

NOTE:
CPU EXCEPTIONS ARE FATAL
CALL IIS FOR ASSISTANCE.

Figure 5.1 - Controller Status

5.2   SERCOS STATUS LEDS

○	OFF	✳	FLASHING	●	ON

✳	
✳	SERCOS PHASE 0
✳	
✳	

○	
○	SERCOS PHASE 1
○	
✳	

○	
○	SERCOS PHASE 2
✳	
○	

○	
✳	SERCOS PHASE 3
○	
○	

PH4	●	
PH3	○	SERCOS PHASE 4
PH2	○	
PH1	○	
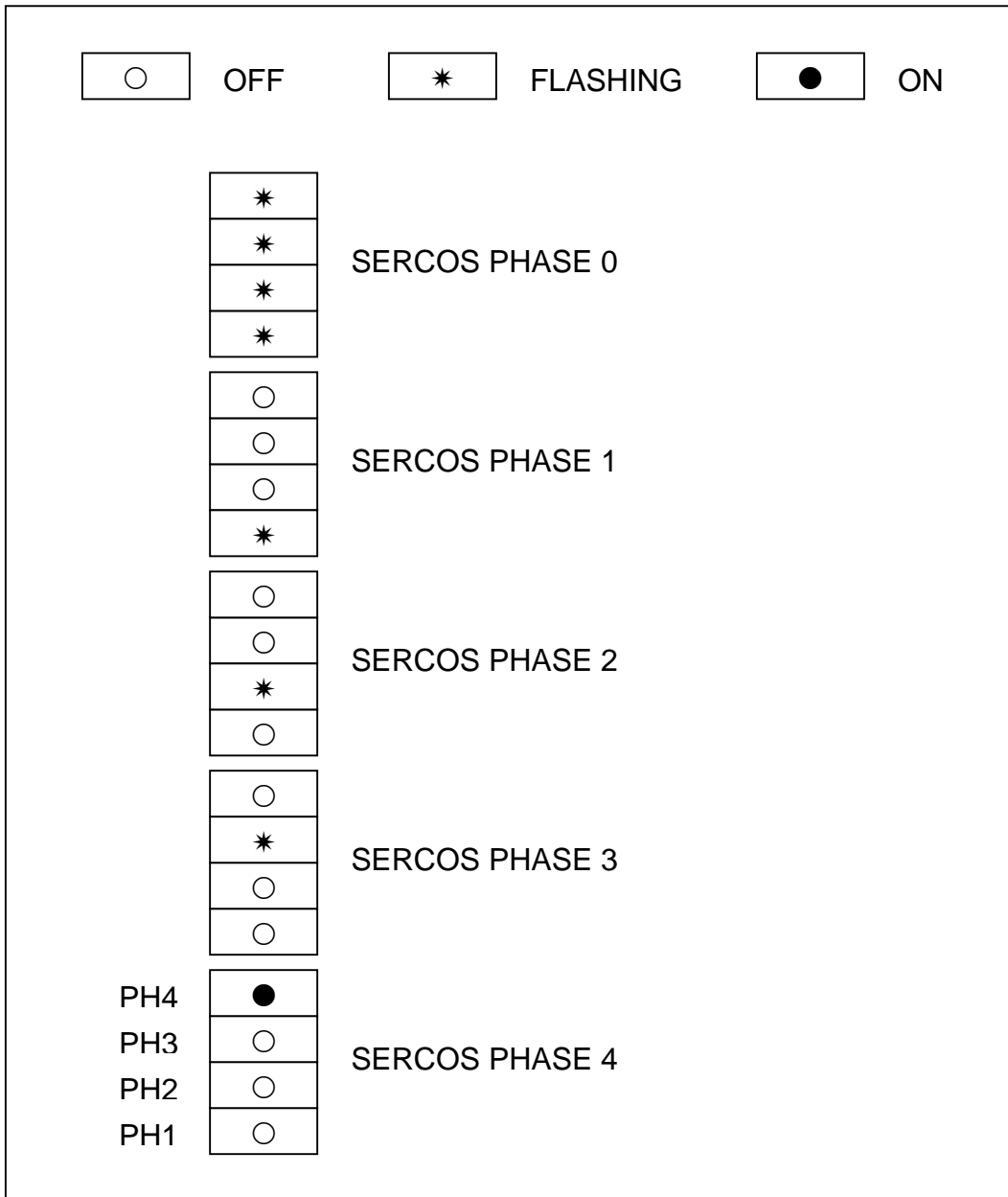
Figure 5.2 - SERCOS Status LEDs

5.3   ETHERNET STATUS DISPLAYS

STATE	LED IS	STATE	DESCRIPTION
Link	DL3	Off	No link (idle)
	DL3	On	Valid link exists
RCV	DL4	Off	Not receiving
	DL4	On	Receiving Data
Xmit	DL5	Off	Not transmitting
	DL5	On	Transmitting data
100M	DL6	Off	10 meg Baud link
	DL6	On	100 meg Baud link

Table 5.1 - Module Status LED

SECTION 6 - CABLES AND ACCESSORIES

DRAWING NUMBER	DESCRIPTION
C-752YYY	SERCOS Fiber Optic Cable, External
C-753YYY	SERCOS Fiber Optic Cable, Internal
C-822YYY	Adaptor Cable
C-987YYY	Modular Data Cable

DATE	SYM	REVISION RECORD	DR	CK	CK
07JAN05	B	PER ECN 04-441	EB		

NOTES:

1.) ASSEMBLE PER QP-08-0006.

2.) MARK PER QP-08-0001.

3.) TEST USING TEST PROCEDURE TST-0061.

4.) MINIMUMM BEND RADIUS - 1.58 (40 MM)
   LOSS INCREMENT=< 0.5dB
   (QUARTER BEND)

5.) REPEATED BENDING ENDURANCE: 5000 TIMES MIN.
   LOSS INCREMENT=< 1dB
   (IN CONFORMITY TO JIS C 6861)

② ③ GRAY ① SEE NOTE 2 ④ BLACK

YYY = [LENGTH IN FEET] $\frac{+1.00" (25.4)}{-0.00"}$

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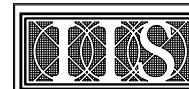| CHECKED BY CD	DATE 3/7/01	THIS DRAWING, AND THE DATA CONTAINED THEREIN, ARE PROPRIETARY INFORMATION OF; INDUSTRIAL INDEXING SYSTEMS, Inc. AND IS ISSUED IN STRICT CONFIDENCE, AND IT SHALL NOT BE REPRODUCED, COPIED, OR USED FOR ANY PURPOSE WHATSOEVER, WITHOUT THE PRIOR WRITTEN PERMISSION OF; INDUSTRIAL INDEXING SYSTEMS, Inc.
APPROVED BY J.CARTER	DATE 3/7/01	
APPROVED BY	DATE	TITLE CABLE, SERCOS FIBER OPTIC, EXTERNAL
MATERIAL _____		

	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES (mm)	DRAWN BY BOWMAN		DRAWING NUMBER
	TOLERANCES	AutoCAD FILE LOCATION Q:\DFTG\CABLES\C-7XX		C-752YYY
FINISH _____	X.X± ---			
	X.XX± ---	ANGULAR ± ---	B	DATE 10MAY00	SCALE ---	SHEET NO. 1 OF 1	REVISION B
	X.XXX± ---			

DATE	SYM	REVISION RECORD	DR	CK	CK
07JAN05	C	PER ECN 04-441	EB		

NOTES:

1.) ASSEMBLE PER QP-08-0006.

2.) MARK PER QP-08-0001.

3.) TEST USING TEST PROCEDURE TST-0061.

4.) MINIMUN BEND RADIUS - .98 (25 MM)
    LOSS INCREMENT=<0.5 dB
    (QUARTER BEND)

5.) REPEATED BENDING ENDURANCE: 5000 TIMES MIN.
    LOSS INCREMENT=< 1dB
    (IN CONFORMITY TO JIS C 6861)

② ③ ① SEE NOTE 2 ④
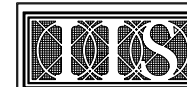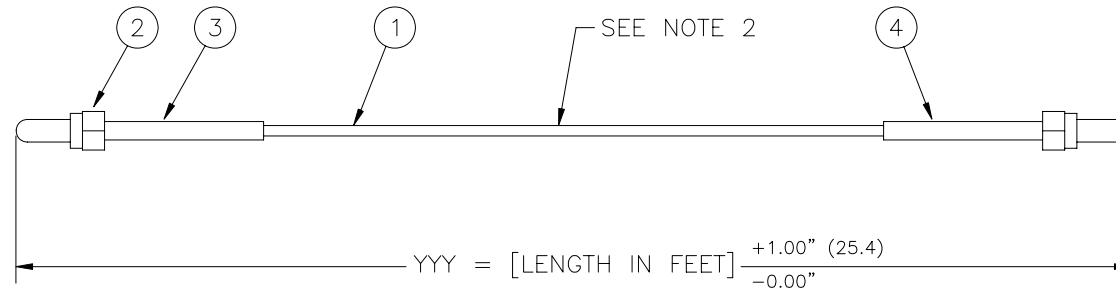
$YYY = [LENGTH IN FEET] {}^{+1.00" (25.4)}_{-0.00"}$

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APPROVED BY	DATE	
APPROVED BY J.CARTER	DATE 3/7/01	TITLE CABLE, SERCOS FIBER OPTIC, INTERNAL

MATERIAL SPEC SHT: GHCP 4001	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES (mm)	DRAWN BY BOWMAN	DRAWING NUMBER	
	TOLERANCES	AutoCAD FILE LOCATION Q:\DFTG\CABLES\C-7XX	C-753YYY	
FINISH ----------	X.X± ---	ANGULAR ± ---		
	X.XX± ---		B	DATE 10MAY00	SCALE ---
	X.XXX± ---			SHEET NO. 1 OF 1	REVISION C

DATE	SYM	REVISION RECORD	DR	CK	CK
13MAR01	C	PER ECN 01-070	EB	EB	CDR

NOTES:

1.) INSULATE UNUSED WIRES.

2.) MARK PER QP-08-0001.

PC-AT
DB-9F

RJ11
JACK

PC-AT DB-9F		RJ11 JACK
RX 2	YEL	5
TX 3	RED	3
COM 5	GRN	4
N.C.	WHT	1
N.C.	BLK	2
N.C.	BLU	6

SEE NOTE 1
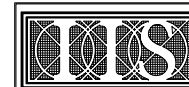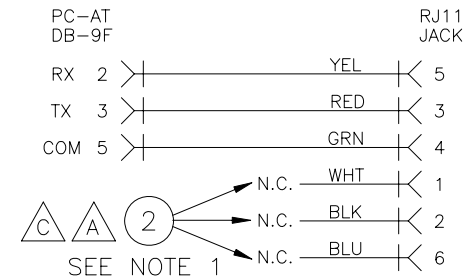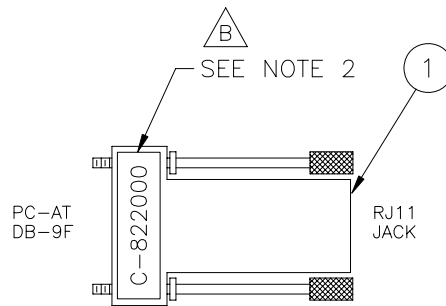
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CHECKED BY	DATE			
APPROVED BY ELS	DATE 15AUG96			
APPROVED BY ELS	DATE 10MAY96	TITLE CABLE ADAPTOR, 9P, FE, STANDARD		
MATERIAL --------		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES (mm)	DRAWN BY BOWMAN	DRAWING NUMBER
		TOLERANCES	AutoCAD FILE LOCATION Q:\DFTG\CABLES\C-8XX	C-822000
FINISH --------		X.X± -- X.XX± -- X.XXX± --	ANGULAR ± --	B	DATE 09MAY96	SCALE NTS	SHEET NO. 1 OF 1	REVISION C

DATE	SYM	REVISION RECORD	DR	CK	CK
29JAN99	A	PER ECN 98-270/99-027	CWB	EB	CDR

NOTES:

1) CRIMP CABLE (ITEM 2) TO ENDS
   (ITEM 1) WITH MODULAR CRIMP TOOL,
   PART No. 1005-6P6C.

2) MARK PER OP-08-0001.

SEE NOTE 2 ⚠A

⚠A PIN 1

⚠A PIN 1

C-987YYY
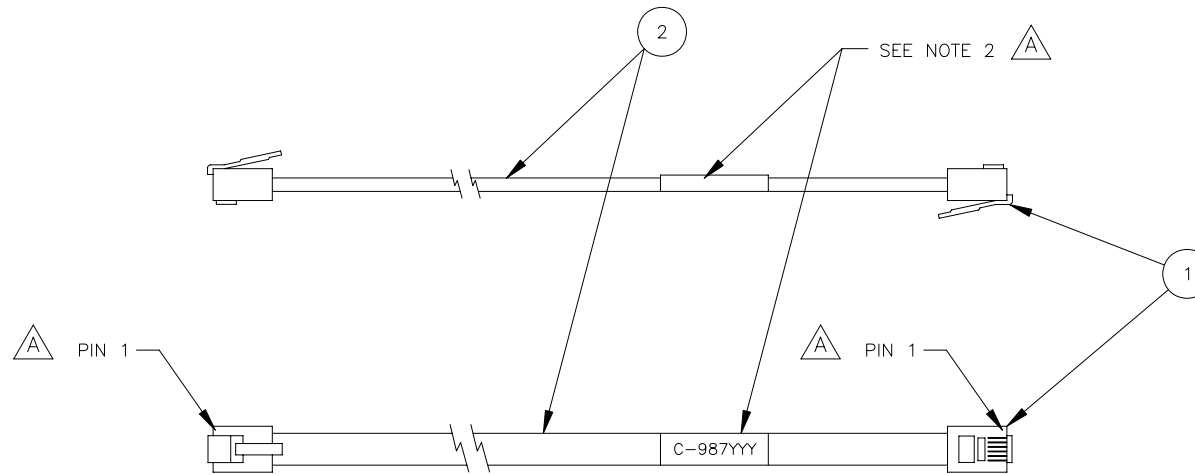
⚠A

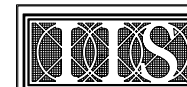| 1	←→	WHT	←→	1
2	←→	BLK	←→	2
3	←→	RED	←→	3
4	←→	GRN	←→	4
5	←→	YEL	←→	5
6	←→	BLU	←→	6

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APPROVED BY J.C.	DATE 8/31/92	
APPROVED BY	DATE	TITLE CABLE, DATA, MODULAR
MATERIAL _____		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES (mm)	DRAWN BY ERTURK	DRAWING NUMBER
TOLERANCES	AutoCAD FILE LOCATION Q:\DFTG\CABLES\C-9XX	C-987YYY
X.X± ---		
X.XX± --- ANGULAR ± ---	B DATE 13AUG92	SCALE ---	SHEET NO. 1 OF 1	REVISION A
X.XXX± ---		

FINISH _____

APPENDIX A - ETHERNET OPERATION BOARD

A.1   ETHERNET OVERVIEW

The Onboard Ethernet Interface functionally emulates the Emerald Series PMC-Ethernet Card. Therefore, when setting up the Ethernet on the card thru the EDE, the PMC Card options will be referenced.

The Ethernet Interface enables the application programmer to run the EDE software tools via Ethernet.

The Ethernet Interface enables access to application data using EMC communication protocol over Ethernet. EMC communication protocol is documented in IB-11B041 and may be simply encapsulated within TCP/IP.

The Ethernet Interface creates an embedded XML document, which allows data to be transferred between a web application and the Motion Controller. The application programmer can specify the exact nature of the resources available to the XML.

A.2   EDE SETUP FOR ETHERNET COMMUNICATION

The EDE is a PC Windows application developed by Industrial Indexing Systems to program the Emerald Motion Controller. The EDE can be configured to communicate remotely with the EMC via RS232, or ETHERNET.

For remote access to the EMC with Ethernet, it is necessary to configure the EDE for communication via Ethernet. It is required that the PC running the EDE has an Ethernet connection.

A.2.1   SELECT ETHERNET FOR CONNECTION TYPE

From the EDE toolbar go to **Setup** then select **Communication**, once the screen for Connection Type appears select **Ethernet** as shown below.

> # NOTE
> **To be able to select communication, the EDE must not be currently connected.**
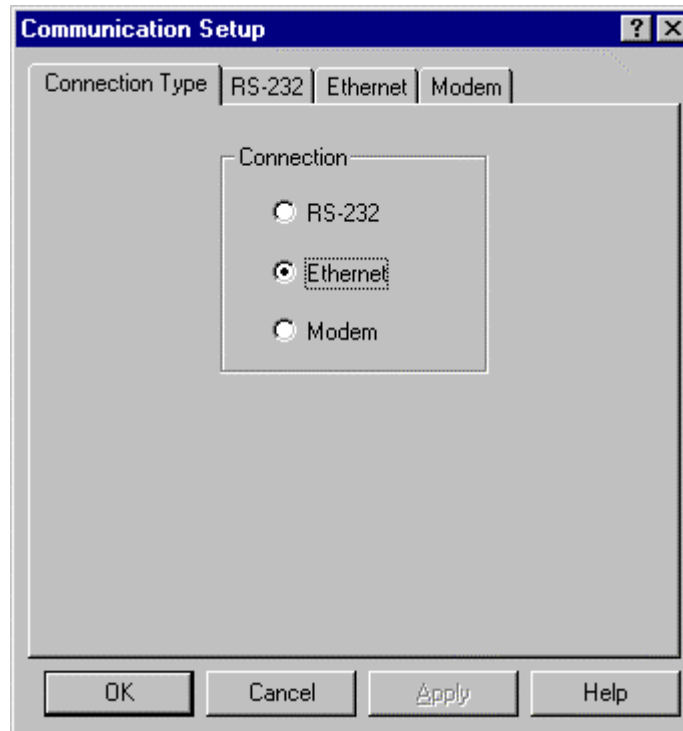
A.2.2 ETHERNET EDE CONFIGURATION SCREEN

After the Connection Type is set to Ethernet, select the Ethernet tab and the screen below will be displayed.
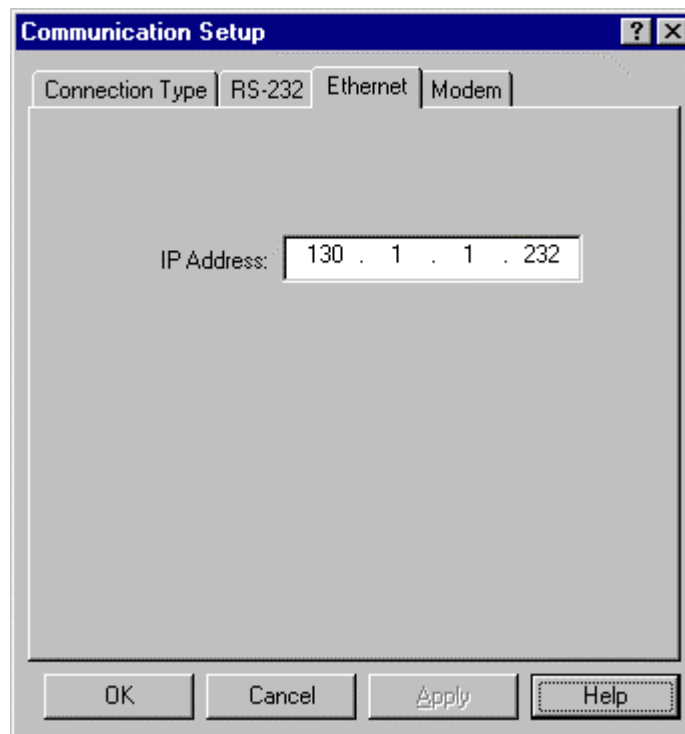

IP Address: This needs to be set to the IP Address of the Emerald controller that you desire to communicate to. After this value is entered, the EDE should be able to communicate over the Ethernet to the desired controller by selecting debug then connect from the EDE toolbar.

A.3 ETHERNET SETUP

While you are connected using RS-232, from the EDE toolbar go to **Emerald Configuration** then select **PMC Cards** and then the Ethernet card from the desired slot. If Ethernet card is not displayed in the list, then the Emerald controller is not recognizing that the card is installed. After selected the desired Ethernet card the following window will be displayed:
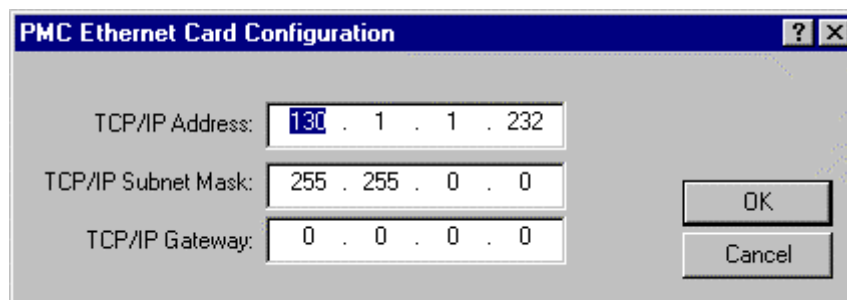
These settings can be modified to the desired settings while connected.

A.4   GLOBAL PARAMETERS

Using the EMC's programming language it is possible to configure 128 Global parameters. These parameters are accessible through XML and controlled through the global parameter configuration.

Name: The name field must match a name used in the configuration section or program area of the selected data type.

Data Type: The type of data that is specified in the name field.

Quantity: This field is only used for data types that can be arrays. The number entered should be the same size or less then the size of the array.

Default Value: This value is currently not being used.

Read Only: If this box is checked the user cannot write any information to this parameter over a network connection.

Min Value: This value will limit the value written to this parameter.

Max Value: This value will limit the value written to this parameter.

A.4   GLOBAL PARAMETERS (cont'd)

The values on this tab of the global parameters can be used to modify the actual value for display purposes.

The following formulas should be used for data types short, long, text, short ext memory, and long ext memory by the web page developer to input a value to the controller and to display a value returned from the controller:

Displayed Value =

$$\text{Displayed Value} = \frac{(\text{Emerald value} + \text{offset}) * \text{multiplier}}{\text{divisor} * (10 \wedge \text{precision})}$$

NOTE: The value displayed should contain the number of decimal places of the entered precision.

$$\text{Value written to Emerald} = \frac{\text{value entered} * \text{divisor} * (10 \wedge \text{precision})}{\text{multiplier}} - \text{offset}$$

NOTE: When the Emerald receives the value it is compared against the min and max limits. If a value is greater then the max limit the number is set equal to the max limit before it is written to the emerald memory. If a value is less then the min limit it is set equal to the min limit value before it is written to the emerald memory.

The unit's string is served up as part of the XML document.

The help string is not currently used.

A.5   DEFAULT WEB PAGE

The EMC will serve up a home page as shown below:
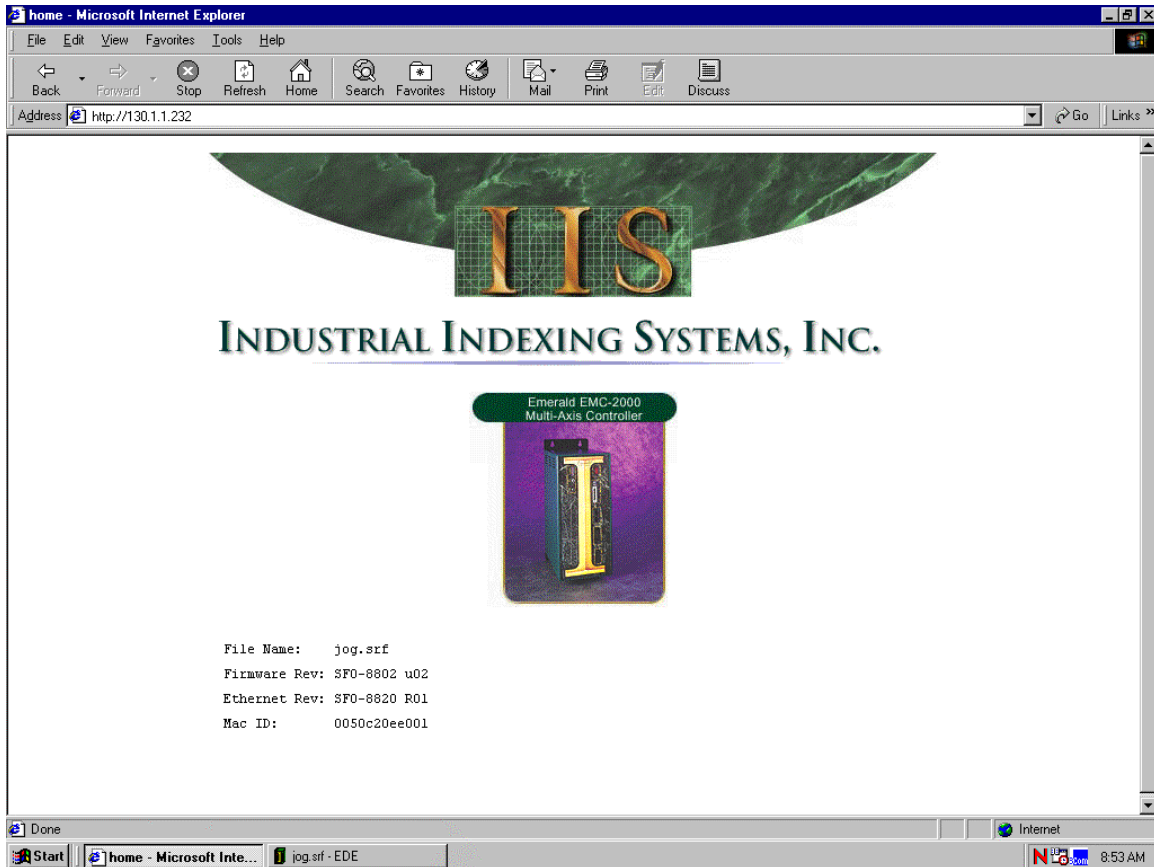
File Name: Program Currently loaded in the Emerald Controller.

Firmware Rev: Revision of firmware currently in the Emerald Controller.

Ethernet Rev: Revision of firmware in the Ethernet card.

Mac ID: Ethernet Mac ID.

A.6 SAMPLE XML DOCUMENT

For web page developers the EMC will serve up an embedded XML document. The document contains application specific data defined during application development using Global Parameter configuration. This document is av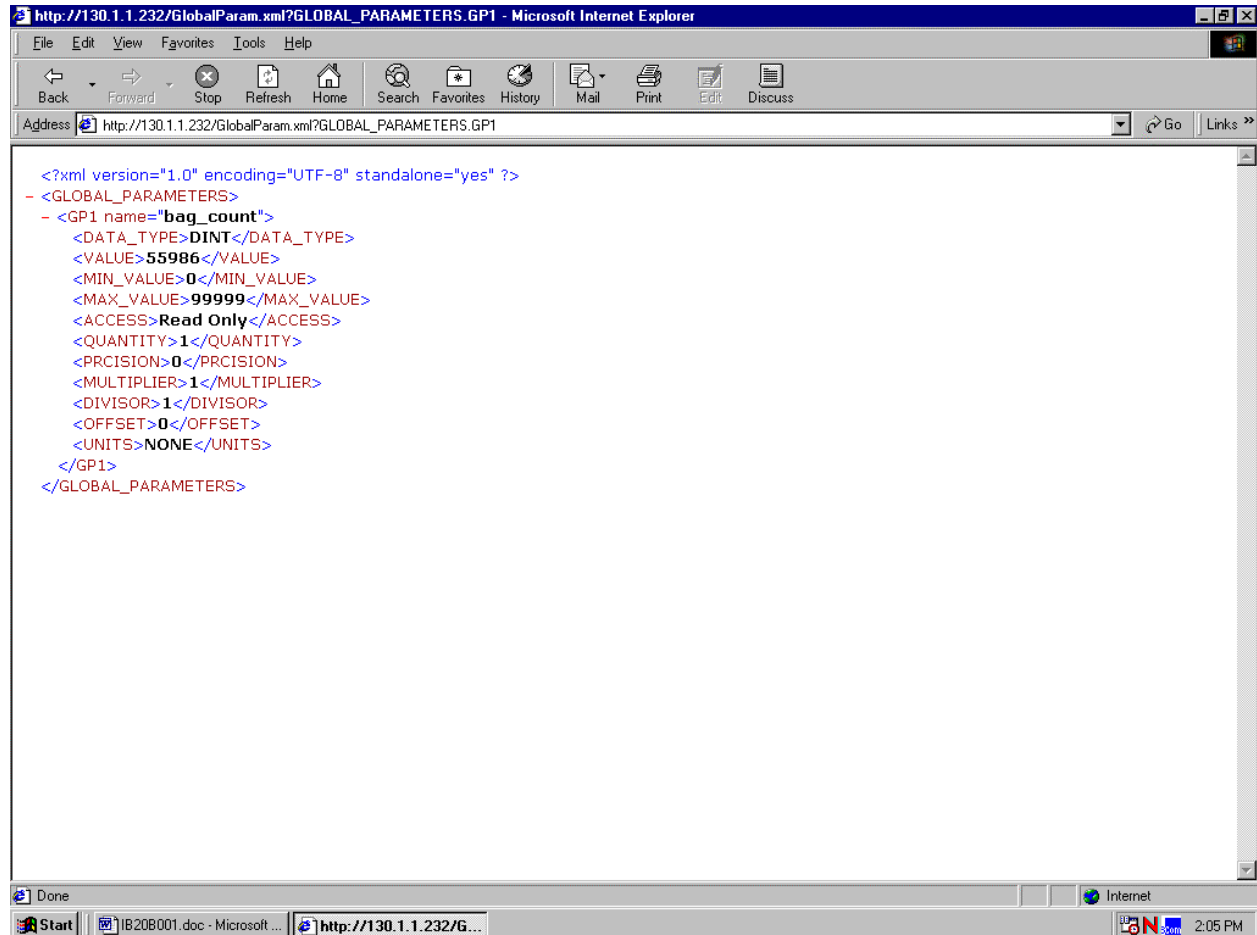ailable through the home page address/GlobalParam.xml. If a value has a quantity greater then 1, then a comma will separate the values returned. If a value is displayed as <VALUE>123,34,12</VALUE> the quantity would be 3. Floating point numbers will be returned in an exponential format with 10 decimal places.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <GLOBAL_PARAMETERS>
  - <GP1 name="bag_count">
      <DATA_TYPE>DINT</DATA_TYPE>
      <VALUE>50828</VALUE>
      <MIN_VALUE>0</MIN_VALUE>
      <MAX_VALUE>99999</MAX_VALUE>
      <ACCESS>Read Only</ACCESS>
      <QUANTITY>1</QUANTITY>
      <PRCISION>0</PRCISION>
      <MULTIPLIER>1</MULTIPLIER>
      <DIVISOR>1</DIVISOR>
      <OFFSET>0</OFFSET>
      <UNITS>NONE</UNITS>
    </GP1>
  - <GP2 name="CLEAR_COUNT">
      <DATA_TYPE>BOOL</DATA_TYPE>
      <VALUE>OFF</VALUE>
      <MIN_VALUE>OFF</MIN_VALUE>
      <MAX_VALUE>ON</MAX_VALUE>
      <ACCESS>Read Write</ACCESS>
      <QUANTITY>0</QUANTITY>
      <PRCISION>0</PRCISION>
      <MULTIPLIER>1</MULTIPLIER>
      <DIVISOR>1</DIVISOR>
      <OFFSET>0</OFFSET>
      <UNITS>NONE</UNITS>
    </GP2>
  </GLOBAL_PARAMETERS>
```

A.7   SAMPLE GLOBAL PARAMETER

To obtain an individual Global Parameter enter the home page address/GlobalParam.xml?GLOBAL_PARAMETER.GPXX where XX is the desired parameter number. If a value has a quantity greater then 1, then a comma will separate the values returned. If a value is displayed as <VALUE>123,34,12</VALUE> the quantity would be 3. Floating point numbers will be returned in an exponential format with 10 decimal places.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <GLOBAL_PARAMETERS>
  - <GP1 name="bag_count">
      <DATA_TYPE>DINT</DATA_TYPE>
      <VALUE>55986</VALUE>
      <MIN_VALUE>0</MIN_VALUE>
      <MAX_VALUE>99999</MAX_VALUE>
      <ACCESS>Read Only</ACCESS>
      <QUANTITY>1</QUANTITY>
      <PRCISION>0</PRCISION>
      <MULTIPLIER>1</MULTIPLIER>
      <DIVISOR>1</DIVISOR>
      <OFFSET>0</OFFSET>
      <UNITS>NONE</UNITS>
    </GP1>
  </GLOBAL_PARAMETERS>
```
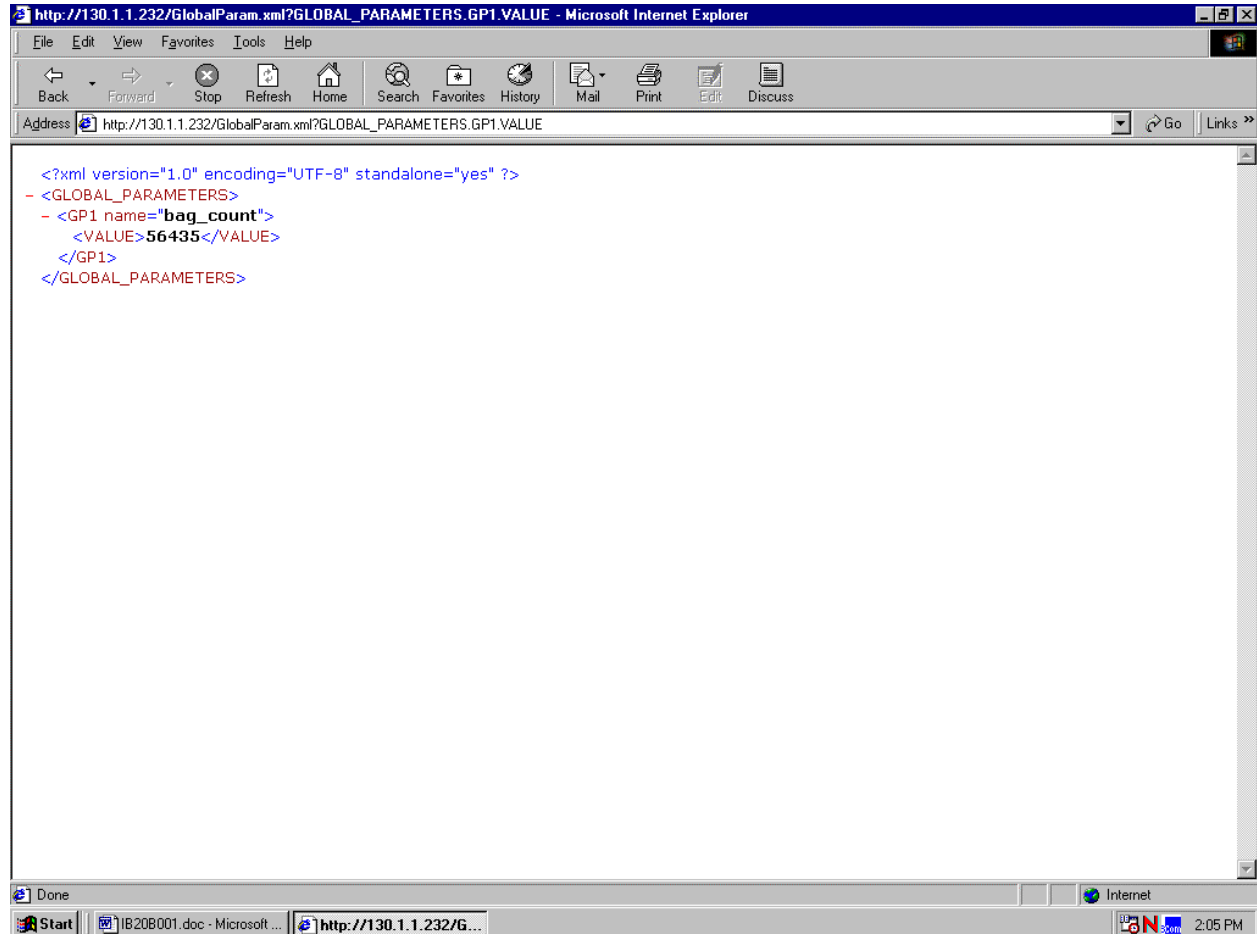
A.8   SAMPLE GLOBAL PARAMETER VALUE

To obtain an individual Global Parameter value enter the home page address/GlobalParam.xml?GLOBAL_PARAMETER.GPXX.VALUE where XX is the desired parameter number. If a value has a quantity greater then 1, then a comma will separate the values returned. If a value is displayed as <VALUE>123,34,12</VALUE> the quantity would be 3. Floating point numbers will be returned in an exponential format with 10 decimal places.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <GLOBAL_PARAMETERS>
  - <GP1 name="bag_count">
      <VALUE>56435</VALUE>
    </GP1>
  </GLOBAL_PARAMETERS>
```
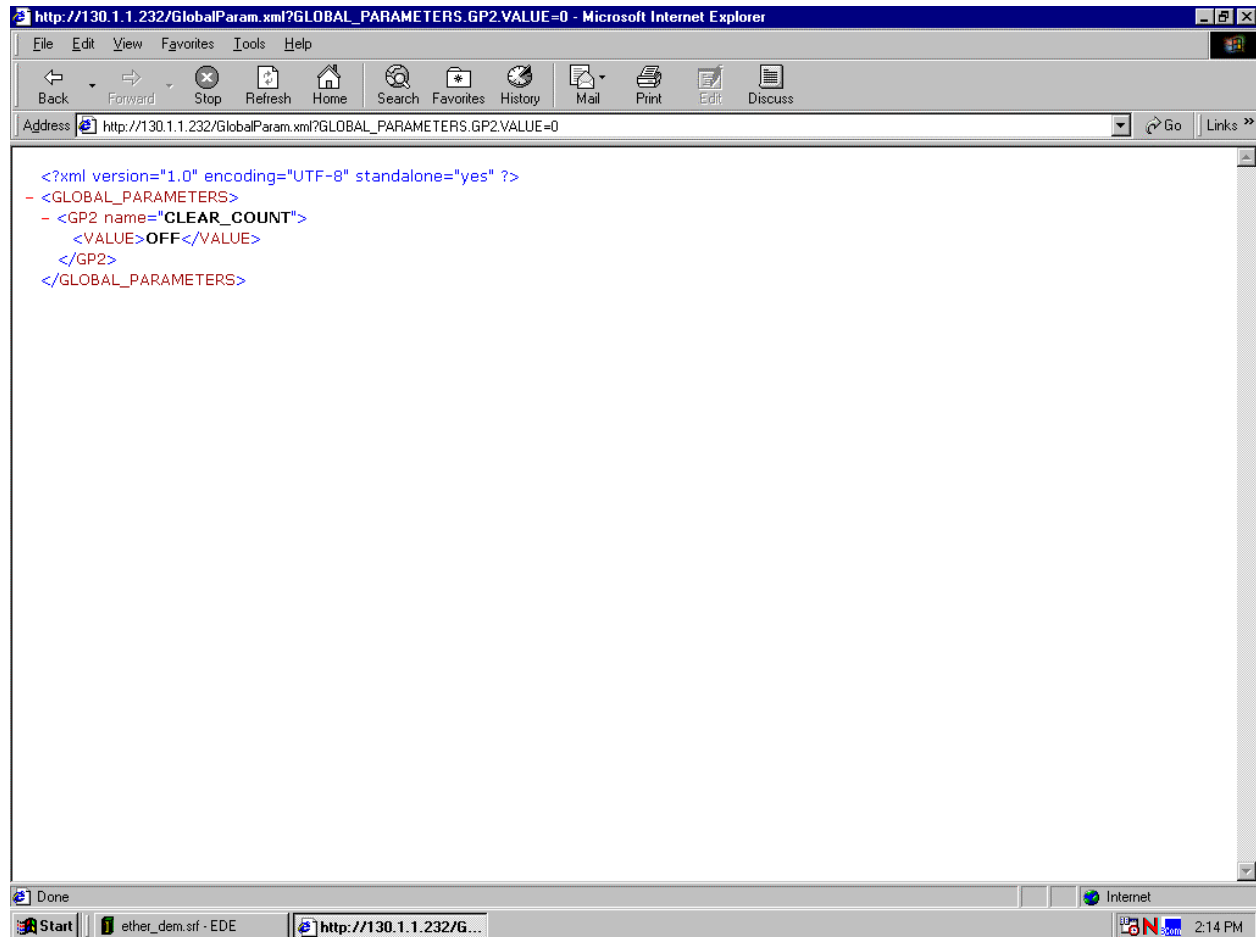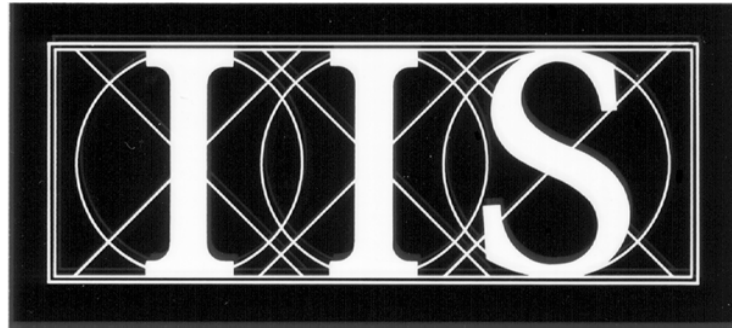
A.9   SAMPLE SETTING A GLOBAL PARAMETER VALUE

To set an individual Global Parameter value enter the home page address/GlobalParam.xml?GLOBAL_PARAMETER.GPXX.VALUE=YYY where XX is the desired parameter number and YYY is the desired input value. The page that will be displayed in the browser is the get a parameter value page. To enter several values to a Global Parameter with a quantity greater then 1, enter the home page address/GlobalParam.xml?GLOBAL_PARAMETER.GPXX.VALUE=YYY,ZZZ where XX is the desired parameter with a quantity greater then 1, YYY is the first value, and ZZZ is the second value. If the Global Parameter is a flag setting the value to 0 will turn it off while setting it to one will turn on the flag. In order to write a value to the controller memory, the Global Parameter must not be read only. Before a value is written, it is compared against the min and max parameter values. If the value is greater then the max value, then the max value will be written. If the value is less then the min value, then the min value will be written to memory.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <GLOBAL_PARAMETERS>
  - <GP2 name="CLEAR_COUNT">
      <VALUE>OFF</VALUE>
    </GP2>
  </GLOBAL_PARAMETERS>
```

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