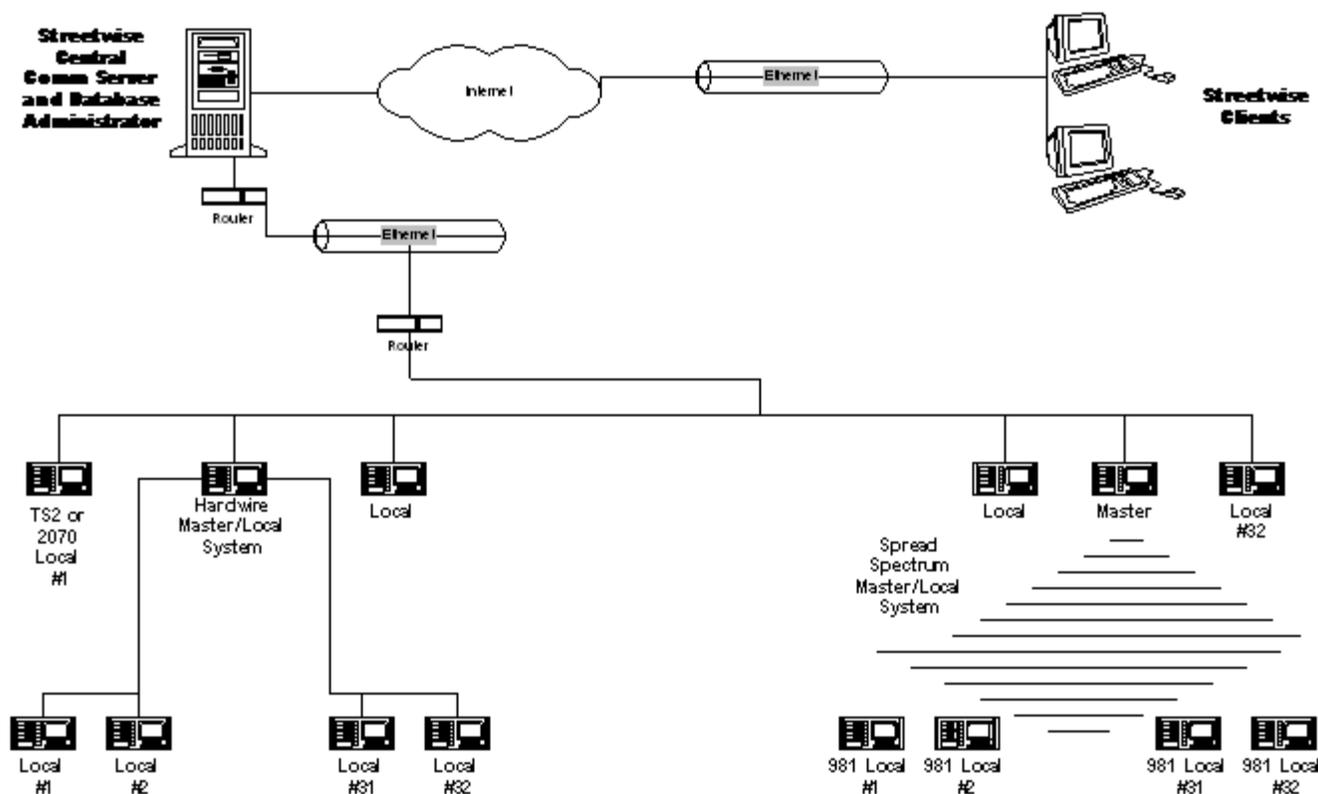


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## TecNote 1006 - Setting Up IP addresses in a Streetwise System and Associated Field Devices

The purpose of this TecNote is to help the user configure a Naztec 980 Secondary Version 61.x , a 981 Master Version 61.x or a 2070 v65.x Controller for use in a Local Area Network, such as one is shown below:



### Internet Terminology

Before discussing how to set up Internet Protocol addressing in a StreetWise system a small glossary of Internet terms will be helpful to you.

**Ethernet:** Ethernet is one of the most popular protocols for Local Area Networks (LAN). The terms Ethernet and the IEEE 802.3 standard are often used interchangeably. Ethernet supports data transfer rates of 10 Mbps. Another version of Ethernet, called 100Base-T (or Fast Ethernet) supports data transfer rates of 100 Mbps. The newest version, Gigabit Ethernet, supports data rates of 1 gigabit (1,000 megabits) per second.

**IP:** Internet Protocol (IP) is the routing layer packet (datagram) delivery service of the TCP/IP suite. IP specifies the addressing scheme.

**IP address:** The thirty-two bit, numeric, Internet Protocol (IP) address is an identifier for a computer or another device on a TCP/IP network. Messages are routed based on the IP address. IP uses 4-byte addresses, like 192.168.1.1 Each byte in the address can range from 000 to 255. Normally for a Naztec LAN setup, all roadside devices, as well as the central computer, will have the first three bytes of the IP address be the same. Byte 4 will uniquely identify each device connected to the network and must be different.

**IP Subnet Masks:** Subnet masks are used in IP to determine which part of the four-byte IP address describes the network you're on, and which part describes which host you are on that network segment. For example, when using a subnet mask of 255.255.255.0, the first three bytes indicate the network you're on, and the last byte is the host you are on for that network. Hosts 1 through .254 are available. The user will be normally using a Subnet Mask of 255.255.255.0.

**MAC address:** The Media Access Control (MAC) address is a hardware address that uniquely identifies each node of a network and is built into the Ethernet Hardware. The user generally does not have to know the MAC address when setting up a Naztec system.

**Static IP Address:** This is a fixed address that must be used for the Naztec StreetWise Network System. All roadside devices require a static IP address that the Central will access.

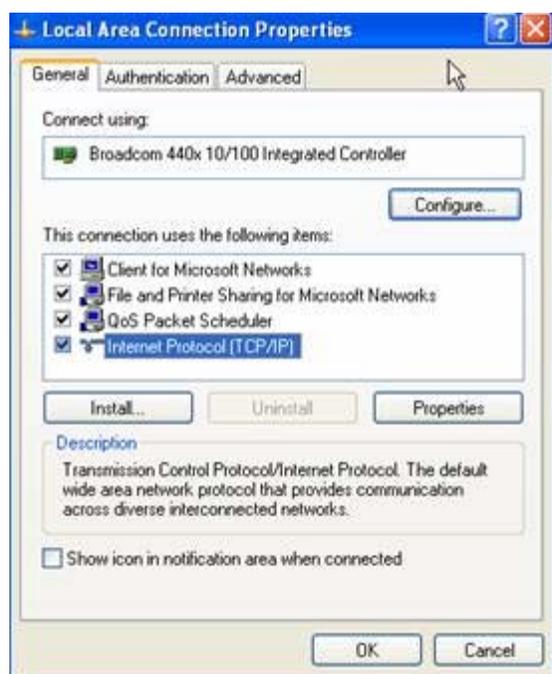
**TCP:** Transmission Control Protocol (TCP) provides a reliable stream delivery and virtual connection service to applications, through the use of sequenced acknowledgement with retransmission of packets when necessary (TCP/IP).

## Programming the StreetWise Central Network Connection in Windows

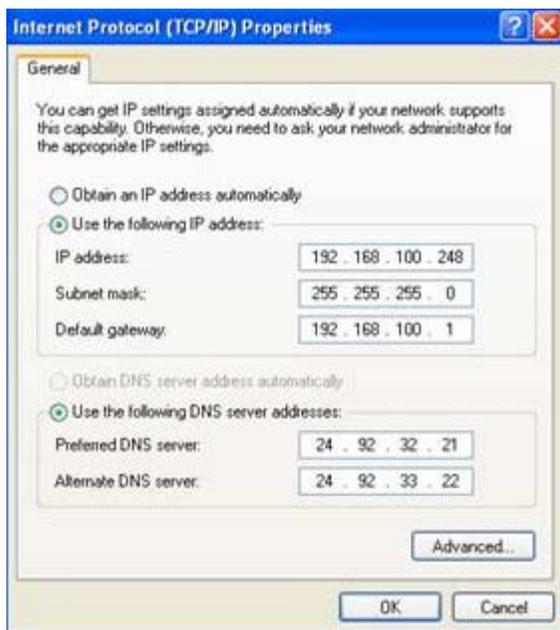
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The following steps are required to setup the Central Connection using a Windows operating system such as XP..

1) To set up the Central Host computer, go to Control Panel then Network Connections and Right Click on Local Area Connection and choose Properties. The following screen should come up:

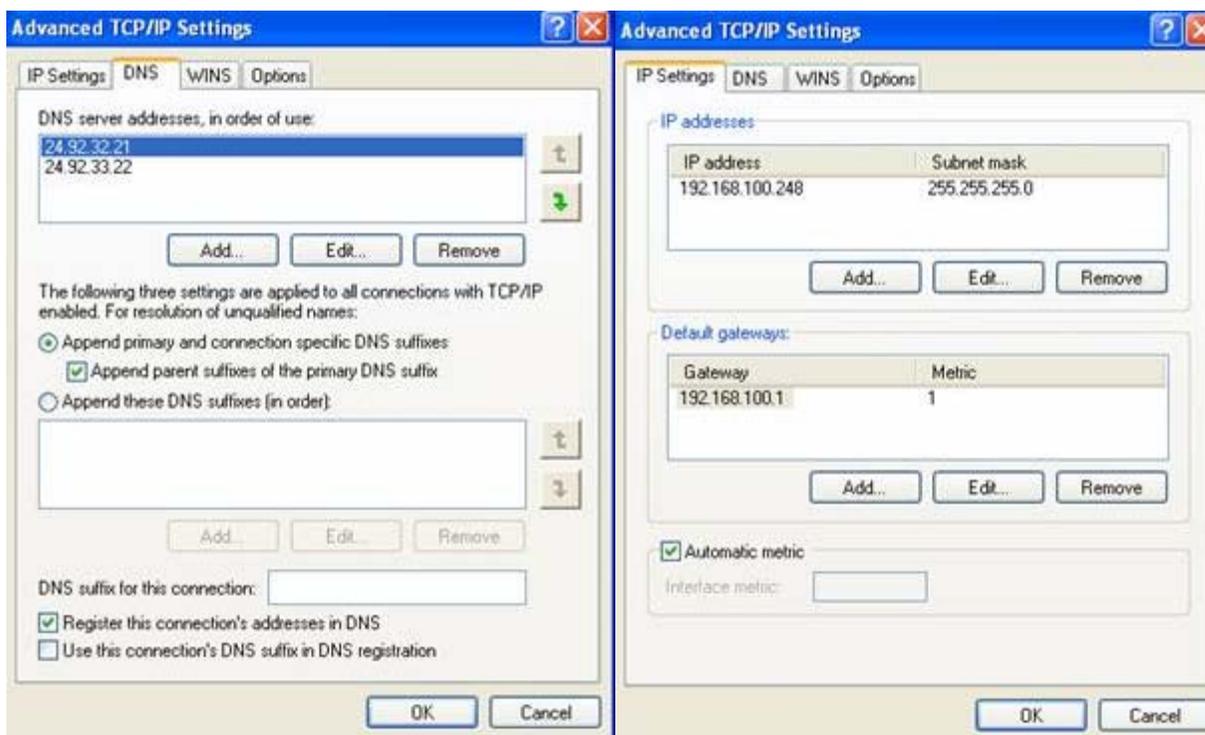


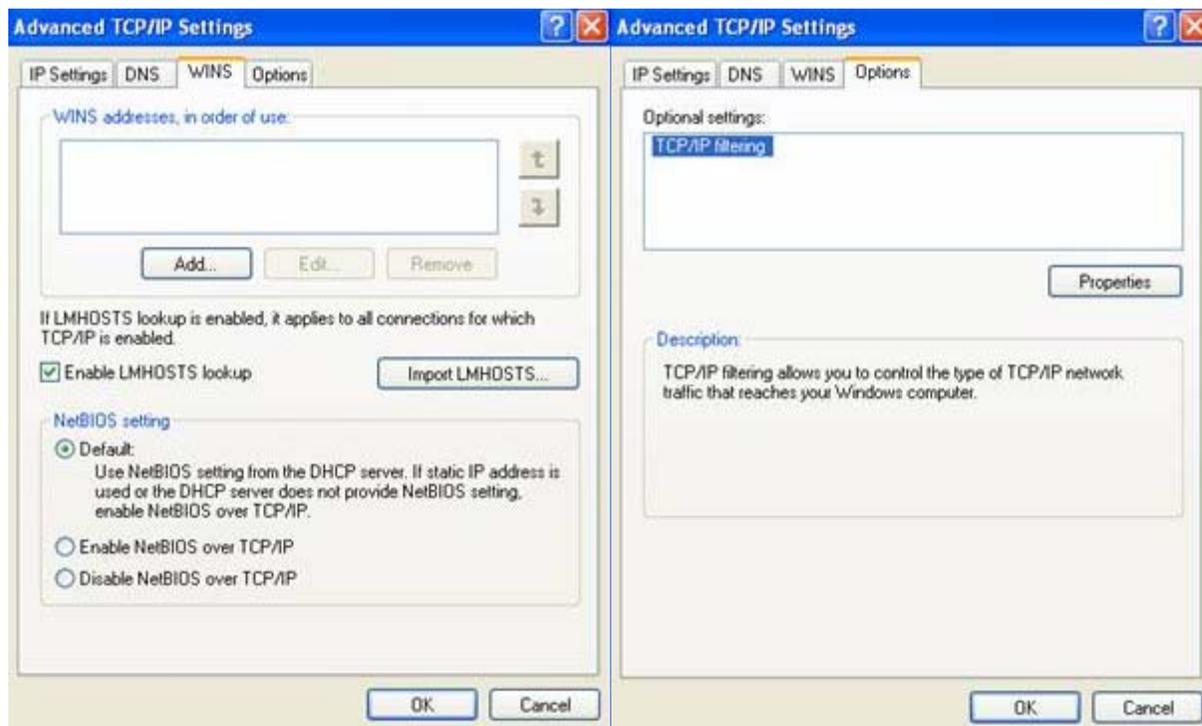
2) Choose Properties and set up the IP addressing. The 4 byte static IP address is one that your network administrator should give you to uniquely identify the central..



The entries for Default gateway and the DNS server addresses are optional and should be discussed with your network administrator.

3) You will not need to do Advanced features but this is what the screens would indicate, if you want to check, based on the above addressing information:





4) Note that for this example your Central Host IP address will be 192.168.100.248

Any other device connected to this Host computer on the network will have the address of 192.168.100.xxx where xxx is valid from 001 to 255 excluding 248.

5) Now re-enable your network connection or reboot your central computer to allow the network to use this Static IP Host address.

## Setting up the controller definitions in StreetWise

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The user must now set up each controller that will be connected to the network by defining it as an Ethernet controller in StreetWise.

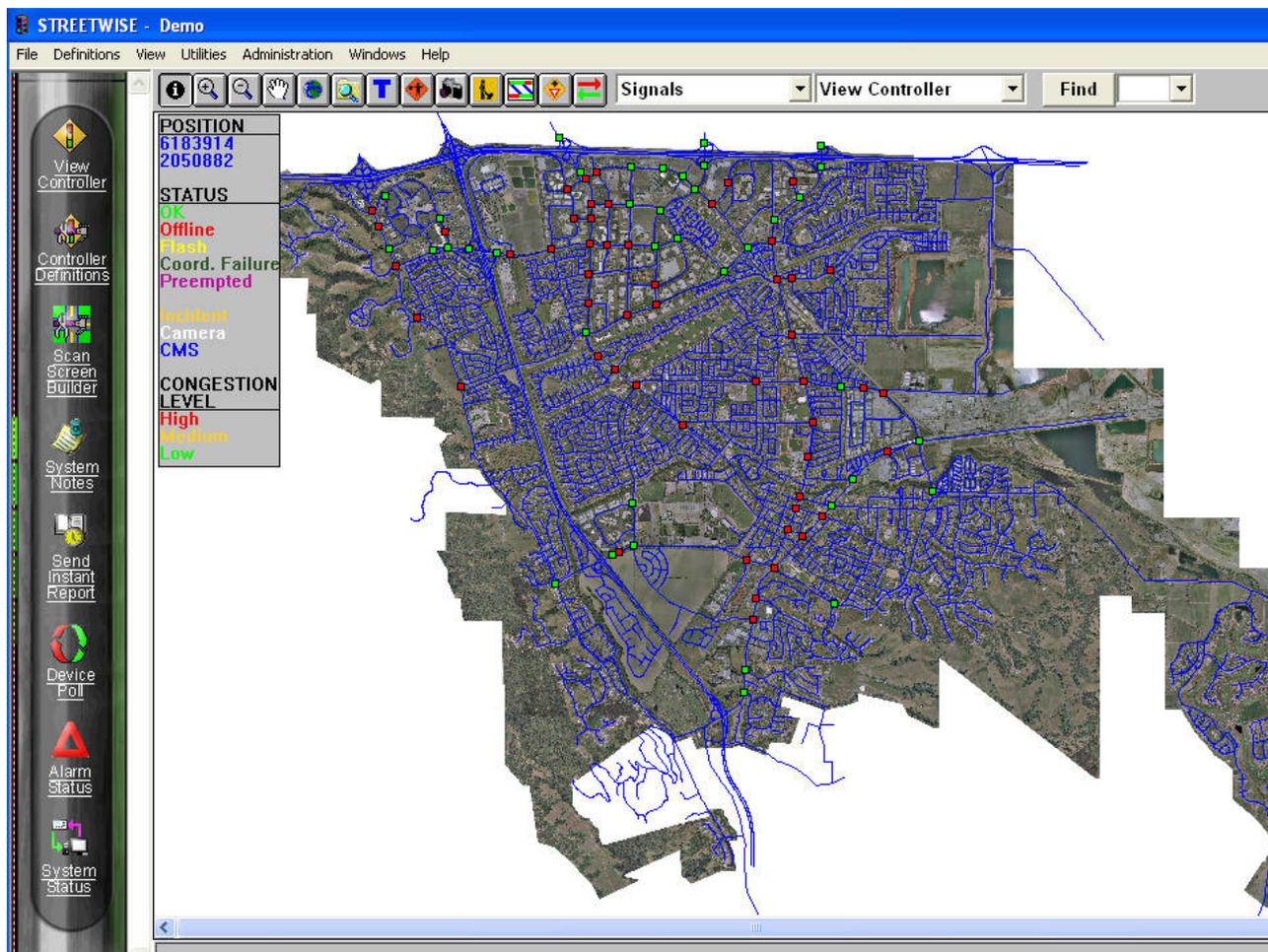
1) You must find the controller type that you will be communicating to. You can access the controller type from the front panel of the controller. Simply type Alt-Fcn->9 on a TS2 controller or F->9 on a 2070 controller to get to the Overview screen. Then hit any key to get to the software description screen. This will tell you the type of controller software that you must set up for your StreetWise definition.

Controller Monitor	Cabinet	System
TIMING	OK	OFFLIN
COORD		

```
Apogee Transportation Control Software
(c)06/15/05 Naztec, Inc.
Version: 65.0M Master/Local (build 828)
```

In this case we have a 2070 controller using Version 65 NTCIP software.

2) Log onto the StreetWise Client. If using GIS you should get the Screen Below.



If using StreetWise Lite or if you are a user without GIS access the following screen will be shown:

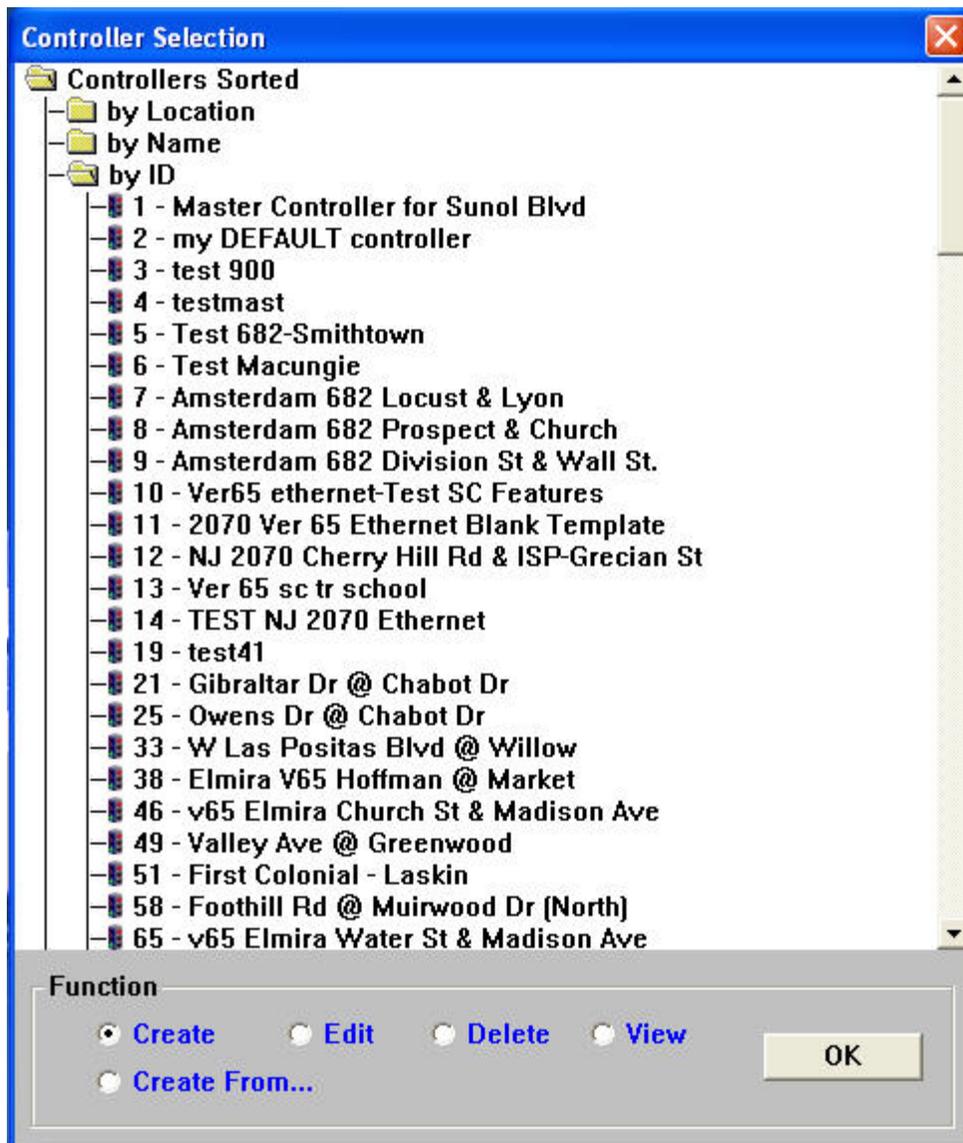


Choose the Icon for Controller definitions  or via the menu bar choose Definitions/Controller/Definition:





The definition Screen will pop up that will allow you define a new controller to the StreetWise system.



Hit the OK button and the following screen will be displayed:

The first thing the user should do is to select the Controller type. StreetWise has many controllers that it can communicate with. Some controllers use the Naztec protocol others use the national standard protocol known as NTCIP. However, you must insure that the type you choose is Ethernet because that will allow you to assign the IP address to the network. Below is a list of Ethernet Controller types.

Controller Type
980 TS2 Sec. 61.x Ethernet
981 TS2 Master 61.x Ethernet
NTCIP 61.x TS2 Ethernet
NTCIP 65.x 2070 Ethernet
NTCIP 65.x 2070 Master Ethernet
NTCIP 60.x 2070 Ethernet
980 TS2/970 Sec. 50.x Ethernet
900 Metro Secondary Ethernet

As per the overview screen shown in step 1, we would choose NTCIP 65.x 2070 Ethernet as our controller type. That will open a new field on the screen for the IP address. You should fill out the IP address to match your host address' first three bytes and follow it with a unique identifier for the fourth byte. Typically, users choose the fourth byte to match the ID number of the controller (as long as the controller Id is less then 256).

**Create Controller Definition**

Controller ID: 247    Auto ID    IP Address: 192.168.100.247

Controller Name: Ethernet Test 980 Local controller

Controller Type: 980 TS2 Sec. 61.x Ethernet

Drop: 2

Optional

Master: [ ]

Group: [ ]

Delay Receive: 1000 (ms)

Delay Transmit: [ ] (ms)

Phone: [ ]

Area: [ ]

North-South: [ ]

East-West: [ ]

X-Reference #: [ ]

Special 1: [ ]    Special 4: [ ]

Special 2: [ ]    Special 5: [ ]

Special 3: [ ]

Use Prefix

Use Postfix

Azimuth [-90 to 90]: [ ]

OK    Cancel

In the example above you must also choose the Drop number to match your Ethernet drop as defined in the server.ini file. Below is the section of the server.ini found under the directory /naznt/bin file that explains the Comm drop information. The specific Ethernet parameters are highlighted in **RED**.

```
# '-----'
# ' COMMUNICATION DROP PARAMETERS '

# 'Number of Drops'
# ' Set the number of drops the same in server, admin and client.ini'

NUMBER_OF_DROPS '2'

# 'Drop Settings---4 parameters are defined for each DROP as follows: '
# 'Param1: 0 if drop is Ethernet '
# '      1-128 for serial drops 1-128 '
# 'Param2: 1 - direct connect, full duplex '
# '      2 - direct connect, half duplex '
# '      3 - TS2 dialup '
# '      6 - 2070 dialup '
# '      7 - Ethernet '
# ' Param3: 0 - Ethernet '
# '      300 - 57600 for serial baud rate '
# 'Param4: 0 - Ethernet or serial (no incoming alarms)' '
# '      1 - serial and TS2 incoming alarms '
# '      2 - serial and 2070 incoming alarms '
```

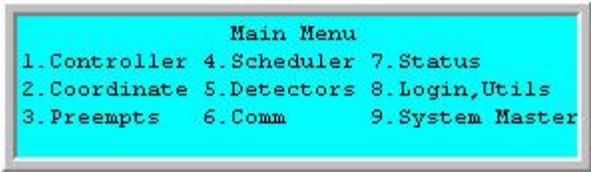
DROP1 '1 1 38400 1'  
**DROP2 '0 7 0 0'**

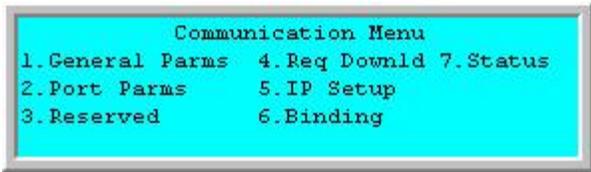
## Programming the 980 Secondary or 2070 Secondary controller

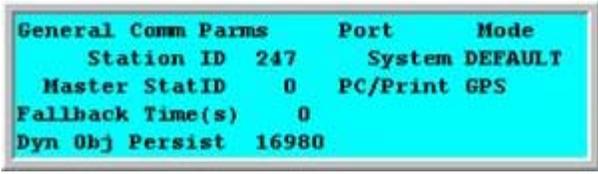
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To communicate with a local controller or master via Ethernet the user must set up (program) the IP address via the front panel of the controller. The following screen shots will assist you:

TYPE	SCREEN	DESCRIPTION
------	--------	-------------

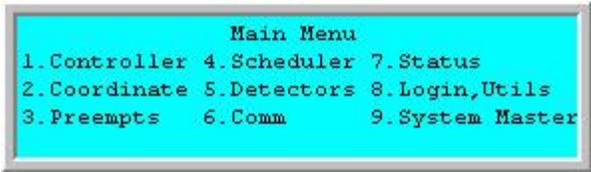
MM		Main Menu
----	---	-----------

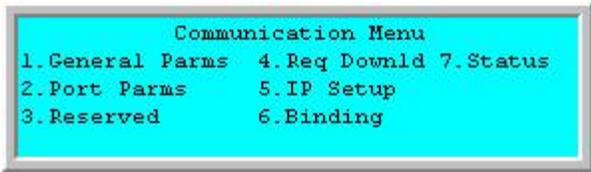
6		Communications Menu
---	---	---------------------

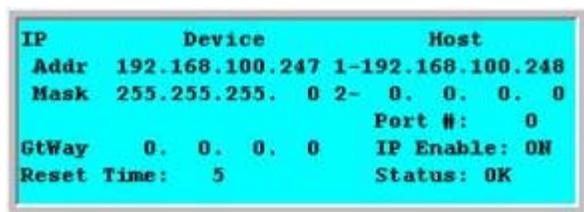
1		Set up Station ID to Match Streetwise ID
---	--	--

In the above example the Streetwise ID is 247 and it must match the entry at MM->6->1. You must also match the **System Mode** to the protocol that the controller is using to communicate with the central system. Valid entries are **NTCIP, Default** or **SYS UP**. Now you have to set up the IP address to match the controller definition's IP address in StreetWise. as shown below

TYPE	SCREEN	DESCRIPTION
------	--------	-------------

MM		Main Menu
----	---	-----------

6		Communications Menu
---	---	---------------------



5

IP Address

When programming the IP Setup screen at MM->6->5 the user must program the IP Addr field to match the IP ADDR field as defined on the StreetWise controller Definition Screen. In addition, the should program MASK field . The HOST field may be programmed as well as the GTWAY field depending on the network and hardware device setup (Such as routers, switches, etc.) that have been installed in the field.

To establish the IP communications one should toggle IP ENABLE to ON.

## Summary

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The user must set up the StreetWise Controller definition as well as the local Naztec controllers with matching IP addresses in order for Ethernet to work properly.,

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