 FurnacePros DIVISION OF LOCHABER CORNWALL, INC.	LCM4 Controller & M4SENET-100 Ethernet Card	DOC NBR: TEC-513
		APRVD: JMC 17 MAY 10
Troubleshoot Instruction		PAGE 1 OF 8

1.0 SCOPE

1.1 Instructions for the troubleshooting the OPTO22 PLC Ethernet card.

2.0 EQUIPMENT AFFECTED

2.1 LCM4 Controller

2.2 M4SENET Ethernet Card

3.0 Hardware Communication and Software Troubleshooting

3.1 Controller Communication

The most often seen problem is no communication between the computer and the controller and is characterized by pound signs "#####" on the screen where you should have temperature or the date or any type of data.

Check the following things in this order:

Log Event Viewer: Any event happening between the computer and the controller is logged on this screen. You can access it by "ALT-TAB". The following are messages that are displayed:

- the normal message is "Attaching to Scanner"
- then a file download, such as the default recipe file.
- a message relating to the Ethernet card, make sure the coaxial cable is plugged in, and the controller IP address is correct.
- out of memory, switching to low scan mode; there is insufficient memory to run the software. Contact FurnacePros for additional memory.
- Incompatible gml file date/time; the source code has been changed, contact FurnacePros.

PLC: If you have communication, but it looks like some data is frozen, it may be a loss of communication between the PLC controller and the PLC modules. Check the PLC LCM4 controller module to be sure the LED's BATT, LINE AND STAT are green.

- Line "green" indicates 5VDC power status is good.
- BATT "green" indicates CMOS battery status is good.
- STAT "green" indicates the firmware is good.
- The LED's "TX" and "RX" indicate data is communicating between the controller and the modules.

Otherwise use the following table to troubleshoot communication problems:

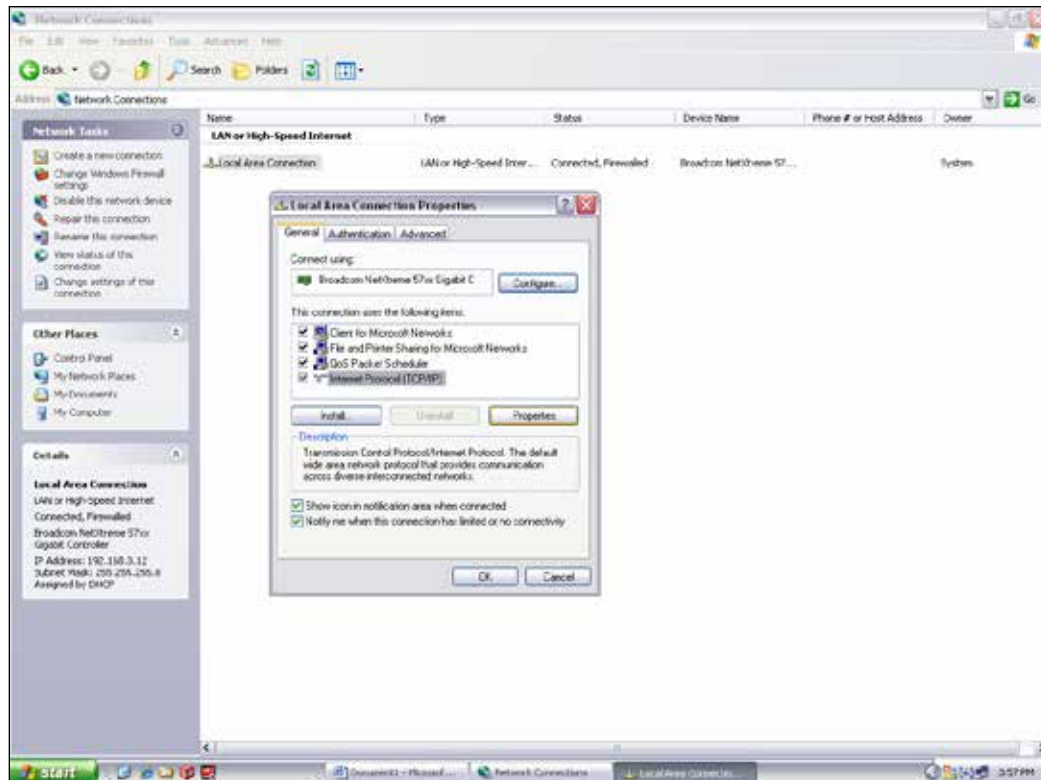
INDICATION	EXPLANATION	REMEDY
LINE LED is off	No Power.	Check wiring.
LIINE LED is red or Controller resets.	Power may be out of specification	Check the power supply for 5V DC power.
STAT LED is off	Controller is faulty	Call FurnacePros Technical Support.
STAT LED blinks red	Firmware problem	Call FurnacePros Technical Support
BATT LED is red	Backup battery is low	Replace backup battery.
RX LED is stuck on	Wiring polarity problem	Call FurnacePros Technical Support.
Controller cannot transmit to PC	Configuration jumpers were changed without cycling power.	Cycle power off/on and retry transmission.
No communication to host PC.	Communication Problems	Check serial port. Check PC IP address (10.192.105.100)
No communication to host PC. RX LED is on, but TX LED is off	Communication Problems	Check controller address (10.192.105.102), baud rate, and ASCII/binary settings.
No communication to host PC. RX and TX LEDs are on	Communication Problems	Try a slower baud rate.
No communication to I/O modules. TX LED is off while trying to communicate.	Communication Problems	Check that I/O port software is configured for correct port. If RX LEDs on I/O modules are off while trying to communicate, check for loose connections, shorts or breakage. IF RX LEDs on I/O are on, check I/O address, baud rate, and protocol setting in software.

If you have communication, but some variables appear as “###”, this means the controller does not know what this particular variable is. Check the Event Log viewer for more details.

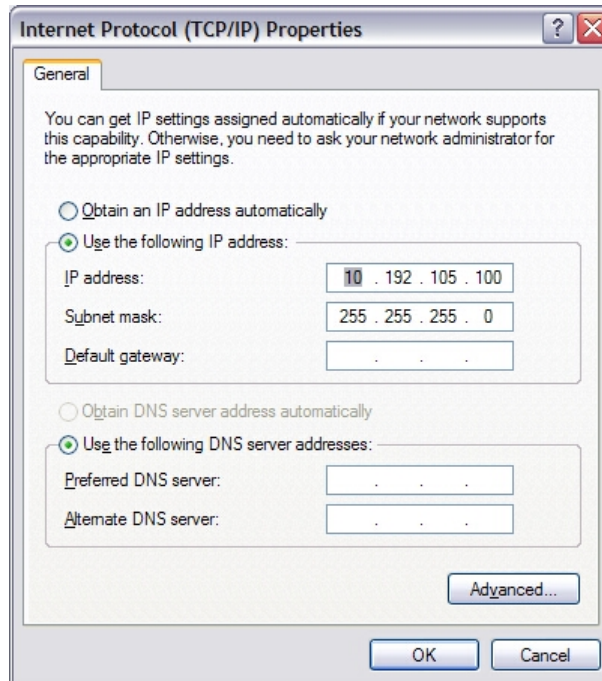
3.2 Ethernet Installation and Troubleshooting

3.2.1 Setup of Windows© PC Ethernet Interface

- a. Open Windows Control Panel<start\settings\control panel
- b. Double click on the “Network Connections” icon.
- c. Choose “Local Area Connection”, right click, “Properties”.
- d. Highlight “Internet Protocol (TCP/IP)”, make sure the box is checked.
- e. “Client for Microsoft Networks”, and “File and Printer Sharing for Microsoft Networks” should be checked.
- f. Click the pushbutton labeled “Properties”.



- g. A dialog box called “Internet Protocol (TCP/IP) Properties” will appear.
- h. On the “General” tab look for the following available two choices:
“Obtain an IP address automatically”
“Use the following IP address:”



Computer Internet Protocol for Local Area Connection

- i. For the case of setting up the communication link between the PC and the Opto22 Controller use the following information. (Setup of the communication link using the second Ethernet card on the PC will be shown afterward.)

- j. Select “Use the following IP address:”

Enter the following in the fields:

IP address: 10.192.105.100

Subnet mask: 255.255.255.0

Clear the Default gateway: fields, and the DNS server addresses fields.

- k. When the furnace PC computer contains two Ethernet cards, configure the “Local Area Connection2” communication link for the second Ethernet card as done above, however, with the following modification shown below:

- l. Select “Obtain an IP address automatically”; Click “OK”, “OK”.

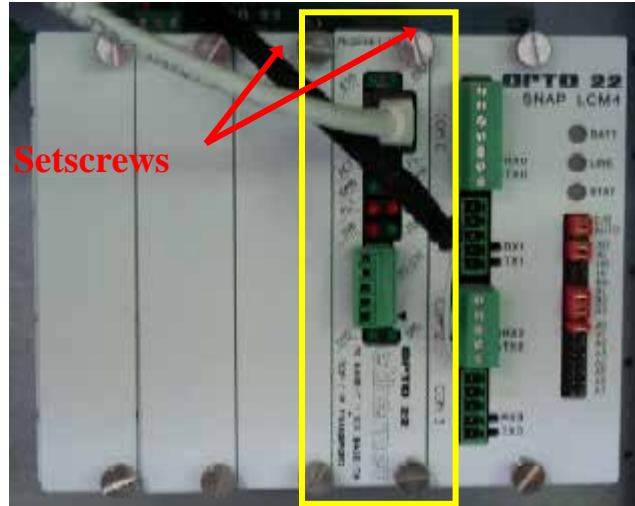
- m. Close “Network Connections”.

3.3 Reset and Assign an IP Address to the Controller’s Ethernet Adapter Card.

- a. Remove power from the controller chassis box.
- b. Remove the controller’s Ethernet adapter card from the controller chassis.

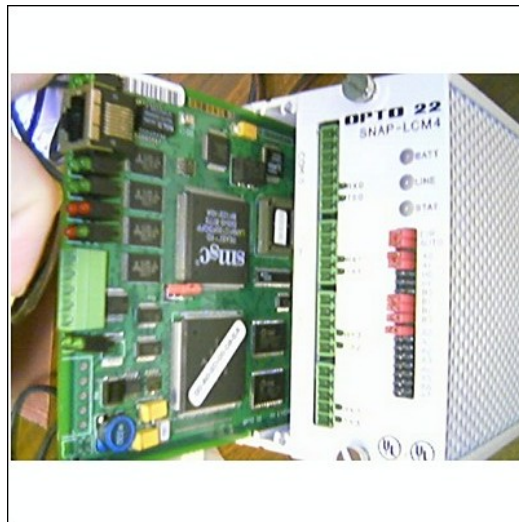
Note: Follow standard anti-static dissipative procedures when removing and handling the card.

- c. Remove Ethernet and RS-232 connectors
- d. Release (4) front panel set screws and (2) covers



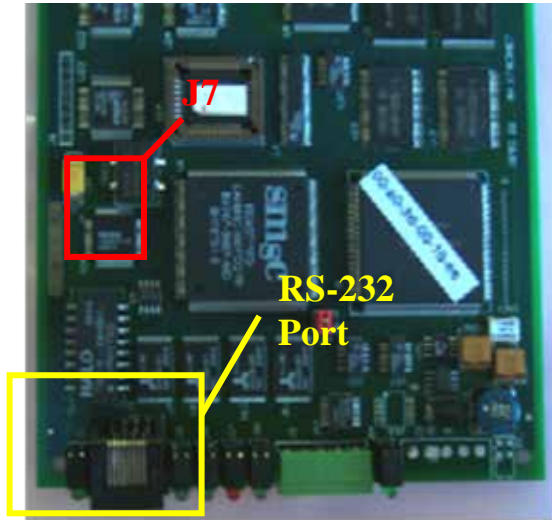
Remove Card from chassis. (See figure below)

- e. Release (4) front panel set screws and (2) covers



Removal of Ethernet Card

- f. Move the J7 Jumper to the Module Reset Position as shown in the following pictures.



Location of Port and J7 Jumper



Move J7 Jumper to Module Reset

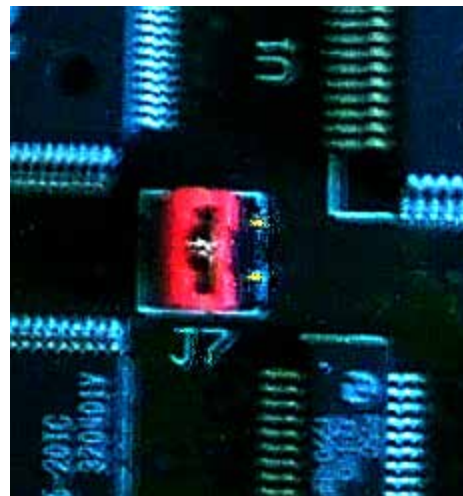
- g. Reinstall the Ethernet adapter card into the Opto22 controller chassis box.
- h. Wait for the STD LED on the Ethernet adapter card to stop blinking, and then turn off, or remove power from the system.

Note: The power switch on the PC may need to be initialized.

- i. Apply power to the controller system.

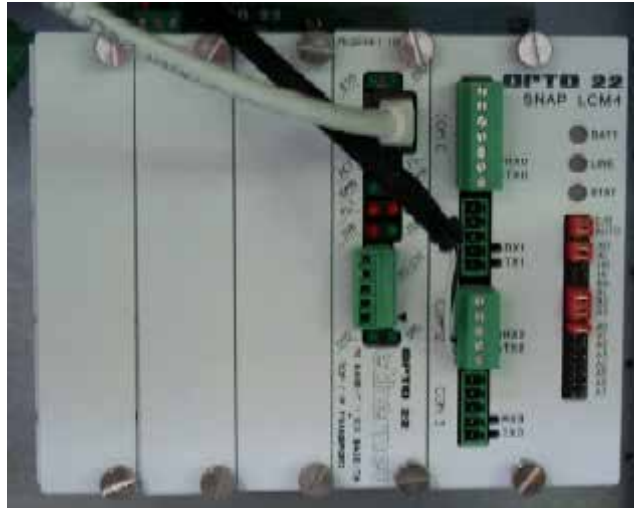
Note: This procedure resets the Ethernet Adapter Card to its factory default settings.

- j. After removing power from the controller system, again remove the Ethernet Adapter card and restore the J7 Jumper to its original position as shown at right



Original J7 Position

- k. Reinstall the Ethernet Adapter card into the Opto22 controller chassis box making sure the covers and set screws are in place.



Ethernet Adapter

- l. From the Windows® Toolbar, Select <Start/Programs\Opto22\OptoUtil\OptoBootP Utility>
- m. On the “OptoBoot Tool” dialog box, click the “Listen” pushbutton located at the upper right.

- n. After a few seconds, in the dialog box’s data window, a Mac address will be listed followed by 0.0.0.0 IP Address and a ????. Subnet Mask.

Double Click on the 0.0.0.0 field to assign an IP Address

Enter “10.192.105.102” for the IP Address and “255.255.255.0” for the Subnet Mask. Leave the Gateway field 0.0.0.0.

Click the “Send” pushbutton to assign the entered address.

The data window should now be updated to display a “Yes” under the “Sent” Column.

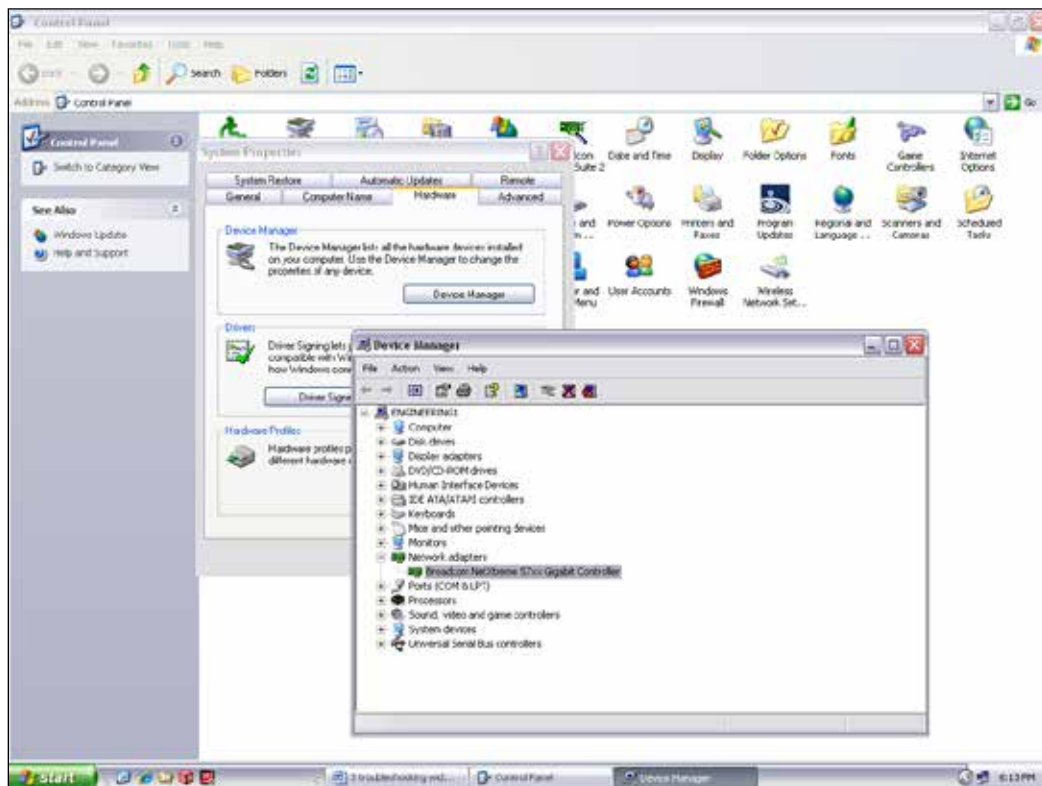
- o. Click on “Exit” to leave the OptoBoot tool application.



OptoBoot Screen

3.4 Troubleshooting Windows® Setup of Ethernet Connection

- a. Open Windows Control Panel<start\settings\control panel>
- b. Double click on the “System” icon.
- c. A dialog box called “System Properties” will appear.
- d. On the “Hardware” tab look for the pushbutton called “Device Manager”.
- e. Click on “Device Manager”. A listing will appear showing the hardware devices installed on the computer. Verify the Ethernet card(s) are shown in this list.
- f. Exit “Device Manager”, “OK”, close Control Panel.



- g. Open Windows Control Panel<start\settings\control panel>
- h. Double click on the “Network Connections” icon.
- i. Check to see that the network connection for the communication link between the PC and the Opto22 Controller (Local Area Connection) appears under the listing Name “LAN or High-Speed Internet”.
- j. Choose “Local Area Connection”, right click, “Properties”.
- k. Highlight “Internet Protocol (TCP/IP)”, make sure the box is checked.
- l. Click the pushbutton labeled “Properties”.
- m. Within the dialog box, “Internet Protocol (TCP/IP) Properties”, in the “General” tab, verify that “Use the following IP address:” is selected and the following address information is entered:
IP address: 10.192.105.100
Subnet mask: 255.255.255.0
- n. Click “OK”, “OK”.
- o. Close “Network Connections”