CONTROL TECHNIQUES

Troubleshooting Guide

En/Epsilon Drive Systems and FM Module Products

November 15, 2001

EMERSON™
Industrial Automation

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Table of Contents

Troubleshooting Section

Introduction

This document is intended to help a user troubleshoot the Control Techniques E Series and Epsilon Series Servo Drives. The user will be pointed to possible solutions through Fault descriptions and Flowcharts.

Drive Status Display

The 14-segment LED display is capable of displaying most letters of the English alphabet in both lower and upper case. Some characters outside of the alphabet are also used.

Drive Display - Normal Operating Modes – No FM Module

Displayed Character	Status	Description
b	Brake Engaged	Brake Control Output = On
d	Drive is disabled	Power Stage is disabled
P	Drive is in Pulse Mode	Ready to receive Pulses
V	Drive is in Velocity Mode	Analog Velocity mode
T	Drive is in Torque Mode	Analog Torque mode
+	Summation Mode	Velocity Summation Mode
C	RMS Foldback active	Motor Torque limited to 80%continuous
c	Stall Foldback active For Motor speed	High Current demand for extended period of time prevents drive damage
. (period)	Ready to Run	If period missing Drive in STOP mode
***(asterisk)**	Reboot	Displayed during a Drive reboot after download

Table 1

Drive Display - Normal Operating Status Codes – EN with FM Module or Ei Drive

Table 2

Displayed Character	Status	Description
R	Ready	FM-3/4 ready to execute motion command.
d	Disabled	Power stage disabled
h	Homing	Drive is homing.
X	Indexing	Index is executing.
J	Jogging	Jog is executing.
P	Program	Program is executing.
\	Stopping	Drive is decelerating.

How to use this Manual

Fault Codes
The drive has several built in Fault detection circuits. If a fault is detected, the drive will display a specific Fault code character.

Fault Description
A brief description of the specific fault and possible causes are found just prior to the Troubleshooting Flow Chart.

Troubleshooting Flow Charts
Troubleshooting Flow charts are used to guide technicians through the fault isolation process. References to connector and cable pin outs are included within the Flowcharts. An Appendix contains the relevant cable pin outs.

Resetting Faults
Some of the detected faults may be reset using the front panel mounted pushbutton. Other faults require the power to be cycled. The cause of the fault should be understood and corrected before resetting.

Important Contact Information
Telephone: (952) 995-8000 or (800) 397-3786
FAX: (952)-995-8099
Website and Email: www.emersonct.com
Technical Support: (952) 995-8033 or (800) 397-3786
Technical Support Email: service@emersonct.com
Training Email: training@emersonct.com

Safety Instructions

Failure to follow safe installation guidelines can cause death or serious injury. The voltages used in the product can cause severe electrical shock and/or burns, and could be lethal. Extreme care is necessary at all times when working with or adjacent to it. The installation must comply with all relevant safety legislation in the country of use.

Qualified Person
For the purposes if this manual and products, a “qualified person” is one who is familiar with the installation, construction and operation of the equipment and the hazards involved. In addition this individual has the following qualifications:

- Is trained and authorized to energize, de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
- Is trained in the proper care and use of protective equipment in accordance with established safety practices.
- Is trained in rendering first aid.

“C” RMS Foldback

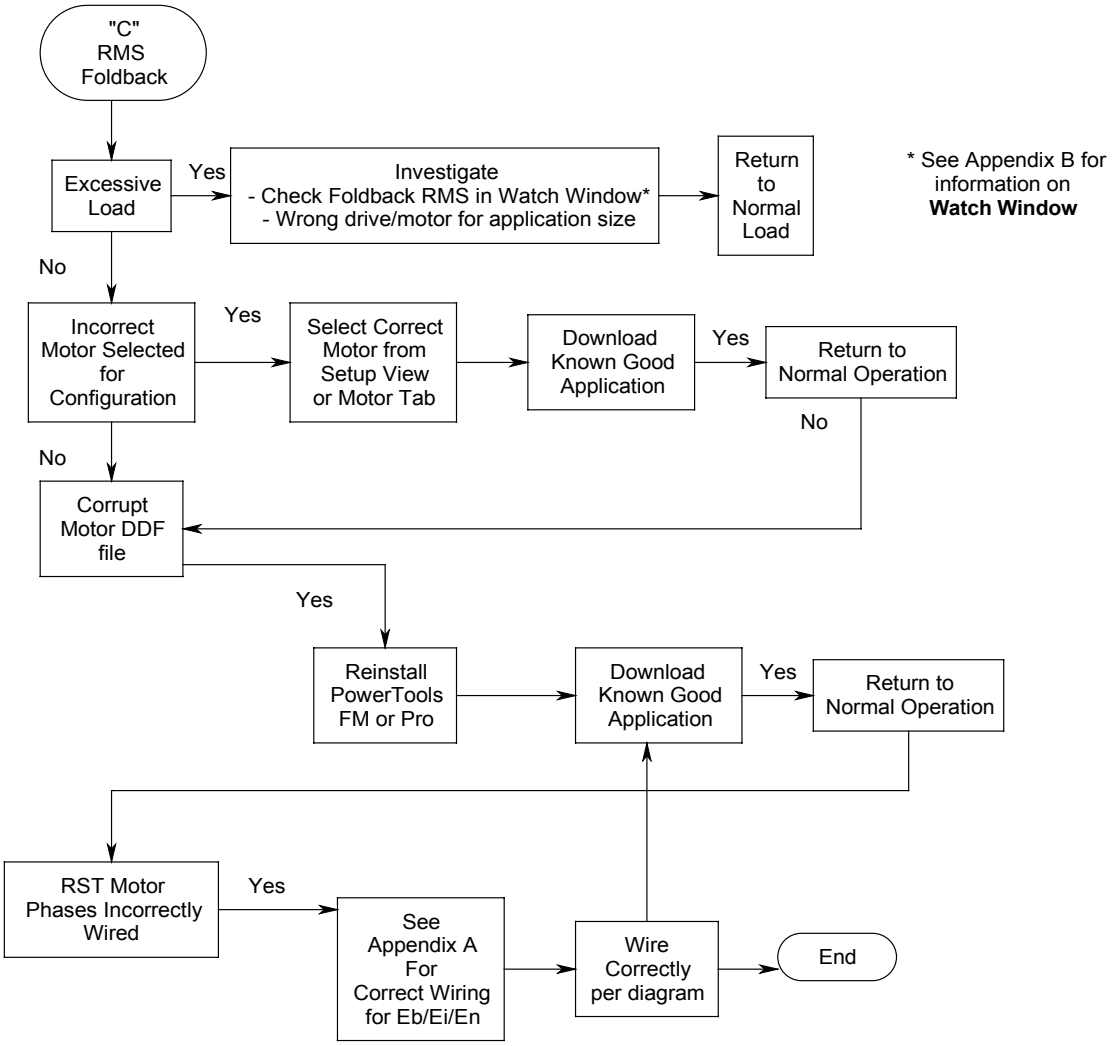
A “C” indicates RMS Foldback in the display window on the EN/EB/EI drives. It is an indication that the RMS current Foldback is active. This is not a fault, does not disable the drive. Output RMS current limit is returned to 80%.

Potential Causes for RMS Foldback

- Excessive Load or Friction
- Motor does not match DDF file or Drive type
- Corrupt Motor DDF file
- RST Motor phases incorrectly wired

Notes

“C” RMS Foldback Display



“c” Stall Foldback

A “c” indicates Stall Foldback in the display window on the EN/EB/EI drives. This is not a fault and the drive will continue to operate. This display indicates that the current command to the motor is 80% of the rated stall current. Motor torque and drive current are reduced until the motor commanded velocity exceeds 100 RPM or the torque demand is reduced.

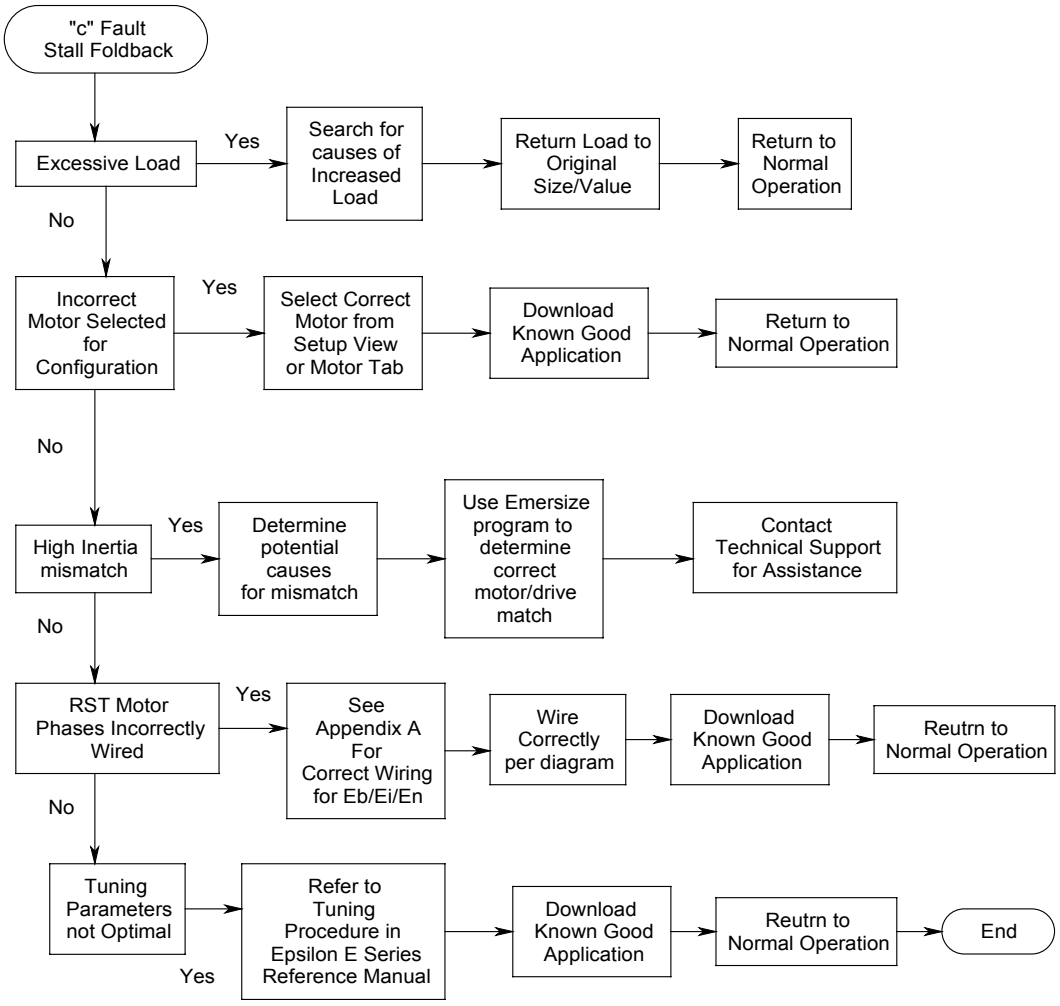
This is done to protect the IGBT’s from excessive power loss due to a combination of slow motor speed and high torque. IGBT’s can overheat under these conditions unless current is reduced.

Potential Causes for Stall Foldback

- Sustained high current demand at low speed
- Wrong motor selected for configuration
- High inertia mismatch
- RST Motor phases incorrectly wired
- Tuning parameters not optimized
- Torque is commanded when machine path is blocked or stopped.

Notes

“c” Stall Foldback display



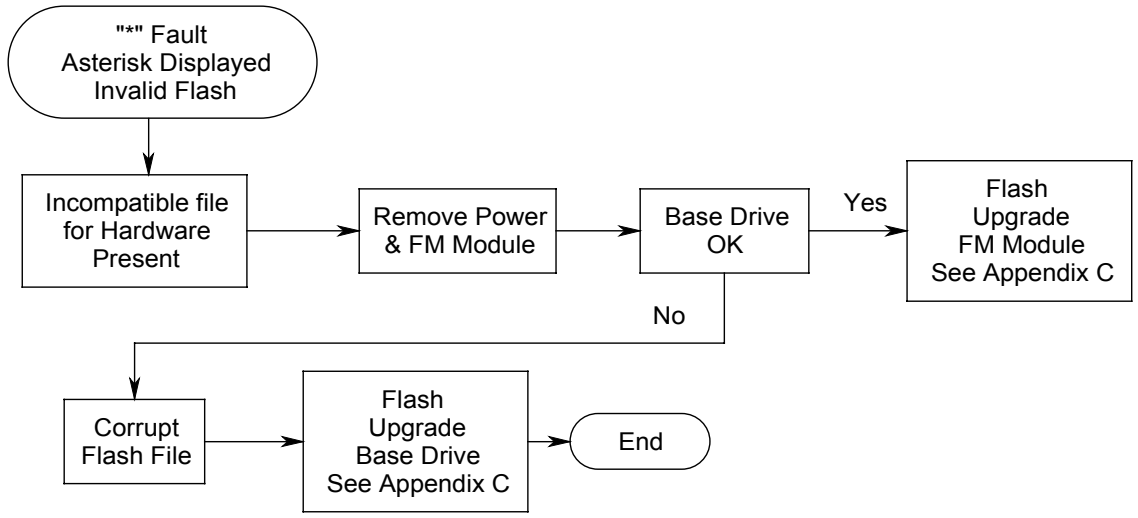
“*” Invalid Flash

This fault is indicated by the display showing an Asterisk. It generally indicates that the “.fsh” (Flash) file is invalid. The most common cause of this fault is an interruption of the update of a Firmware Flash process.

Potential causes for the Flash Invalid fault

- Incompatible file for the hardware present
- Corrupt flash file

“ “*” Flash Invalid”



Very Important Notice!

Before attempting Flash upgrade contact Tech Support.

Notes

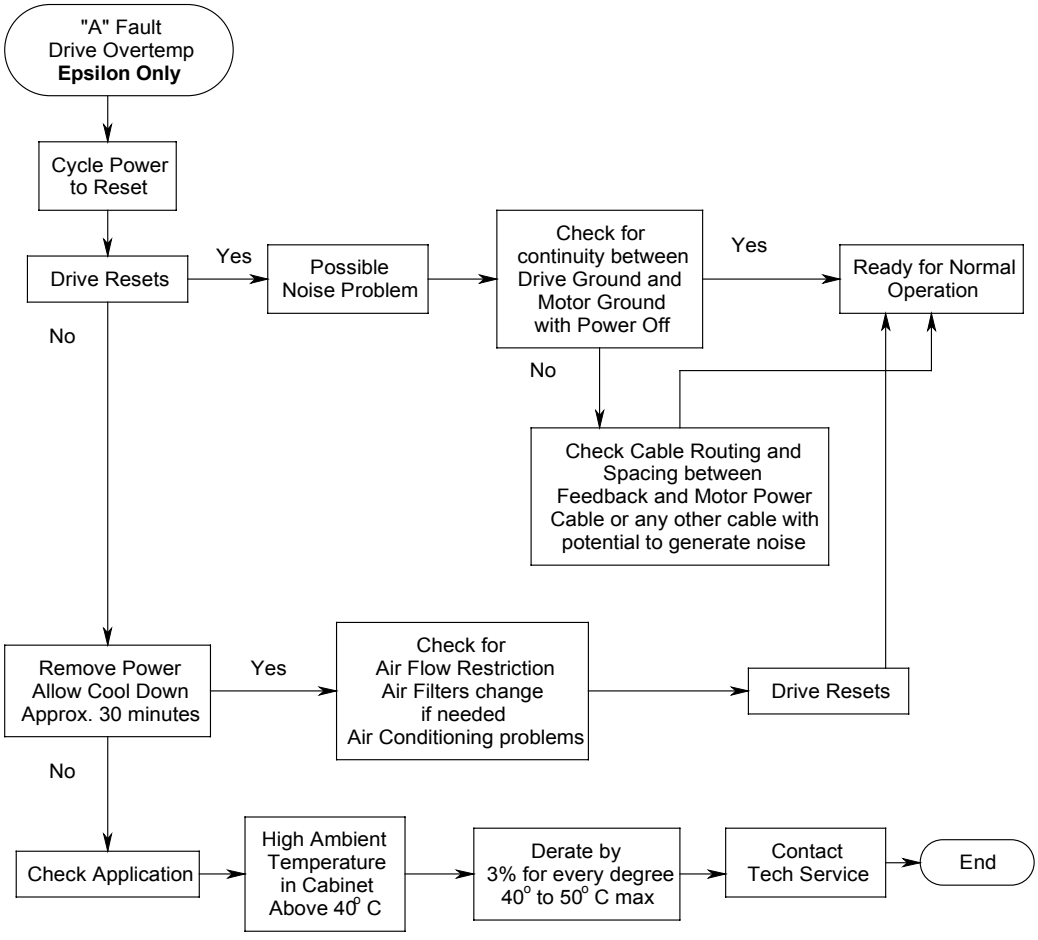
"A" Drive Overtemp

This fault is applicable to the **Epsilon Drive only**. It is indicated by the display showing an "A". If the equipment cabinet that the drive is mounted in has any problem with its circulation of air or the cooling equipment malfunctions this fault will likely occur.

Potential causes for the "A" Drive Overtemp fault

- Sensed temperature in the IGBT (Insulated Gate Bi-polar Transistors a.k.a. Power Stage) has exceeded 100° Centigrade (212° F).
- Noise

" A" Drive Overtemp"



Notes

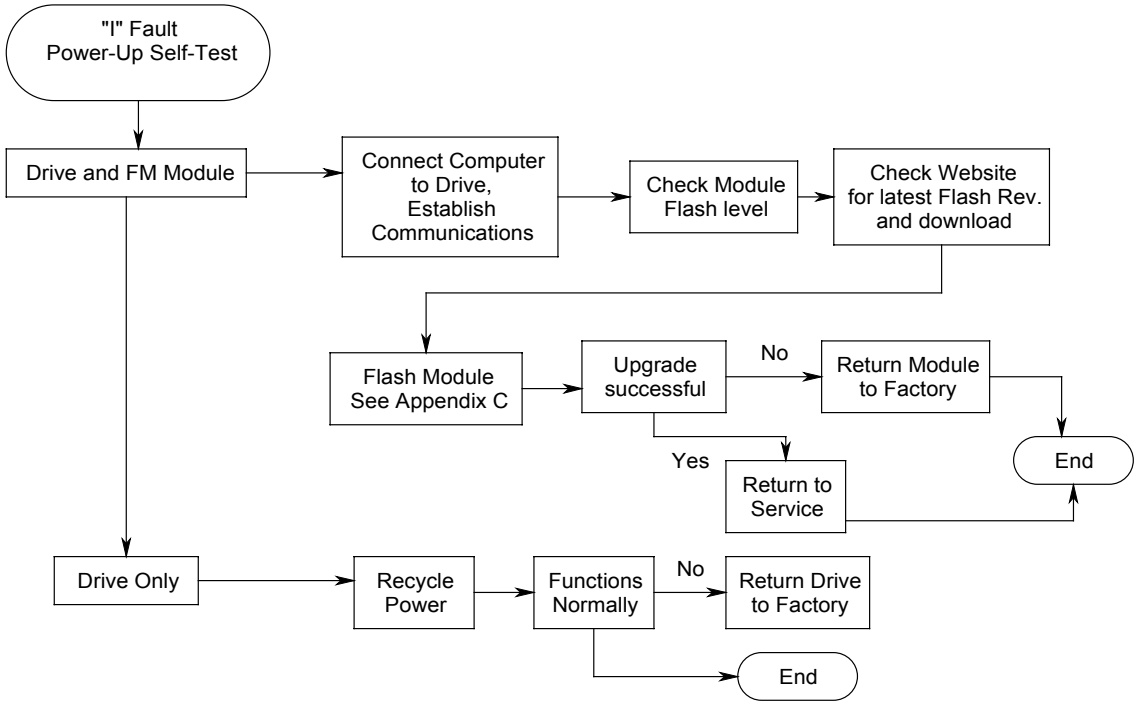
“I” Power-Up Self-Test

This fault is indicated by the display showing a “I”. This display indicates drive did not complete its internal self test.

Potential causes for the “I” Power-Up Self-Test fault

- Incorrect firmware in drive or module
- Failed internal component
- Failed FM module

“I” “Power-Up self-Test”



Very Important Notice!

Before attempting Flash upgrade contact Tech Support.

Notes

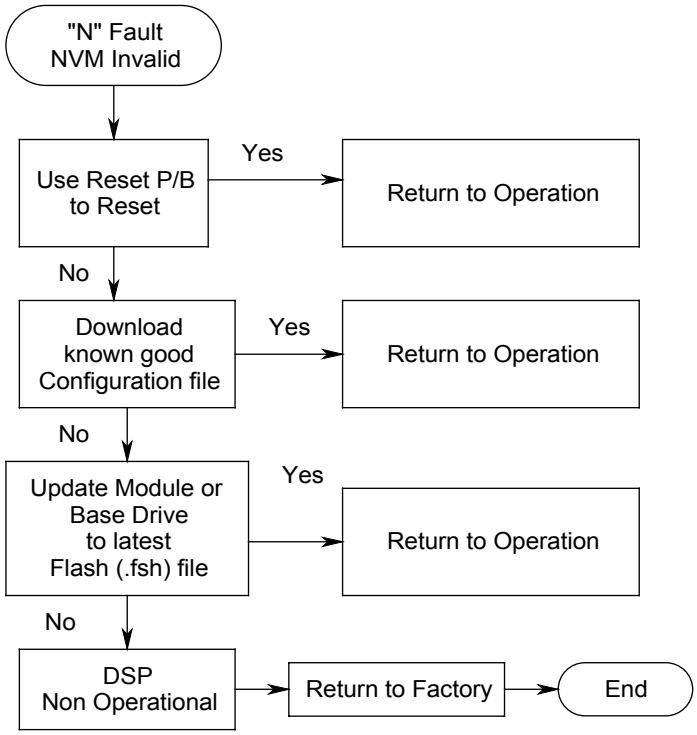
“N” NVM Invalid

This fault is indicated by the display showing a “N”. NVM stands for Non Volatile Memory.

Potential causes for the “N” NVM Invalid fault

- Corrupt configuration file
- Corrupt flash file
- DSP is non operational

“N” “NVM Invalid”



Notes

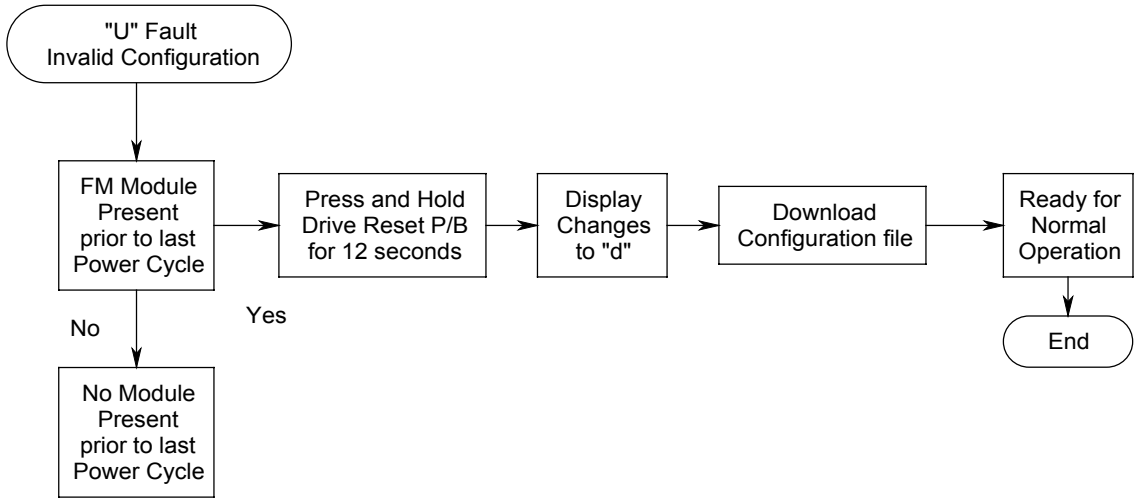
“U” Invalid Configuration

This fault is indicated by the display showing a “U”. This display indicates a change in the physical configuration of the drive. It is not known if setup data in the FM module matches the current drive and motor attached.

Potential causes for the “U” Invalid configuration fault

- FM module **not on** the drive at previous power up
- FM module **on** the drive at this power up was missing at the prior power up

“U” “Invalid Configuration”



Notes

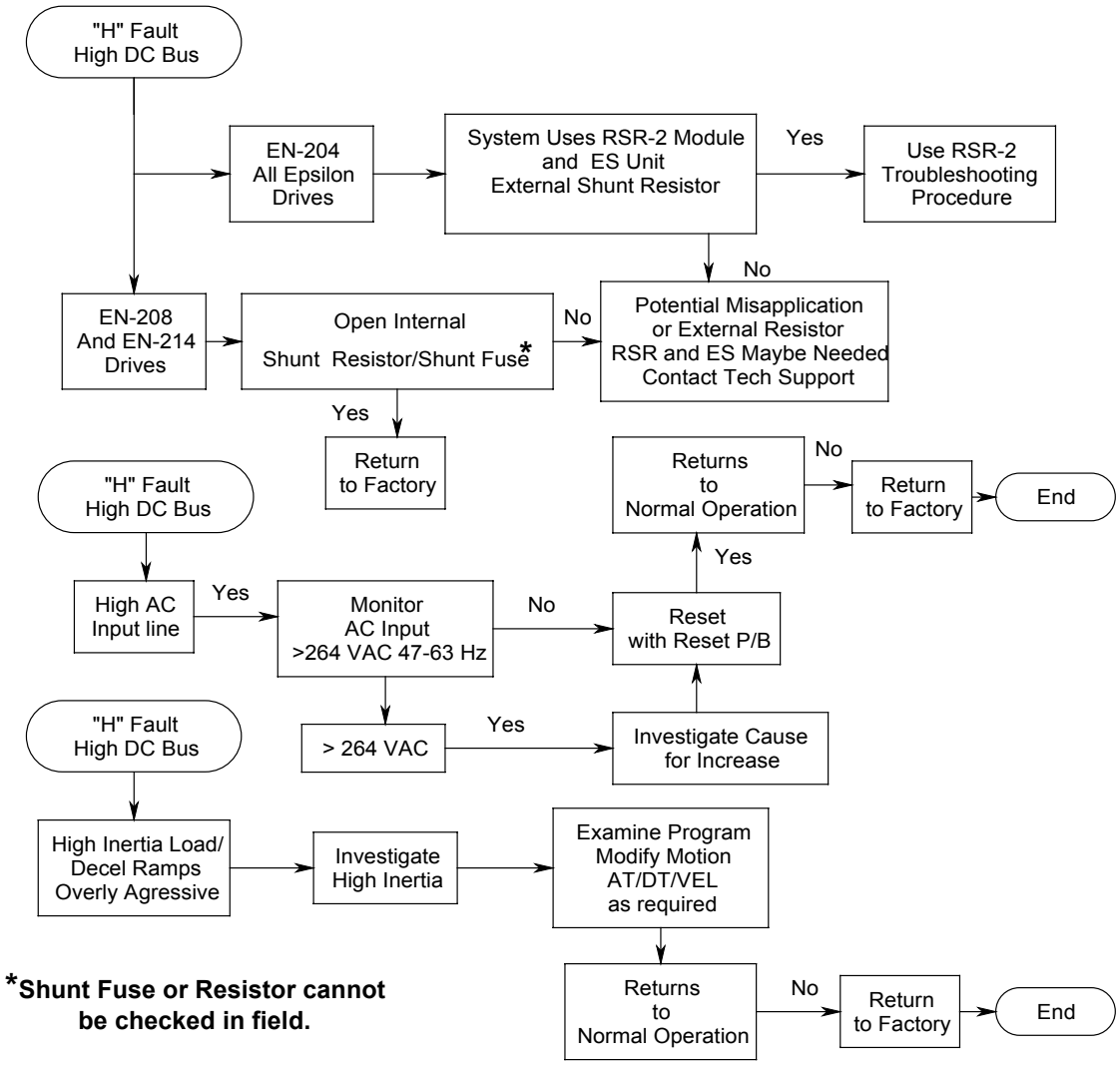
“H” High DC Bus

This fault is indicated by the display showing a “H”. The DC bus is internal to the drive. This indicates a fault involving the DC bus and voltages or with its associated components.

Potential causes for the “H” High DC Bus fault

- DC Bus exceeds 440 VDC (EN), 415 VDC (Epsilon)
- Open Shunt Resistor either internal or external
- RSR-2 module malfunction or improper installation
- High AC input line
- High inertial load, deceleration ramps too aggressive

“H” “High DC Bus Fault”



“Z” Power Stage Fault

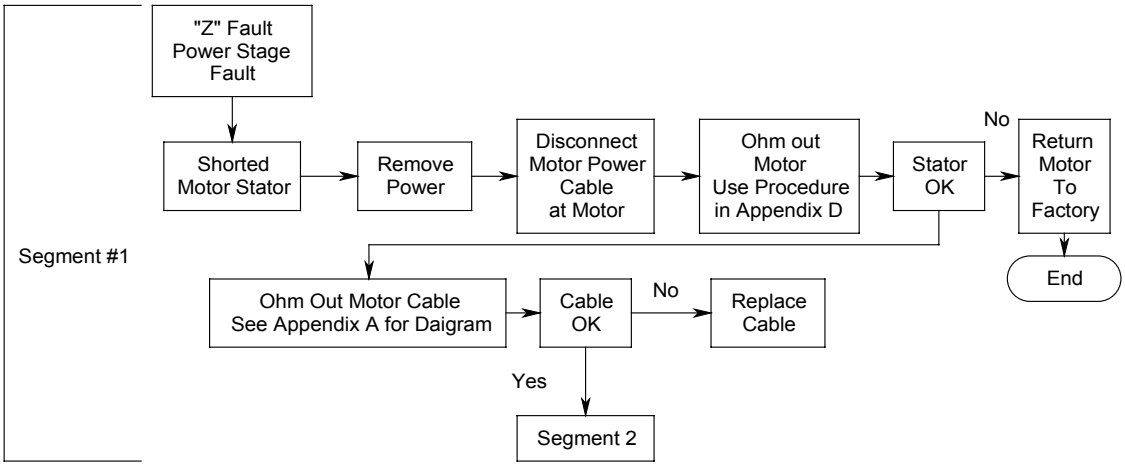
This fault is indicated by the display showing a “Z”. This indicates a fault in the Power Stage logic power supply or the Power stages of the drive.

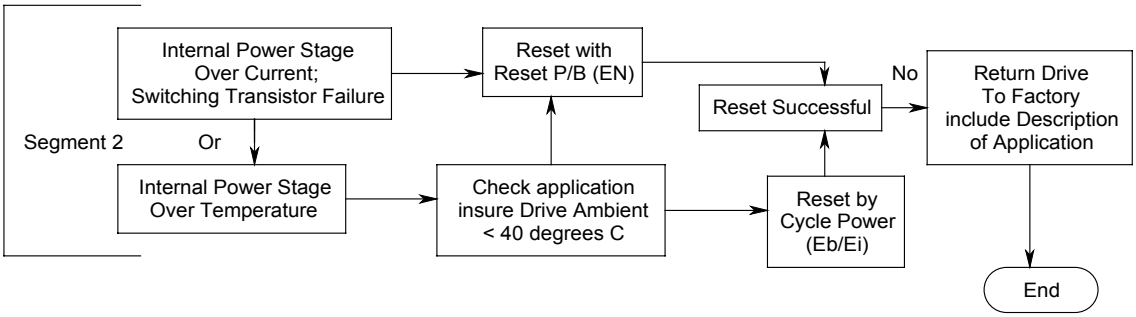
Potential causes for the “Z” Power Stage fault

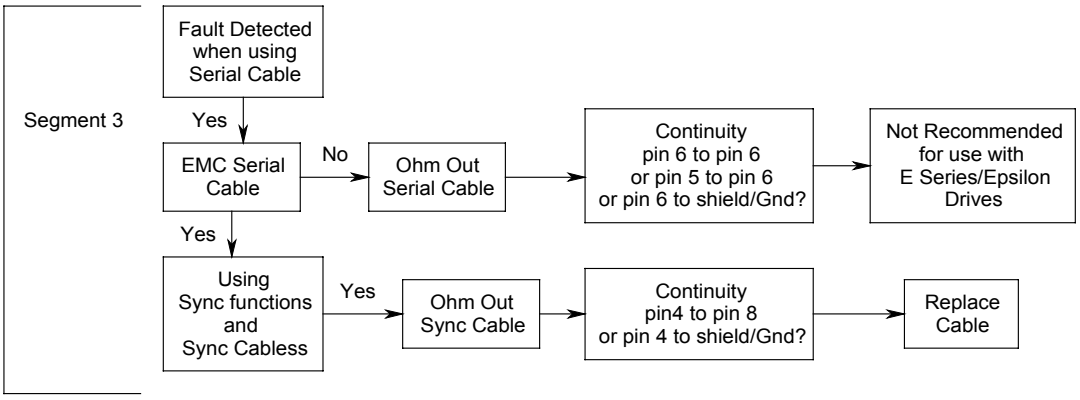
- Power Stage over-temperature or over-current
- Power Stage switching transistor failure
- Loss of Power Stage logic power supply
- Use of improper serial or sync cables
- Motor shorted to ground
- Motor Phases shorted

Notes

“Z” “Power Stage Fault”







“u” Low DC Bus

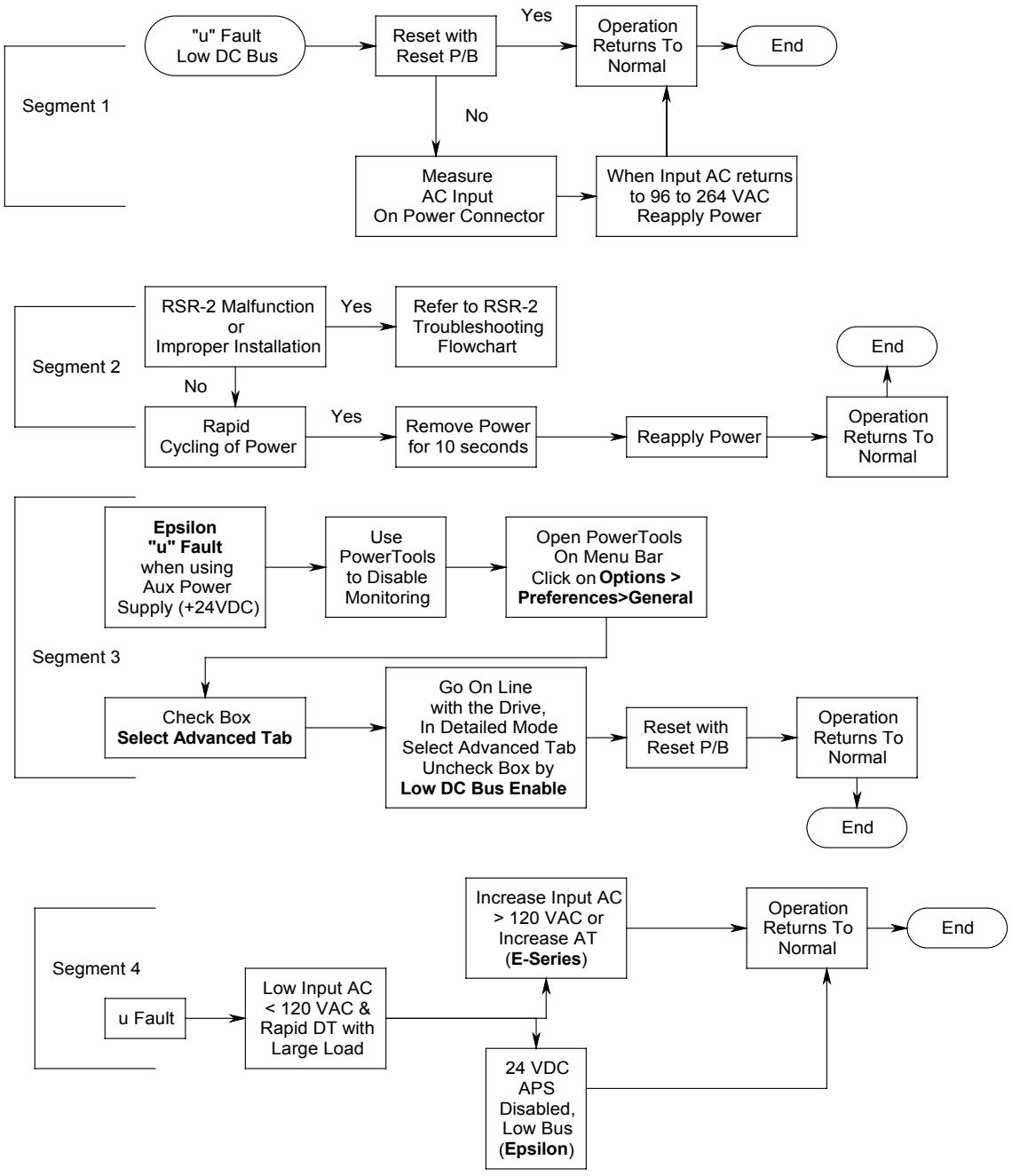
This fault is indicated by the display showing a “u”. Indicates a fault involving the DC bus and voltages or with its associated components.

Potential causes for the “u” Low DC Bus fault

- DC Bus falls below 96 VDC
- Low AC line, below 90 VAC for greater than 50 milliseconds (3 cycles of 60 Hz)
- RSR-2 module malfunction or improper installation
- Repeated rapid cycling of AC power to amplifier
- Removal of AC Input AC Voltage Normal
- Removal of Aux Supply Powering Logic (Normal)

Notes

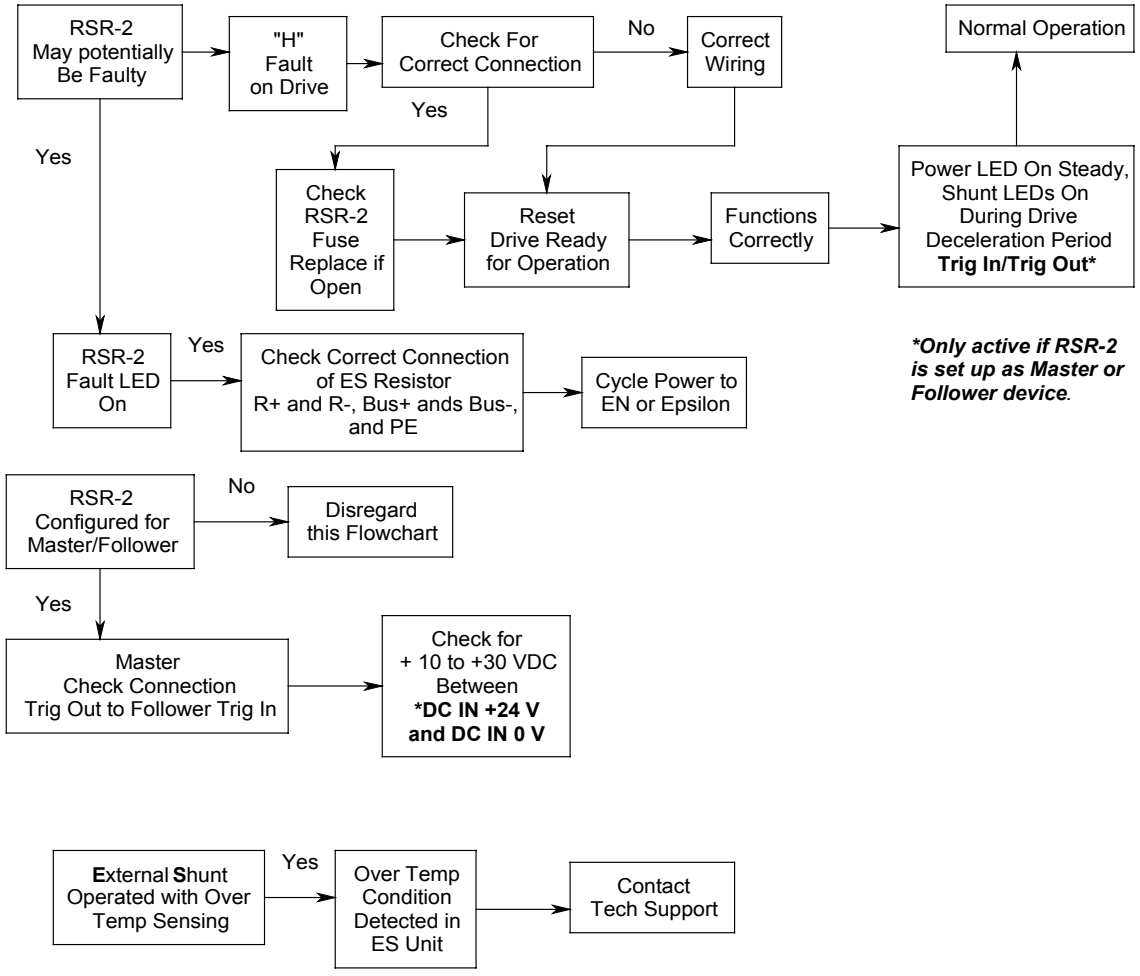
“u” “Low DC Bus Fault”



RSR-2 Troubleshooting Flow Chart

RSR-2

This information is provided for systems equipped with an RSR-2 and an ES Resistor package. If your system is not configured in such a manner please use this for reference purposes only.



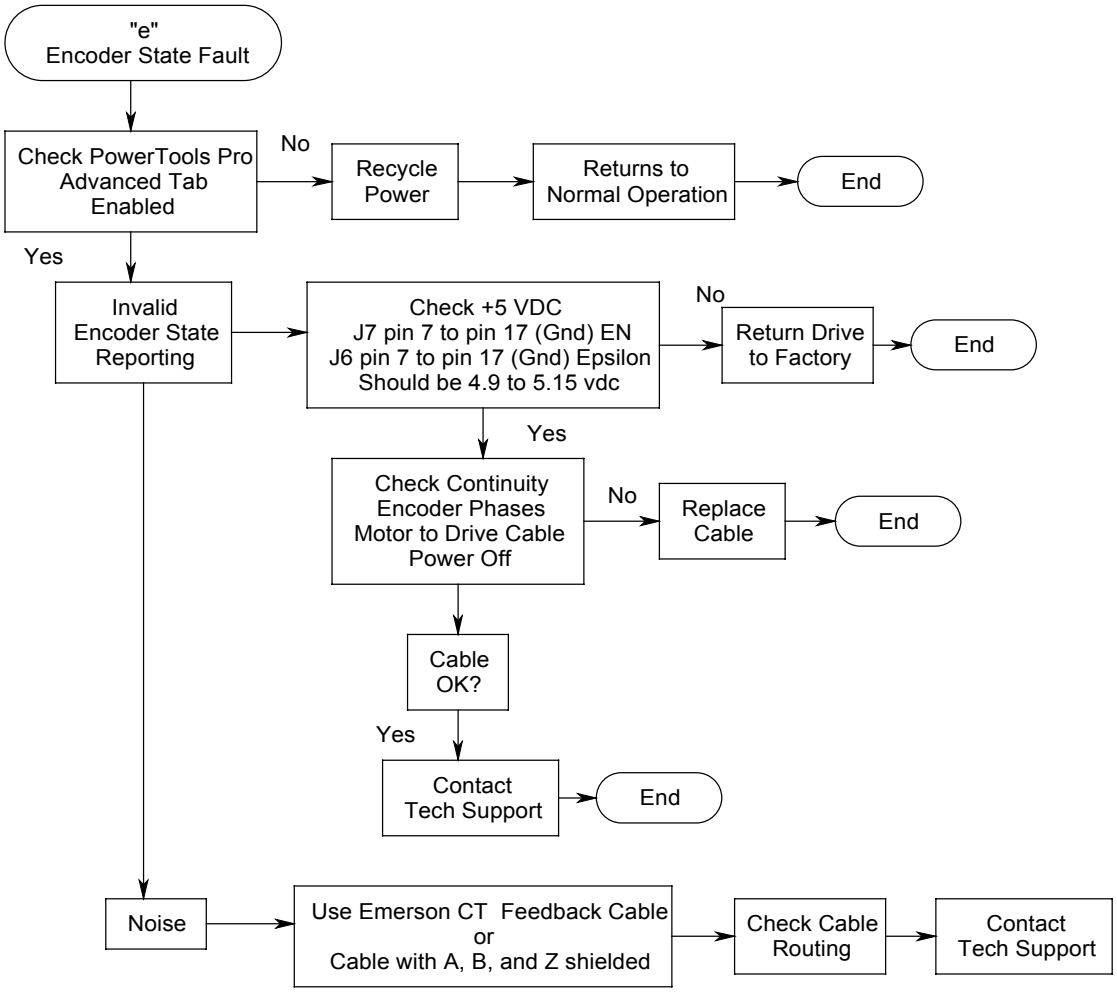
“e” Encoder State

This fault is indicated by the display showing what appears to be a lower case “e”. It indicates a fault involving the Encoder feedback.

Potential causes for the “e” Encoder State fault

- Any Encoder Output and its Compliment in same state
- Poor Shielding (Use “E” Fault Flow Chart)
- Custom Cable

“e” “Encoder State Fault”



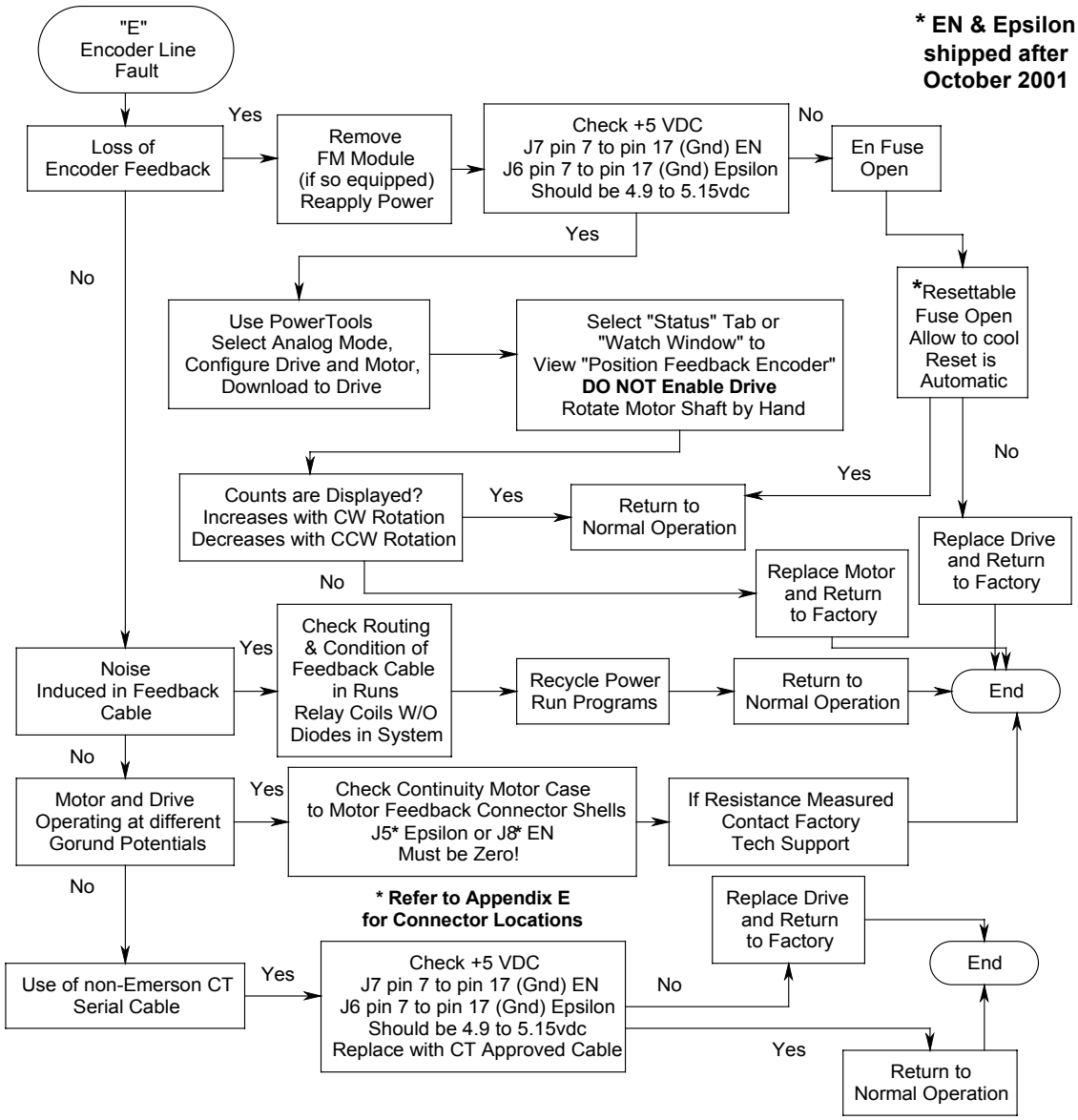
“E” Encoder Line Fault

This fault is indicated by the display showing a “E”. Indicates a fault involving the Encoder feedback.

Potential causes for the “E” Encoder Line Fault

- Loss of Encoder feedback
- Excessive noise induced into Encoder cable
- Drive and motor operating at different ground potentials
- Improper feedback wiring or potential cable issues
- Flexing of a non-flex cable
- Use of non-Emerson CT serial cables

“E” “Encoder Line Fault”



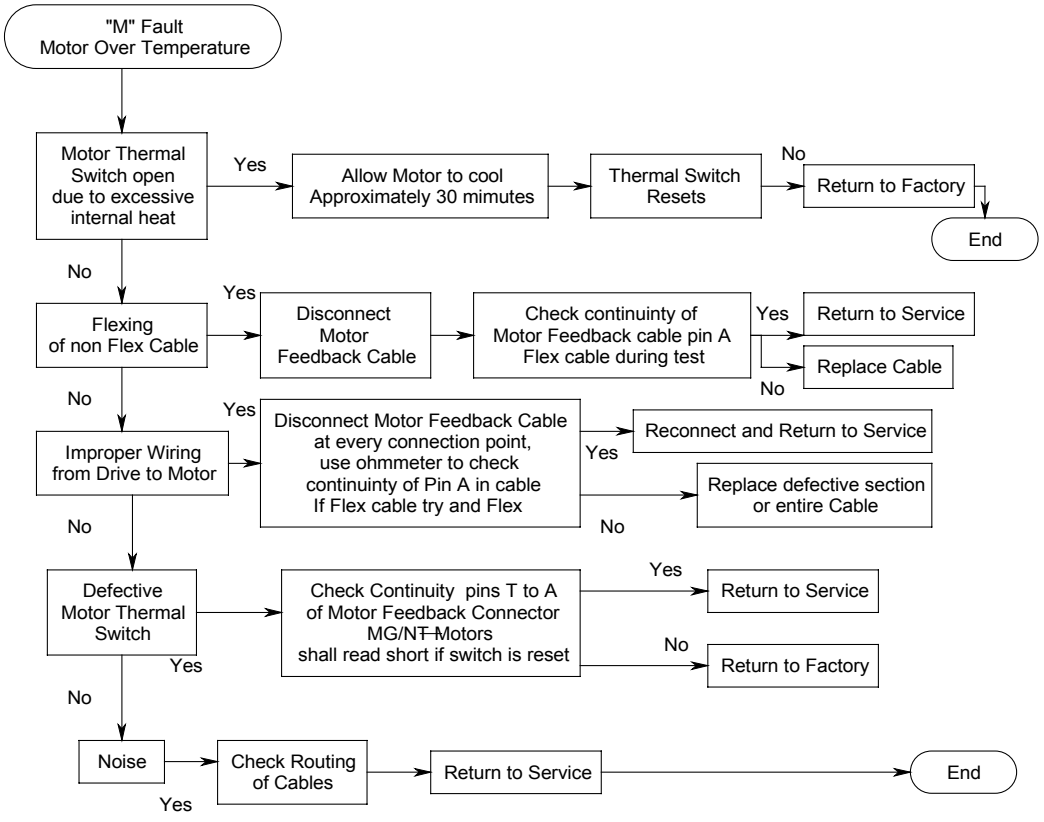
Motor Over Temperature Fault

This fault is indicated by the display showing a "M". This indicates a fault involving excessive motor temperature.

Potential causes for the "M" High DC Bus fault

- Motor thermal sense switch is open due to excessive heat build up in the motor.
- Flexing of a non-flex cable
- Improper wiring
- Defective thermal switch internally in the motor
- Noise

"M" "Motor Over Temperature Fault"



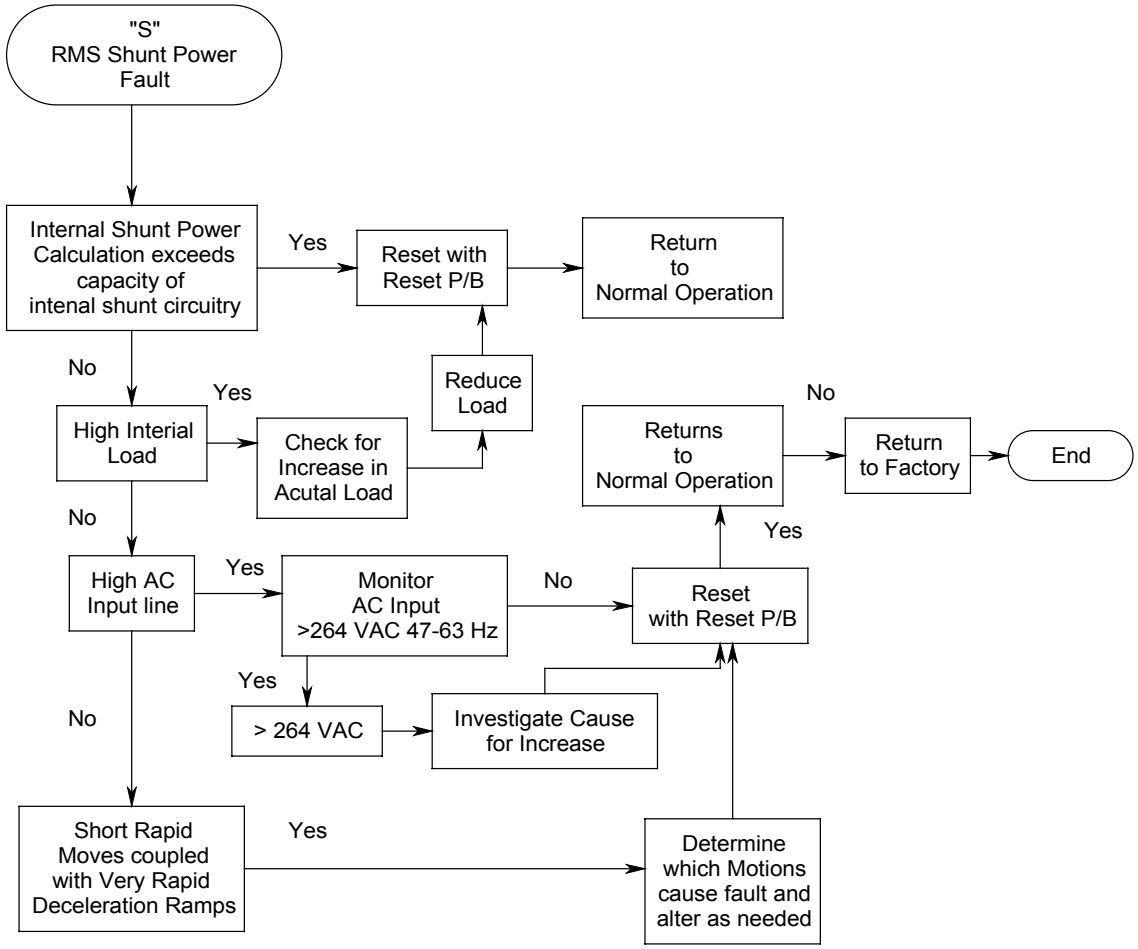
“S” RMS Shunt Power Fault

This fault is indicated by the display showing a “S”. This indicates a fault involving the drives internal shunt circuitry. The shunt power parameter is an internally calculated parameter.

Potential causes for the “S” High DC Bus fault

- Internal shunt power calculation has exceeded capability of internal shunt circuitry
- High Inertial load
- High AC line
- Short rapid moves coupled with very short deceleration ramps

“S” “RMS Shunt Power Fault”



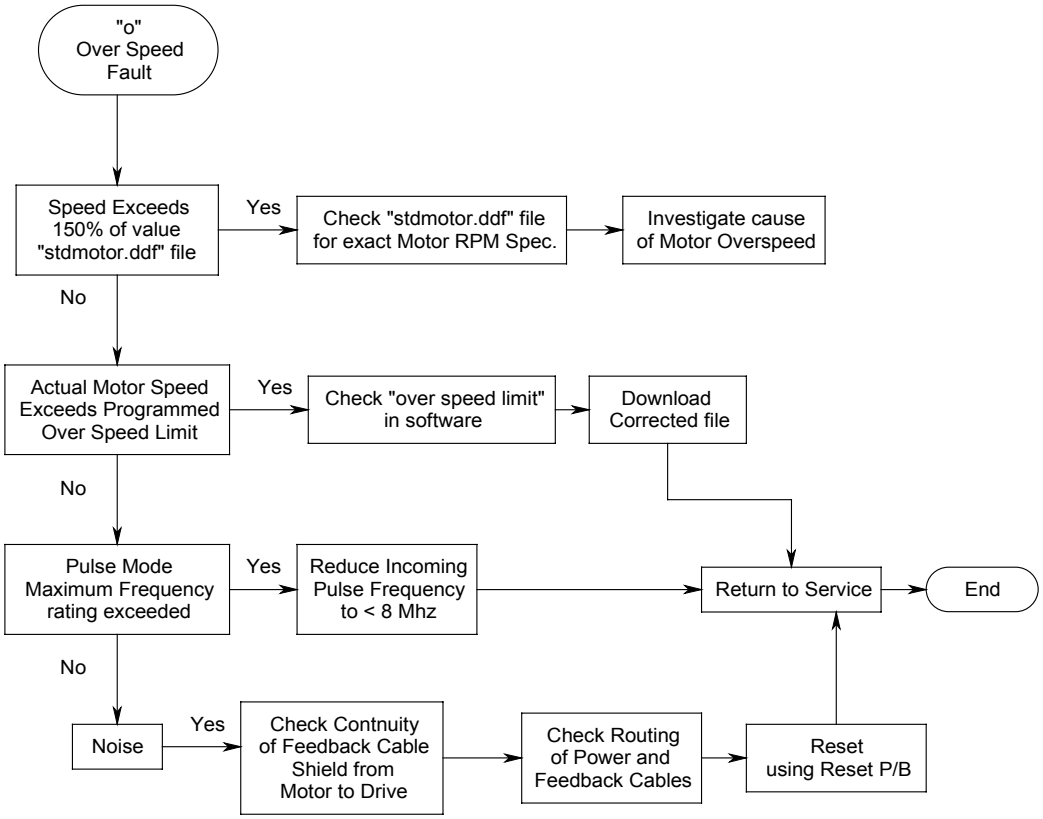
“o” Over Speed Fault

This fault is indicated by the display showing a lower case “o”. This indicates a motor over speed has occurred.

Potential causes for the “o” Over Speed fault

- Motor speed exceeds 150% of maximum value as defined in “stdmotor.ddf” file
- Actual motor speed exceeds programmed motor limit speed
- Pulse mode maximum frequency rating exceeded
- Noise

“o” “Over Speed Fault”



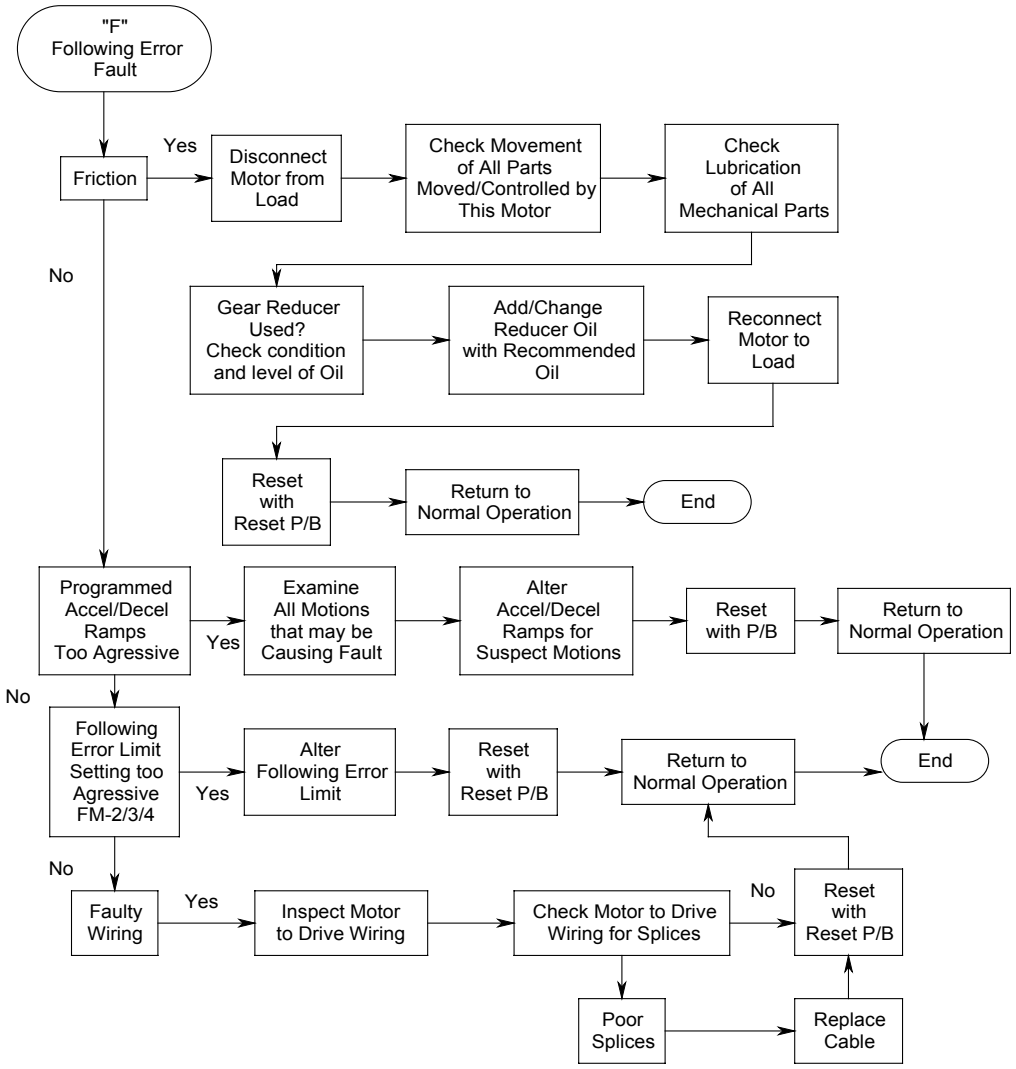
“F” Following Error Fault

This fault is indicated by the display showing a “F”. This indicates the following error detected exceeds the programmed limit value.

Potential causes for the “F” Following Error Fault

- Friction
- Faulty wiring
- Programmed acceleration/deceleration ramps are too fast

“F” “Following Error Fault”



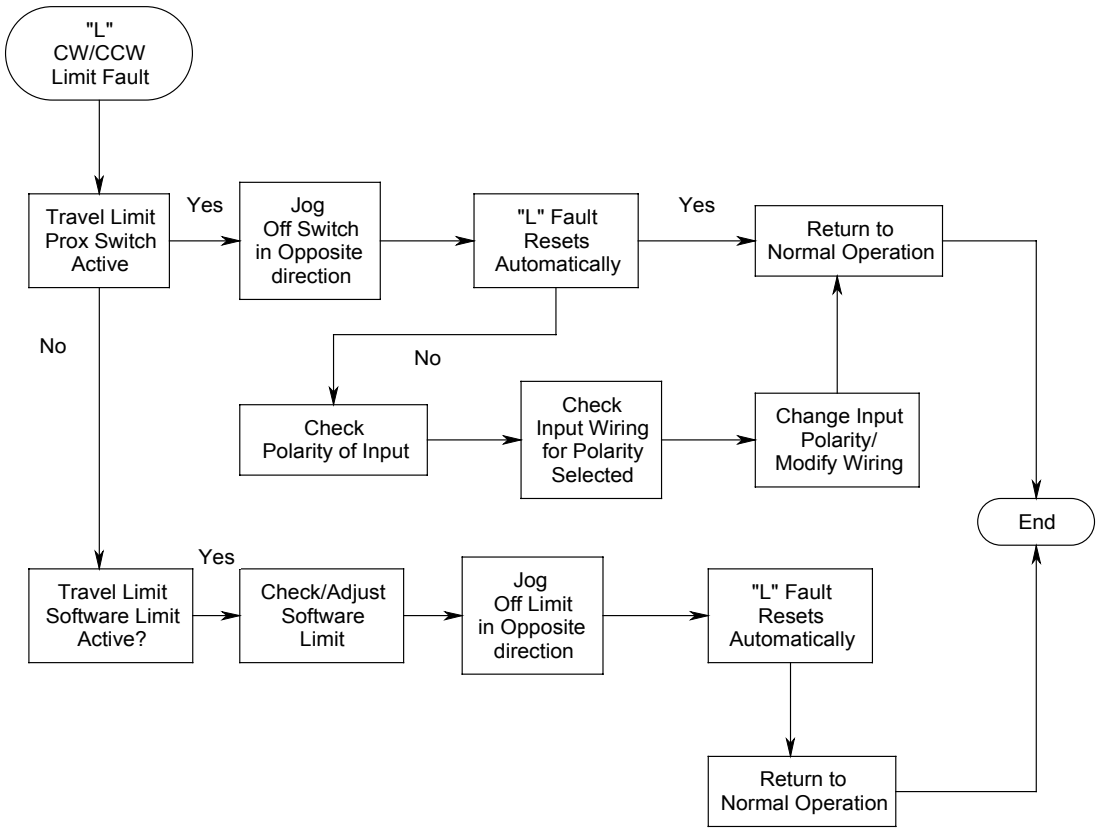
“L” CW/CCW Limit Fault

This fault is indicated by the display showing an “L”. Encountering either Hardware or Software limits may cause this fault.

Potential causes for the “L” CW/CCW Limit fault

- CW/CCW limit sensor active
- Reached the end of the hardware or software established limits in either direction
- Polarity of input function is incorrect for wiring configuration at the input connector

Troubleshooting Flow Chart for “CW/CCW Limit Fault”



All LED Segments On

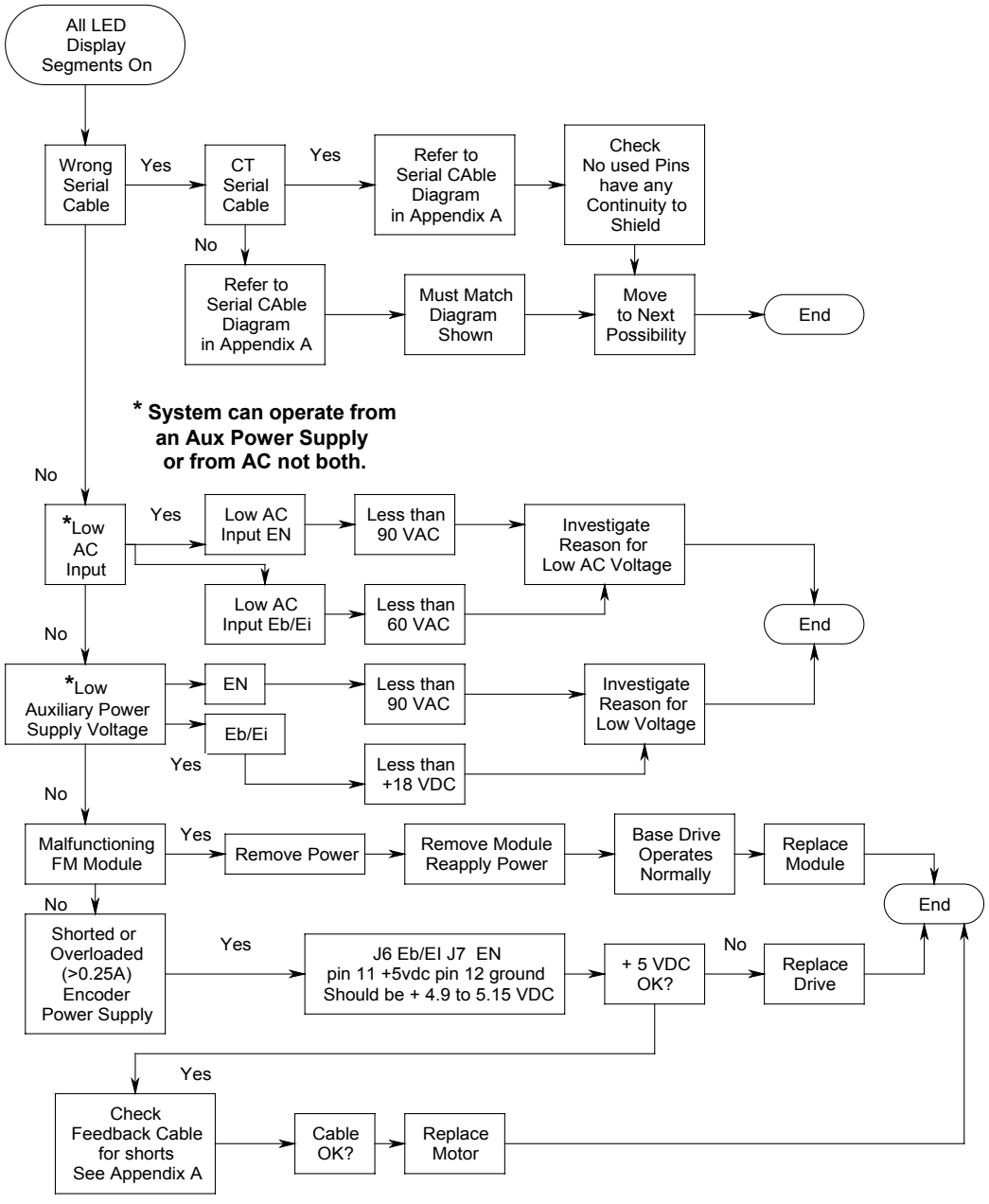
All LED segments being on simultaneously indicate this Fault.

Potential causes for the All LED's On fault

- Wrong Serial cable
- Low AC
- Low APS Voltage
- Faulty FM module
- Shorted or overloaded (>0.25A) encoder

Notes

All LED's on Fault



FM-3 Hardware Error

This fault is indicated by the display showing a "3". This is a fault specific to the FM-3 module only.

Potential causes for the "3" FM-3 Hardware Error

- FM-3 has been applied to an incompatible drive such as an older FM-3 on a newer base drive. Consult Tech Support for details.
- All other faults under this fault type ("3") are displayed on the FM-3 LCD Display.
- Trajectory Fault- normally related to velocities, accelerations or decelerations the FM-3 is unable to perform.
- ISR Overrun- is triggered by the modules flash memory problem.
- No Program- indicates that there is no current configuration contained in the base drive.
- Out of Sync- indicates that the system is not operating in a synchronized mode. Sync between the module and base drive has been lost.
- Program Fault- indicates an FM-3 user program fault.

Troubleshooting Flow Chart for "FM-3 Hardware Error"

- See combined Flow Chart for FM-3/4

FM-4 Hardware Error

This fault is indicated by the display showing a "4". Indicates a fault specific to the FM-4 module. This is similar to a FM-3.

Potential causes for the "4" FM-4 Hardware Error

- All other faults under this fault type ("4") are displayed on the FM-4 LC Display
- Trajectory Fault- normally related to velocities, accelerations or decelerations the FM-4 is unable to perform.
- ISR Overrun- is triggered by the modules flash memory problem.
- No Program indicates that there is no current configuration contained in the base drive.
- Out of Sync- indicates that the system is not operating in a synchronized mode. Sync between the module and base drive has been lost.
- Program Fault- indicates a FM-4 user program fault.

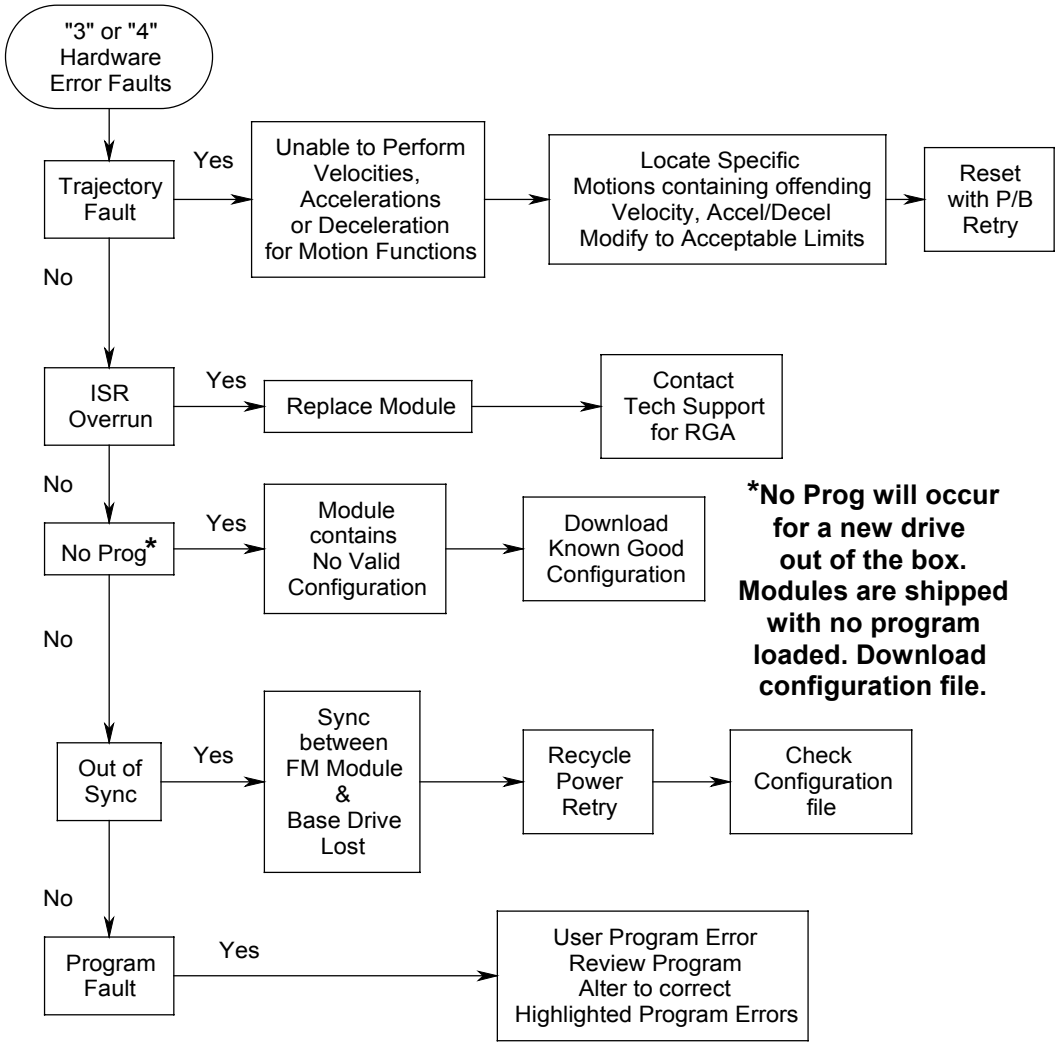
Troubleshooting Flow Chart for "FM-4 Hardware Error"

- See combined Flow Chart for FM-3/4

Note

Two bars are shown in the display during the Flash Upgrade process.
This is a normal indication.

“FM-3/4 Hardware Error”



Appendix Section

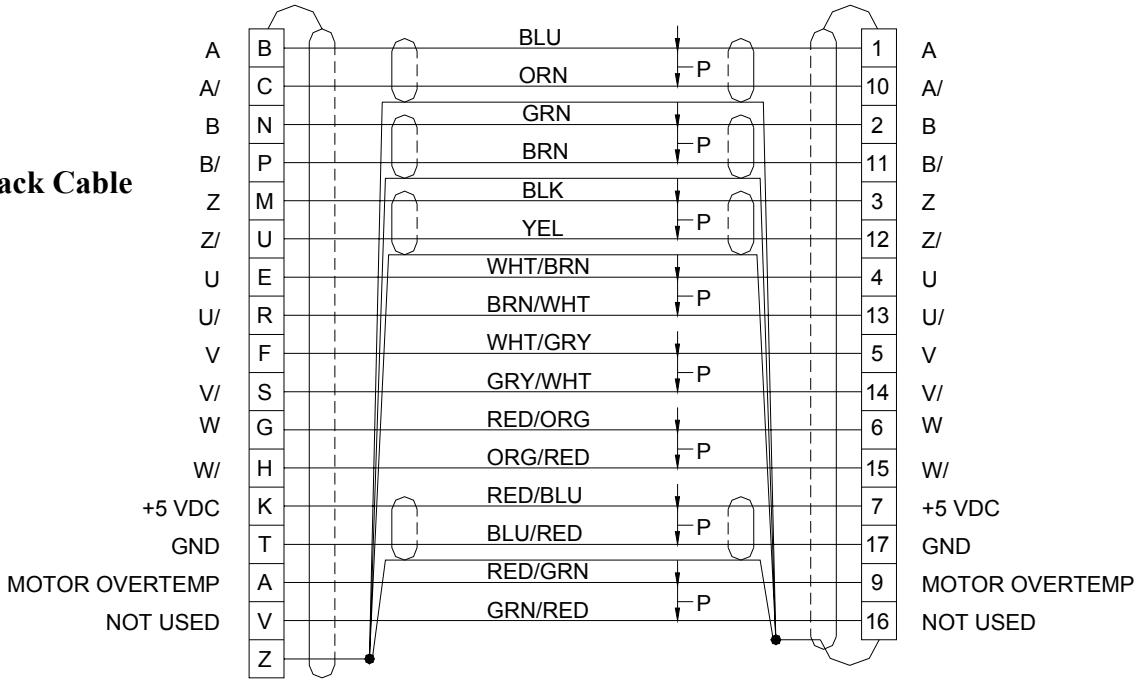
Appendix A: Cable Diagrams

CMDS CABLE WIRE DIAGRAM

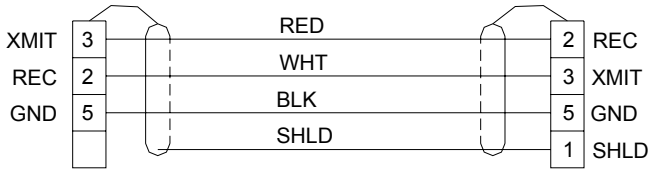
Drive to Motor Cable

Drive to Motor Cable
Shown is Flex Cable
Wire Colors for non-Flex is:
R = Brown; S = Black; T= Blue

Motor Feedback Cable

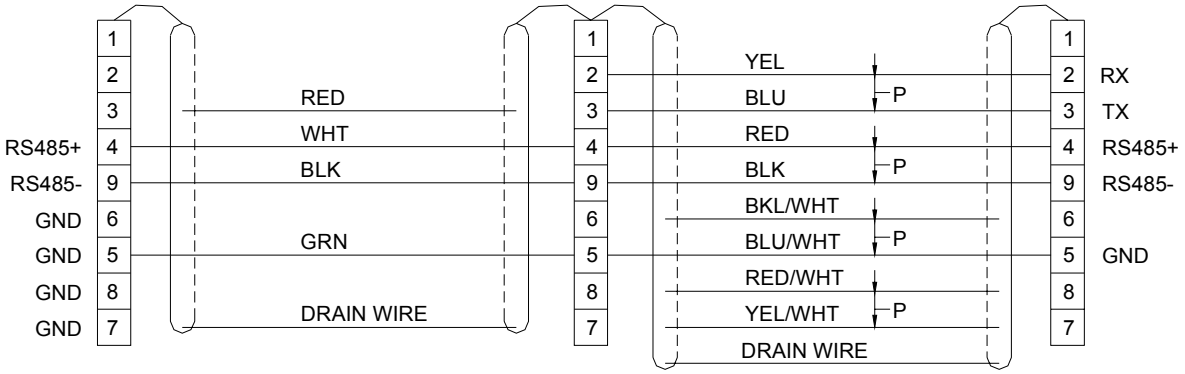


CFCS CABLE WIRE DIAGRAM



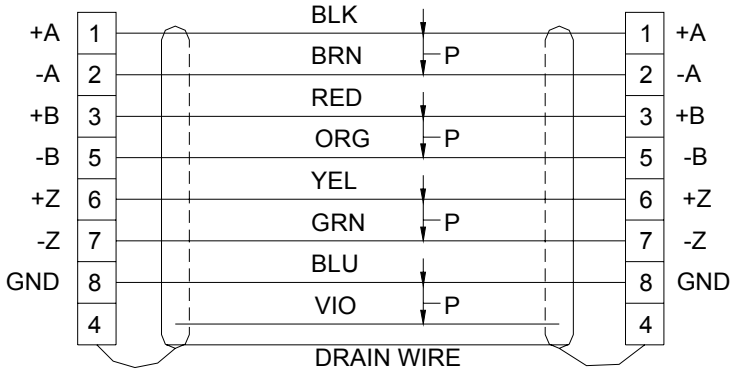
TIA CABLE WIRE DIAGRAM

Emerson CT Serial Cable



DDS CABLE WIRE DIAGRAM

Emerson CT DDS Cable



SNCDD CABLE WIRE DIAGRAM

Emerson CT SNCDD Cable

Appendix B: Using the Watch Window

This procedure covers the usage of the Watch Window diagnostic tool. The Watch Window is built into the PowerTools FM and PowerTools Pro programming software. It is used to actively monitor Modbus registers within a base En/Eb drive as well as an Ei drive and any En drive that is equipped with an FM-1/2/3/4 programming module. Please refer to the appropriate procedure listed below for your particular application.

Using the Watch Window with PowerTools FM Software

This procedure applies to:

- En base drive systems without a FM module attached
- En drive systems with a FM-1 or FM-2 module attached
- Epsilon drive systems
- Ei (Epsilon Indexing) drive systems

Step 1: Going Online with the Drive System

In order to use the Watch Window diagnostic tool, you must be online with the drive system. The easiest way to establish an online connection is to click on the "Upload All" icon from the PowerTools FM toolbar as shown in Figure 1.

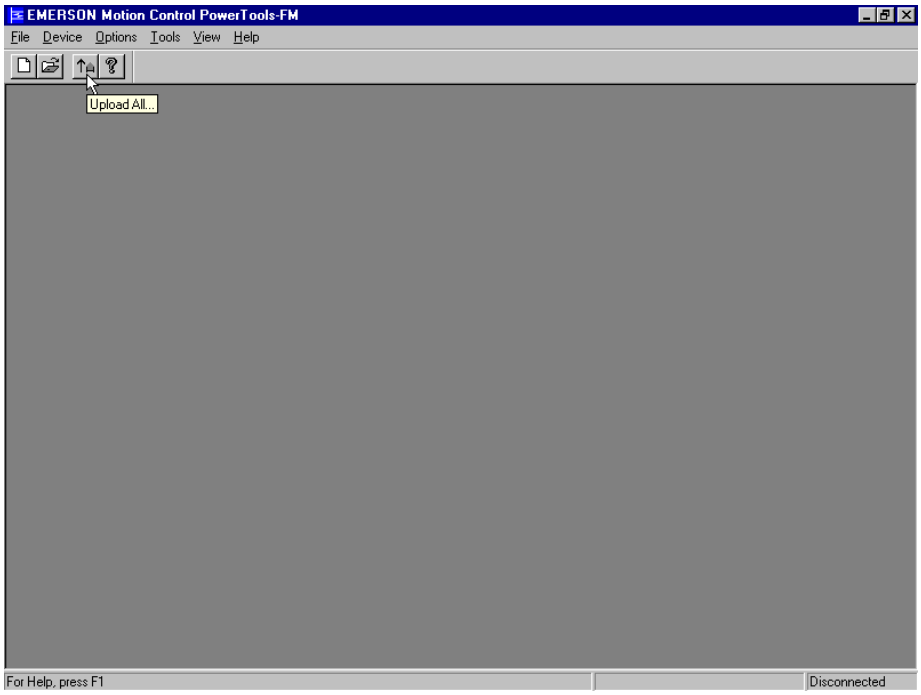


Figure 1

After clicking on the "Upload Drives" icon, the software will attempt to open a communication channel with the drive system. If you have your communications setup properly, you will see the dialog box shown in Figure 2. If you get a communications error, refer to the Serial Communications Troubleshooting flowchart.

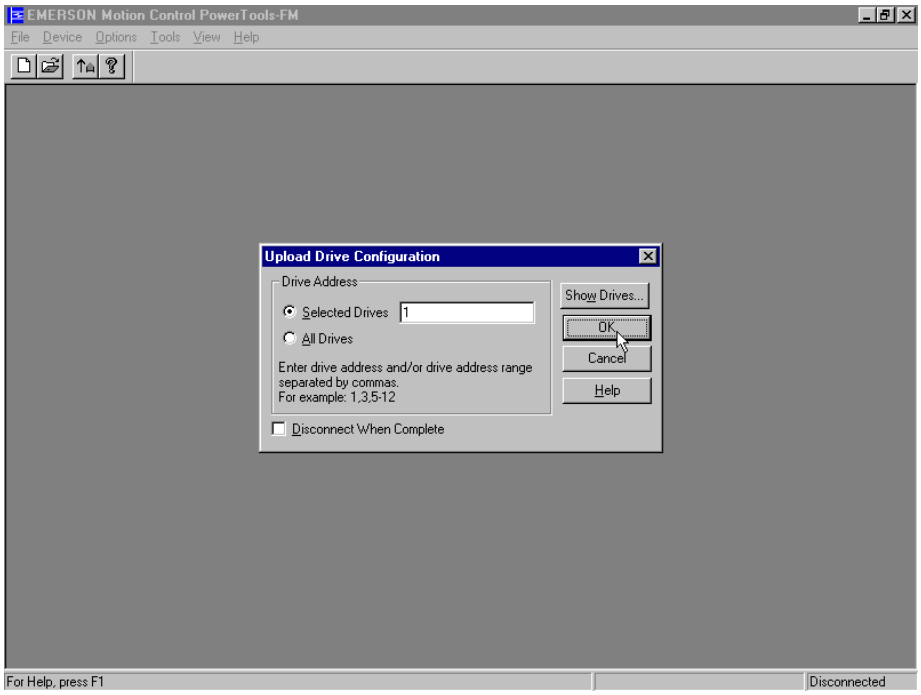


Figure 2

Once you have clicked on the "OK" button as shown in Figure 2, the current drive configuration will be uploaded and your screen will look like the screen in Figure 3. Please note the "Connected" status in the lower right corner of the status bar.

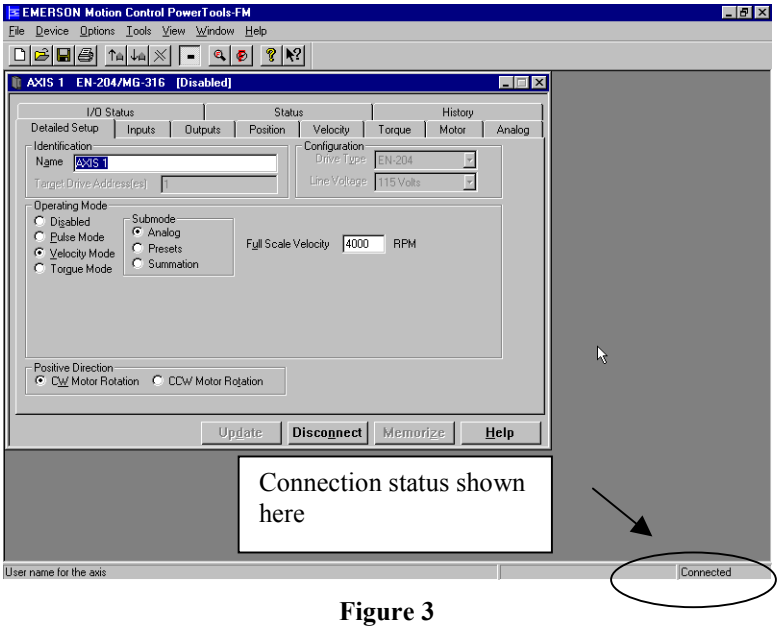


Figure 3

Step 2: Configuring the Watch Window
Open the Watch Window configurator by clicking on the “Watch Window” option in the PowerTools FM “Tools” menu as shown in Figure 4.

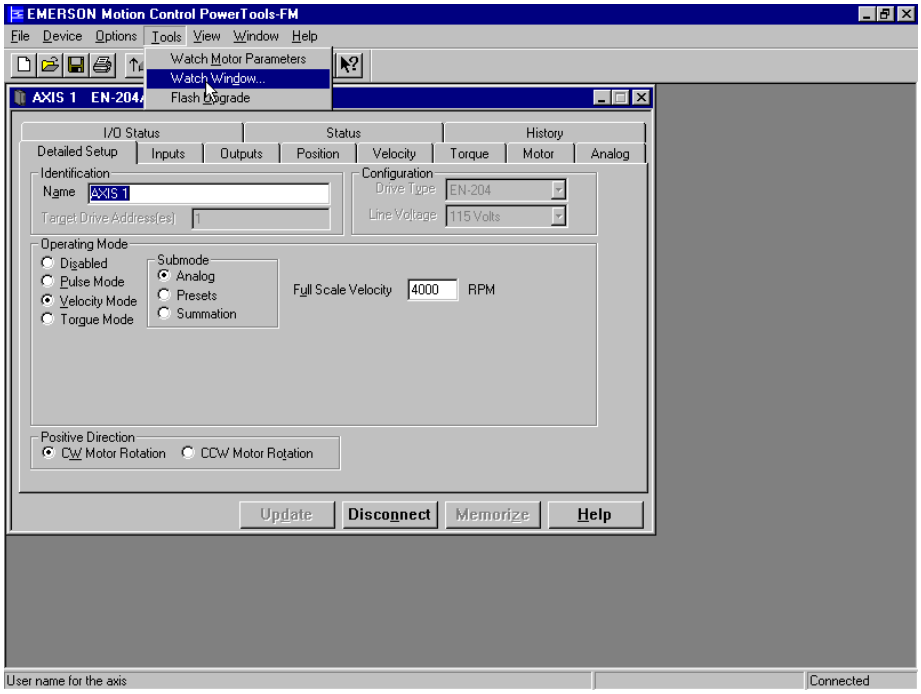


Figure 4

The available Modbus registers are arranged by group in the configuration window as shown in Figure 5. The “All” group has all of the registers arranged in alphabetical order. To reduce the number of selections, choose a group of registers from the drop down list.

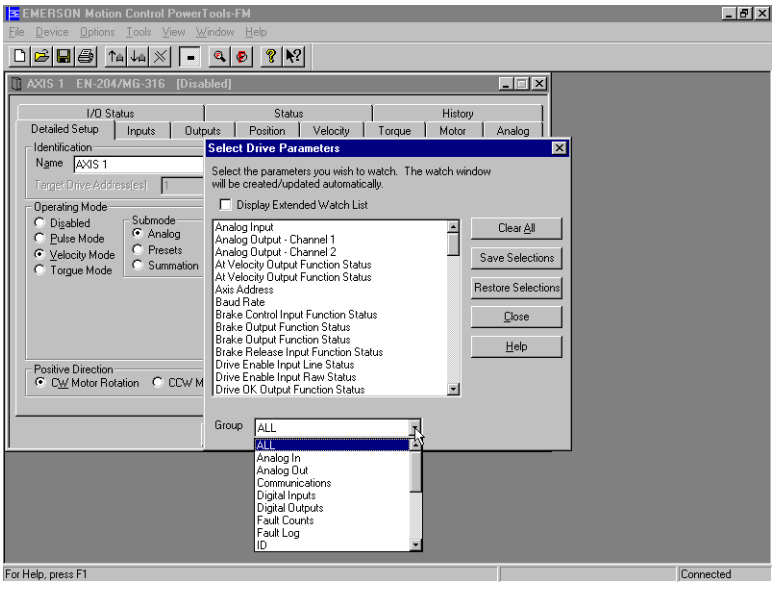


Figure 5

Configure the Watch Window by selecting the registers that you would like to monitor from the group that you have chosen as shown in Figure 6. Once you have selected a register, the Watch Window will appear on your screen with the registers you have selected.

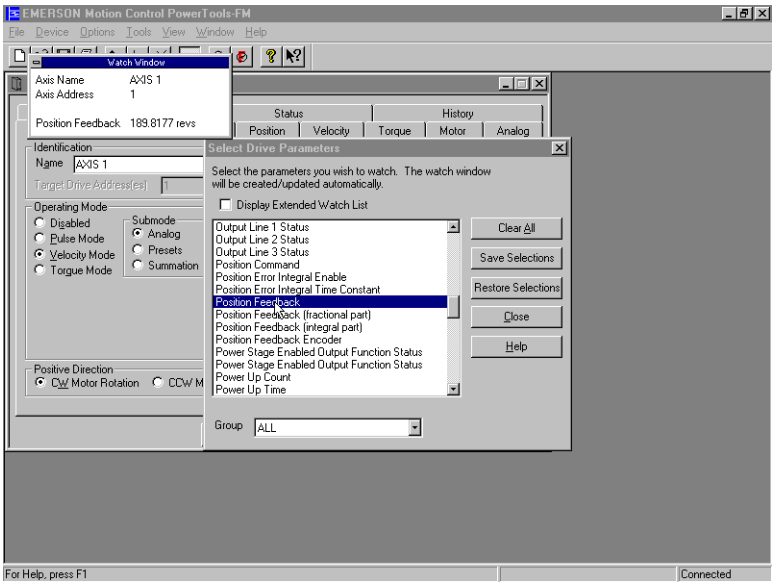


Figure 6

The Watch Window is a floating dialog box and can be left open even if the programming software is *minimized* as shown in Figure 7. Closing the software will close the Watch Window

.

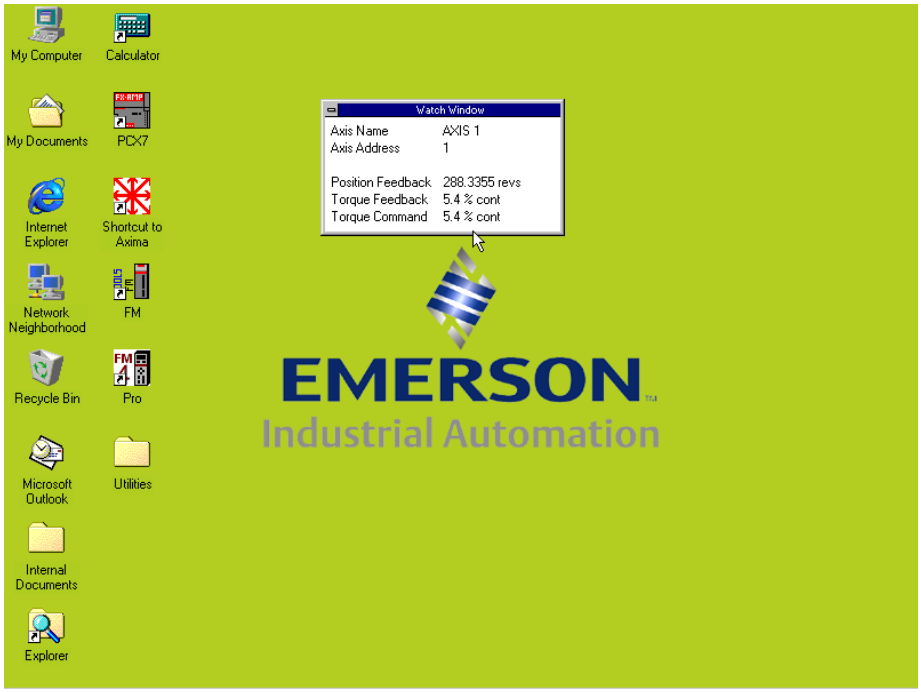


Figure 7

Appendix C: Updating Firmware Using the Flash Upgrade Process

This procedure covers the steps necessary to upgrade the operating firmware in either an En/Eb/Ei drive or a FM programming module.
The Flash Upgrade procedure should only be performed when absolutely necessary. There are compatibility issues that must be considered prior to performing this procedure. Please ensure that the hardware you are attempting to upgrade is fully compatible with the new firmware before proceeding. If you are in doubt, contact the Control Techniques Technical Support department *before you begin* to reduce the potential for problems. Failure to do so may result in non-operational equipment and downtime for your machine.
It is important to note that you cannot Flash Upgrade a **base** drive *through* a FM module. In order to Flash Upgrade the base drive, you must remove the FM module first. In some cases, **both** the base drive **and** the FM module will need to be upgraded. In that case, upgrade the base drive first and then the FM module.
It is not advisable to attempt to upgrade more than 1 piece of hardware at a time. Therefore, disconnect any drive to drive serial cables before proceeding and upgrade only 1 piece of hardware at a time.

Obtaining Firmware Upgrades

The latest revisions of firmware for your drive or FM module may be freely downloaded from our company website at: www.emersonct.com. The files are located in the "Sales & Support/File Downloads" area. These files have the file extension **.fsh** and are organized according to product type.
The firmware flash files are also located on our PowerCD. A PowerCD is included in the box along with all of our equipment.

Step 1: Launching the Flash Upgrade Tool

In this example, the firmware of a FM-3 module is being upgraded.
Presuming that you have already located/downloaded the appropriate flash file, the first step is to launch the Flash Upgrade tool. To launch the tool, select "Program Flash" from the "Tools" menu in PowerTools Pro as shown in Figure 1.

Figure 1

Step 2: Establishing Communications

Once the Flash Upgrade tool has been launched, it will immediately attempt to open a communications channel with the drive system as shown in Figure 2. If communications are not successful, please refer to the Serial Communications Troubleshooting flowchart for assistance.

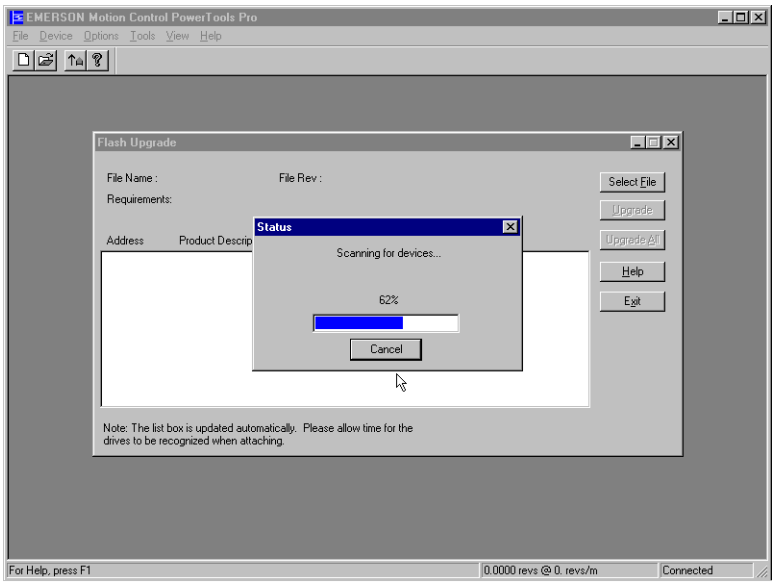


Figure 2

If communications were successful, your screen will look similar to the one in Figure 3.

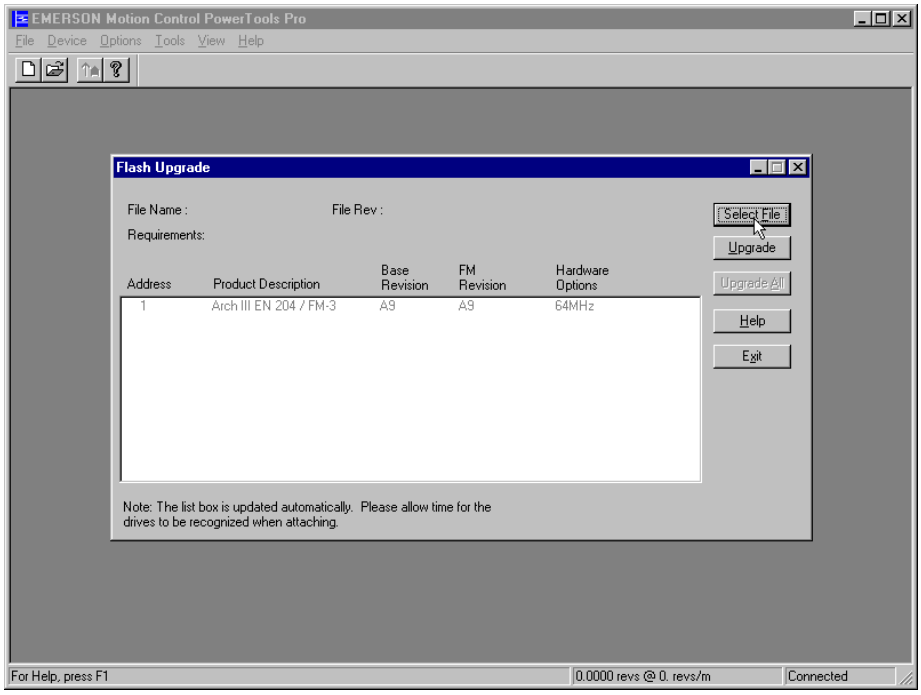


Figure 3

Step 3: Selecting the Flash file

Click on the "Select File" button (see Figure 3). Doing so will open a window that will allow you to navigate to the folder where you have stored the downloaded flash (.fsh) file as shown in Figure 4.
NOTE: If you are going to use a flash file that is located on the PowerCD, it is a good idea to copy the file from the PowerCD to a local folder on your computer's hard drive. Doing so will avoid the possibility of any data read errors that can occur between your PC and the CD-ROM drive thereby resulting in the interruption of the Flash Upgrade process.
WARNING: If the Flash Upgrade process is interrupted, there is a good chance that you will not be able to proceed without factory assistance. Never interrupt the Flash Upgrade process.

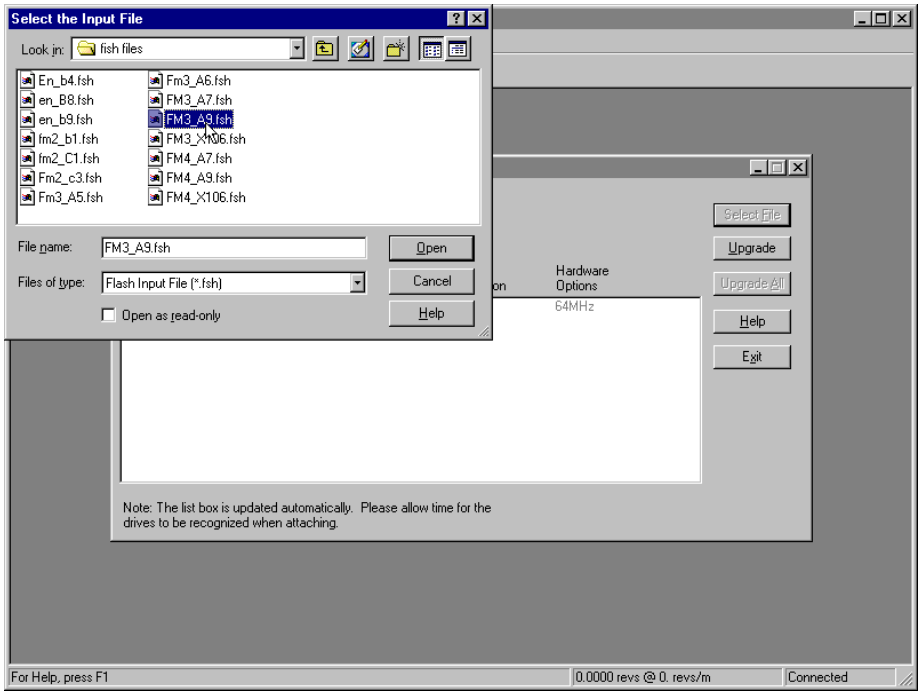


Figure 4

Once you have selected the flash file (by clicking on it) and clicked on the Open button, the file explorer window will close and you will be returned to the Flash Upgrade screen. You will notice that the hardware information in the window is now active (not grayed out), and you are now ready to begin the upgrade process itself.

Step 4: Performing the Upgrade

To start the Flash Upgrade process, select the hardware you would like to upgrade from the Flash Upgrade window as shown in Figure 5.

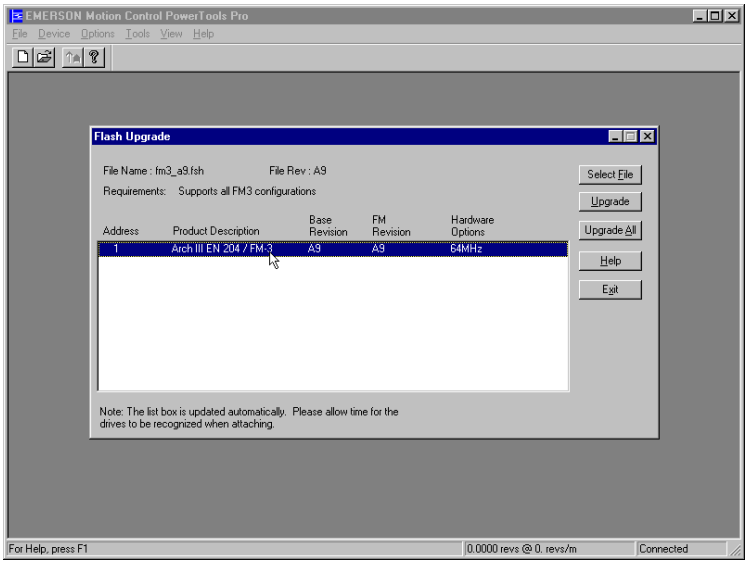


Figure 5

Once you have selected the hardware to upgrade, click on the “Upgrade” button to begin the process as shown in Figure 6.

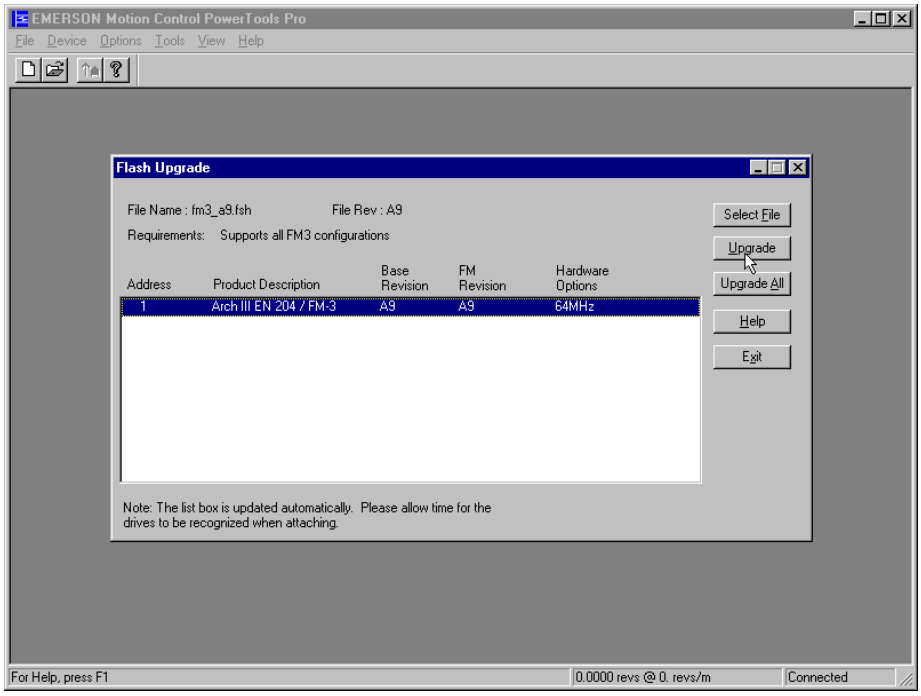
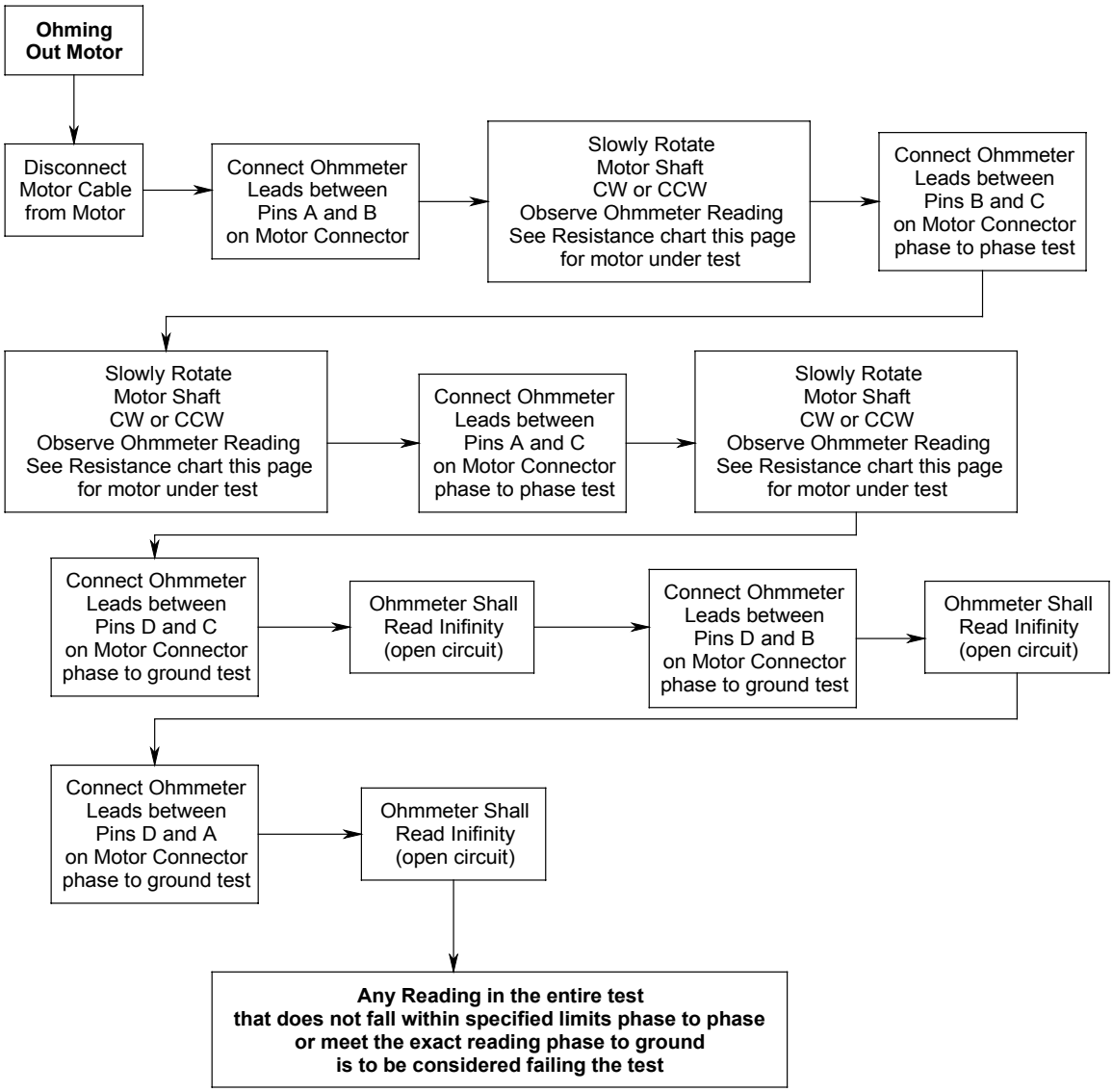

EMERSON Motion Control PowerTools Pro
File Device Options Tools View Help
Flash Upgrade
File Name : fm3_a9.fsh
File Rev : A9
Requirements: Supports all FM3 configurations
Address
Product Description
Base Revision
FM Revision
Hardware Options
1
Arch III EN 204 / FM-3
A9
A9
64MHz
Select File
Upgrade
Upgrade All
Help
Exit
Note: The list box is updated automatically. Please allow time for the drives to be recognized when attaching.
For Help, press F1
0.0000 revs @ 0. revs/m
Connected

Figure 6

Appendix D: Ohming Motor Procedure

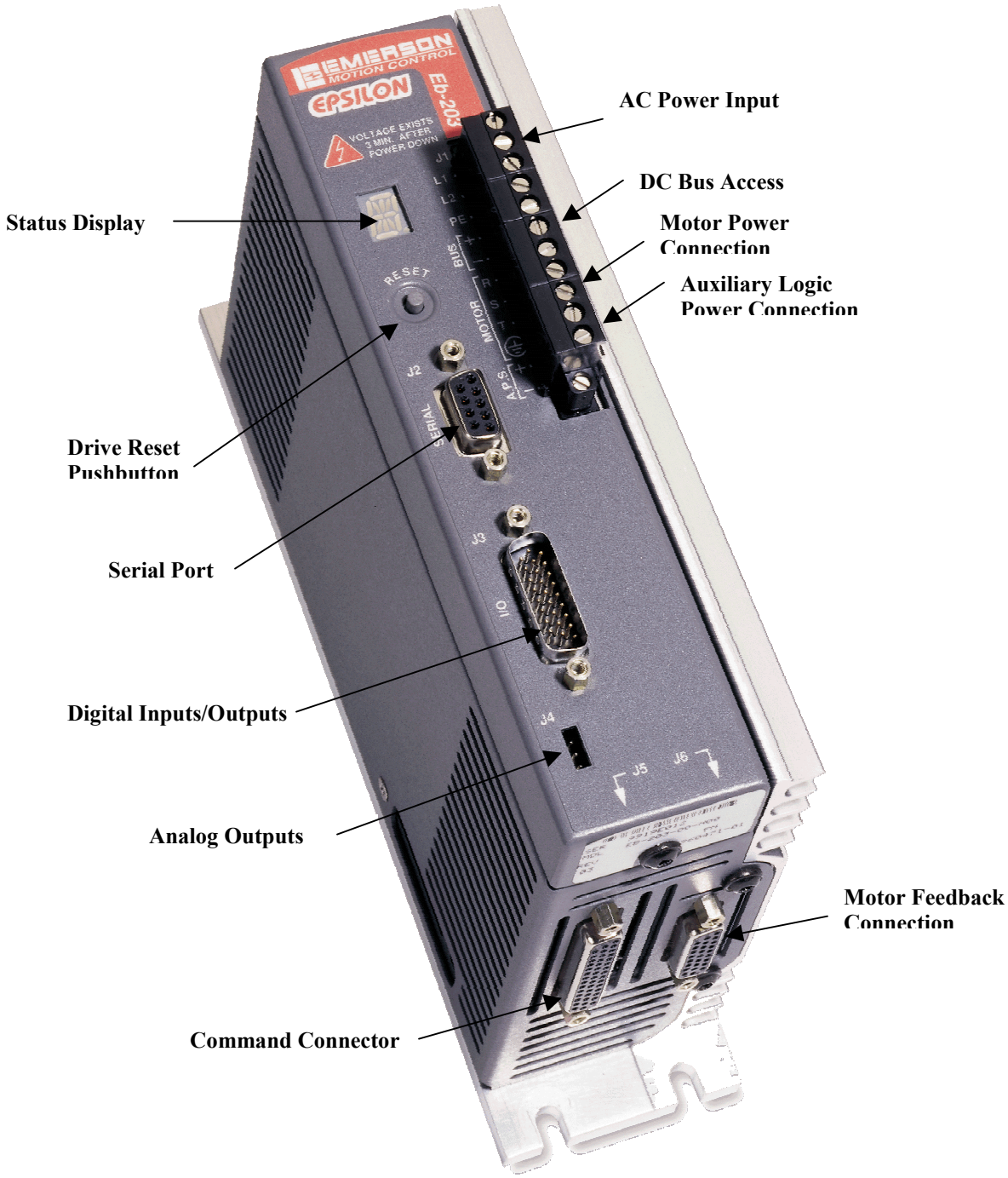


For motors not listed contact Control Techniques to obtain information.

MOTOR	D.C. Resistance (Ohms)
NT-207	11.1
NT-212	4.6
NT-320	1.5
NT-330	1.2
NT-345	1.3
NT-355	1.0
MG-205	18.5
MG-208	7.3
MG-316	3.9
MG-340	1.9
MG-455	1.1
MG-490	0.4
MG-4120	0.4

Appendix E: En and Epsilon Drives Physical Connections

Epsilon Eb/Ei Drives



En Drives


AC Power Input
(Located on top of drive)
Auxiliary Logic Power, DC
Bus access
(Located under plastic
knockout on top of drive)
FM Module Connector
EN-214
Digital Servo Drive
Analog Outputs
Drive Reset Pusbutton
Status Display
Command Connector
Serial Port
Digital I/O
Motor Feedback
Connection
Motor Power Connection

Appendix F: Serial Loopback Test

This procedure will demonstrate how to test the operation of a serial communication port (COM port) on an IBM compatible PC running Windows 95 or Windows 98. This procedure may also apply to computers running Windows NT 4 and Windows 2000 although this procedure has not been verified on those operating systems.
This procedure relies on a Windows communications utility called "HyperTerminal" being installed on your computer. To determine if you have this program installed follow these steps:

1. Click on the "Start" button on the Windows Desktop.
2. Select "Programs", then "Accessories", and then "Communications" from the popup menus.
3. If HyperTerminal is installed, you should see it in the "Communications" menu (See Figure 1). Note that on some computers, HyperTerminal may appear in the "Accessories" menu instead.
4. If HyperTerminal is not installed, either install it from your Windows CD or consult with someone who can help you with this process.

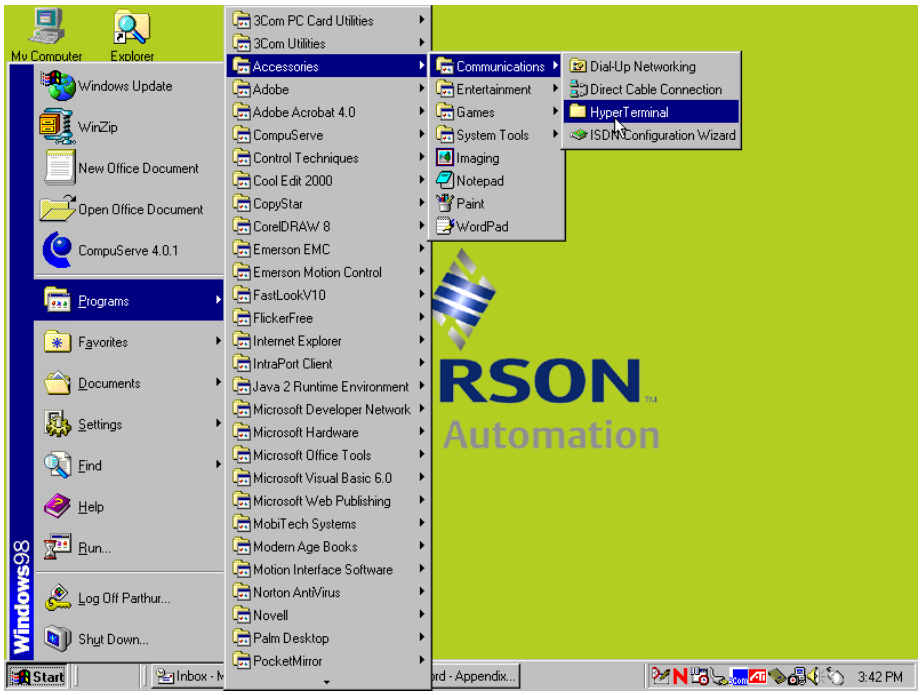


Figure 8

Initial Tests

If you are having communications problems and you are sure that the serial cable you are using is correctly configured per the serial cable wiring diagram (see Appendix A), verify that **none** of the following are true before proceeding:

1. **There are no other programs consuming the serial port's resources.**

   Typical examples of programs that can cause problems would be any Fax software or Palm Pilot software that may not be active and open, but yet are "poised and ready" in the Windows system tray (See Figure 2). These programs "watch" the serial port for any activity and when they detect a connection attempt will block access to the port. If you have any programs of this nature (including Allen Bradley's "RSLinx" software) close them at once by right clicking on their icons in the system tray and then closing the programs.

Figure 2

2. **You have the serial cable plugged into the wrong port.**

   Ensure that the serial communications cable is plugged into the serial port on the En/Eb/Ei drive. Refer to Appendix E for the location of the serial port on the drive.

3. **The power is turned off.**

   In order to communicate with any En/Eb/Ei drive, the main AC power must be present.

4. **The drive you are trying to communicate with is faulted.**

   There are certain faults that can cause communication failures. If you cannot reset the drive, it may be that you will not be able to communicate with it either.

Serial Loopback Test

Step 1: Re-start your PC

For best results, shut down and restart your PC. If you have just turned on the PC, ignore this step. Please refer to step 1 above if you see any Fax or Palm icons in the system tray after you restart your computer.

Step 2: Create a new HyperTerminal Connection

Open the HyperTerminal folder from the Windows start menu by clicking on it (See Figure 1). Once the folder is open, double click on the "Hypertrm.exe" shortcut (See Figure 3) to begin a new connection.

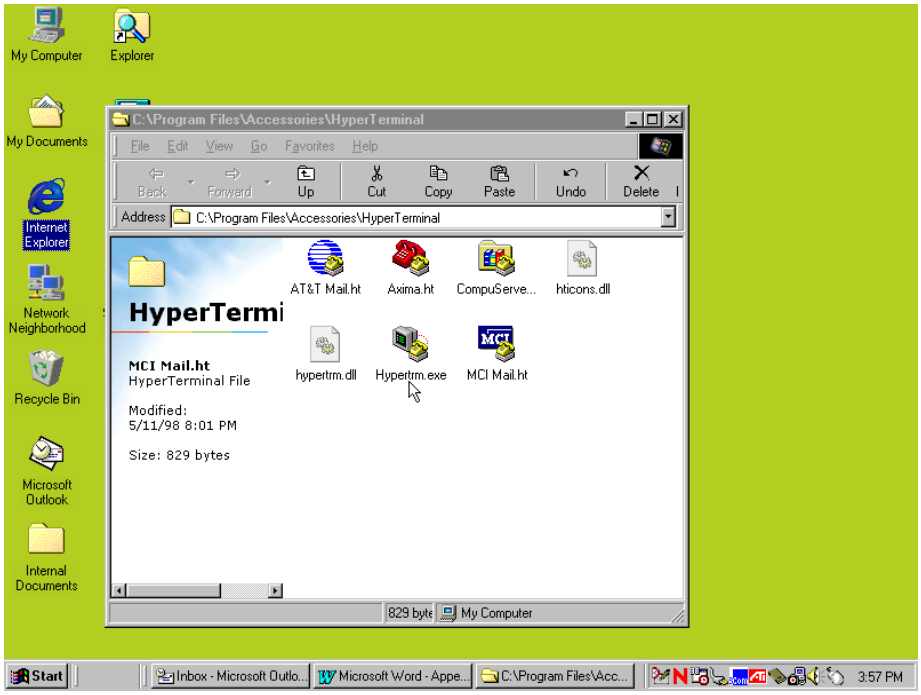


Figure 3

Begin by giving the new connection a name. A good choice would be "Com*x* Test" where x is the number of the Com port you are testing. In this example, Com 1 is being tested.

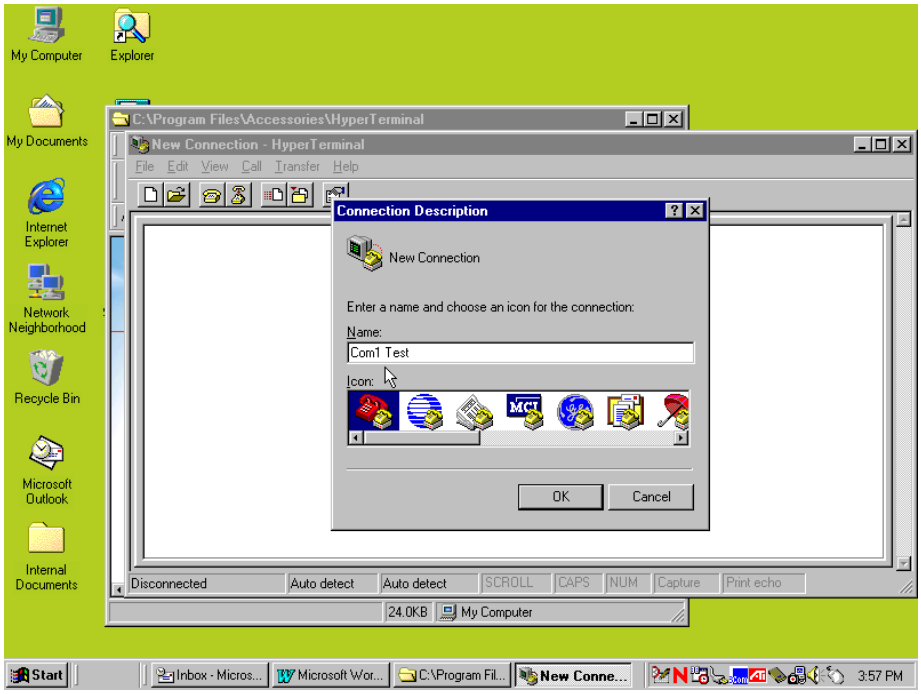


Figure 4

Next, you will be presented with the dialing properties dialog box. This program assumes that you are trying to connect to another computer using a modem. However, if you expand the “Connect Using” drop down box, you will see not only your modem (if you have one installed) but also all of the available Com ports. Select the Com port you would like to test from this list.

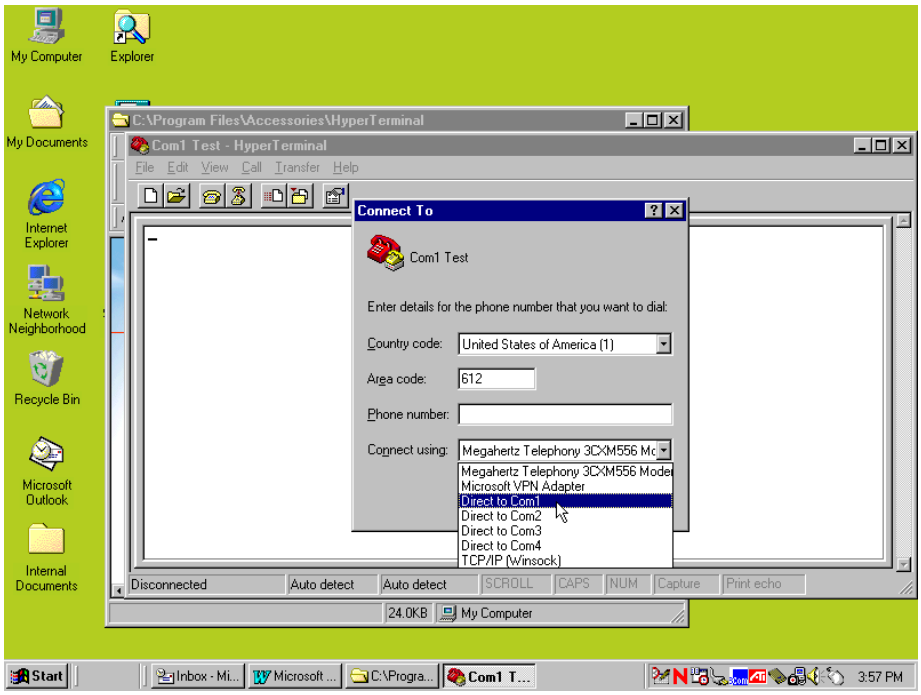


Figure 5

Next, configure the properties for the Com port you have selected. Ensure that your configuration matches the picture in Figure 6 exactly.

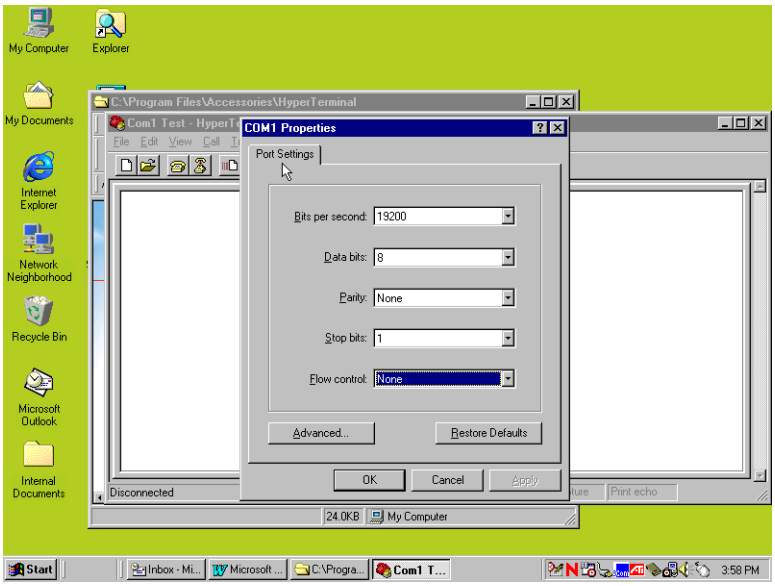


Figure 6

Once the Port Settings are defined, click on the OK button and HyperTerminal will open the Com port automatically. You can determine if the program is active by referring to Figure 7. HyperTerminal will show “Connected” in the lower left corner of the Status bar.

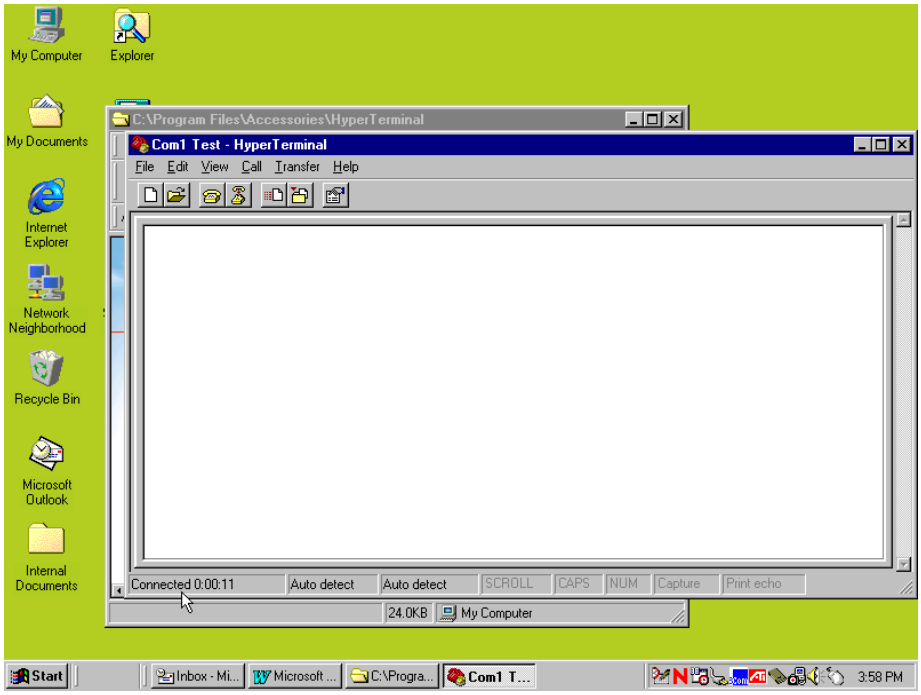


Figure 7

Do **not** expect the ability to communicate with an En/Ei/Eb drive using HyperTerminal. The En family of drive products, including Epsilon drives, communicate using a binary form of communication (Modbus). HyperTerminal uses ASCII protocol for all of its communications and therefore will not work. The point of this test is not to test the ability of the En/Epsilon drive to communicate, but rather to test the operation of your PCs Com port.
Disconnect the Com port by clicking on the Disconnect icon on HyperTerminal's toolbar (see Figure 8).

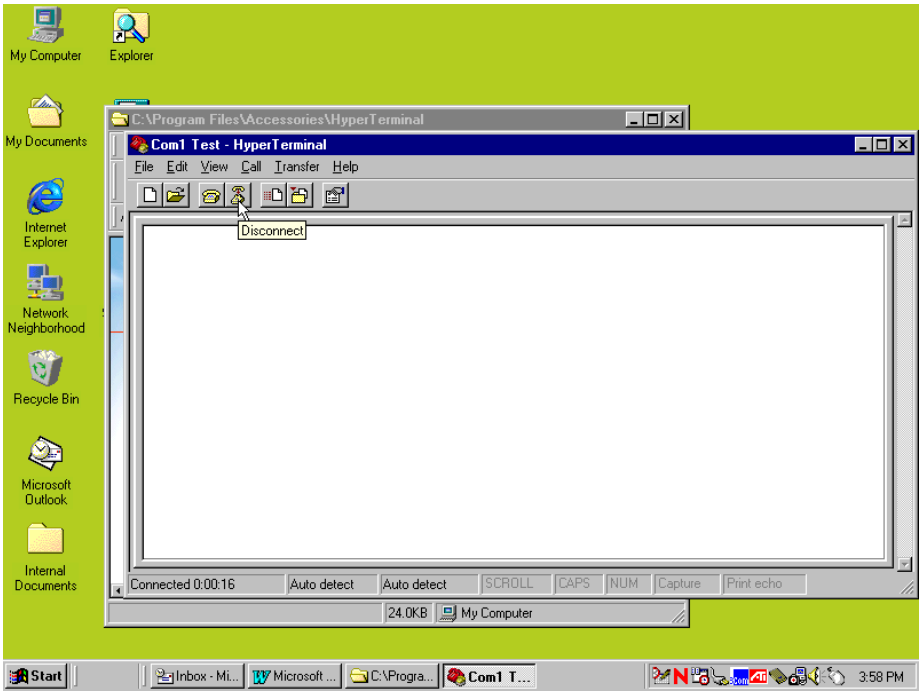


Figure 8

To complete the settings for the new connection, Select “Properties” from the HyperTerminal “File” menu as shown in Figure 9.

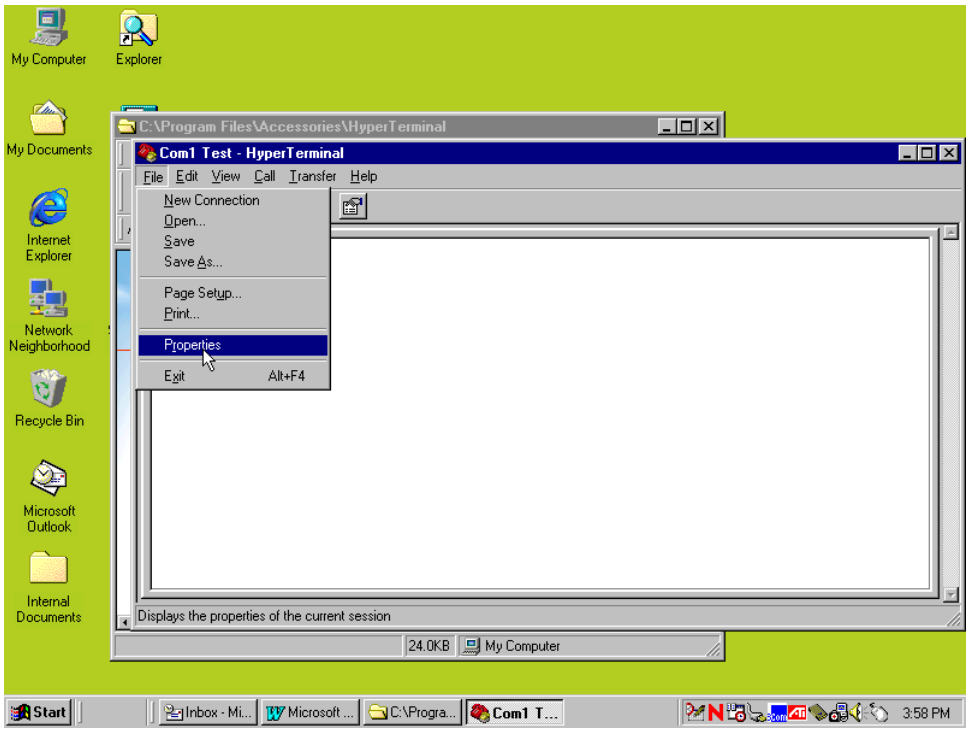


Figure 9

Click on the “Settings” tab as shown in Figure 10.

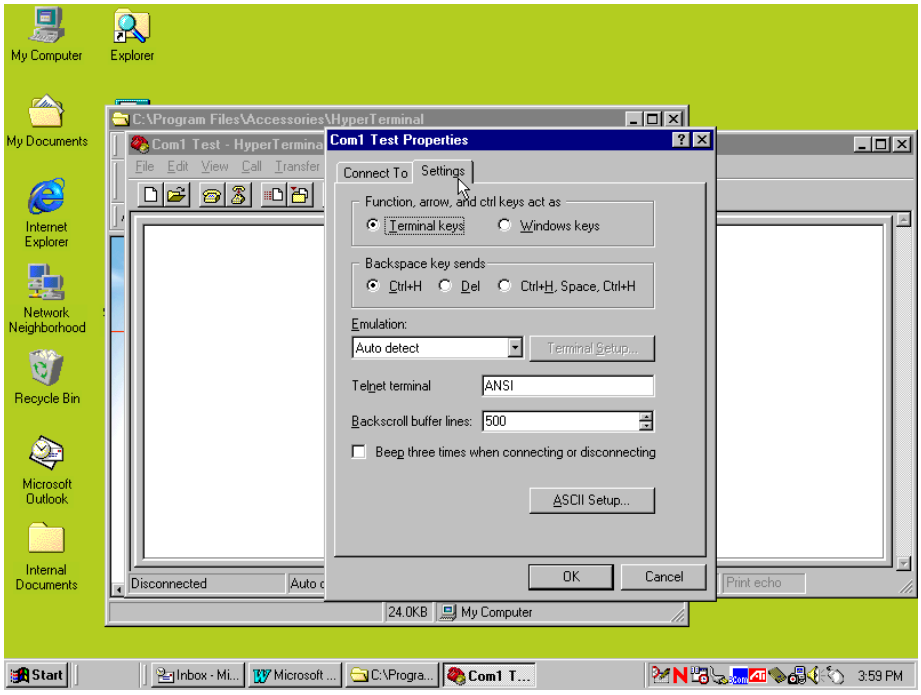


Figure 10

Expand the “Emulation” drop down list and select “ANSI” from the list.

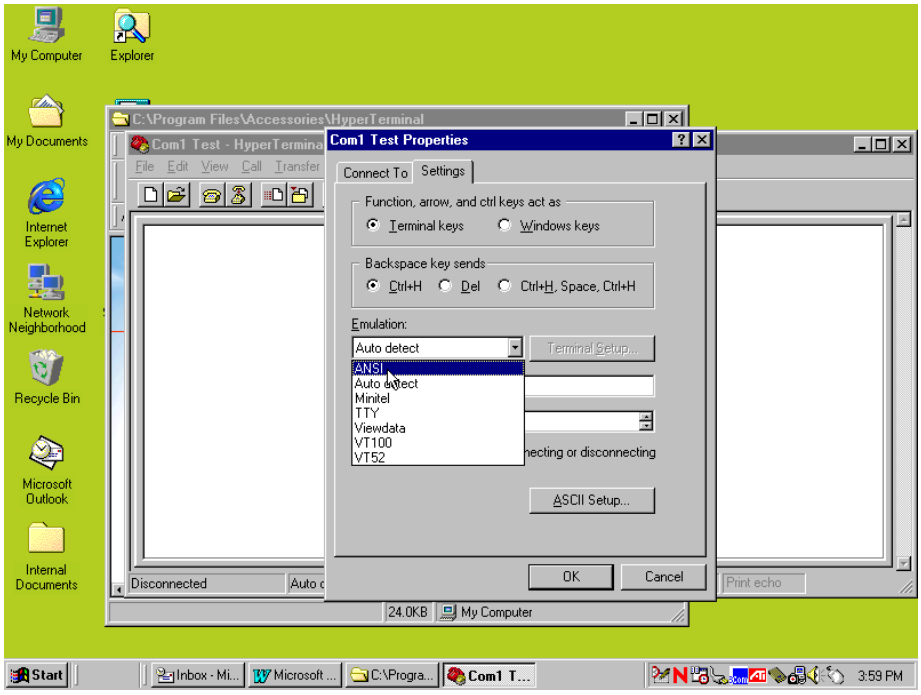


Figure 11

Save your new connection by selecting “Save” from the HyperTerminal “File” menu.

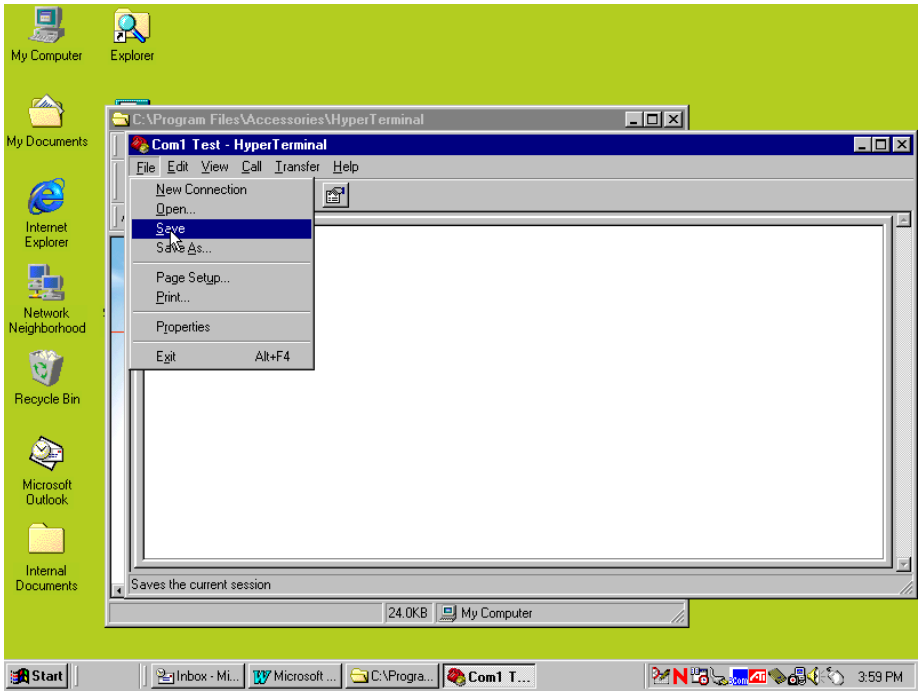


Figure 12

Close the HyperTerminal Program.

Step 3: Testing the Port

This step works best if you have a partner to help you.
Begin by removing the serial cable from the En/Epsilon drive communications port if you've not done so already. Be sure that the other end remains connected to your computer's serial port.
Have your partner hold the serial cable in his/her hand with the row of 5 pins facing him or her on top as shown in Figure 13.

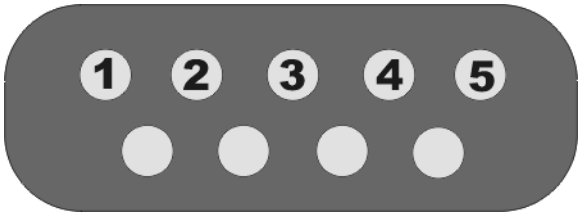


Figure 13

Using a metallic object such as a small screwdriver, short pins #2 and #3 together. The pin numbers will correspond to the diagram in Figure 13. Be careful not to accidentally touch any other pins!
Open the HyperTerminal connection that you configured in step 2.

Using the keyboard on your computer, type in some characters as shown in Figure 14. If your serial port is working correctly, whatever you type on the keyboard should be echoed back to the HyperTerminal screen. If you do not see any characters on the HyperTerminal screen, and you are sure that you have the correct pins shorted together on the cable, this would indicate that your computer's serial port is not functioning. Your choice is to have the port repaired, or switch to a different computer and try the procedure again.

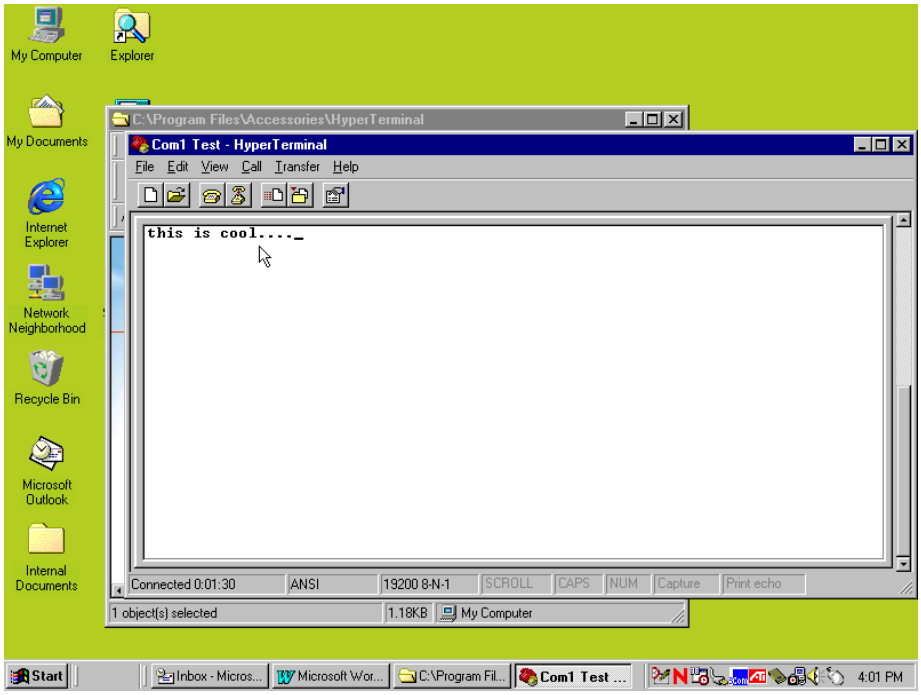


Figure 14


EMERSON
Industrial Automation