Lakewood Automation
27911 Clemens Road Westlake, Ohio 44145

CJ1W-ETN11 ETHERNET CONNECT FROM INTERNET.

PURPOSE:

This document will show how to configure the settings on the CJ1W-ETN11 Ethernet Module to connect remotely through a router or via the Internet.

REQUIRED EQUIPMENT:

1.	CJ1M-CPU11-ETN	Omron CJ1 PLC
2.	CJ1W-PA202	PLC power supply
3.	Ethernet Cables	Cat 5 Straight or Crossover
4.	CS1W-CN226	Toolbus Serial Cable

REQUIRED SOFTWARE:

1.	CX-PROG V5	Omron PLC Programming Software

DISK:

CJ1W-ETN11 connect remote.doc	The file you are reading.
CJ1M_Ethernet.cxp	CX-Programmer PLC program file
CJ1M_Ethernet.opt	CX-Programmer opt file

HELPFUL MANUALS:

W343 – CS/CJ Series Ethernet Unit Operation Manual
W393 – CJ1 Operation Manual

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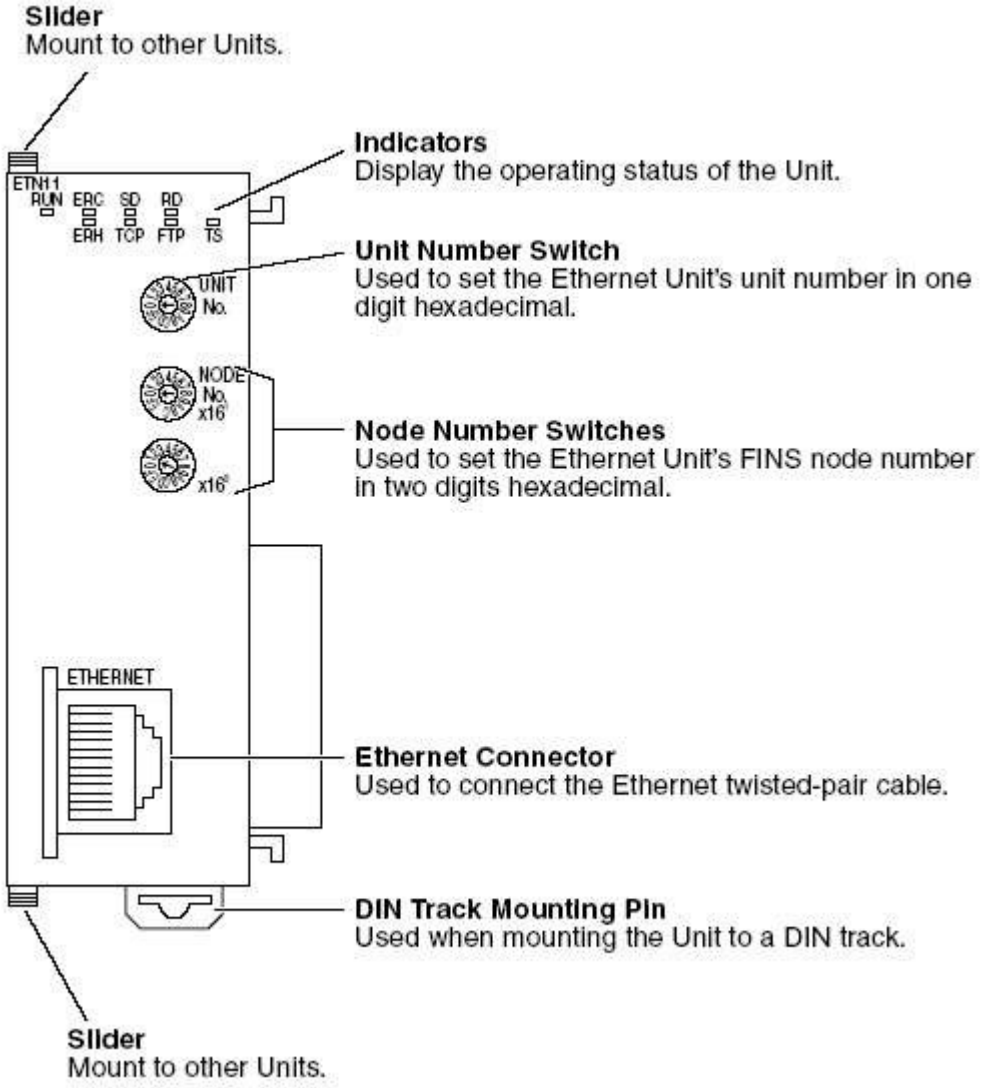
INSTRUCTIONS:

The first thing the user must do is setup the Ethernet card, CJ1W-ETN11. The CJ1W-ETN11 is Omron's 10 base T Ethernet card; the CJ1W-ETN21 is the 100 base T Ethernet card. Setup applies to both; the only difference is how quickly the card can pass data. The user must set a proper UNIT NUMBER. In our example, we are unit number 0. The users must also set up a valid NODE NUMBER. In our example we set the node number to be 59 on the rotary switches. This number is in hexadecimal. The user must convert that number to decimal (89).



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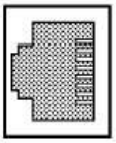


Connector pin	Signal name	Abbr.	Signal direction
1	Transmission data +	TD+	Output
2	Transmission data –	TD–	Output
3	Reception data +	RD+	Input
4	Not used.	---	---
5	Not used.	---	---
6	Reception data –	RD–	Input
7	Not used.	---	---
8	Not used.	---	---

This is the Ethernet socket pin out.

Examples Used IP Addresses

10.0.089	Ethernet PLC
10.0.0.43	LAN Gateway
66.178.233.41	Routers mapped IP to Ethernet PLC
207.166.222.153	Outside PC

Ok, first lets review what users are trying to do here. The user has an Ethernet module on the PLC. The user has a private network. This network sits behind a router. (See picture below) If the user is not familiar with a router go here, http://www.webopedia.com/TERM/r/router.html

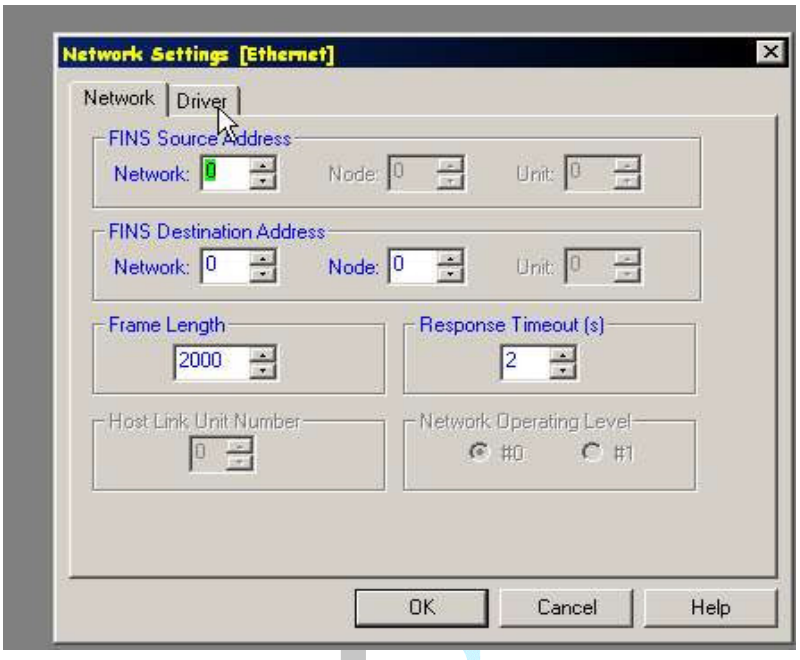
This is a typical Router.

Also the user has a switch in line with the router. If the user is not familiar with a switch go here, http://www.webopedia.com/TERM/s/switch.html

This is a typical Switch

So the user has a PLC tied to a Switch and sitting behind a Router, and the user is somewhere completely different but has a PC and an Internet connection. The user can "remotely" log into that PLC by following these instructions. This can be useful because now the programmer or tech person has no need to travel to that specific site and can sit in the users office and remotely program!

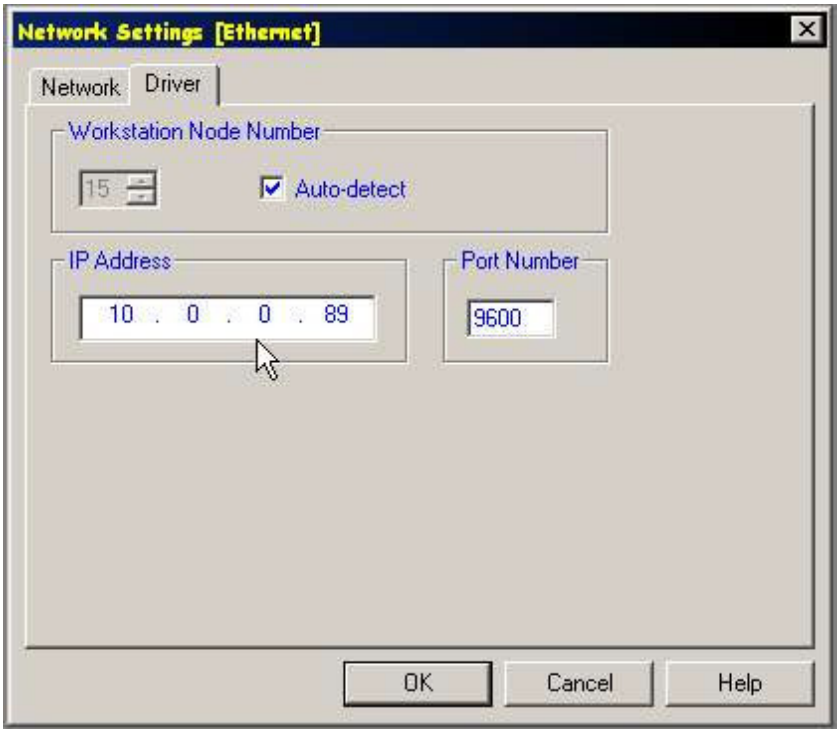
The user must open CX-Programmer and start a program up for the CJ1 PLC. This must be done at the PLC's site. The user must double click on the PLC type and configure the type as Ethernet and click on the Driver tab.



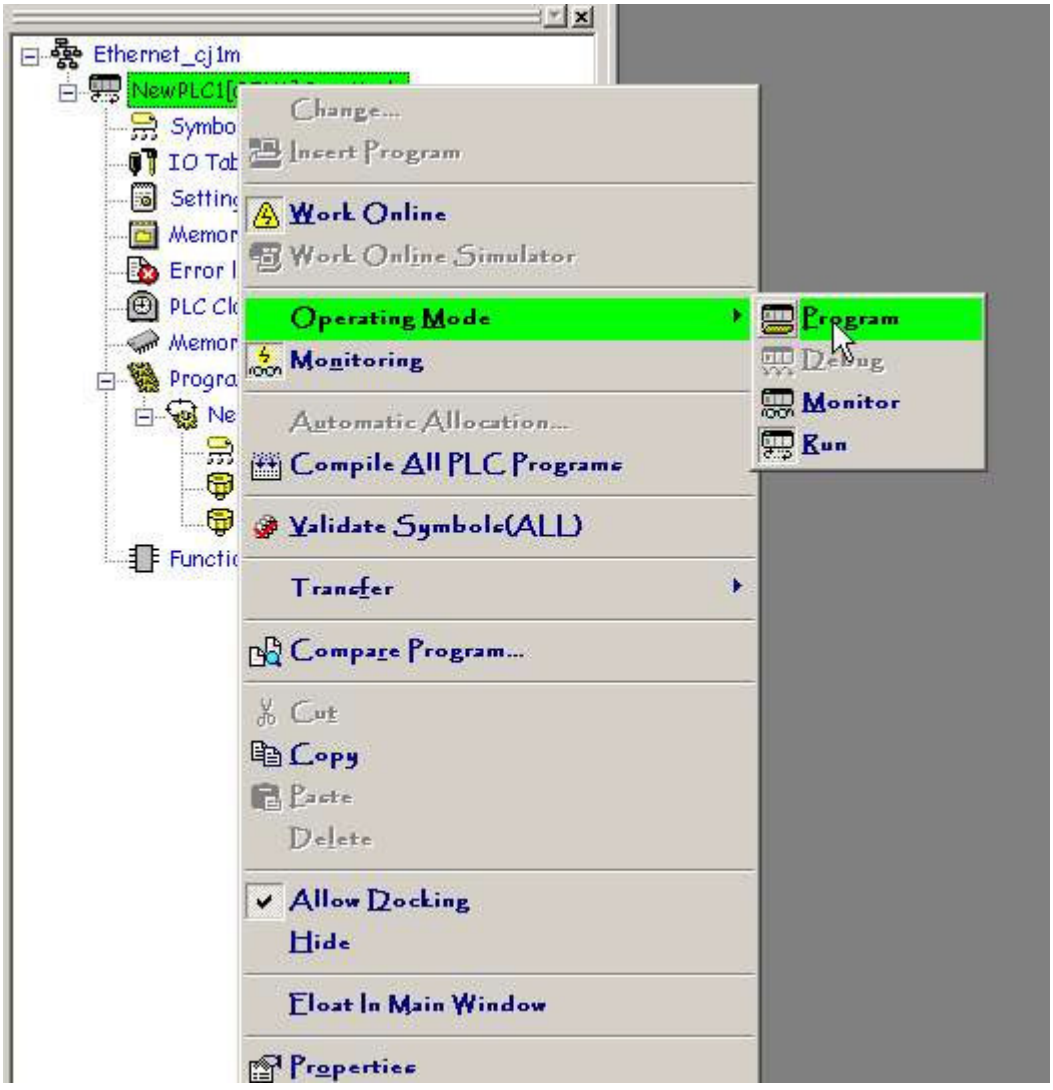
Once the user is in the driver tab, the user must assign the IP Address. The user then can say OK, and close out of this section.

The IP Address is 0A.00.00.**59** in hex.

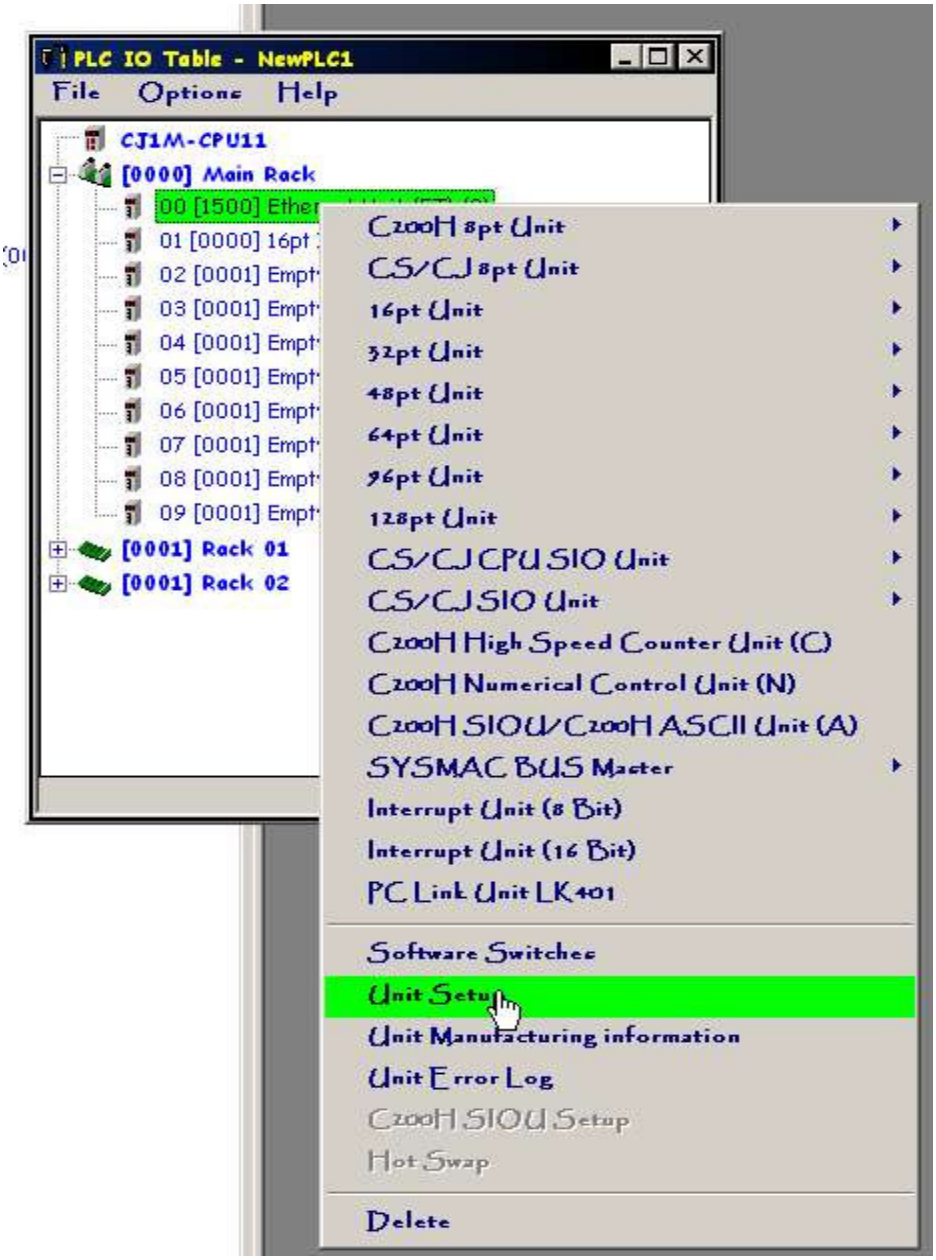
This converts to 10.0.0.**89** in decimal.



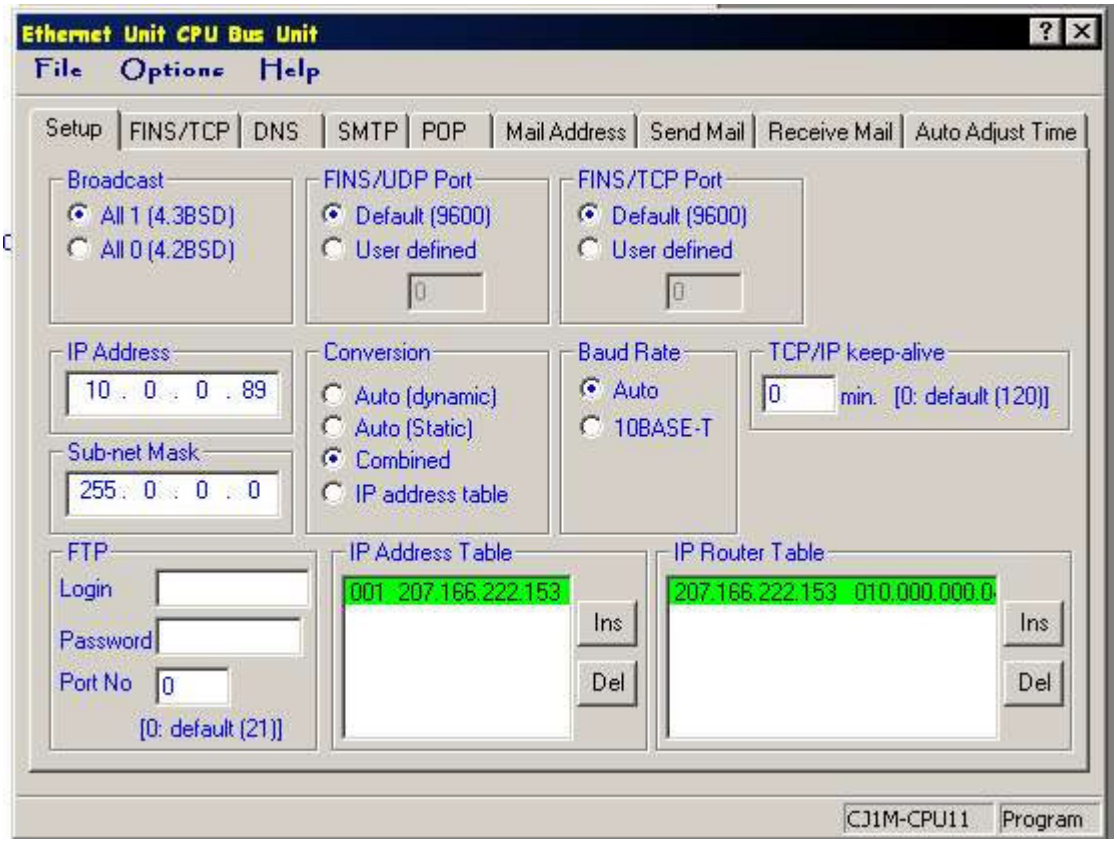
Once the user has done this and connected to the PLC, the user must place the PLC in PROGRAM MODE. (See Picture Below)



The user must then double click on the IO TABLE to pop open the PLC IO TABLE. The user the can right click on the Ethernet module, and go to unit setup.



After the user right clicks on Unit Setup this screen below will pop up. This screen is where everything is configured in the Ethernet Card. First of the user should set up the IP address and the Sub-net Mask. Before the user fills everything in the user should set vague IP address up and try to PING the Ethernet card. (See Below the Picture for information on PING)

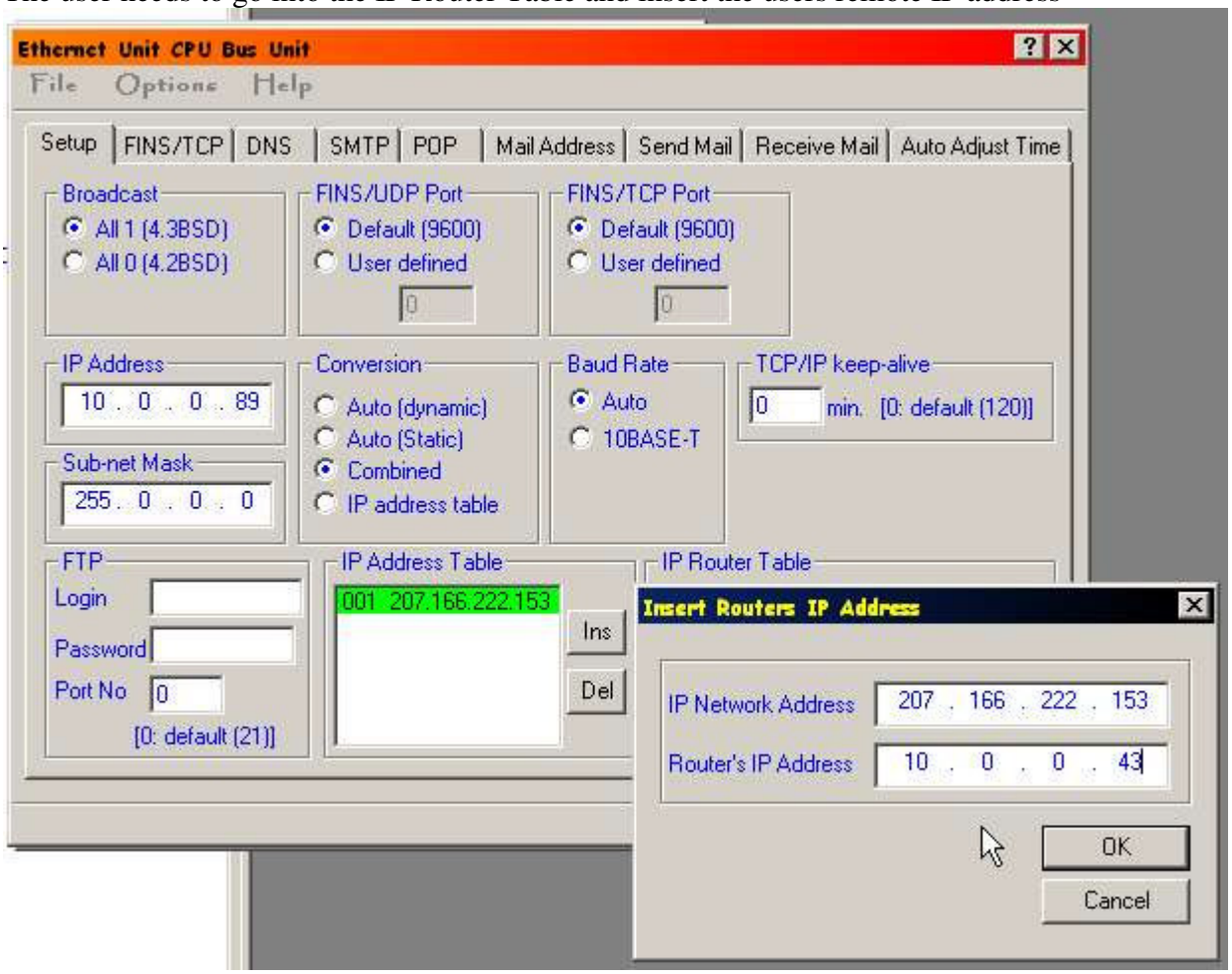


3-12-2 PING Command

The PING command checks communications with another node by sending an echo back request packet and receiving a response packet. Use the PING command as required to check communications. Using the PING command between nodes that support the PING command makes it possible to check whether internode communications are normal.

For details on using the PING command, refer to *9-2 PING Command*.

The user needs to go into the IP Router Table and insert the users remote IP address



If the user sets up a vague IP Address, with our given example, into the IP Router Table the user should be able to Ping the module. The user must also TRANSFER TO THE PLC, the changes the user just made.

In the **IP Router Table:**

IP Network Address 207.0.0.0
Router's IP Address 10.0.0.43
With a Sub-net mask 255.0.0.0

3-11 Creating an IP Router Table

An IP router table is a table of correspondences between IP router IP addresses and the network numbers of segments relayed by the IP router. If the Ethernet network is configured of multiple segments, an IP router table must be registered for communications between the segments. (For details on segments and connecting nodes, refer to *1-2-2 Node Connections*.)

If the Ethernet network has the minimal configuration of just one segment, there is no need to create an IP router table. In that case, proceed to *3-12 Checking Communications*.

Note

1. An IP router table needs to be created only when the IP address table method or the combined method is used for address conversion.
2. With CJ-series Ethernet Units, it is possible to register one default IP router (the IP router selected when the applicable network number is not registered).

Connecting and Using a Programming Device for the PC

The IP router table must be created using the Unit settings on a CX-Programmer connected to the PC. It cannot be created using a Programming Console. For details on how to connect and use a CX-Programmer, refer to the *CX-Programmer User's Manual*.

The user at this point should be able to ping from outside the private network into the private network. Once the user can PING pass the Router, then the user is well on the way to setting this up.

The user then needs to go back to the PLC and set up a few more items. The user will need to fill in the COMPLETE IP address in the IP Router Table.

The IP NETWORK ADDRESS should be the IP address of the machine that sits outside the private network or LAN.

The ROUTERS IP ADDRESS should be the IP address of the "gateway" inside the private network or LAN.

(See Picture Below)

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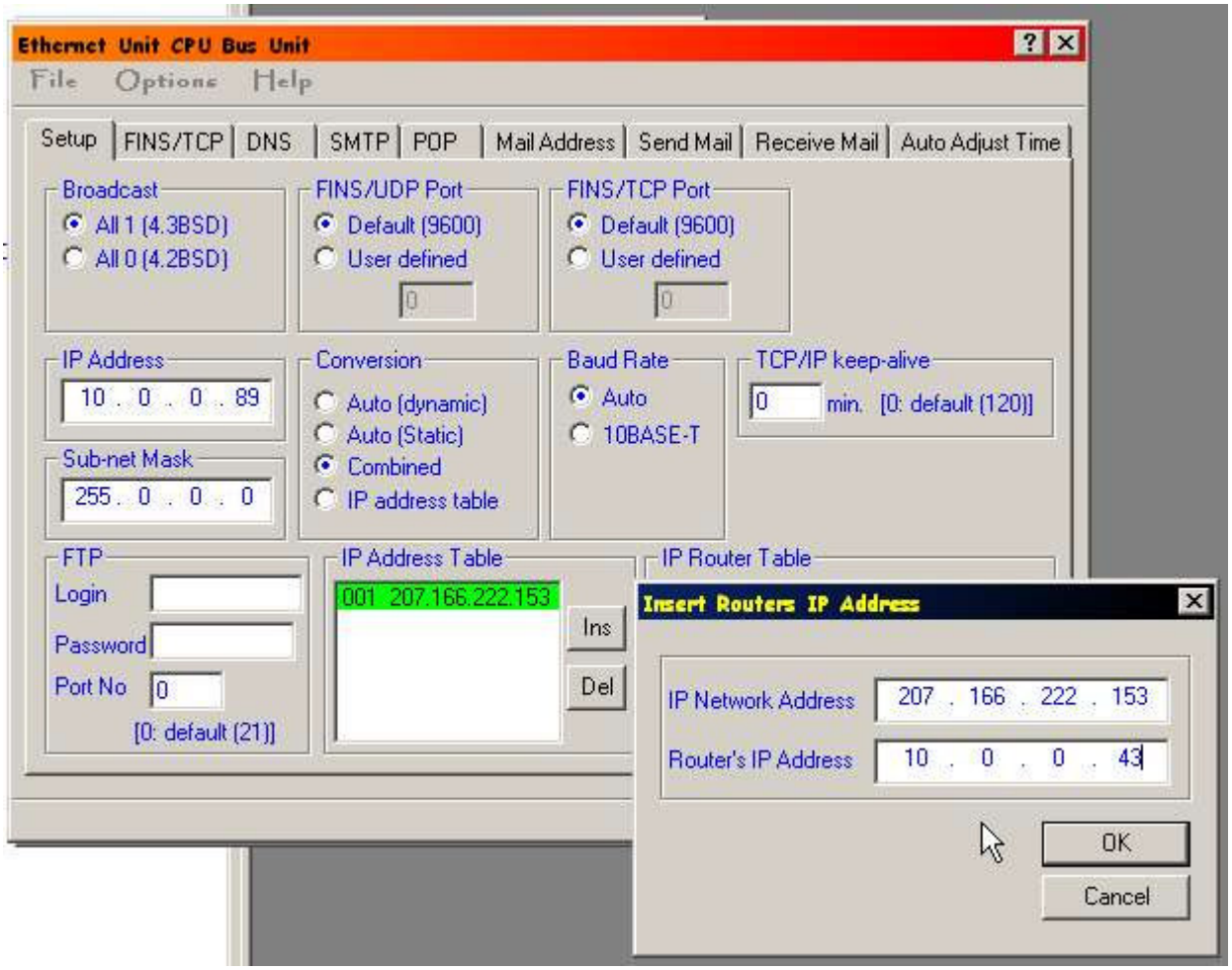

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Once the user has all this information entered in the proper spot, the user needs to place an IP address into the IP Address Table. The user must place the IP address of the PC that sits outside the LAN into the table and assign the IP address a node number. In our example we used Node Number 1. This is completely different than the Node Number set on the face of the Ethernet card and has nothing to do with it.

3-10 Creating an IP Address Table

An IP address table is a table of correspondences between node numbers and IP addresses, and it is used for finding IP addresses from FINS node numbers. It is necessary to register an IP address table when using the IP address table method as the method for address conversion. (For details regarding preliminary procedures, refer to *3-1 Before Operation*.)

An IP address table does not necessarily need to be registered in order to use the combined method for address conversion. If none is registered, however, the automatic address generation method will always be used.

If the automatic address generation method is to be used exclusively, then there is no need to register an IP address table. In that case, proceed to *3-11 Creating an IP Router Table*.

Connecting and Using a Programming Device for the PC

The IP address table must be created using the Unit settings on a CX-Programmer connected to the PC. It cannot be created using a Programming Console. For details on how to connect and use a CX-Programmer, refer to the *CX-Programmer User's Manual*.

Note An IP address table can also be registered using the FINS command IP ADDRESS TABLE WRITE. For details, refer to *IP ADDRESS TABLE WRITE* on page 237.

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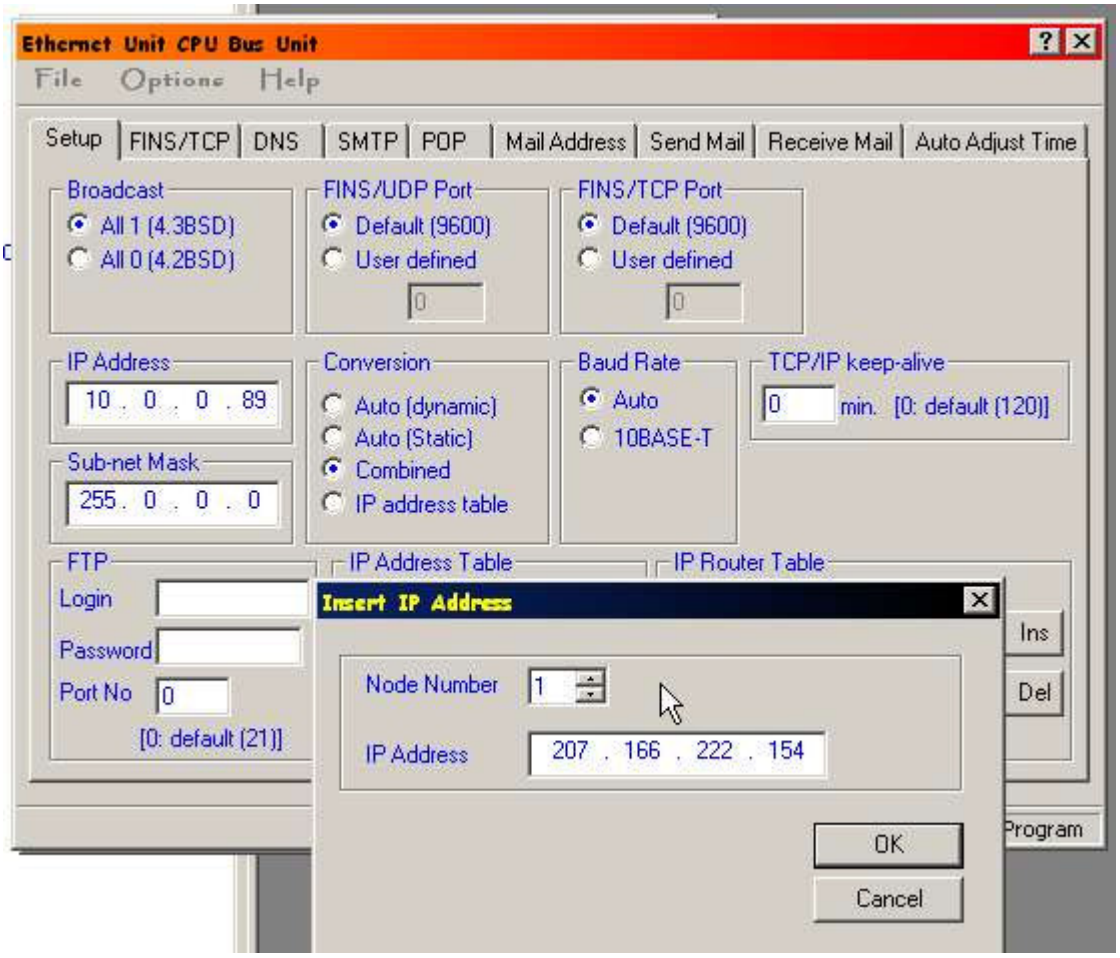

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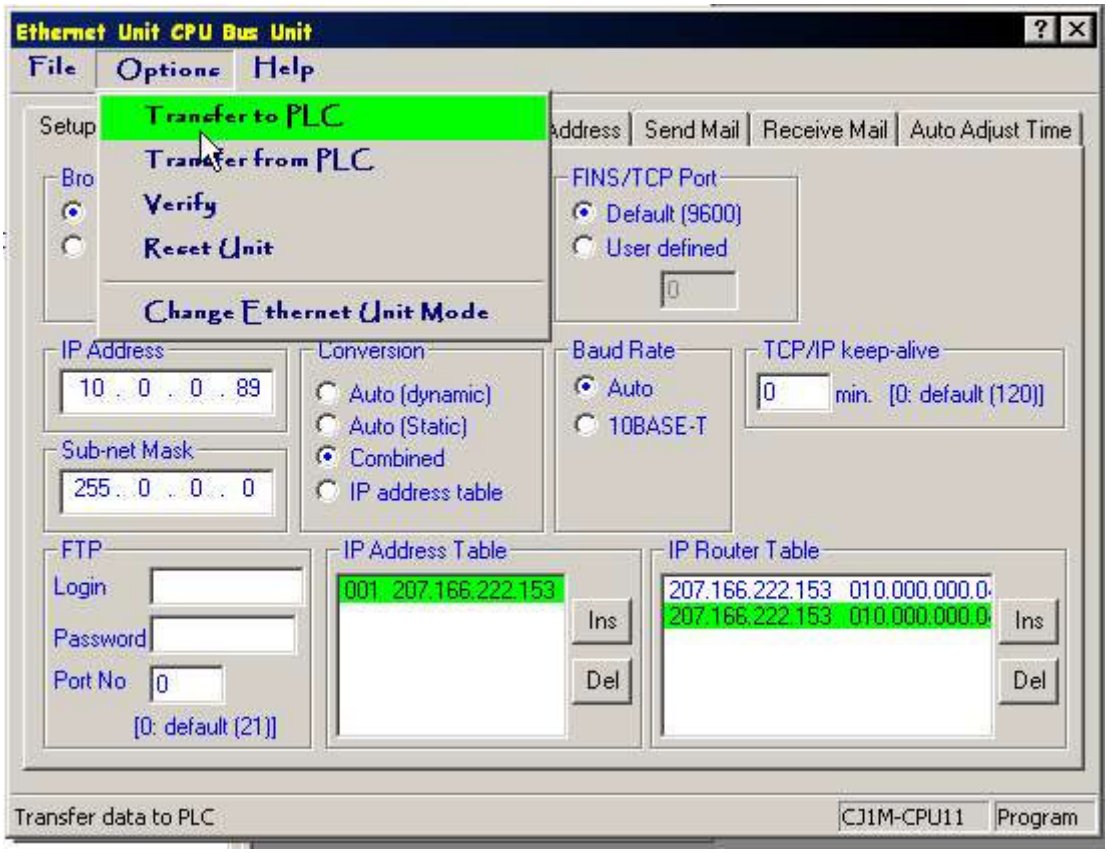
The user must also set the IP Conversion to be COMBINED.

After the user has everything set up correctly the user has to once again transfer the data to the PLC. This all has to be done at the PLC's site. Once the new data is in the PLC, the user can Verify. If the Verification is ok, the user is done at the PLC's Site.



The user then needs to go to the remote site and take the same program or make a new one that matches the setup for the PLC type. The user must set this up as Ethernet. Again the user has to do to the Driver tab. The user must set 2 items up here.

The first is the Workstation Node Number as 1. This is because we set this up to be 1 in the IP Address Table.

The second thing the user must do is to place the IP Address of the Router into the IP address section.

Now the user should connect right up and can do an UPLOAD to get the current program in the PLC.