

MCN Server™ *and* MCN Advanced Server™

Version 7.25
Remote Comparator Display Software

For
Windows Vista, 7, 10
Server 2003, 2005 and 2008R2

S2-61170-260



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Revision History

S2-61170-100	Production Release
S2-61170-101	Corrected miscellaneous minor errata.
S2-61170-102	Corrected miscellaneous minor errata.
S2-61170-205	Added Sections for Master-Sub and Multi-Dependency. Re-organized sections to coincide with MCNRCD Standard Manual.
S2-61170-210	Added Sections for Triggered Output option (Program version 4.01.
S2-61170-220	Added Sections for Client Permissions & Watchdog States (Program version 4.24)
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S2-61170-225	Added information for Version 5.00 with support for Windows Vista, 7, and Server 2008R2. Removed support for Windows 2000.
S2-61170-230	Added information for Version 6.00 & 7.00 with support for the HIB-IP 8000 Network Interface Hardware.
S2-61170-240	Updated Screen shots & added information for Version 7.20 with support for the HIB-IP 8002 Network Interface Hardware.
S2-61170-250	Production Release.
S2-61170-260	Updates for Version 7.25 software & Windows 10 Support. Added Paired / Non-Paired Column Widths. Updated Client operation, including Unicast Client support Updated HIB-IP family information Added Windows Event Logging and updated other logging information Added Backup & Restore, IP Traffic Priority appendices Moved Master-Subs and Triggered Outputs to Advanced Config section.

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Introduction to MCN™ Systems

CTI Products' Monitoring and Control Network (MCN™) system provides a modular, scalable system for managing your comparator display requirements. MCN modules connect to your comparator device to provide comparator status monitoring and control. Monitor and control functions can be provided either locally, in the same physical building as the comparator, or remotely over a wide area Communications Link.

This manual covers the installation, configuration, and operation of the MCN (Monitoring and Control Network) Server software. It will discuss two of the versions that support remote clients:

- **MCN Server**
- **MCN Advanced Server**

The three versions of the software differ in their capabilities as indicated below.

Function	Server	Advanced Server
Number of Network Interfaces supported	1	4, expandable to 64 with additional NI Packs
Remote Client Support	4, expandable to 64 with additional Client expansion packs	4, expandable to 64 with additional Client expansion packs
Support for Third Party Clients	No	Yes, with optional TPCI Licenses

The manual will refer generically to "MCN Server" or "Server Software". It will specifically call out the Advanced version when describing features that are different between the versions. The Server and Advanced versions have different executable file names as shown below:

Version	Executable file name
MCN Server	McnRcd Server.exe
MCN Advanced Server	McnRcd Advanced Server.exe

RCD stands for "Remote Comparator Display".

The manual will refer to other programs in a shorthand notation:

Program	Shorthand	Executable file name
Hardware Setup	HWSetup	Hardware Setup Server.exe
Configuration Program	MCNConfig	McnConfig Server.exe
Client Program	MCN Client	ClientRcd.exe



Major sections of the manual include:

Introduction

General discussion of the MCN Monitoring & Control Network, system requirements for the MCN Server software.

Installation

Installation of the software
(and PCLTA Driver Software if used).

System Considerations

IP Networking Considerations

MCNConfig Program

This is the largest part of the manual, because it describes in detail all the system configuration features and options.

MCN Server Program

Operation of the MCN Server run-time program.

MCN Client Program

This covers the operation of the MCN Client program.

Advanced Configuration Topics

Master/Sub comparators and Triggered Outputs.

Appendices

Troubleshooting, special configuration, etc.

MCN Software Overview

The main programs that make up the MCN Server software package:

MCNConfig Program

(McnConfig Server.EXE)

This is the configuration program run by an engineer or technician to build the configuration files when the system is installed or changed.

MCN Server Program

(McnRcd Server.EXE or McnRcd Advanced Server.exe)

This is the program that runs on the MCN Server PC. It has a local display that displays the status of the devices on the MCN system (Comparators, I/O points, alarms, etc.). It allows the operator to control receivers (with Force-Vote and Disable functions) and other I/O devices (relays, etc.) from the MCN Server PC.

The MCN Server program also passes the status and control data to MCN Client PCs over an IP LAN or WAN.

MCN Client Program

(ClientRCD.exe)

This is the Client program that runs on remote PCs to control and displays the status of the MCN system. The MCN Client program runs on PCs connected to the MCN Server via an IP network, and thus do not need their own MCN Network Interface.

Typical Monitoring & Control Network (MCN) Systems

There are a few things that must be configured and connected in order to establish a working system. A typical MCN Server is shown in the figure below attached to an MCN network. The MCN Client-Server Remote Comparator Display system consists of:

An MCN Server PC running MCN the Server program.

One or more network interfaces for the MCN Server PC (such as a HIB-IP 8002, internal PCLTA or HIB-232).

One or more Comparator I/O Modules (such as an AIB or CIB).

Optionally, other interface modules (such as IOB) to drive auxiliary outputs and alarms.

Client PCs connected to the PC over an IP LAN or WAN.

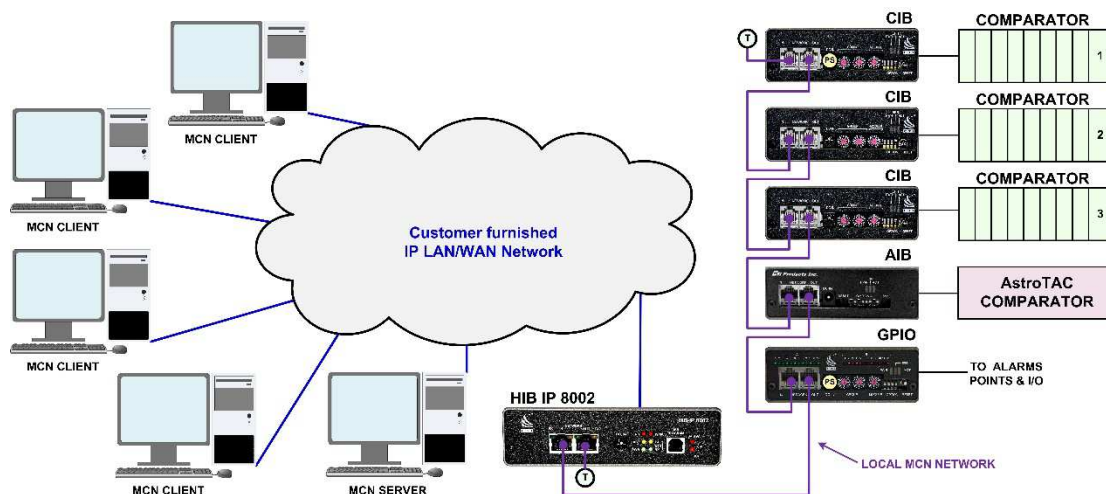


Figure 1 - Simple MCN Server System

Reference Documents

Details of other hardware components of the system can be found in the following documents:

- Monitoring and Control Network, System Manual
Part Number S2-60425
- HIB-IP & HIB-IP 8000 Remote Network Interface Hardware Reference Manual
Part Number S2-61173
- HIB-IP 8002 Remote Network Interface Hardware Reference Manual
Part Number S2-61808
- HIB-232 Host Computer Interface Module, Hardware Reference Manual
Part Number S2-60427
- CIB Comparator I/O Module, Hardware Reference Manual
Part Number S2-60426
- AIB Astro-TAC Comparator Interface Module, Hardware Reference Manual
Part Number S2-60399
- IOB I/O Control Module, Hardware Reference Manual
Part Number S2-60630
- EXB-232 and EXB-IM Network Extender Modules, Hardware Reference Manual
Part Number S2-60596
- EXB-IP and EXB-FI Network Extender Modules, Hardware Reference Manual
Part Number S2-61089
- Router Modules, Hardware Reference Manual
Part Number S2-60649

Package Contents

The MCN System package will include the following:

Software CDs

The MCN *Server* software package includes:

Installation Program:

The Server Install shield program has the MCN Server and the MCN Client software on it. The CD contains the HwSetup, McnConfig, and MCN Server software; but also includes software for client PCs.

HWSetup Program:

This is used to select which network Interfaces to use for legacy support.
It is also used to enter the Software Key for the system to operate.

MCNConfig Server Program: (McnConfig Server .exe)

This is the configuration program that is used by an engineer or technician to build the configuration files when the system is installed or changed.

MCN Server Program:

This program operates on the MCN Server PC. It has a local display that displays the status of the devices on the MCN system (Comparators, I/O points, alarms, etc.). It allows the operator to control receivers (with Force-Vote and Disable functions) and other I/O devices (relays, etc.) from the MCN Server PC.

The MCN Server program also passes the status and control data to MCN Client PCs over an IP LAN or WAN.

MCN Client Program: (ClientRCD.exe)

This program operates on remote PCs to control and display the status of the MCN system. The MCN Client program operates on PCs connected to the MCN Server via an IP network, and thus do not need their own MCN Network Interface.

System/User Manuals

Hard copies of the System, User and Hardware manuals.

PDF copies of System, User and Hardware manuals.

Hardware Key

A serialized USB Key is included with the MCN Server version only

Software Key CD

This CD will have the Software Key for the system. The Software Key matches the serial number of the Hardware Key. It will contain the capabilities which are licensed for the software (number of Network Interfaces, number of clients, etc.)



Note: There are no PCs included with the MCN System Package

PC Hardware Requirements

MCN Server software requires a PC with the following minimum system configuration:

Windows Vista, or 7, Windows Server 2003, 2005, 2008R2.

Pentium D or Core i3 at 2GHz or above.

2 GB Memory.

Color Monitor with at least 800 x 600 resolution ([Higher resolution recommended](#)).

Mouse.

100Base-T Ethernet port.

One open serial port if the local network interface is a HIB-232.

CD ROM Drive.

Available USB Port.

One available PCI slot if the network interface is a PCLTA
(only for 32-bit operating systems).



Note: All PCs are not equipped with an available and correct type of PCI slot.
Check the manufacturer mother board specifications carefully for compatibility.

For MCN Client PCs, requirements are similar to those for the Server:

Windows Vista, or 7, Windows Server 2003, 2005, 2008R2

Pentium D or Core i3 at 2GHz or above

2 GB Memory

Color Monitor with at least 800 x 600 resolution, higher resolution recommended

Mouse

100Base-T Ethernet port

CD ROM Drive

Supported Operating Systems

MCN Program	Version	Win XP	Serv 2003	Win Vista		Win7		Server 2008 R2	
				32B	64B	32B	64B	32B	64B
MCN Client	3.xx	✓	✓	--	--	--	--	--	--
	4.xx	✓	✓	--	--	--	--	--	--
	5.xx	✓	✓	✓	✓	✓	✓	✓	✓
	6.xx	✓	✓	✓	✓	✓	✓	✓	✓
	7.xx	--	--	✓	✓	✓	✓	✓	✓
MCN Server	3.xx	✓	✓	--	--	--	--	--	--
	4.xx	✓	✓	--	--	--	--	--	--
	5.xx	✓	✓	✓	!	✓	!	✓	!
	6.xx	✓	✓	✓	!	✓	!	✓	!
	7.xx	--	--	✓	!	✓	!	✓	!
MCN Advanced Server	3.xx	✓	✓	--	--	--	--	--	--
	4.xx	✓	✓	--	--	--	--	--	--
	5.xx	✓	✓	✓	!	✓	!	✓	!
	6.xx	✓	✓	✓	!	✓	!	✓	!
	7.xx	--	--	--	--	✓	!	✓	!



Fully Supported



Only supports systems using HIB-232 and HIB-IP Network Interfaces. PCLTAs are not supported under 64 Bit OS versions.

--

Not supported.



NOTE: Support for Windows 2000 has been discontinued in Version 5.00.
Support for Windows XP has been discontinued in Version 7.00.

Released Software Versions and Options

The following table, list the different versions of the MCN software and the specific features that are available with each one.

MCN Program	Ver.	Client & Server	Clients	Dial Up	Network Interfaces Supported	TCPI
Server	Up to 7.x	Yes	One (1)	Yes With HIB-232	Up to 4 (Option)	No
Advanced Server	Up to 7.x	Yes	4 – 64 (Option)	Yes With HIB-232	4 – 64 (Option)	UP to 4 (Option)

User Access Control

Permission windows have been added to Version 5.x in the following programs, for when a user makes a change that requires access rights under the Windows User Access Control scheme:

- HWSetup
- MCN Config Server
- MCN Server
- MCN Advanced Server
- ClientRcd

Network Interfaces & Drivers

Three general categories of MCN Network Interfaces are used with MCN Server program:

HIB-IP External Modules

For connection to MCN networks over IP networks.

(The manual may refer generically to "HIB-IP" even when discussing the 8000 or 8002 units)

HIB-232 External Modules

For Local RS-232 connection; (Although the HIB-232 manual talks about dial-up operation, the MCN Server program is intended to be connected full-time to the MCN network(s) that it serves. It does not support dial-up operation of the HIB-232.)

Internal Boards PCLTA-21

For direct connection to the MCN Network

Supported only with 32-bit operating systems.

(Also supports connection to remote networks using EXB Network Extender Modules)

Supported Network Interface Details

The MCN Server program can use the following versions of HIB modules or the PCLTA cards for the interface between the PC and the MCN network.

Network Interface	Software Vers	
HIB-IP Modules	1.10 & up	78K
HIB-IP 8000 Modules	7.00 & up	78K
HIB-IP 8002 Modules	7.20 & up	78K

HIB-232 Modules	1.10 & up	78K (with Rotary address switches on back) Only HIB-232 versions 200 & up are supported.
PCLTA-21 Boards	1.10 & up	Half-Size PCI boards 78K or 1250k versions Only for 32-bit operating systems.

The PCLTA-21 card is specifically a 32 bit PCI card type with the universal 3.3v and 5v compatibility for use with Conventional slots. See Figure 2.

Note: All PCs are not equipped with the correct type or number of available PCI slots. Check the manufacturer motherboard specifications carefully for compatibility.

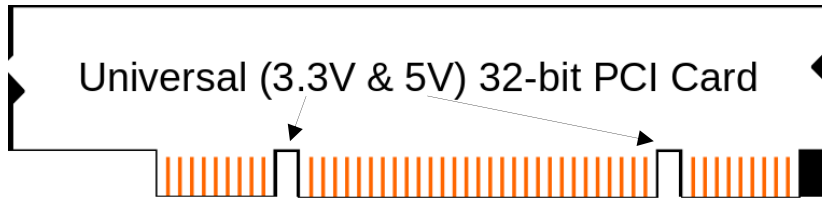


Figure 2

Warning: PCLTA Internal PCI Network Interfaces are supported only with 32-bit operating systems. Device drivers for the PCLTA cards are not available for 64-bit operating systems.



Unsupported Network Interfaces

The following are older Network Interfaces which are not supported with MCN Server:

HIB Modules	Version 000-199	(without Rotary address switches on back)
PCLTA (original)	Full-size ISA bus boards	78K or 1250 versions Single or dual interfaces
PCLTA-10	Half-size ISA bus boards	78K or 1250 versions
PCLTA-20	Half-size PCI bus boards	78K or 1250 versions

All HIB-232 modules have a unit number of S2-60081-xxx. If the 'xxx' number is less than 200 you have an early version HIB module that is unsupported.

Network Interface Drivers for MCNConfig Server

There are a couple of drivers that may need to be installed, depending on the type of Network Interface that is being used.

- The PCLTA Interface boards need a software driver to run the MCN Server program. This will be included with the PCLTA & software package. This driver is only available for 32-bit operating systems.
- The older HIB-IP and HIB-232 modules do not need a driver for normal operation of the MCN Server program.
- The HIB-IP 8002 module requires a USB driver to be installed before any of the MCNConfig applications can perform its hardware configurations.

Installation

Installation Overview

The installation of the MCN Server software and network interfaces should be done in the following order:

- 1) If a PCLTA network interface will be used, install the PCLTA device drivers first and then the network interface card, before testing the interface. See *PCLTA Network Interface Installation (If needed)* on Page 23.
- 2) Run setup.exe on the MCN Server PC to install the MCN Server software. See *MCN Server Software* on page 28.
- 3) Run the MCNConfig program to customize the MCN System Resources and display windows for your system. See *MCNConfig Program*
- 4)
- 5) *Overview* on page 50.
- 6) If you are using HIB-IP units, program them using MCNConfig program. See *Programming HIB-IP*, HIB-IP 8000 and HIB-IP 8002 Units on page 67.
- 7) Insert the Security Hardware Key in to one of the USB slots on the MCN Server PC.
- 8) Run the MCN Server program on the MCN Server PC. See *MCN Server Program* on page 117. You will be asked to enter the MCN Software Key and IP parameters on the first use.
- 9) Run setup.exe on the MCN Client PCs to install the MCN Client program. See *Installing MCN Client* on page 45 for details.
- 10) Run the MCN Client program on the Client PC(s). See *MCN Client Program* on page 136.

Quick Setup Procedure

Initially and otherwise, it may be desirable or even necessary to quickly configure a working MCN system. The following outline will assist and guide you through the necessary steps to do so.

Gather System Information

What you need to know:

- The Type and Quantity of the Equipment that will be monitored.
- Whether equipment monitoring must be performed remotely or locally.
- If remotely monitored, which method will be used to connect the Remote location to the MCN Network server; e.g. WAN, PSTN, T1 Trunk or other.

If locally monitored, which method will be used to connect the PC to the local MCN Network; e.g. LAN, RS232, Lease Line or PSTN.

- What type of MCN Network Interface (**NI**) you will be connecting to.

Install and Setup

Software Installation:

Identify which system you will install. Pages 28

- Server (Single Interface, Single Client, Key required)
- Advanced Server (Multi-Interface, Multi-Clients, Key required)

HW Setup Program:

Pages 31-42.

(Using the information gathered previously choose the NI to configure.)

- If PCLTA Pages **39**
- If HIB-232 Pages **41**
- If HIB-IP family Pages **42**

Building a System; (Use the MCN-Config Program)

Add Network Interface:

Use 'Network Interface' window: (**MENU: View / Network Interface**)

See Page: 64

Select and configure the appropriate type of interface(s): (PCLTA, HIB-232, HIB-IP)

MCN Server: Min: 1 Max: 1

MCN Advanced Server: Min 4 Max: per license

Add Channels and/or Channel Names:

(Optional, but recommended to provide better clarity for the Displayed statuses)

Use 'Channels' windows (**MENU: View / Channels**). **See Page: 74**

Add Hardware Modules: *(Minimum Requirement is one)*

Use 'Hardware' window: (MENU: View / Hardware) See Page: 72

Add the correct type of Monitoring interface device. (e.g. Select CIB for a Comparator interface board). Other options: (AIB, IOB, GPIO)

Enter Receiver & I/O Point Names & Information:

Use 'Receivers' window: (MENU: View / Receivers) See Pages: 79

Enter data for all receivers & I/O Points in the Receiver Window.

Select the proper Display Table Type (Comparator, Generator, Door, etc.) for all Receivers & I/O points.

Email Group: *(Optional, for problem reporting.)*

Use 'Email Group' window: (MENU: View/ Email Group)

See Pages: 76

Display Windows:

Use 'Display Windows' window: (MENU: View/ Display Window ...)

See Page: 95

Creates and configures the screen Layout and Appearance of the receivers to be displayed.

Display Tables: *(Optional - to add or change a Display Table.)*

Use 'Display Tables' window: (MENU: View/ Display Tables)

See Page: 84

Translates the hardware data into states on the status display screen.

Client Permissions: *(Optional)*

Use 'Client Permissions' window: (MENU: View/ Client Permissions)

See Pages: 111

Controls which client PCs can log into the Server and load which screens (Display Windows).

PCLTA Network Interface Installation (If needed)

PCLTA Internal PCI Network Interfaces are supported only with 32-bit operating systems. Drivers for the PCLTA cards are not available for 64-bit operating systems.

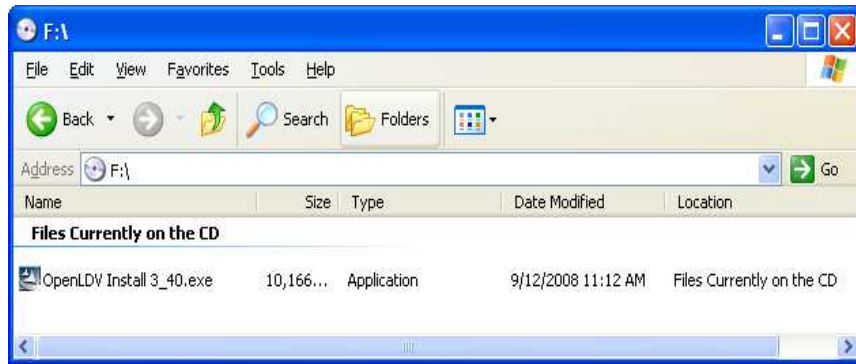


Note: All PCs are not equipped with the correct type or number of available PCI slots. Check the manufacturer motherboard specifications carefully for compatibility.

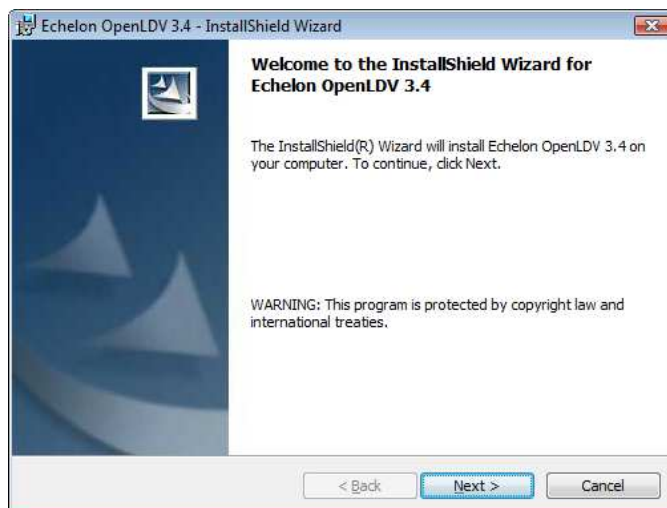
If you are not using a PCLTA card, skip to the **MCN Server Software** section on page 28.

Installing PCLTA Device Drivers (32 bit operating systems only)

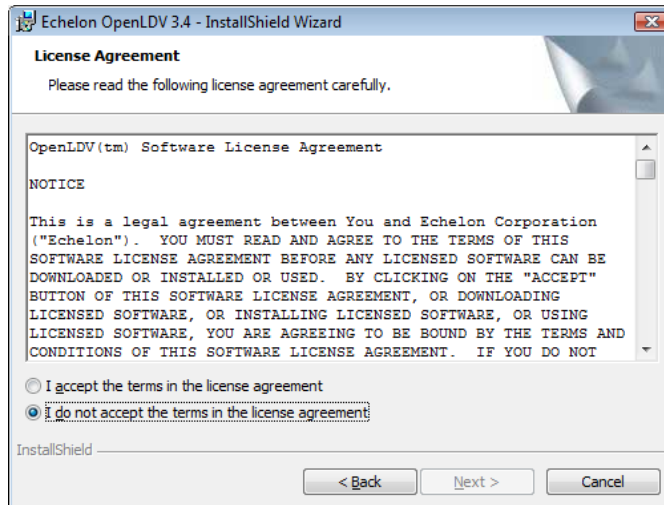
Insert the PCLTA driver CD into the CDROM drive. When the CD contents folder is displayed as shown below, double-click the **“OpenLdv Install 3 40.exe”** file to start the installation of the PCLTA device drivers and OpenLdv.



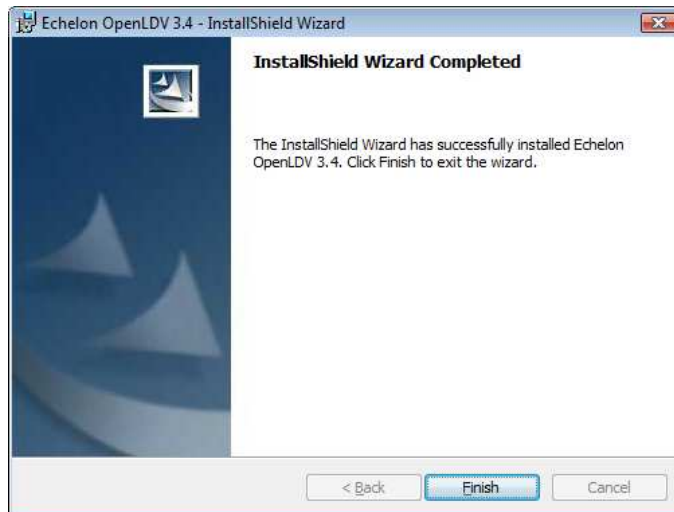
The OpenLDV Install welcome screen will be displayed as shown below. Before continuing, it is recommended that you exit all Windows programs.



Click the **Next** button to display the “Software License Agreement” window as shown below.



Click on **"I Accept the terms in the License agreement"** then click the NEXT button. OpenLDV and the PCLTA drivers will be installed. Once complete, the "Setup Complete" window will be displayed as shown below.



Click the **Finish** button.

Finally, you must power down the computer before installing the PCLTA network interface card.

Install PCLTA Network Interface Card

The PCLTA device drivers must be installed prior to installing the card. If the drivers have not been installed, complete each of the previous steps for this section.

To install a PCLTA card into your PC, follow these steps:

1. Turn off the PC and remove the power cord.
2. Open the PC case and locate an empty slot.
3. Remove the corresponding blank panel from the rear of the PC.

Quick Setup

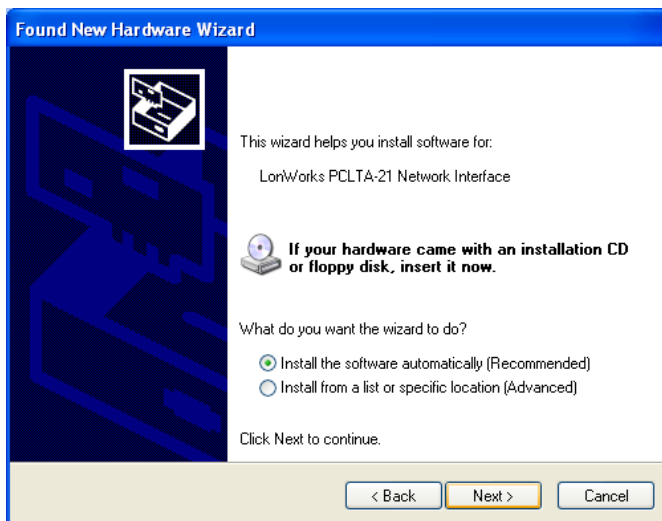
4. Insert the PCLTA card into the slot, ensuring that the edge connectors are fully mated, and the slot in the rear panel-mounting lug of the PCLTA is aligned with the threaded hole in the PC chassis.
5. Replace the screw to hold the PCLTA firmly in place.
6. Reinsert the power cord and then restart the PC.

On power-up, Windows will automatically sense the Plug-n-Play adapter, and associate it with the drivers installed in the previous step.

If the Plug 'n Play features of the card *failed*, the following “Found New Hardware Wizard” window may be displayed.



Select “No, not this time”, then click the **Next** button to display the following window.



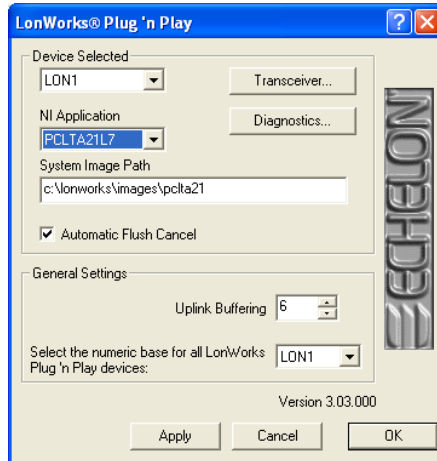
On the above window, select “Install the software automatically”, and then click the **Next** button. Click the **Next** or **Finish** buttons in the remaining windows to complete the installation.

Configure and Test the PCLTA Network Interface

Configure & test the PCLTA board as shown below. *It will not run if it is not configured.*

From the **Start** menu button on the Windows desktop, select Control Panel from the list, and then double click the “Lon Works Plug ‘n Play” icon. (If the “Lon Works Plug ‘n Play” icon is not visible, change the Control Panel properties to “Classic View”).

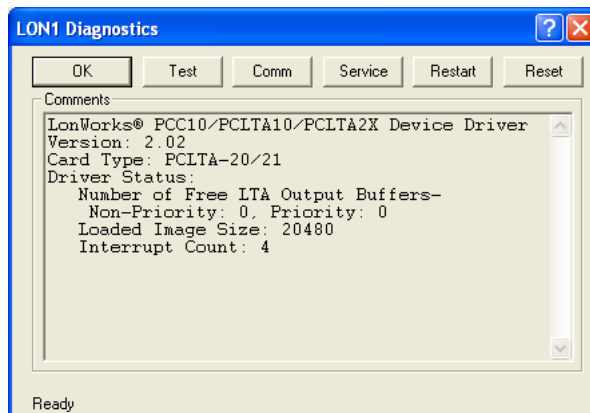
The following “Lon Works Plug ‘n Play” window will be displayed.



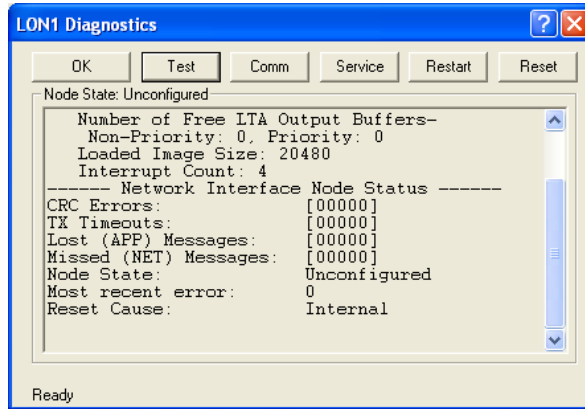
In the NI Application drop-down list, choose an image that is compatible with MCNRCD from the following table. (For all operating systems, the Image name should end with “L7”.) Then click the **Apply** button.

	Windows XP, Vista, 7 (32 bit versions only)
Images Compatible with MCNRCD	PCLTA21L7
Images to Avoid	PCLTA21VNI, PCL10VNI

To check if the PCLTA network interface has been installed correctly, click the **Diagnostics** button to display the following window.



Finally, click the **Test** button to display status information similar to the following window.

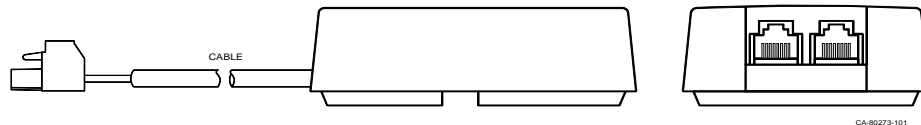


When finished, click the **OK** button on this “LON1 Diagnostics” window, and then click the **OK** button on the “Lon Works Plug ‘n Play” window.

If the PCLTA network interface card was installed prior to device driver installation, the PCLTA may not function correctly. To correct this situation, see *Appendix D: Fixing PCLTA Installation* on page 198.

Cabling and Termination

The PCLTA card is different from all other MCN modules in that it does not have an RJ-45 connector for the network cable to plug into. A ‘T’ Adapter (S2-60617), shown below, must be installed to connect the PCLTA’s two-pin connector with the MCN network cable. Use one RJ-45 connector on this adapter for the network cable, and plug a terminator (either TP/XF1250 or TP/FT10) into the other.

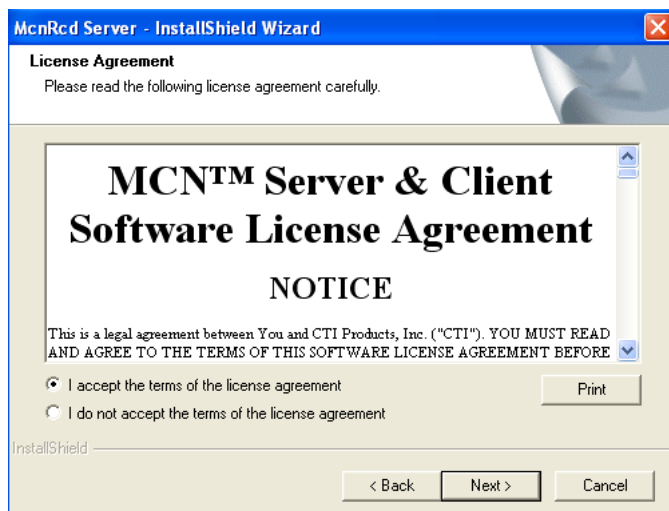
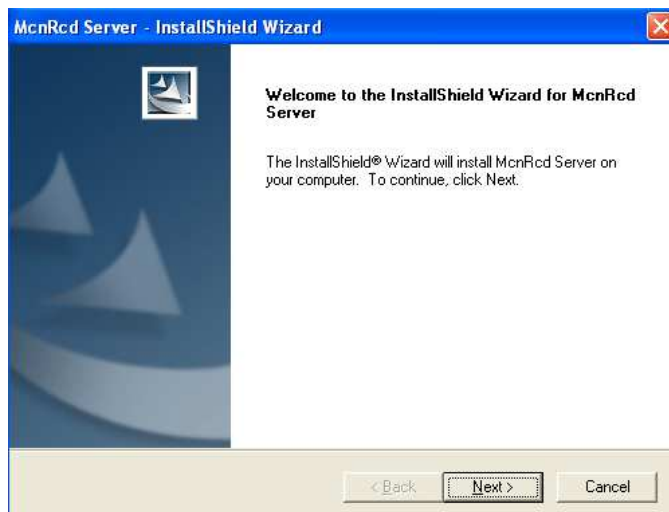


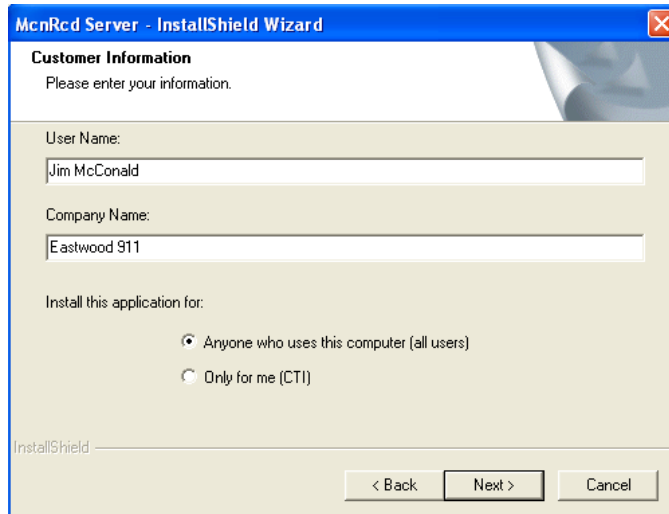
MCN Server Software Installation



Run Setup.exe from the CD.

You must have Administrator rights to install the MCN Server software.





McRcd Server - InstallShield Wizard

Customer Information
Please enter your information.

User Name:
Jim McDonald

Company Name:
Eastwood 911

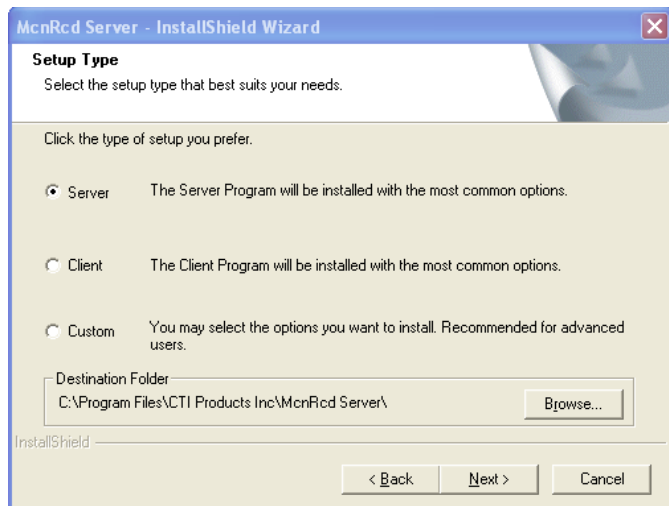
Install this application for:

☒ Anyone who uses this computer (all users)

☐ Only for me (CTI)

InstallShield

< Back Next > Cancel



McRcd Server - InstallShield Wizard

Setup Type
Select the setup type that best suits your needs.

Click the type of setup you prefer.

☒ **Server** The Server Program will be installed with the most common options.

☐ **Client** The Client Program will be installed with the most common options.

☐ **Custom** You may select the options you want to install. Recommended for advanced users.

Destination Folder:
C:\Program Files\CTI Products Inc\McnRcd Server\ Browse...

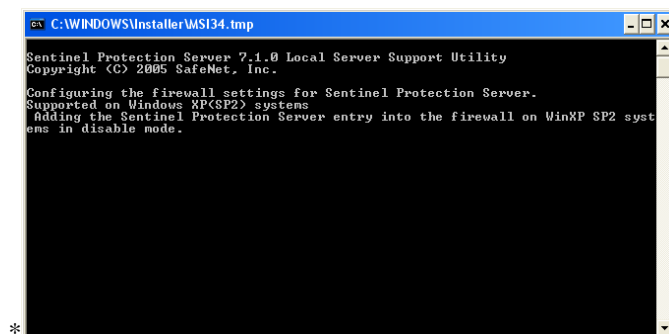
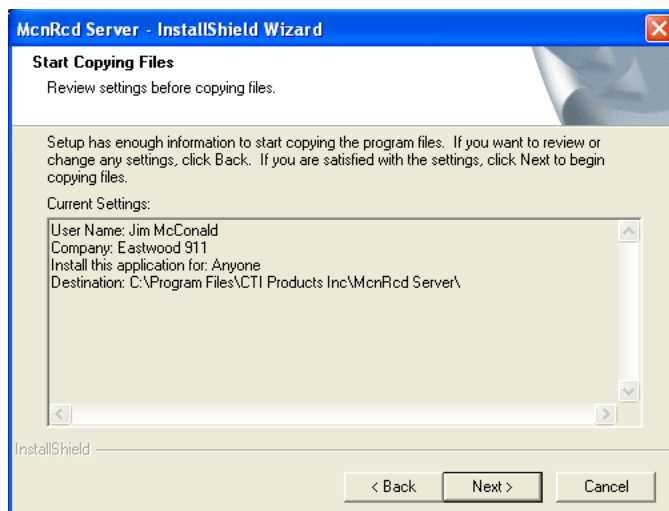
InstallShield

< Back Next > Cancel

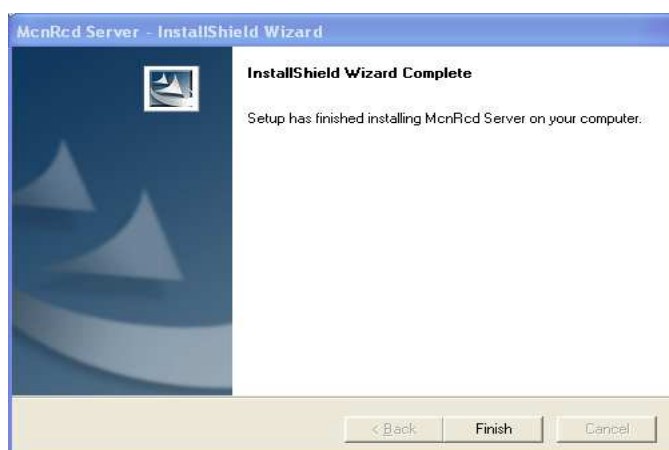
If you choose the custom installation, you can install both the MCN Server and the MCN Client programs on your PC.



(You don't need to install the Client software on the Server PC since the Server software includes a user interface. It is, however, convenient to install the Client software on the Server PC since it can be used to test Client screen configuration locally on the Server.)



The above screen may only be visible in Pre-Windows 7 version OS.

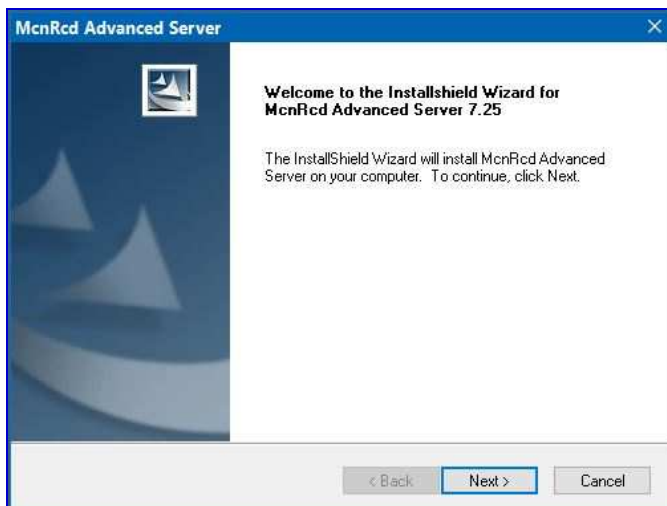


MCN Advanced Server Software Installation

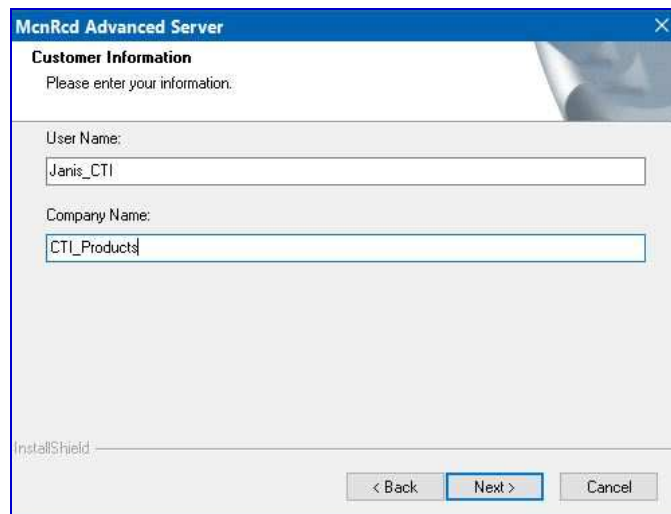


Run Setup.exe from the CD.

You must have Administrator rights to install the MCN Server software.

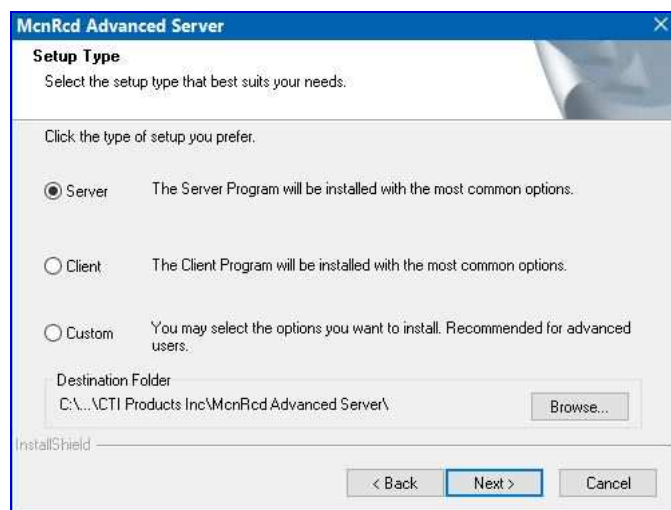


Quick Setup

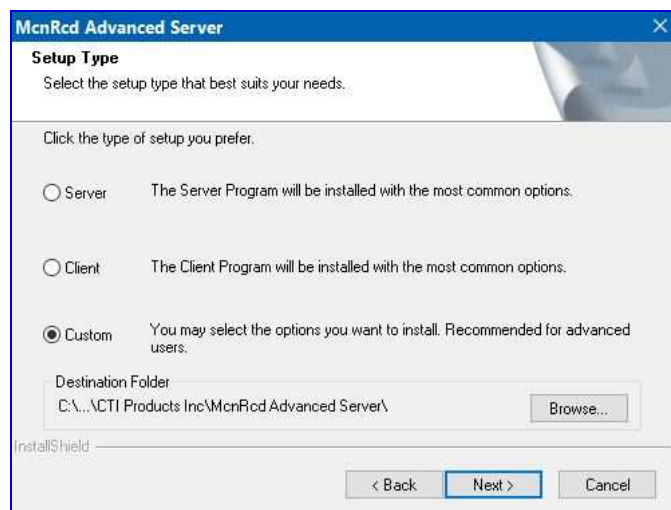


The dialog box is titled "McRcd Advanced Server" and has a close button (X) in the top right corner. The main heading is "Customer Information" with the instruction "Please enter your information." Below this, there are two text input fields. The first is labeled "User Name:" and contains the text "Janis_CTI". The second is labeled "Company Name:" and contains the text "CTI_Products". At the bottom left, there is a small "InstallShield" logo. At the bottom right, there are three buttons: "< Back", "Next >" (which is highlighted with a blue border), and "Cancel".

You have the option of installing the Server, the Client, or Custom combination.



The dialog box is titled "McRcd Advanced Server" and has a close button (X) in the top right corner. The main heading is "Setup Type" with the instruction "Select the setup type that best suits your needs." Below this, there is a text label "Click the type of setup you prefer." followed by three radio button options. The first option is "Server" (selected with a filled radio button) with the description "The Server Program will be installed with the most common options." The second option is "Client" (unselected) with the description "The Client Program will be installed with the most common options." The third option is "Custom" (unselected) with the description "You may select the options you want to install. Recommended for advanced users." Below these options is a "Destination Folder" section with a text box containing "C:\...\CTI Products Inc\McRcd Advanced Server\" and a "Browse..." button. At the bottom left, there is a small "InstallShield" logo. At the bottom right, there are three buttons: "< Back", "Next >" (highlighted with a blue border), and "Cancel".



The dialog box is titled "McRcd Advanced Server" and has a close button (X) in the top right corner. The main heading is "Setup Type" with the instruction "Select the setup type that best suits your needs." Below this, there is a text label "Click the type of setup you prefer." followed by three radio button options. The first option is "Server" (unselected) with the description "The Server Program will be installed with the most common options." The second option is "Client" (unselected) with the description "The Client Program will be installed with the most common options." The third option is "Custom" (selected with a filled radio button) with the description "You may select the options you want to install. Recommended for advanced users." Below these options is a "Destination Folder" section with a text box containing "C:\...\CTI Products Inc\McRcd Advanced Server\" and a "Browse..." button. At the bottom left, there is a small "InstallShield" logo. At the bottom right, there are three buttons: "< Back", "Next >" (highlighted with a blue border), and "Cancel".

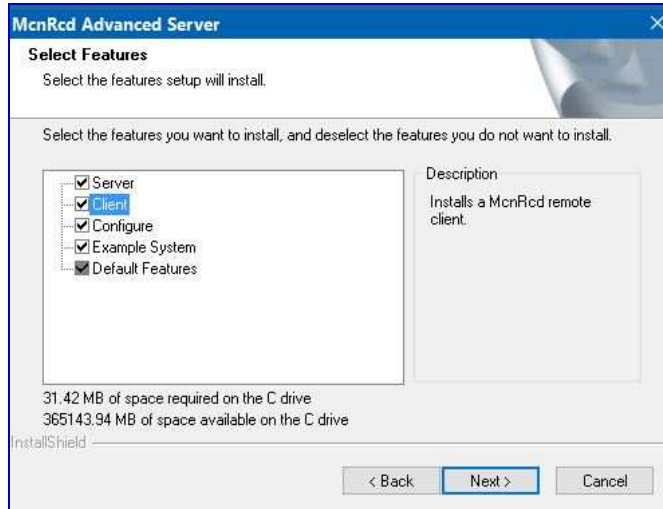
For Client PCs, use the "Client" option

Quick Setup

If you choose the custom installation, you can install both the MCN Advanced Server and the MCN Client programs on your PC.

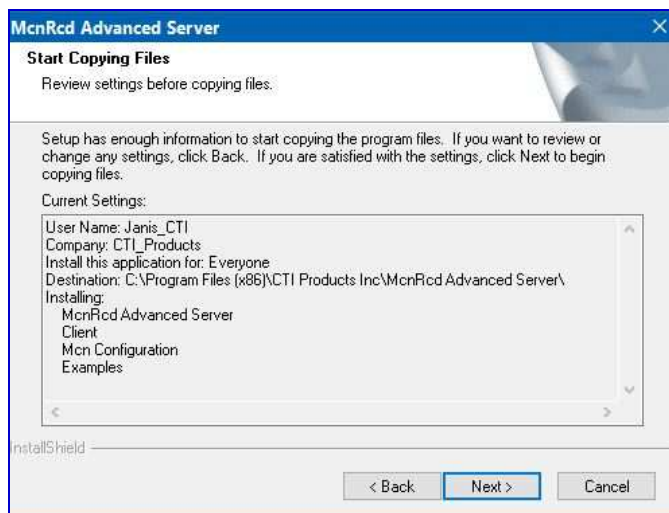


If the “Custom” option is chosen, the following window is displayed.



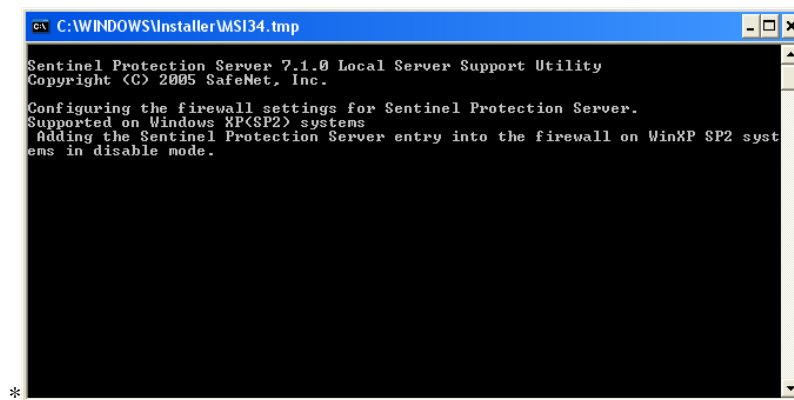
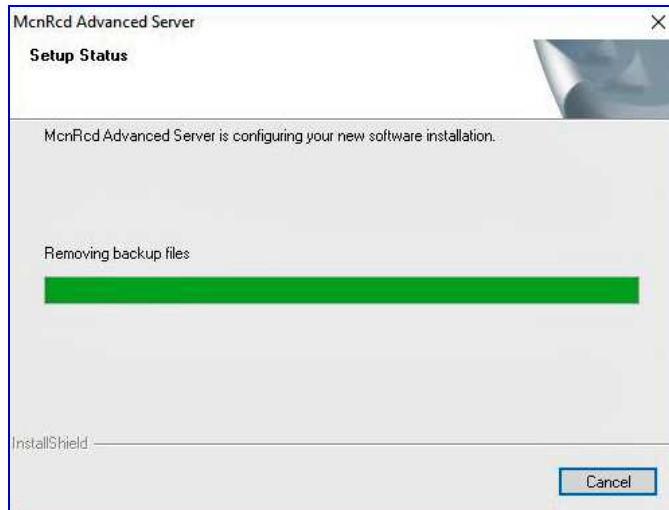
(You don't need to install the Client software on the Advanced Server PC since the Advanced Server software includes a user interface. It is, however, convenient to install the Client software on the Advanced Server PC since it can be used to test Client screen configuration locally on the Advanced Server.)

The installation program asks for confirmation before copying the appropriate files.



The files will be copied to the PC.

Quick Setup



The above screen may only be visible in Pre-Windows 7 version OS.

The next step in the installation is to install the USB driver for the HIB-IP 8002 module if you have one present in your system. This driver creates a virtual COM port used to configure the HIB-IP 8002 module with the MCN Config Server program.



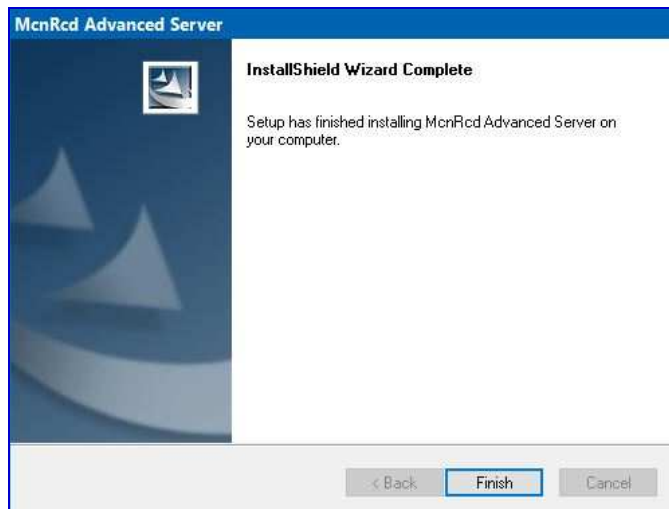
The Windows 10 installation will totally install the driver so that it is ready when the HIB-IP 8002 unit is connected



Some PCs, particularly PCs running the Windows Hardening Kit (WHK) running on Motorola Astro® 25 networks, have tighter security restrictions which do not recognized all signed driver installation files. On those PCs, a Windows Security window will be displayed.



The above window indicates that the driver has been installed and will be ready for use when the HIB-IP 8002 module is connected to the USB port on the PC.



Click Finish.

Remove the CD.

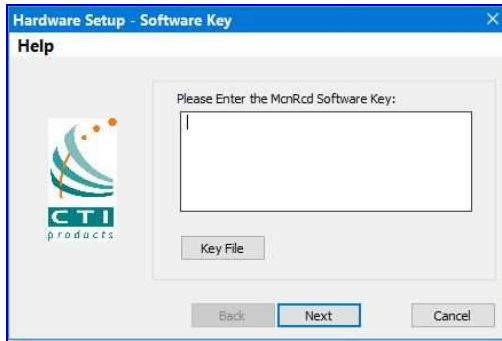
This will finish the software installation. The Installshield program will then run the HWSetup program.

Hardware Setup – HWSetup.exe

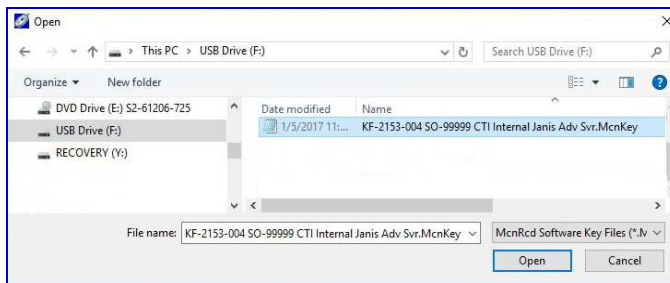
The Hardware Setup program is used to select and set up the Network Interface (PCLTA, Non-Dial-up HIB-232, or HIB-IP) to use in the system.

Software Key

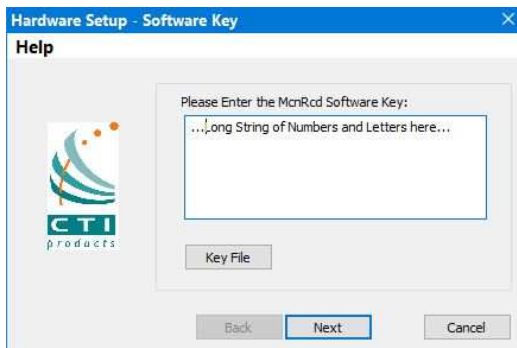
You will be asked to enter your software key.



You can type it, but it's easier to hit the Key File button and find your key file. Your software key file will be included on a custom CD for your system.



Navigate to find the software key file and click **Open**.

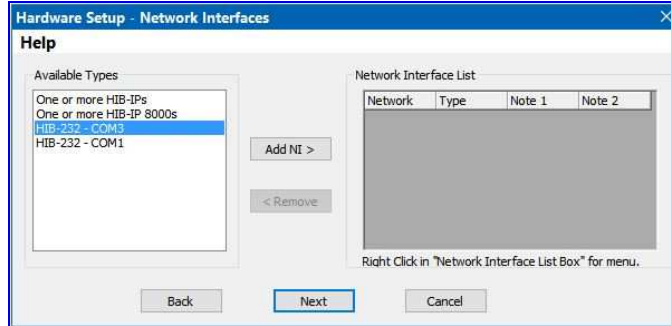


The Software Key will be entered. Click the **Next** key.

HW Setup - Network Interface Setup

The first time HW Setup is run, it sees that there is no Network Interface defined on the PC. It will ask you what type of Network Interface (NI) you plan to use.

For HIB-IP 8002 modules, use HIB-IP 8000.



Select the type of Network Interface you intend on using with your system, from the list of possible types available.



Important The server version of MCN program will allow the selection of **only one** Network Interface from this window; So if the wrong interface is selected you will have to remove it first, before you can add the correct one. The Advanced Server version will allow the selection of multiple Network Interfaces, depending on the feature options purchased on the installed License key.

Network Interface Type	Description
PCLTA	Internal board in the PC. The MCN network will connect directly to this board. If there is a PCLTA board that is properly installed, the HW Setup program will list it in the "Possible Types" list. See: HW Setup - PCLTA Setup
HIB-232 - COMx	Non-Dial-up HIB-232 units - Non-dial-up HIB-232s connect to a COM port directly or through external leased-line modems or equivalent. - The program detects all COM ports reported by Windows. Depending on your PC, not all ports may be available for use. Some COM ports may not be brought out to a connector. Some COM ports may be reserved for an internal modem. (For example in the snapshot above, COM3 is actually an internal modem.) See HW Setup – HIB-232 (non dial-up)
HIB-IP	HIB-IP Module - Connects to the PC through an IP channel. You will set up parameters for the HIB-IP unit in the system database by using McnConfig program. (You will also have to download those settings to the HIB-IP from the McnConfig program.)
HIB-IP 8000	HIB-IP 8000 or HIB-IP 8002 Module - Connects to the PC through an IP channel. You will set up parameters for the HIB-IP 800x unit in the system database by using McnConfig program. (You will also have to download those settings to the HIB-IP from the McnConfig program.)

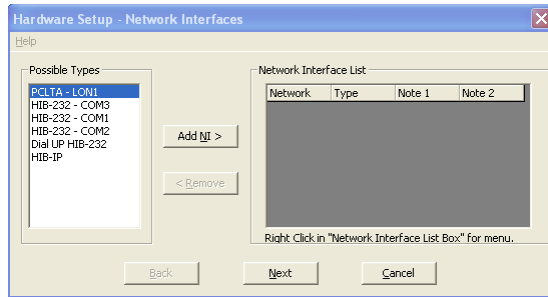


HW Setup - PCLTA Setup

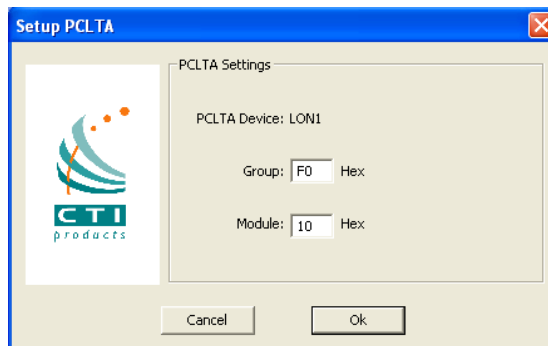
Warning: There are no PCLTA drivers available for 64 Bit Operating Systems.

If a PCLTA Card (and its driver) are properly installed on your PC, the HW Setup program will detect it and present it in the *Possible Types* list box.

You can check to see if the PCLTA card is installed and operational, by going to Control Panel and running the LonWorks application. You may then click on the Diagnostics tab; if the installation was done correctly there will be a status box without error indications.



- Select the PCLTA and click the *Add NI* button.



The Group/Module address defaults to “F0/10” during installation.

- Change the Group and Module address as required for your system.
- Click the OK button.

Some complex systems may use MCN Advanced Server with multiple PCLTAs. These steps will need to be repeated for each PCLTA.



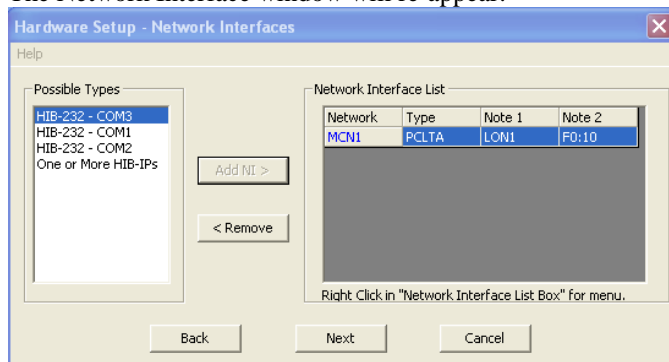
Important: MCN Address Setting

Each PC and each MCN module in the system must have a unique address. If you are setting up multiple PCs, be sure to set up each PCLTA card with its own address.

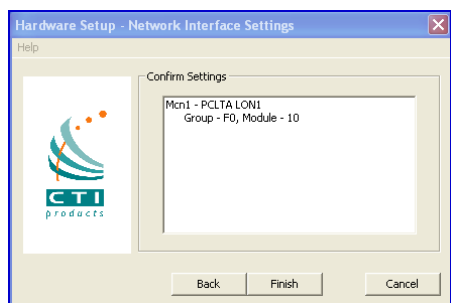
If you have a Custom Engineered System (with custom system documentation part number KA-8xxx-xxx), be sure to set the PCLTA address to the Group & Module numbers shown in your documentation. Failure to do so may cause the system not to work

- In the above window, click the **OK** button.

The Network Interface window will re-appear:



- Click the Next button.



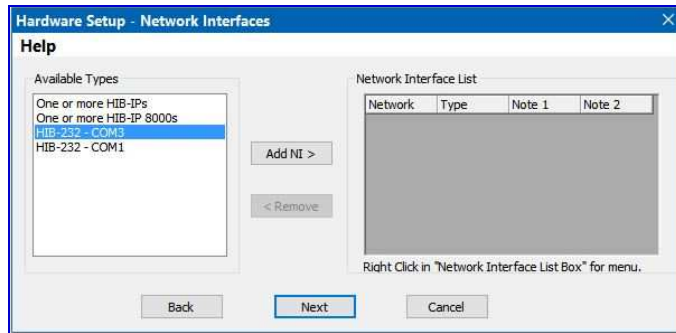
- Click the Finish button in the confirmation window.

The appropriate information for the PCLTA is now stored in the registry and will be available for use by McnConfig and MCN Server programs.

The MCN Group and Module addresses are set up on hex rotary switches on the back of the HIB-232 unit.

HW Setup – HIB-232 (non dial-up)

If you have a HIB-232 module (and are using it directly connected or through leased line modems) select the proper COM port from the **Possible Types** list box:



The program detects all COM ports reported by Windows. Depending on your PC not all ports may be available for use.

- * Some COM ports may not be brought out to a connector.
- * Some COM ports may be reserved by an internal modem.

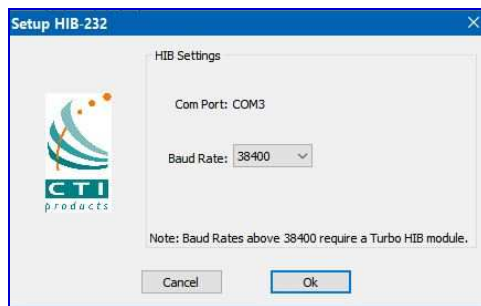
USB to Serial Adapters

The MCN Server program will work with some USB to Serial adapters. We cannot guarantee that it will work with all such adapters since we cannot test all brands.



Important: Some USB to Serial adapters will change their COM port number assignment when they are plugged into a different USB connector. If you are using one of these and you change its connection, you will have to re-run the HW Setup program to select the new COM port.

- Select the proper COM Port and Click the Add NI button

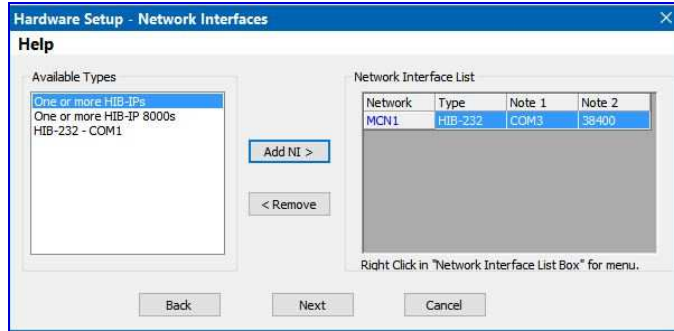


- Select the appropriate baud rate.
Be sure that the baud rate matches the Baud rate switches on the HIB-232 module.

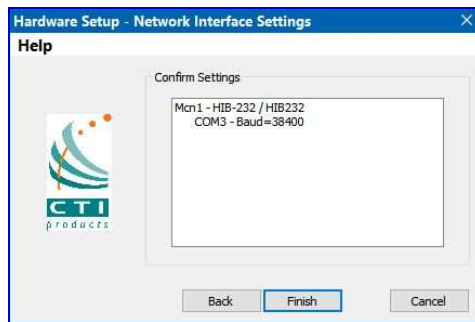
(The Group and Module addresses for the HIB-232 unit are set with rotary switches on the unit. See **Important: MCN Address Setting** on Page 39 for more information on MCN addressing).

- Click the OK button.





- Click the Next button



- And Click the Finish button.

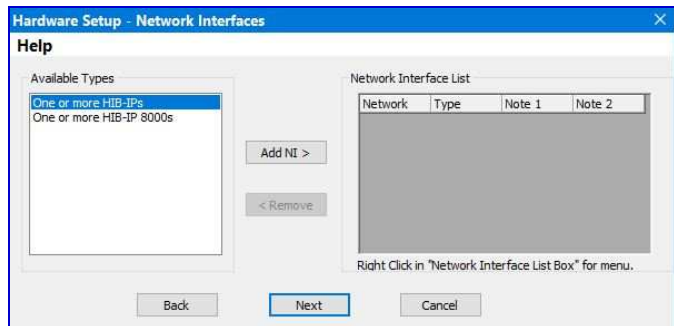
The HW Setup program will save the setting in the registry.

This setting will be used by the MCN Server program.

HW Setup – HIB-IP, HIB-IP 8000 or HIB-IP 8002

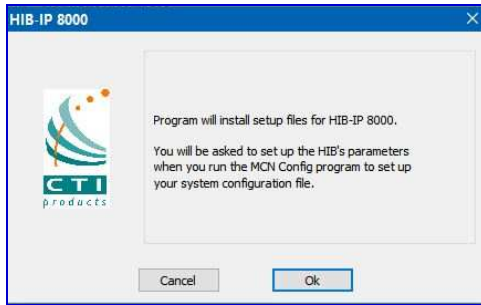
When using one or more HIB-IP modules to connect to an MCN system, select the HIB-IP option from the Possible Types list.

When using one or more HIB-IP 8000 or HIB-IP 8002 modules to connect to an MCN system, select the HIB-IP 8000 option from the Possible Types list. (The example below shows the operations for a HIB-IP 8000 or HIB-IP 8002.)

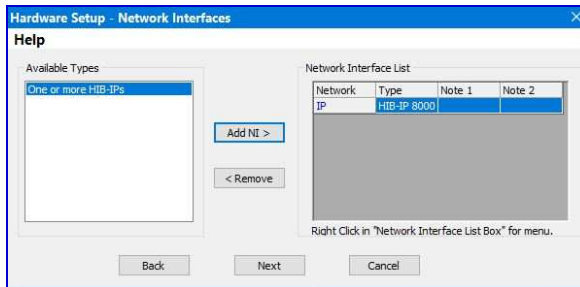


- Select the HIB-IP or HIB-IP 8000 option, whichever is appropriate:
 - Although the line says "One or more HIB-IPs", you will be able to use only one HIB-IP with the MCN Server program.
 - If you need to connect to multiple HIB-IP units at a time, you'll need the MCN Advanced Server software.

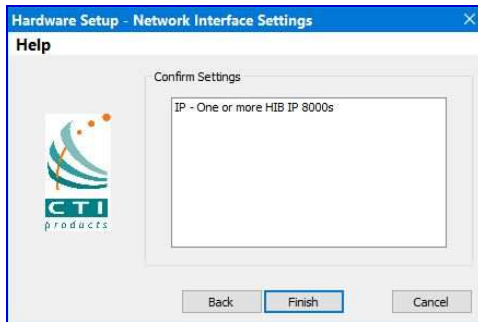
- Click the Add NI button.



- Click the OK button.



- Click the Next button



- Click the Finish button.

HIB-IP Parameters

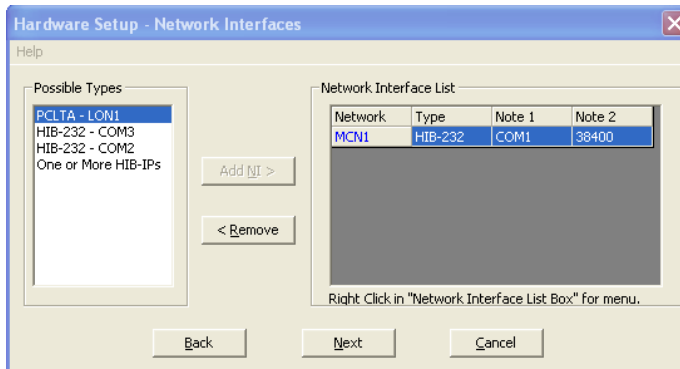
As shown in the “**Setup HIB-IP**” window above, you will later need to enter the HIB-IP parameters in the system database using the McnConfig program. You will also have to download those parameters to the HIB-IP using McnConfig.

Miscellaneous Installation Considerations

Changing Settings for your Network Interface

If you need to Change, Remove or Add a Network interface, re-run the HWSetup program. This program can be used to change the:

- Type of Network Interface
- PCLTA Device or Group & Module address
- HIB-232 COM Port or Baud Rate



To change these items you can either:

- Double click on the Network Interface to edit its parameters or
- Click the Remove button to remove the Network Interface and select a different one.

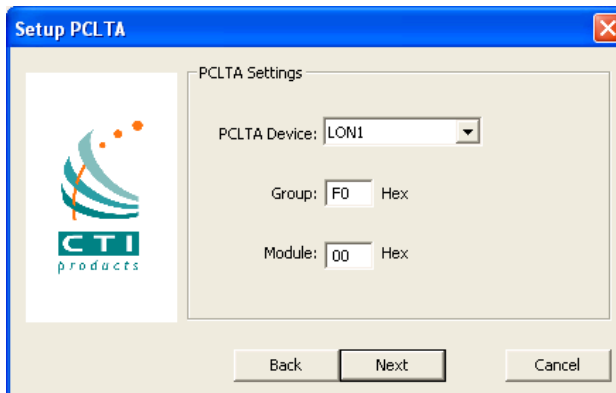


Warning: If you have a Custom Engineered System (with custom system documentation part number KA-8xxxx-xxx), be sure to set the PCLTA address to the Group & Module numbers shown in your documentation. Failure to do so may cause the system not to work

In the above window, click the **Next** button

Changing the PCLTA Group/Module Address

If the Group/Module address for the PCLTA Network Interface needs to be changed (or to query the PCLTA for its current address), simply run the *hwsetup.exe* program. This program can be found in the main program working directory (typically c:\Program Files\CTI Products Inc\McnRcd). Then click the **Next** button until the following window is displayed.



Quick Setup

The Group/Module address defaults to “F0/00” during installation. However, each PC must have a unique address.

In the above window, click the **Next** button, then the **Finish** button to complete the address change for the PCLTA Network Interface.

PC Power Options Setup

The “Power Options” icon in the Control Panel allows for a wide variety of PC operation parameters. However, installation of MCN Server software will disable any possibility of the PC going into the Standby or Hibernate Mode.

The monitor may be allowed to “sleep” as long as the “Monitor Timeout” is less than the “Standby Time”. Otherwise, the monitor will never sleep.

Printer Installation

For printer logging to occur, a printer must be installed from the Windows operating system. From the **‘Start’** menu button on the windows desktop, select “Printers and Faxes” from the list, then select “Add a Printer” from the list of “Printer Tasks”.

Installing MCN Client Program

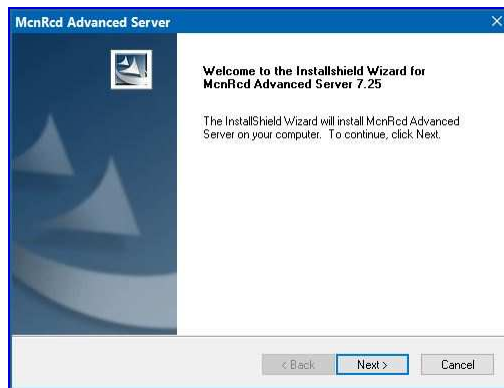
You would normally install the MCN Client program on a separate PC from the MCN Server, but you can also install a copy on the MCN Server PC.



You must have Administrator rights to install the MCN Server software. Check for and disable any real-time virus protection program that is running (ex: McAfee Antivirus Access Protection & On-Access scanners).

Run Setup.exe from the CD.

The installation steps are shown below.

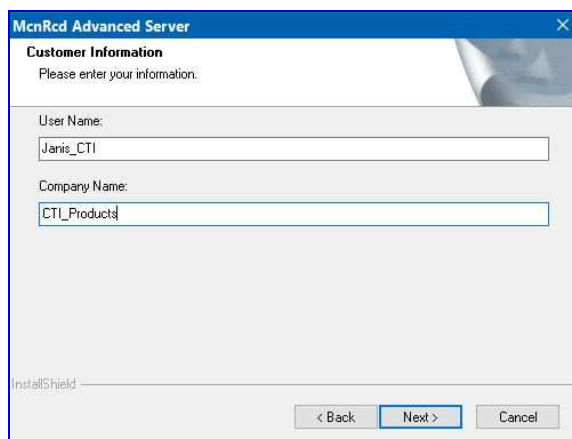




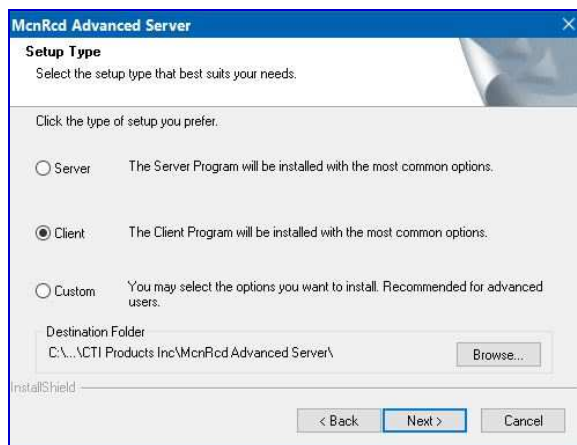
Read the License Agreement.

If you agree to the terms, click the "I Accept..." button as shown above and then hit the Next button to continue the installation.

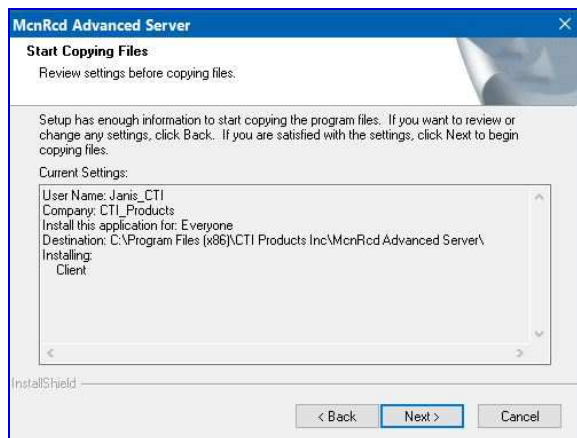
Enter your user information.



Select the “Setup Type” as “Client”.

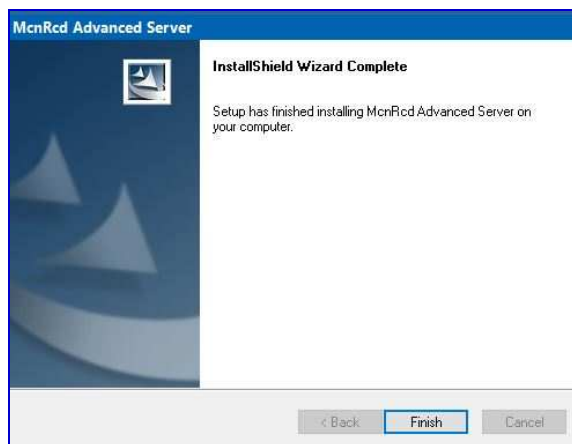
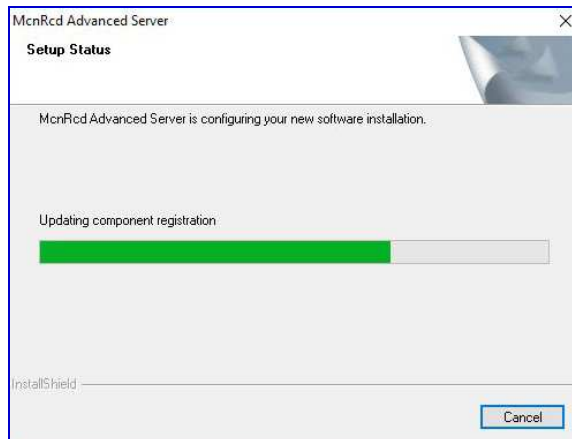


After you confirm everything is in order, hit **Next**.



Quick Setup

The Installshield program will install the files.



Click the **Finish** button to finish.

Uninstalling MCN Server or Client Software

There are a few methods for uninstalling the MCN software suite provided below. Certain methods support Installed feature selection while others only perform complete removal.

Using the Installation Disk (For Full or Select feature removal)

To uninstall MCN Server software or any of its features, you can use the Installation CD. Insert the MCN Server distribution CD into the CDROM drive. If 'Autoplay' is enabled in your windows OS, a Dialog/options box should pop up with options to 'Run setup.exe'. After clicking the Run setup.exe, you may choose to either remove specific features or the entire program suite and all installed features.

If the Autoplay feature is disable use the following 'Menu method'

Click the **Start** menu button on the Windows desktop, then select "**Run**" from the list. In the "**Run**" dialog box, type *d:setup.exe* (where 'd' is the drive letter of the CDROM drive), then click the **OK** button. In the "InstallShield Wizard" window, select "Remove", then click the **Next** button. Follow the prompts until the InstallShield Wizard completes the removal process.

Using the Control Panel (For complete removal only)

Click the **Start** menu button on the Windows taskbar, select control panel from the list. Depending on your view selection, choose either 'Programs' or 'Programs and Features'. Locate and double click the McnServer name from the list and follow the prompts.

System Considerations

IP Networking Considerations

Network Compatibility

The installer should consult with the customer's network engineers for proper settings.

The IP network routers and switches must be configured to pass:

- Unicast IP traffic between the MCN Server PC and all HIB-IP, HIB-IP 8000 or HIB-IP 8002 devices.
- Unicast IP traffic between the Client PCs and MCN Server PC(s)
- IP Multicast traffic from the MCN Server to the Clients (in normal Multicast mode).

The system requires static IP addresses for the following items:

- MCN Server 8000 PC
- ClientRcd PCs
- HIB-IP, HIB-IP 8000 and HIB-IP 8002 units
- Multicast IP Address for Server to Client traffic.

All IP addresses, IP Subnets, and Subnet Masks should be set based on the proper settings for the particular system.

Unicast Clients

MCN Server 8000 software Version 7.00 and up supports Unicast clients for up to 10 Clients for systems that don't support IP Multicast. This operating mode will increase IP traffic between the Server and Clients. Standard Multicast and Unicast clients can be mixed on a system.

MCNConfig Program

Overview

The MCNConfig program is used to configure an MCN system. System configuration involves:

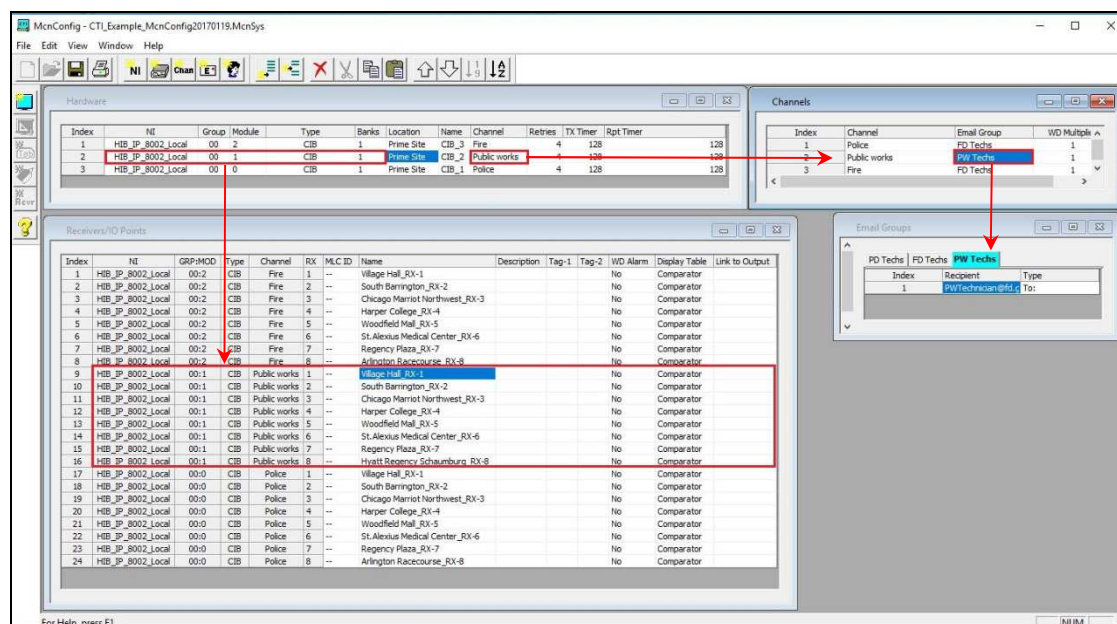
1. Defining system resources in the **Resource Windows**, such as Network Interfaces, Hardware Modules, Receiver Names, Channels, and Email Groups.
2. Designing the **Display Windows** to be displayed for the MCN Server and MCN Client programs.

Resource Windows

The MCNConfig program will be used to define your system by entering data into the following Resource Windows. (There is only one of each type of Resource Window for each system.)

- **Network Interface** Indicates which Network Interface is used for this system. If you are using a HIB-IP unit, this is where you will enter the IP and MCN address settings.
- **Hardware** Enter the information about the hardware modules (CIBs, AIBs, IOBs, etc.) present in the system.
- **Receivers** Enter the site Names and Descriptions for all the receivers in the system.
- **Channels** Enter the names of the radio channels used in the system. Each channel can have multiple hardware modules.
- **Email Groups** Enter the Email Groups & Recipients for alerts generated by the MCN Server program.
- **Display Tables** Each type of device to be monitored and controlled will have a Display Table. The Display Table maps the hardware I/O bits of the device into status indications. The MCN Server software ships with the standard Comparator Display Table and a number of generic I/O Display Tables.
- **Watchdog States** Optional: If your system has a System Performance Toolkit option, this is the window to use to define the Watchdog states.
- **User Permissions** This allows you to control which Client PCs can access the Server and which screens (Display Windows) they can load. You could, for example have different screens for Fire dispatchers and Police dispatchers.

Certain fields of the resource windows link to each other as shown by the arrows.



Display Windows (Screens)

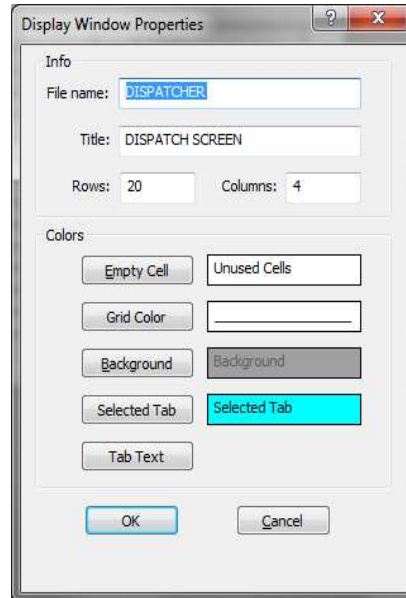
The Display Windows are the User Interfaces (Screens) used to display the system status in the MCN Server and Client run-time programs. Each Display Window can contain multiple Tabs and multiple channels. Multiple Display Windows can be defined for a system (ex: Dispatch & Technician screens or Police Dispatch & Fire Dispatch screens).

If there are multiple Display Windows, you will have to click the “View” tab and select “Display Window” and choose which specific screen you want to view.



Renaming a Screen

You can rename existing screens if changes are made to the system; by opening the specific screen, clicking the “**Edit**” tab and selecting “**Display Window Properties**”.



Screen Examples

The screenshot shows a window titled "Technician Screen" with two tabs: "Police" and "Fire - EMS". The "Fire - EMS" tab is active, displaying a grid with columns for Fire, Status, EMS, Status, Hilltop WT Alarms, and Status. The data is as follows:

Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Generator	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	Door	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	AC Power	Off-Line
West High	Off-Line	West High	Off-Line	Battery Charger	Off-Line
Mt. Airy	Off-Line	Mt. Airy	Off-Line	DC Power	Off-Line
Harrison	Off-Line	Harrison	Off-Line	Microwave	Off-Line
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		

Typical Technician Display Window

The following is an example of the Display Windows configurability:

For Technicians, a large display grid with one tab showing all systems on a single grid.

For Dispatchers, a small grid with multiple tabs showing only one channel per tab.

Different Display Windows for different dispatchers with different subsets of channels available.
(Police channels for Police dispatcher, Fire & EMS channels for Fire Dispatcher, etc.)

The screenshot shows a window titled "PD Dispatch" with three tabs: "East", "West", and "Detectives". The "Detectives" tab is active, displaying a list of channels and their status:

Channel	Status
Comm Center	Off-Line
Fernwood	Off-Line
Anderson Twp	Off-Line
Milford	Off-Line
Clermont	Off-Line
Mariemont	Off-Line
3 Mile WT	Off-Line
West High	Off-Line
Mt. Airy	Off-Line
Englewood	Off-Line
Hammond Twp	Off-Line
Harrison	Off-Line
Airport	Off-Line
Wassamata U	Off-Line
PS 104	Off-Line

Typical Dispatcher Display Window

Example System

You can load the Example System from the "Example System" directory off the main program directory.

Navigating the MCNConfig Program:

The MCNConfig program is a 32-Bit Windows program. Navigation, menus and toolbars are similar to other Windows programs.

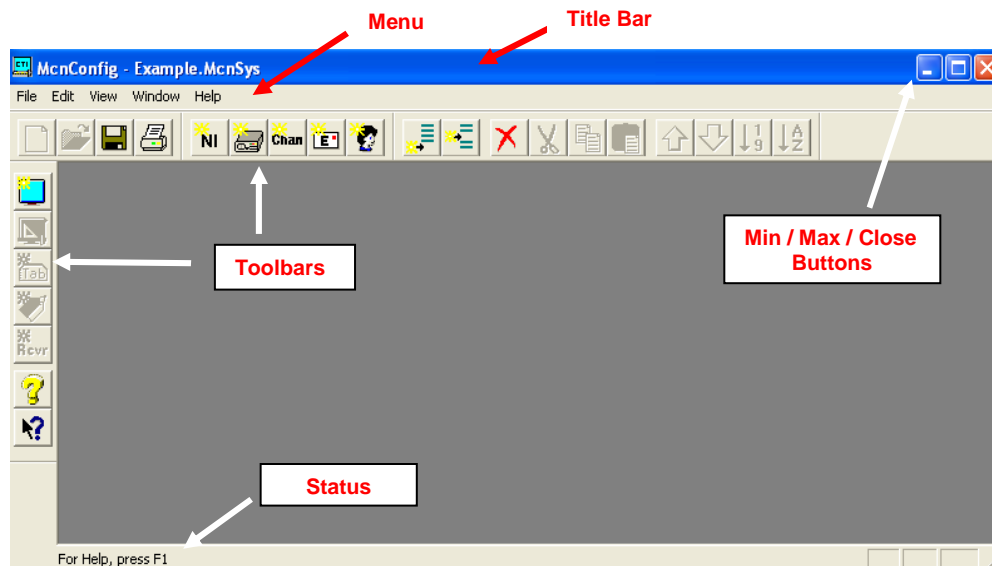
- Standard Windows **Hot-Keys** that can be used with this program include:
Ctrl-C Copy current selection to clipboard
Ctrl-V Paste clipboard to current location in selected window.
- **Context Sensitive Menus** are available in different windows by Right-clicking an item.
- **Scroll Bars** are available when the contents of a window (other than the main window) are larger than the size of that window.

Controlling the Windows

You can have multiple windows (resource windows or display windows) open on the workspace at a given time. You can control the windows as follows:

- **View** the Resource Windows (Hardware, Receivers, Channels, Display Tables or Email Groups) or Display Windows with the **View** menu.
- **Select** an open window by clicking the mouse on it or using the **Window** menu.
- **Move** a window by grabbing its title bar and dragging it.
- **Re-size** a window by grabbing an edge or corner and dragging it.
- **Minimize /Restore, Maximize and Close** the window using the standard Windows buttons on the top right corner of each window. If you close the last window, you will close the system. If changes have been made, you will have a chance to save the system.
- You can save the sizing and layout of your workspace by using the **Save Layout** command in the **Edit** menu.

Screen Elements



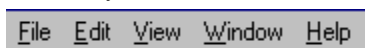
This program has many standard menu functions that are used in other Windows programs. For example, menus can be selected with the mouse or by holding down the **ALT** key while pressing the underlined letter on the menu. Note that a menu's appearance may change, and various menu options may be disabled, depending on the current state of the system.

Menu Bar

Two views of the Menu Bar will be displayed. When there is no system opened, a small Initial Menu Bar will be displayed:

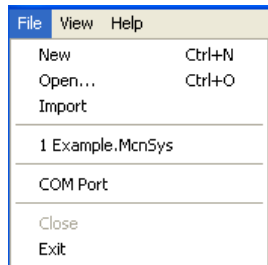


When a system is loaded, the standard Menu Bar will be displayed:



Initial File Menu

When there is no system loaded, the Initial File Menu is available.



New

Starts a new system from scratch.

Open

Opens an existing system from storage drive or device. This will open all the files associated with a particular system. Only one system can be open at a given time. You must close the existing system before starting a new system, or opening another system.

Import

Imports a system from the DOS version of the MCNRCD program.

Recent Files

Allows you to quickly open a recently used system.

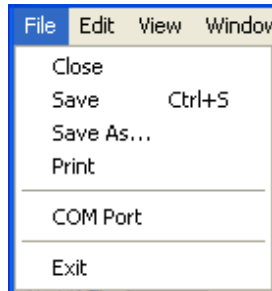
COM Port

Selects the COM port used to program HIB-IP units

Exit

Exits the program.

Standard File Menu



Once a system is loaded, the Standard File Menu is available:

Close Closes the current system.
If something has changed, you will be given a chance to save it.

Save Saves the current system with the current name.
This will save all the files associated with a particular system.

Save As Saves the current system with a new name.
This will save all the files associated with a particular system.

Prints the contents of the currently selected window.

Selects the COM port used to program HIB-IP units

Exits the program. If something has changed, you will be given a chance to save it.

Print

COM Port

Exit

The Standard File Menu does not have the Open, Import, or Recent Files menu items.

Saving Files

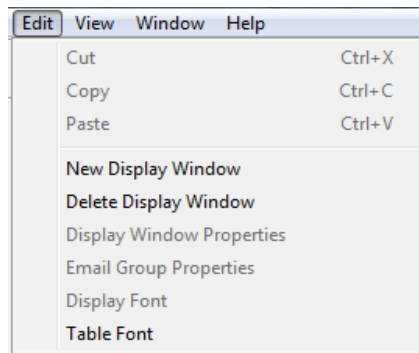


When you first save a system, Windows may default to the My Documents folder. Select an appropriate folder (or add a new folder) for your system. Normal users will need Read access to the folder that has the system files in it. We recommend that normal users do not have Write or Delete rights to that folder.

Edit Menu

The **Edit** Menu is available whenever a system is loaded.
(Some menu items may not be enabled depending on the currently active window.)

Note: Any font settings made from here are only effective within MCN Config program.
The font settings for the MCN Server programs (and the MCN Client program) are set by the user from within those programs.



Cut

Cuts the selected item(s) and saves a copy in the clipboard.

Copy

Copies the selected item(s) to the clipboard.

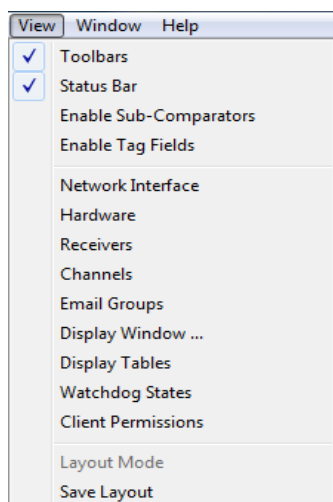
Paste

Pastes the contents of the clipboard to the current cursor location. Some fields are special fields and will only accept certain data (or certain ranges of data) from the clipboard.

New Display Window	See <i>Restrictions on Using the Clipboard</i> on page 1096 for more details.
Delete Display Window	Opens a new MCN Display Window.
Display Window Properties	Deletes an MCN Display Window.
Email Group Properties	Sets the properties (Window Title, Number of Rows & Columns) for the currently selected MCN Display Window.
Display Font	Sets the properties (Group Name, Hold-off Time) for the currently selected Email Group.
Table Font	Only available to set the font and size of text within the Display Window; Used to simulate the display for the MCN Server program.
	Sets the font and size of text within currently opened, active windows. Not active in the Display Window.

View Menu

The **View** Menu is used to display a list of available windows, from which you may quickly select and make active for use. Some items will only appear when certain options are purchased with the License.



Toolbars	Turns the Toolbars on or off.
Status Bar	Turns the Status Bar (at the bottom of the screen) on or off.
Enable Sub-Comparators	Displays a tab for Sub-comparator fields and options in the Display Table and Receiver Window. Turn this off for a less cluttered screen view if sub-comparators are not used.
Enable Tag Fields	Displays a column of Tag fields in the Receiver Window. Used with the Advanced Server for TPCI option.
Network Interface	Opens the Network Interface Window and makes it active.
Hardware	Opens the Hardware Resource Window and makes it active.
Receivers	Opens the Receiver Resource Window and makes it active.
Channels	Opens the Channel Resource Window and makes it active.
Email Groups	Opens the Email Groups Window and makes it active.
Display Window	Opens an RCD (Remote Comparator Display) Display Window and makes it active.

Display Tables

Opens the Display Tables Window and makes it active.

Watchdog States

Opens the Watchdog States window and makes it active.
Used only with the System Performance Toolkit software option.

Client Permissions

Opens the Client Permission Window and makes it active.

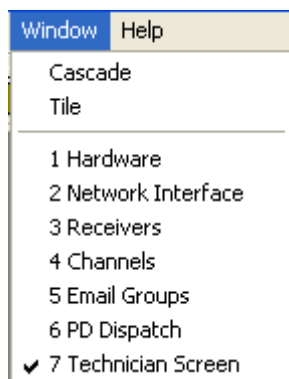
Layout Mode

Turns on Layout Mode in a Display Window to enable re-sizing of columns (active only when a Display Window is active.)

Save Layout

Saves the current working screen layout (Window Positions, Column widths). This layout will be used the next time the program is started.

Window Menu



Cascade

Cascades all open windows

Tile

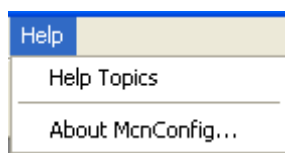
Tiles all open windows

Window List (1-N)

Indicates currently open windows. Use this list to select and open a Resource (Network Interface, Hardware, Receivers, Channels, Email Groups, and Display Table) or Display window. The Resource Windows will appear in the order they were opened.

Display Windows will be listed as named by the user.
(Windows 6 & 7 in this screen shot are Display Windows.)

Help Menu



Help Topics

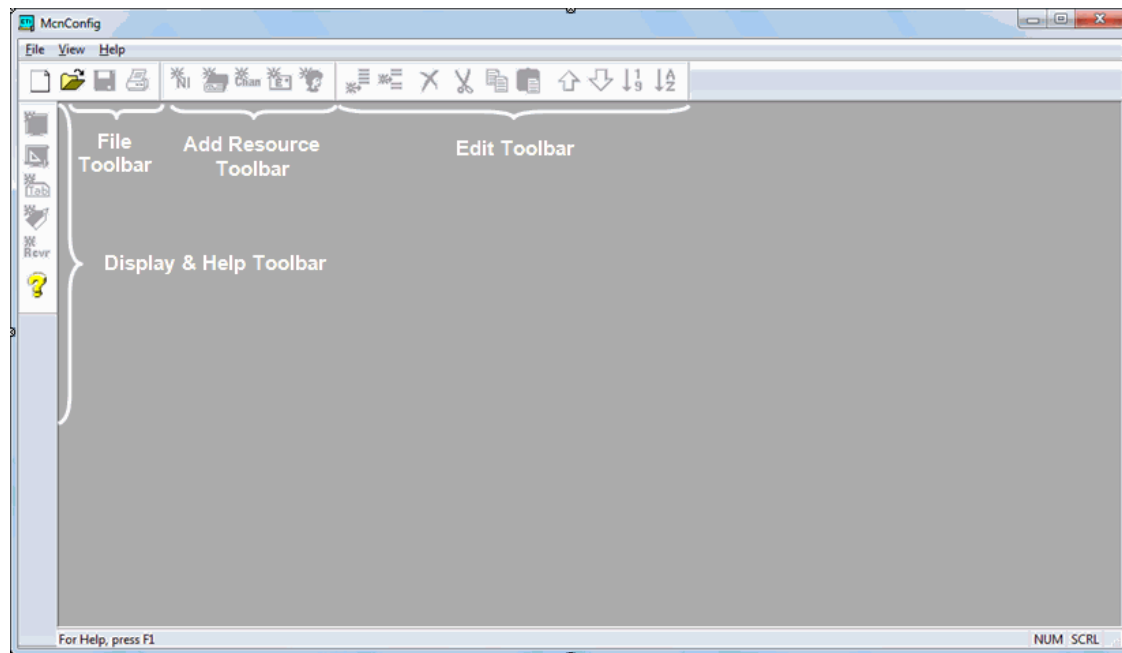
Brings up the standard **Help** menu.

About MCNConfig

Displays information about the program.

Toolbars

The MCNConfig program has dock-able toolbars indicated in the screen capture below. You can move the toolbars by clicking on the beginning or ending line in the toolbar and dragging it to the desired location.



Each Toolbar button has a Tool Tip that will be displayed when you hover the mouse over it. A more lengthy description of the button will appear in the Status Line at the bottom of the main window.

File Toolbar



New

Opens a new system.
Same as **File ... New** menu item.



Open

Opens a system from disk.
Same as **File ... Open** menu item.



Save

Saves the current system to disk.
Same as **File ... Save** menu item.



Print

Prints the data from the active window.
Same as **File ... Print** menu item.

Add Resource Toolbar



New Network Interface Module

Adds a new Network Interface module to the Network Interface resource window. (The MCN Server program supports only 1 Network Interface. If you need to support more than one Network Interface, you will need the MCN Advanced Server software.)



New Module

Adds a new module to the Hardware List resource window. Adds the appropriate number of Receivers or I/O Blocks in the Receiver window.



New Channel

Adds a new channel to the Channel List resource window.



New Email Group

Adds a new Email Group (tab) to the Email Group resource window.



New Email Recipient

Adds a new Email Recipient to the currently selected Email Group. If no Email Group is defined, this will add a new Email Group.

Edit Toolbar

Items in the Edit Toolbar work only in the currently selected window. If a toolbar item is not available in a particular window, it will be grayed out.

Note: Some fields are special fields and will only accept certain data (or certain ranges of data) from the clipboard. See *Restrictions on Using the Clipboard* page 109 for more details.



Append

Adds a new item to the end of a list of items. This item is not available in the Receiver Window or Display Window.



Insert

Inserts a new item at the current location in a list of items. This item is not available in the Receiver Window or Display Window.



Delete

Deletes the currently selected item(s).



Cut

Deletes the currently selected item(s) and copies them to the clipboard.



Copy

Copies the currently selected item(s) to the clipboard without deleting them from the selected window.



Paste

Pastes the clipboard contents to the current location in the selected window: See Preceding **Note**.



Move Up

Moves up the currently selected item in the list. This item is not available in the Receiver Window or Display Window.



Move Down

Moves down the currently selected item in the list. This item is not available in the Receiver Window or Display Window.



Sort Numeric

Sorts the Hardware Module list by MCN Group & Module numbers. This item is available only in the Hardware Window.



Sort Alpha

Sorts the list alphabetically. This item is available only in the Channel Window and the Email Window.

Display & Help Toolbar



New Display

Adds a new display window.



Display Window Properties

Opens the Grid Properties dialog box. Allows changes to be made to the window Title, and the number of rows and columns for a Display Window. This item is available only when a Display Window is selected.



New Tab

Appends a display tab to the selected Display Window. This item is available only when a Display Window is selected.



New Label

Adds a Label at the current position in the selected Display Window. This item is available only when a Display Window is selected.



New Receiver

Adds Receiver(s) or I/O Group(s) to the current position in the selected Display Window. This item is available only when a Display Window is selected.



Help

Displays the Help menu window.

Configuring MCNConfig Program: System Resources

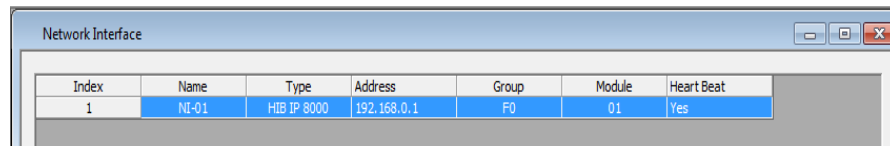
The process to configure a working system begins with configuring the following Resource Windows:

Network Interface Window	Displays the Network Interface selected for this system. This window also lets you configure the IP settings for a HIB-IP module (if used).
Hardware Window	Define hardware modules & addresses
Receiver Window	Define receiver names & I/O group names for all hardware modules
Channel Window	Enter channel information
Email Group Window	Enter email information for alerting

Network Interface Window: Details

This window displays the Network Interface selected for this system.

This window also lets you configure the IP settings for a HIB-IP module (if used).



Index	Name	Type	Address	Group	Module	Heart Beat
1	NI-01	HIB IP 8000	192.168.0.1	F0	01	Yes

The MCN Server software only supports a single Network Interface. If you need to support multiple Network Interfaces, you'll need to upgrade to the MCN Advanced Server software.

The Network Interface Resource Window includes the following fields:

Name

Network Interface Name (as stored in the database for this system)

Type:

Type of Network Interface Module:

Non-IP PCLTA
 HIB-232

IP HIB-IP, HIB-IP 8000, HIB-IP 8002

The settings for Non-IP Network Interfaces are set up with the HWSetup program and stored in the PC registry. The MCN Server program will get that information from the registry when it runs.

The settings for the IP Network Interfaces (HIB-IP family) are set up in the MCNConfig program and saved in the database for the MCN system. You will also use the settings stored in the system database to program HIB-IP and HIB-IP 800 units through a COM port. You program HIB-IP 8002 units using a USB port.

Address

This is used only for Non-IP Network Interfaces.

It is a pointer to the Non-IP Network Interface that is set up with the HWSetup program. It will normally be "MCN1".

Group

MCN Group Number for this module (Hex value 00-FE).

This is shown only for HIB-IP units (which are configured in MCN Config program).

Module

MCN Module Number for this module (Hex value 0-F).

This is shown only for HIB-IP units (which are configured in MCNConfig program).

MCN Group & Module Settings



Warning: All Network Interfaces and MCN modules must have unique addresses.

In addition, with regard to custom engineered systems with Routers and EXB Network Extenders, there may be specific Group & Module addresses that must be used with particular Network Interfaces, depending on their location in the MCN network.

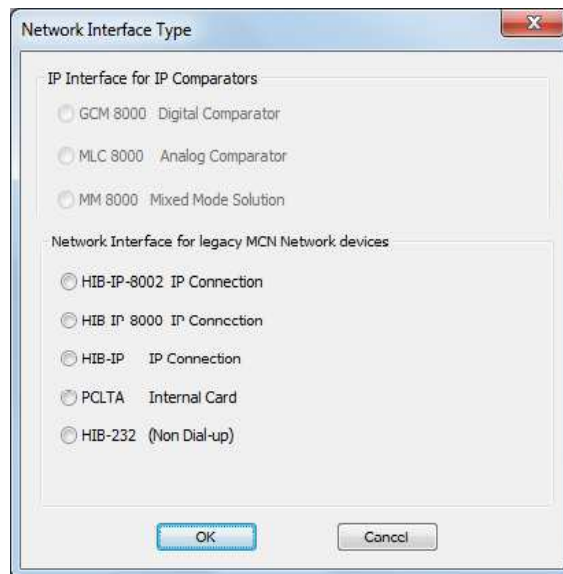
If you have a Custom Engineered System, be sure to consult your custom system configuration documentation for the proper setting for the Group & Module addresses for your Network Interfaces.

Adding a HIB-IP, HIB-IP 8000 and HIB-IP 8002 Network Interface

Note: If you are using a PCLTA or HIB-232 Network Interface Skip this section and go to **Hardware Resource Window** Page 70.

When you start to build a new system, the MCNConfig Server program will look in the registry to determine which Network Interface you have selected. If you have set up a Non-IP Network Interface (such as a PCLTA, or a Non-Dial-Up HIB-232) in the HWSetup program, the MCNConfig program will find it and select it as the Network Interface for this system.

If however you have a HIB-IP, HIB-IP 8000, or HIB-IP 8002 in the HW Setup program, when the MCNConfig program opens the 'Network Interface Type' window will be shown as seen below on the left.



Upon selection of the required type of HIB-IP interface the 'HIB-IP Parameters' window will appear.

Enter the appropriate parameters for the HIB-IP, HIB-IP 8000 or HIB-IP 8002 unit:

Name

You may re-name the HIB-IP unit to change its default to a preferred name. This is the name that you will refer to when you add hardware modules to the system.

Address

Enter a valid Class A, B, or C IP address for this unit.
See details in the HIB-IP Hardware Reference Manual.

Subnet Mask

Enter the Subnet Mask for this IP address.
See details in the HIB-IP Hardware Reference Manual.

The HIB-IP Subnet Mask **cannot be less restrictive** than the following standard IP Class Subnet Masks

Class	First Octet	Standard Subnet Size	Standard Subnet Mask
A	1-127	16,777,214	255.0.0.0
B	128-191	65,543	255.255.0.0
C	192-223	253	255.255.255.0
D	224-239	Multicast – Do not use.	
E	240-255	Experimental – Do not use.	

The HIB-IP units can accept a subnet mask that is more restrictive (more 1's set in the Subnet Mask), but not less restrictive.

Gateway

If the MCN Server PC will be using an IP address that is in a different subnet than the HIB-IP, you must enter a Gateway IP address. This is the IP address of the IP router that the HIB-IP will communicate to in order to talk to a PC that is on a different IP subnet. The Gateway IP address must be on the same subnet as the HIB-IP unit.



If the MCN Server PC and the HIB-IP are on the same subnet, you do not have to enter a Gateway address.

See details in the appropriate HIB-IP Hardware Reference Manual.

Group

MCN Group address for the HIB-IP.

Value: 00-FE Hex

See Warning under **Important: MCN Address Setting** on Page 39.

Module

MCN Module address for PCLTAs and HIB-IP units.

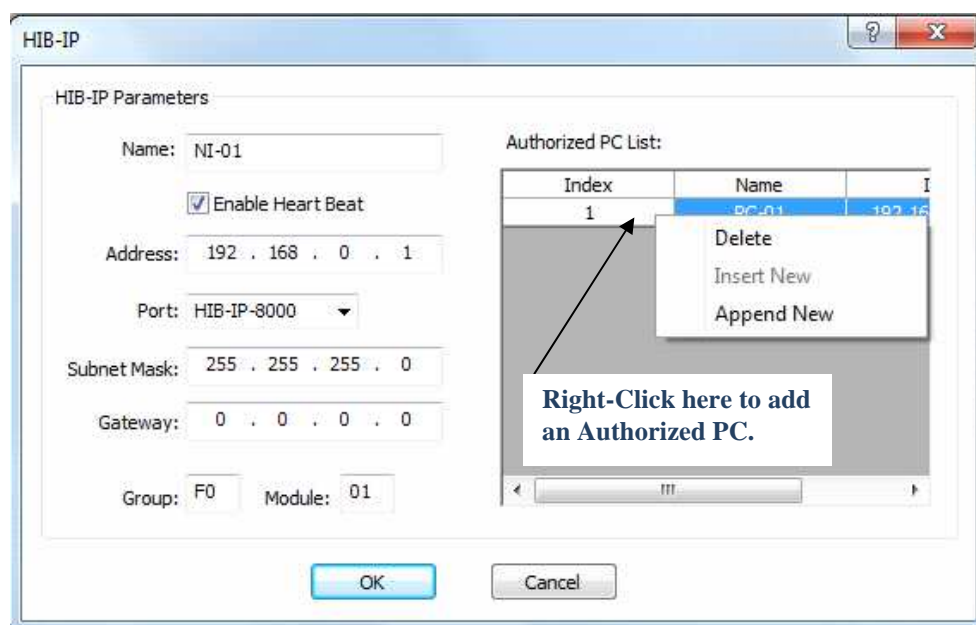
Value: 00-7E Hex Usually a HIB-IP will be set for a module number of 10 hex or above. This leaves room for HIB-232 modules in the system, which are limited to Module Numbers 0-F.

See Warning under **Important: MCN Address Setting** on Page 39.

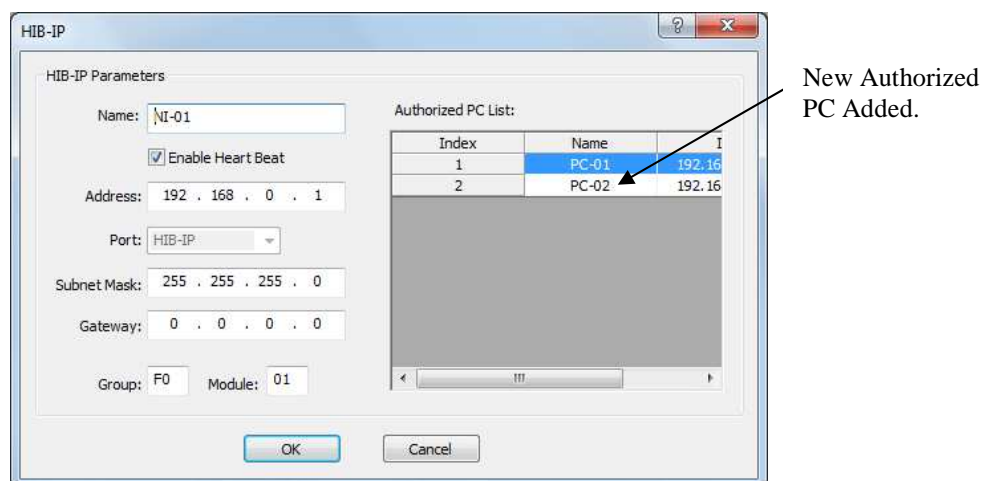
HIB-IP Authorized PCs

For system security purposes, the HIB-IP will communicate only with Authorized PCs (Authorized Servers). There will normally be a HIB-IP unit in the system for each Server PC that needs to communicate with its MCN network. The HIB-IP unit can, however, be configured for IP addresses for multiple Authorized PCs.

To add an Authorized PC, **Right-Click** on the Authorized PCs list to bring up the menu.



Select **Append New**.



- Enter the PC Name (if desired).

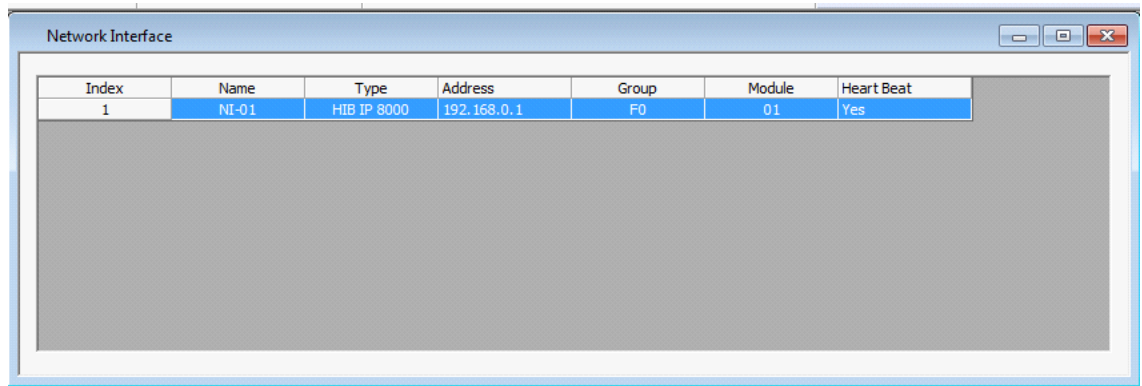
MCNConfig Program: Network Interface Window

- Enter the IP settings to match the PC you plan to use.
- You can add additional Authorized PCs by right-clicking in the Authorized PC list.
- Set up the parameters for the HIB-IP unit.
- When you are finished entering Authorized PCs, click the **OK** button.



Although you can enter multiple Authorized PCs in the HIB-IP database, the HIB-IP can only connect to one PC at a time. If a second PC attempts to connect to a HIB-IP at the same time (even if it is in its Authorized PC list), it will be rejected.

The HIB-IP unit will appear in the Network Interface window.



It will then be associated with all the hardware modules (such as CIBs, AIBs, and IOBs).

- The MCN Server software supports only one Network Interface per system.
- The MCN Advanced Server software supports multiple Network Interfaces.

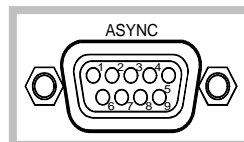
Programming HIB-IP, HIB-IP 8000 and HIB-IP 8002 Units

You must use the MCNConfig program to upload the system configuration parameters to the HIB-IP unit before you can use it.

1. Be sure all the HIB-IP and Authorized PC parameters have been entered into the PC database as described above

For Legacy HIB-IP and HIB-IP 8000 Modules with the DB9 Serial connector:

2. Connect a Null Modem cable (CTI # 89-11314) between the PC and the Async Serial Programming connector on the HIB-IP.



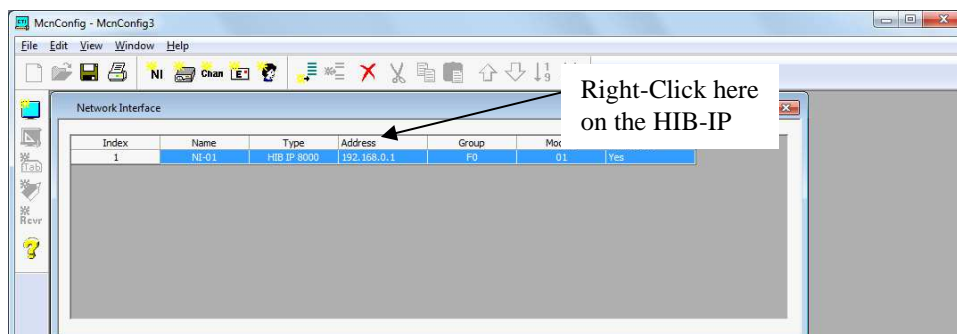
For HIB-IP 8002 Modules with the USB connector:

3. Connect a standard 4 pin A/B male USB Cable between the PC and the USB Programming connector on the HIB-IP 8002.

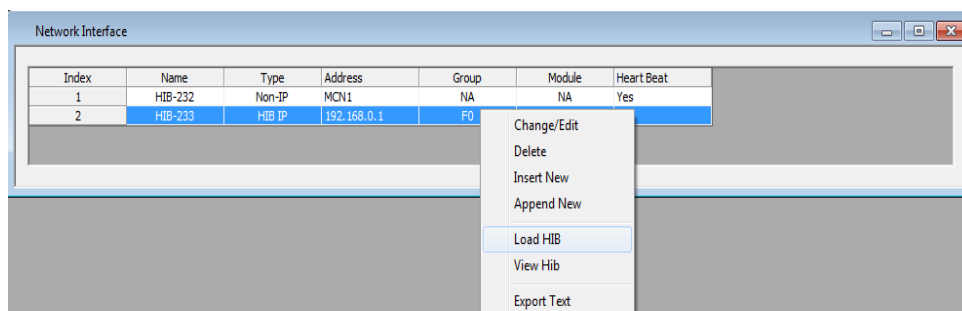
1.



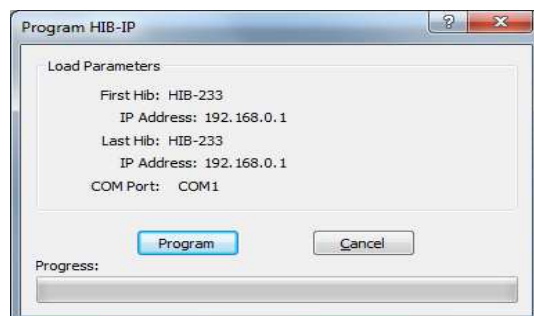
4. Go to the Network Interfaces window and select the proper HIB-IP unit, if more than one is listed.



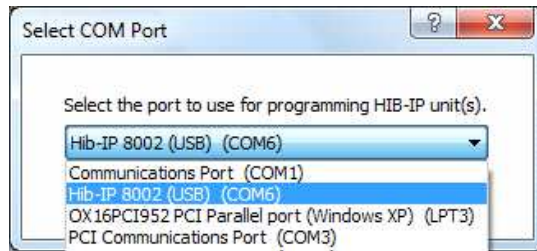
5. Right-click on the HIB-IP unit and select "Load HIB" from the pop-up window.



6. Click the "Program" button.



The application will automatically scan for all the available ports and display a list.

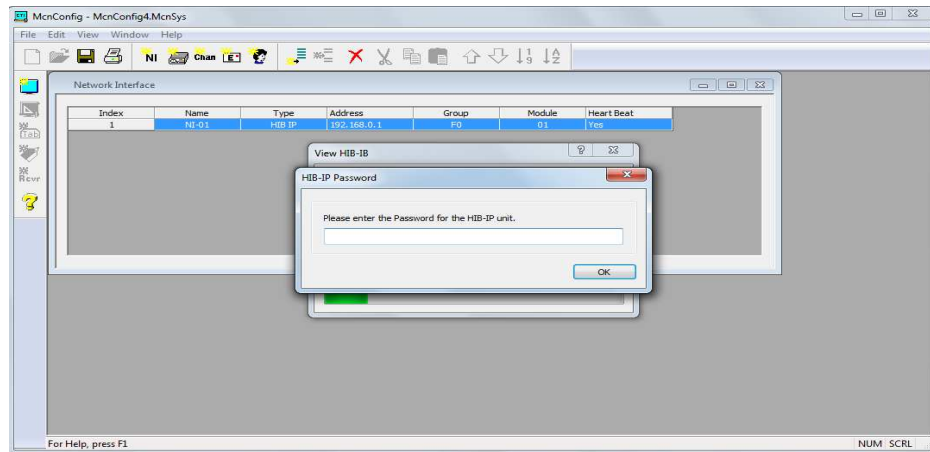


After selecting the appropriate communications port and clicking ok,

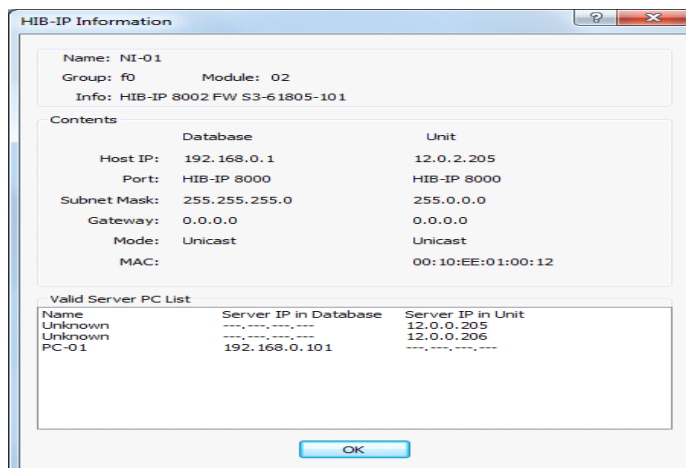
For the HIB-IP 8002 you will initially be required to enter a Password to authorize configuration changes to the module. There is a default Password which can be changed if needed. (See Changing Password.) Passwords are case-sensitive.



NOTE: Default Password = "Initial-Password!"



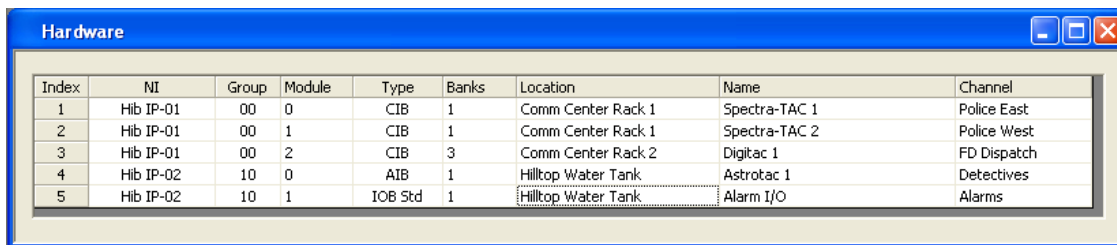
7. You can also read or verify the information in the HIB-IP module by selecting the "View HIB" menu item from the previous pop up window. This will read and display the configuration data within the HIB-IP unit.



You may also refer to the appropriate HIB-IP, HIB-IP 8000 or HIB-IP 8002 Hardware Reference Manual for additional details on HIB-IP Set up and Installation.

Hardware Resource Window

This is a list of hardware modules in the system.



The screenshot shows a window titled "Hardware" with a table containing 5 rows of hardware modules. The table has columns for Index, NI, Group, Module, Type, Banks, Location, Name, and Channel.

Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	Hib IP-01	00	0	CIB	1	Comm Center Rack 1	Spectra-TAC 1	Police East
2	Hib IP-01	00	1	CIB	1	Comm Center Rack 1	Spectra-TAC 2	Police West
3	Hib IP-01	00	2	CIB	3	Comm Center Rack 2	Digitac 1	FD Dispatch
4	Hib IP-02	10	0	AIB	1	Hilltop Water Tank	Astrotac 1	Detectives
5	Hib IP-02	10	1	IOB Std	1	Hilltop Water Tank	Alarm I/O	Alarms

The Hardware Resource Window includes the following fields:

NI

Network Interface to use for this module.

This is a drop-down field that will let you select from the defined Network Interfaces for this system (either PCLTA, HIB-232, or HIB-IP). In the example above, there is a HIB-IP at the Communications Center connecting to the modules there and another at the Hilltop Water Tank.

Group

MCN Group Number for this module (Hex value 00-FE)

Module

MCN Module Number for this module (Hex value 0-F)

Type

Module Type from the following table:

Module Type	Description	Receivers or I/O Blocks
CIB	Comparator Interface 4 Bits per Receiver	8
CIB 2-Bit	CIB Module for 2 Bit I/O 2 Bits per I/O Block	16
CIB 1-Bit	CIB Module for 1 Bit I/O 1 Bit per I/O Block	32
AIB	Astrotac Comparator Interface	8, 16, 24, 32, 40, 48, 56, 64 (Depending on Bank setting)
IOB Std	General I/O Controller 4 Bits per I/O Block	8 I/O Blocks
IOB 2 Bit	General I/O Controller 2 Bits per I/O Block	16 I/O Blocks
IOB 1 Bit	General Input Device 1 Bit per I/O Block	32 Input Blocks
GPI-12	General Purpose Input Module	12 Opto-Isolated Inputs
GPI-24	General Purpose Input Module	24 Opto-Isolated Inputs
GPO-12A	General Purpose Output Module	12 SSR Outputs (Form A)
GPO-24A	General Purpose Output Module	24 SSR Outputs (Form A)
GPIO-1212A	General Purpose Input/Output Module	12 Opto-Isolated Inputs 12 SSR Outputs (Form A)
GPIO-1208C	General Purpose Input/Output Module	12 Opto-Isolated Inputs 8 E-M Relay Outputs (Form C)
GPO-16C	General Purpose Output Module	16 Magnetically Latched Relay Outputs (Form C)
GPIO-1208L	General Purpose Input/Output Module	12 Opto-Isolated Inputs 8 Magnetically Latched Relay Outputs (Form C)
GPO-16L	General Purpose Output Module	16 Magnetically Latched Relay Outputs (Form C)
GPIO-1212LA	General Purpose Input/Output Module	12 Opto-Isolated Inputs 12 Latched Alarm Outputs

Banks

Number of receiver banks (8 receivers per bank). AIB modules can have up to 8 banks. All other modules have only 1 bank. A drop-down list is provided.

Location

Typically refers to site name for this particular module.

Free format text field for customer use.

Not required for program operation.

Can be used in error logging & emails

Name

Typically used to identify a particular module.

Free format text field for customer use.

Not required for program operation.

Used in error logging & emails.

Channel

The radio channel associated with this module.

Drop-down field.

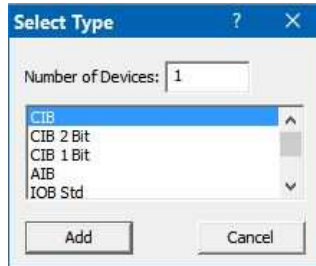
Select one of the Channels from the Channel resource list.

Can be used in error logging & emails



Adding a Hardware Module

Add new hardware module with the **New Module** button.



Select a Hardware Type and hit Add.

A new hardware module will be added to the bottom of the list. It will have the next Group & Module number.

Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	Hib IP-01	00	0	CIB	1	Comm Center Rack 1	Spectra-TAC 1	Police East
2	Hib IP-01	00	1	CIB	1	Comm Center Rack 1	Spectra-TAC 2	Police West
3	Hib IP-01	00	2	CIB	3	Comm Center Rack 2	Digitac 1	FD Dispatch
4	Hib IP-02	10	0	AIB	1	Hilltop Water Tank	Astrotac 1	Detectives
5	Hib IP-02	10	1	IOB Std	1	Hilltop Water Tank	Alarm I/O	Alarms
6	Hib IP-02	10	2	CIB	1			None

If this is an AIB module, enter the proper number of banks.

Enter the Location and Name.

Select a Channel from the drop--down menu

Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	Hib IP-01	00	0	CIB	1	Comm Center Rack 1	Spectra-TAC 1	Police East
2	Hib IP-01	00	1	CIB	1	Comm Center Rack 1	Spectra-TAC 2	Police West
3	Hib IP-01	00	2	CIB	3	Comm Center Rack 2	Digitac 1	FD Dispatch
4	Hib IP-02	10	0	AIB	1	Hilltop Water Tank	Astrotac 1	Detectives
5	Hib IP-02	10	1	IOB Std	1	Hilltop Water Tank	Alarm I/O	Alarms
6	Hib IP-02	10	2	CIB	1	Hilltop Water Tank	Spectra-TAC	None



Don't see any Channels in the list? See **Adding a Channel** on page 74 for instructions on how to create channels.

Group & Module Numbers

The program assigns the first module a Group:Module address of 00:0.

If this is not correct for your system, you can change the Group & Module numbers.

Group numbers are hex values that can be from 00 to FE.

Module numbers are hex values that can be from 0 to F.

The program will automatically increment the Module number from the last used number.

When the Module number rolls over from F to 0, it will increment the Group number.

Group & Module number combinations in any particular MCN system must be unique. The MCN Server can access multiple separate MCN Networks with multiple HIB-IP units. Separate MCN Networks are networks that are not tied together with EXB modules. Separate MCN Networks can have modules with the same MCN Group & Module number combinations.

Automatic Linking to Receiver Window

When you add a new Hardware Module, the program automatically adds the appropriate number of Receivers or I/O Groups in the Receiver window.

When you change the order of hardware modules in the Hardware window, the Receivers & I/O Groups follow in the Receiver Window.

When you select a hardware module, the receiver window scrolls so that the first receiver or I/O group in that module is visible.

Hardware Window Toolbar Buttons

The following toolbar buttons will also function in the Hardware Window:



Append



Insert



Delete



Copy

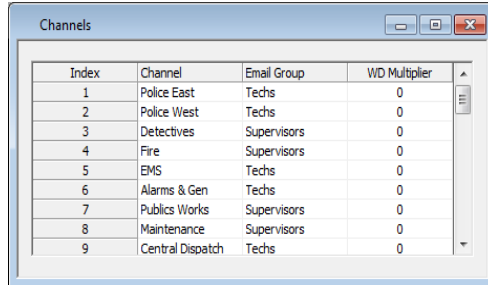


Paste

See *Toolbars* on page 60 for more details.

Channels Resource Window

The Channels Window contains a list of radio channels used in the system. It is used to logically group a number of hardware modules. It can also be used to route email alerts to different email groups for different channels.



Index	Channel	Email Group	WD Multiplier
1	Police East	Techs	0
2	Police West	Techs	0
3	Detectives	Supervisors	0
4	Fire	Supervisors	0
5	BMS	Techs	0
6	Alarms & Gen	Techs	0
7	Publics Works	Supervisors	0
8	Maintenance	Supervisors	0
9	Central Dispatch	Techs	0

Each channel has the following fields:

Channel

Channel name. (e.g.: Fire East, Countywide, Command, etc.) Free format text field.
Used in error logging & emails

Email Group

This is the group of Emails to send error alerts to for this channel.
Drop-down field: Select one of the Email Groups from the Email Group resource list.

WD Multiplier

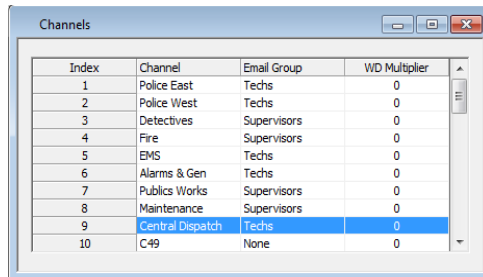
The Watch Dog Multiplier configures the time interval for error monitoring and logging.
Drop-down field: Select a multiplier value from the list.
This is a licensed feature that is only available and viewable with the System Performance Toolkit option.



Adding a Channel

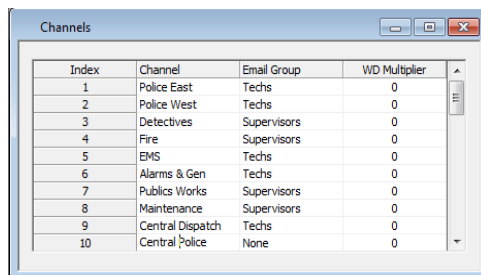
Add new channel with the **New Channel** button.

The program will add a new Channel to the end of the list



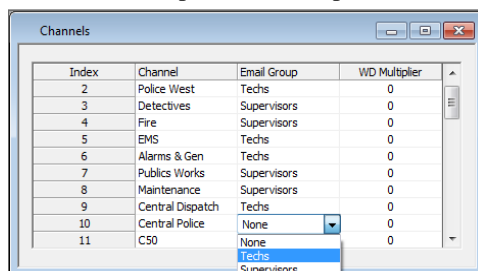
Index	Channel	Email Group	WD Multiplier
1	Police East	Techs	0
2	Police West	Techs	0
3	Detectives	Supervisors	0
4	Fire	Supervisors	0
5	BMS	Techs	0
6	Alarms & Gen	Techs	0
7	Publics Works	Supervisors	0
8	Maintenance	Supervisors	0
9	Central Dispatch	Techs	0
10	C49	None	0

Enter the Channel Name.



Index	Channel	Email Group	WD Multiplier
1	Police East	Techs	0
2	Police West	Techs	0
3	Detectives	Supervisors	0
4	Fire	Supervisors	0
5	BMS	Techs	0
6	Alarms & Gen	Techs	0
7	Publics Works	Supervisors	0
8	Maintenance	Supervisors	0
9	Central Dispatch	Techs	0
10	Central Police	None	0

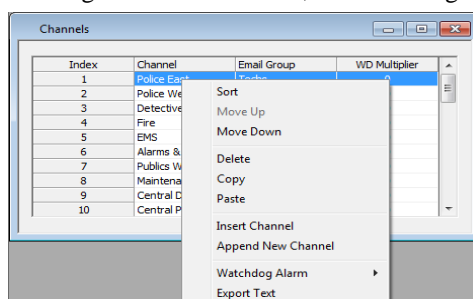
Select an Email Group from the drop-down selection



Don't see any Email Groups in the list? See **Adding an Email Group** on page 76 for instructions on how to create channels.

Channel Window Context Sensitive (Right Click) Menu

By right-clicking on the Channel list, the following menu appears:



Sort: organizes the channels alphabetically.

Move Up and **Move Down:** will shift the selected channel up or down in the list.

Delete: will erase a channel.

Copy: will record the current selection to the clipboard.

Paste: will write the clipboard contents to a specified location.

Insert New Channel: will add a new channel at a specific location in the list.

Append New Channel: adds a new channel at the end of the list.

Watch Dog Alarm: enables or Disable Watchdog flags for all receivers, and points, in the channel. (Available only with the System Performance Toolkit 'SPT' Option.)

Export Text: will export a text file copy, of the contents for this window.

Channel Window Toolbar Buttons

The following toolbar buttons will also function in the Channel Window:



Append



Insert



Delete



Copy



Paste



Up



Down

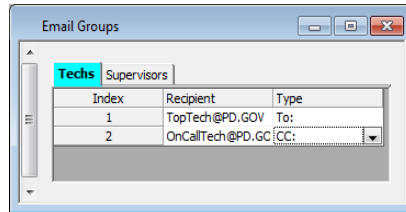


Sort Alpha

See **Toolbars** on page 60 for more details.

Email Groups Resource Window

The MCN Server program can send emails when it detects failures. Emails can be sent to multiple recipients. You can send email alerts to different groups of email recipients based on which channel has a failure. An email window with two email groups is shown below



If the Email Group window is not visible, use the menu command **View ... Email Groups** to open it. Each Email Group has its own tab. An "Email Group Tab" identifies a group of email addresses with a "Group Name". This is a free format text field. (ex: Police Techs, FD/EMS Techs). Each entry in an Email group has the following fields:

Recipient

Destination email (ex: TopTech@PD.GOV)
There can be multiple recipients in an Email Group.

Type

Message type to use for messages to this email address.
Select from: To:, CC:, BCC:



Adding an Email Group

Add a new Email Group with the **New Email Group** button.
The Email Group Dialog box appears. It will have a unique Email Group name.



Enter the desired Email Group Name and the Hold Off Time and click the **OK** button.

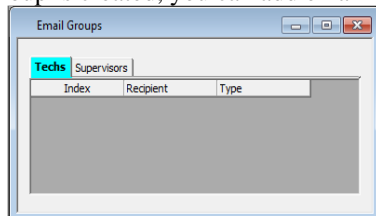


Email Hold off Time

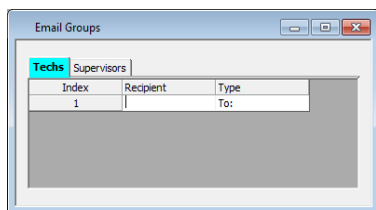
In normal system operation, multiple failures can happen within a short time of each other. For instance, a "Stuck Microphone" will eventually cause all the receivers to go into Fail mode. Typically, all the receivers will fail within about 15 seconds of each other. The system can aggregate these failures into one email instead of sending multiple emails. When the program starts to send an email to an Email group, it will wait for the Email Hold off Time to expire before sending the email. When the timer times out, the system will send all the collected messages in one email.

Adding Email Recipients

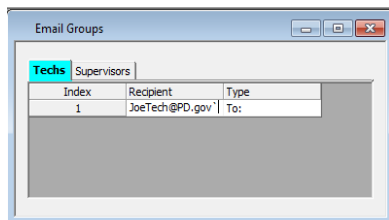
Once an Email Group is created, you can add email recipients.



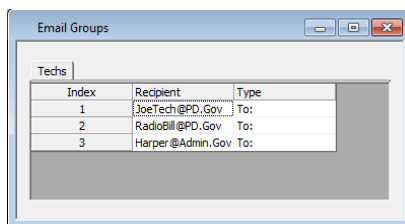
Add a new Email Recipient with the **New Email Recipient** button
If no Email Group is defined, this will add a new Email Group.



Enter the desired email address.



Continue the process to add more recipients to a group.



Adding Multiple Email Groups



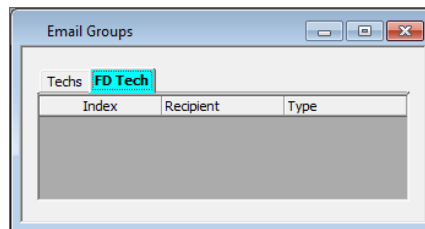
Add additional Email Groups by using the **New Email Group** button or right click on the Current Group Tab: Then enter the preferred Group name.



Default Name.



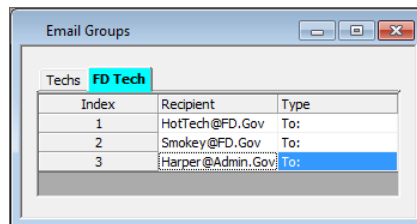
Edit Name.



Finished.

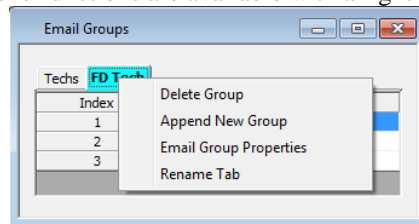


Add recipients with the **New Recipient** button.



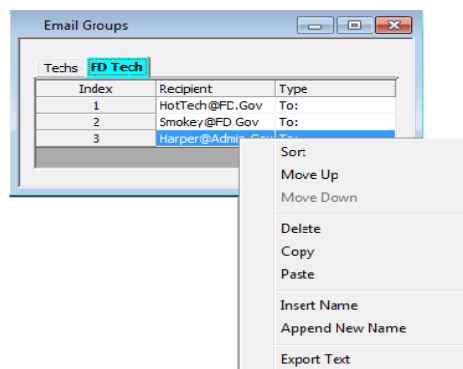
Email Group Context Sensitive (Right Click) Menu

The following menu functions are available with a right click on the Email Group tabs.



Email Recipient Context Sensitive (Right Click) Menu

The following menu functions are available with a right click in the Email Recipient list.



Email Group Window Toolbar Buttons

The following toolbar buttons will also function in the Email Groups Window:



Append



Insert



Delete



Copy



Paste



Up



Down



Sort Alpha

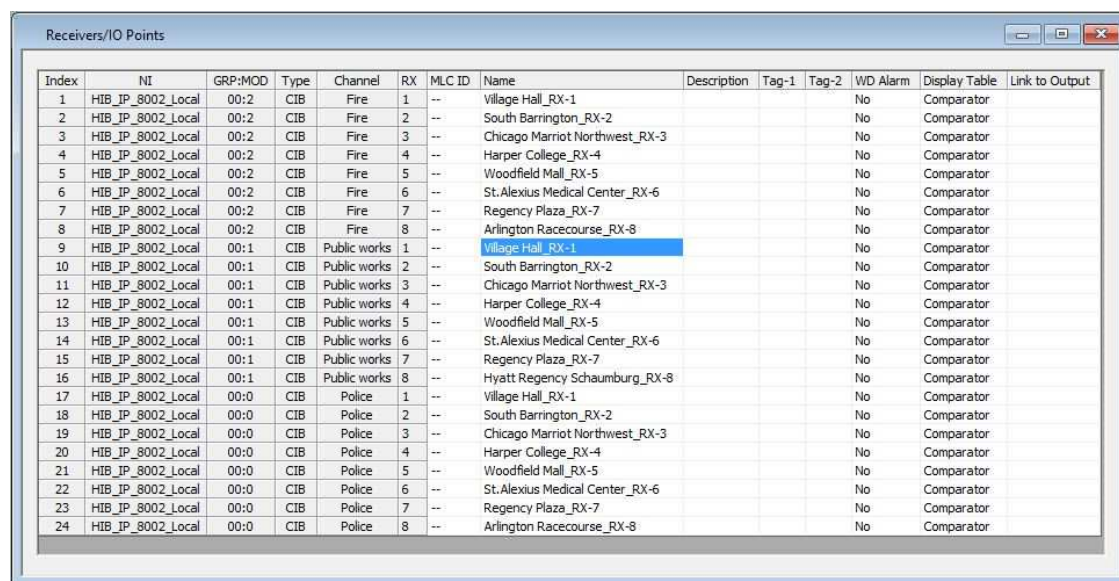
See *Toolbars* on page 60 for more details.

Receivers Resource Window

The Receivers Window shows:

- The site names for all the receivers in the system.
- Input/Output groups for I/O modules

It is based on the modules defined in the Hardware Window.

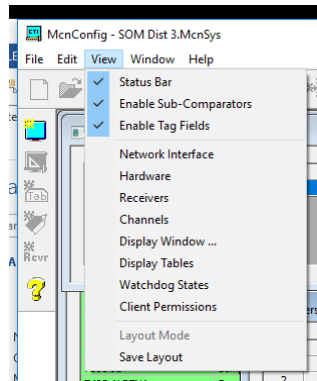


The screenshot shows a window titled "Receivers/IO Points" with a table containing 24 rows of receiver data. The table has columns for Index, NI, GRP:MOD, Type, Channel, RX, MLC ID, Name, Description, Tag-1, Tag-2, WD Alarm, Display Table, and Link to Output. The data is organized into groups based on the RX column (Fire, Public works, Police) and the NI column (HIB_IP_8002_Local).

Index	NI	GRP:MOD	Type	Channel	RX	MLC ID	Name	Description	Tag-1	Tag-2	WD Alarm	Display Table	Link to Output
1	HIB_IP_8002_Local	00:2	CIB	Fire	1	--	Village Hall_RX-1				No	Comparator	
2	HIB_IP_8002_Local	00:2	CIB	Fire	2	--	South Barrington_RX-2				No	Comparator	
3	HIB_IP_8002_Local	00:2	CIB	Fire	3	--	Chicago Marriot Northwest_RX-3				No	Comparator	
4	HIB_IP_8002_Local	00:2	CIB	Fire	4	--	Harper College_RX-4				No	Comparator	
5	HIB_IP_8002_Local	00:2	CIB	Fire	5	--	Woodfield Mall_RX-5				No	Comparator	
6	HIB_IP_8002_Local	00:2	CIB	Fire	6	--	St.Alexius Medical Center_RX-6				No	Comparator	
7	HIB_IP_8002_Local	00:2	CIB	Fire	7	--	Regency Plaza_RX-7				No	Comparator	
8	HIB_IP_8002_Local	00:2	CIB	Fire	8	--	Arlington Racecourse_RX-8				No	Comparator	
9	HIB_IP_8002_Local	00:1	CIB	Public works	1	--	Village Hall_RX-1				No	Comparator	
10	HIB_IP_8002_Local	00:1	CIB	Public works	2	--	South Barrington_RX-2				No	Comparator	
11	HIB_IP_8002_Local	00:1	CIB	Public works	3	--	Chicago Marriot Northwest_RX-3				No	Comparator	
12	HIB_IP_8002_Local	00:1	CIB	Public works	4	--	Harper College_RX-4				No	Comparator	
13	HIB_IP_8002_Local	00:1	CIB	Public works	5	--	Woodfield Mall_RX-5				No	Comparator	
14	HIB_IP_8002_Local	00:1	CIB	Public works	6	--	St.Alexius Medical Center_RX-6				No	Comparator	
15	HIB_IP_8002_Local	00:1	CIB	Public works	7	--	Regency Plaza_RX-7				No	Comparator	
16	HIB_IP_8002_Local	00:1	CIB	Public works	8	--	Hyatt Regency Schaumburg_RX-8				No	Comparator	
17	HIB_IP_8002_Local	00:0	CIB	Police	1	--	Village Hall_RX-1				No	Comparator	
18	HIB_IP_8002_Local	00:0	CIB	Police	2	--	South Barrington_RX-2				No	Comparator	
19	HIB_IP_8002_Local	00:0	CIB	Police	3	--	Chicago Marriot Northwest_RX-3				No	Comparator	
20	HIB_IP_8002_Local	00:0	CIB	Police	4	--	Harper College_RX-4				No	Comparator	
21	HIB_IP_8002_Local	00:0	CIB	Police	5	--	Woodfield Mall_RX-5				No	Comparator	
22	HIB_IP_8002_Local	00:0	CIB	Police	6	--	St.Alexius Medical Center_RX-6				No	Comparator	
23	HIB_IP_8002_Local	00:0	CIB	Police	7	--	Regency Plaza_RX-7				No	Comparator	
24	HIB_IP_8002_Local	00:0	CIB	Police	8	--	Arlington Racecourse_RX-8				No	Comparator	

Column Visibility

The Tag and Sub-Comparator fields are normally not used in small systems. You can turn them on or off in **Menu: View** as shown below.



Fast Navigation in Receiver Window

The Receiver Window is linked to the Hardware Window. Clicking on a module in the Hardware Window will bring up the first receiver of that module in the Receiver Window.

Each entry in the Receivers Window has the following fields:

NI

Network Interface for this hardware module. This is a read-only field and is defined in the Hardware window.

Grp:Mod

The MCN Group & Module number for the hardware module. This is a read-only field defined in the Hardware Window. The order of modules follows the module order in the Hardware window.

Type

The Module Type (CIB, AIB, IOB Std, IOB 2 Bit, IOB 1 Bit, etc.) for the hardware module. This is a read-only field that is controlled in the Hardware Window

Channel

The radio channel for the hardware module. Read-only field (defined in Hardware list).

Rx

The Receiver Number for this receiver. This is a sequential number for a particular receiver within its module. Read-only field. The maximum receiver number in a module is based on the Bank number in the Hardware list.

MLC ID

Not used in MCN Server and MCN Advanced Server. Used with MCN Server 8000 configurations and Motorola's MLC 8000 comparators.

Name

Receiver site name (ex: North Tower, VA Hospital, etc.). Free-format text field. Change the Receiver Name by selecting the cell and typing in the name.

You can also cut & paste descriptions from Excel. See *Copying Data from other Applications* on Page 108.



Description

Free format text field for general customer use. Many customers use this field to store an identifier for the leased line, microwave channel, or T1 channel bank and channel number for this receiver. This field is not required for program operation. Can be used in error logging & emails

You can also cut & paste descriptions from Excel. See *Copying Data from other Applications* on Page 108 for more details.

Tag-1

This is a free-format user defined field. It is used with the TPCI option in the Advanced Server software. You can use it as a note field in the MCN Server software.

Tag-2

This is a free-format user defined field. It is used with the TPCI option in the Advanced Server software. You can use it as a note field in the MCN Server software.

Sub-Device

This is an available feature of the Advanced Server software, when the Sub Comparators under the View Menu is enabled.

It allows a sub device to be linked to a particular Receiver.

WD-Alarm

This is an optional feature in the Advanced Server software, if the System Performance Toolkit (SPT) is purchased. It can be enable for each receiver by selecting yes in the Receiver Window under WD Alarm.

It allows the SPT to give an alarm if No vote or No Receive is detected.

Link to Output

This is a field used only with the Triggered Output license option. See *Error! Reference source not found.* section on Page Error! Bookmark not defined. for details.

It is designed for use in special cases, to provide alarm outputs (from a CIB or GPIO module) to an external device when a failure on one or more input devices occurs.

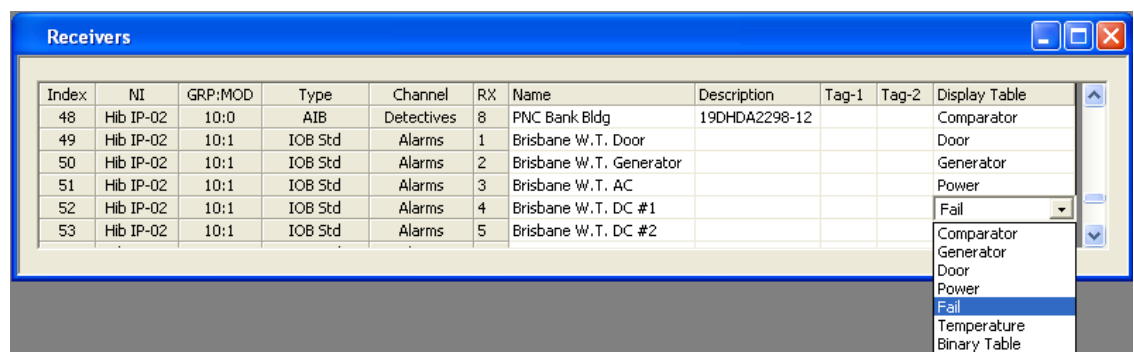
Display Table

This is the mapping table to use for this receiver (or alarm point). The Display Table determines how the input bits from the hardware modules are mapped to the status display.

If you have all receivers, you will probably only use the "Comparator" table. This maps the inputs to the standard "Vote", "Rx", "Dis", and "Fail" statuses.

If you have any Input / Output groups which can be used for things such as microwave or site alarms, you will need to select a different Display Table (such as "Generator", "Door" or "Power") for those points.

This is a drop-down field. Select one of the Display Tables from the drop-down list.



Receiver Window Context Sensitive (Right Click) Menu

The following menu functions are available with a right click in the Receiver list.



Receiver Window Toolbar Buttons

The following toolbar buttons will also function in the Receiver Window:



Delete



Cut



Copy



Paste

See *Toolbars* on page 60 for more details.

Since the Receiver & I/O Group rows are controlled by the Hardware Window, functions such as Append, Insert, Sort, Up & Down are not available in this window.

Display Tables, Alarms & Logging

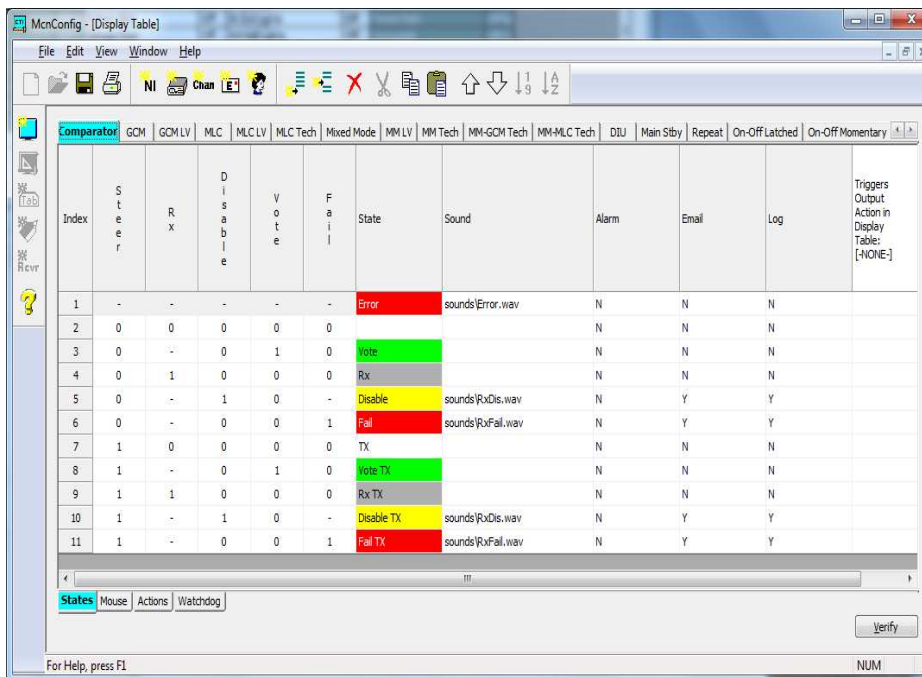
Display Tables map the input bit values from the devices to the text and colors to be displayed on the screen. The Display Tables window allows you to define various Display Tables for I/O devices. If there is a standard Display Table for your receivers or I/O types, you probably will not need to modify the data in the Display Tables window.

The Display Table types may vary depending on the version of the software package, but a number of Display Tables are pre-defined:

- Comparator
- Generator
- Door
- Power
- Fail
- Temperature
- Alarm
- Binary Table

You can also configure "sticky" alarms in the system through the Display Tables. Alarms will be displayed in the Alarm tab of the System events (Log) Window. They will remain in that window until acknowledged and reset. Alarms can also generate sounds when they go into the active state. See the **Error! Reference source not found.** section on page 133 for details on Alarm operations, and the *States Tab* 85 section starting on page 85 for instructions on how to enable alarms in the Display Tables.

From the menu, select **View / Display Tables**.



Display Table Tab Properties

To display the overall properties for a Display Table, **Double-Click** on its tab.



From the Display Table window you can change the following items for this Display Table:

- Display Table (tab) name
- Number of input bits
- Offline Text & Colors (displayed when a module is offline)
- Logging flag for the Off-Line state.
- Busy State indicator (for legacy modules)

State Priority

The states in the table have the following priority:

- | | |
|--------------------|---|
| 1. Off-Line | If the module is off-line. |
| 2. Numbered States | Lowest number has the highest priority. |
| 3. Default State | If no other state is found to match the input bits. |

If an input value is covered by two defined states, the lower numbered state will be displayed.

State Text & Color Field

This is free-format text to be displayed when this state is active.

Foreground and background colors can be defined for each state.

Sound Field

This field is the .WAV sound file to be played whenever any input changes to this state. This field is typically used only for alarm conditions.

Sounds are played only if the state is also logged. If you want a sound to play for a state entry, make sure the Log field is set to 1.

Email Field

This is a flag to determine whether or not to log this state to email.

0 = Don't log

1 = Log

If the Logging flag is set to 1, an email log entry will be generated whenever an input goes into or out of this state.

Log Field

This is a flag to determine whether or not to log this state (to screen, printer, or disk).

0 = Don't log

1 = Log

If the Log flag is set to 1, a log entry will be generated whenever an input goes into or out of this state.

Triggers Output in Display Table

Used with the Triggered Output license option. See *Error! Reference source not found.* section on Page *Error! Bookmark not defined.* for details.

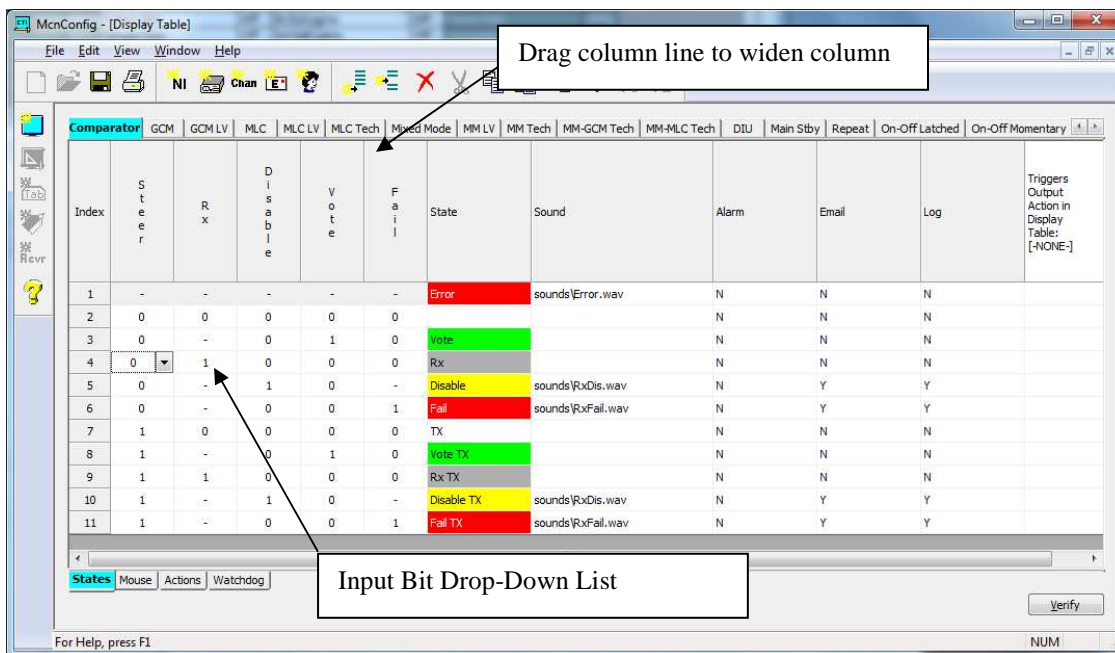
Editing the fields

Input Bit Values:

Click in the bit value field to edit.

You can either enter a value (0,1,-) or use the drop-down list.

You may need to widen the columns to see the drop-down list properly.

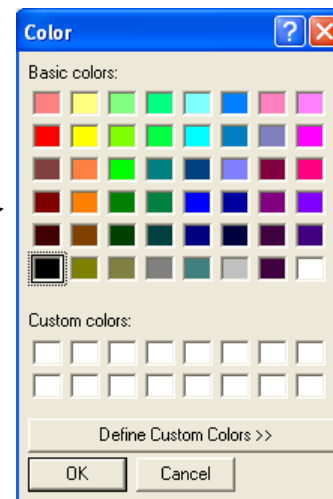
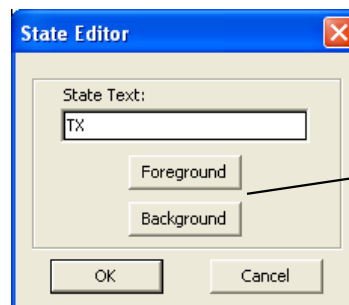


State Names

Double click on the State name.

A State Editor dialog box will appear.

Enter the appropriate State Text.

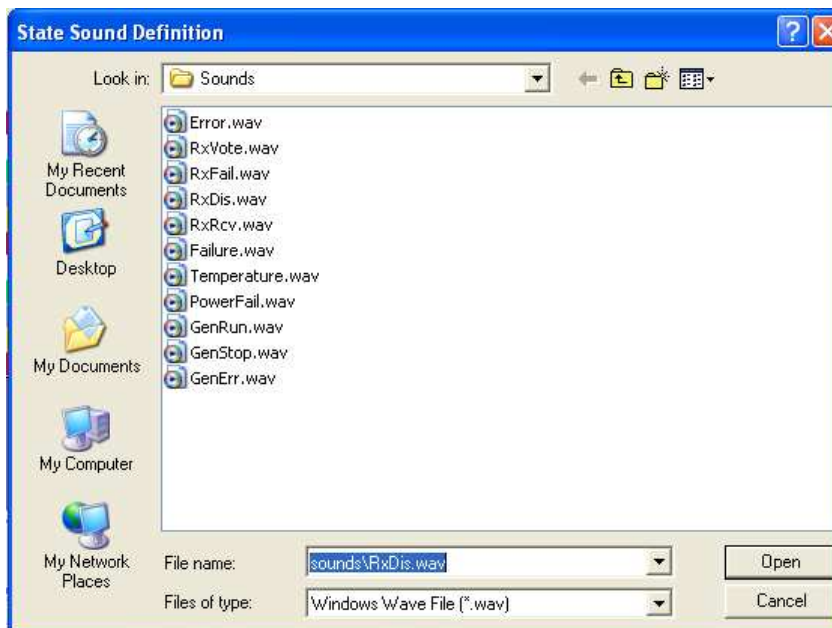


State Color

From the State Editor dialog box, hit the Foreground or Background button. Select the appropriate color.

Sound

To select a sound, double click in the Sound cell.
Select the appropriate WAV file from the State Sound Definition window.



Alarms Flag

Click in the field.
Type in "Y" or "N" or use the Drop-Down List.

Email Flag

Click in the field.
Type in "Y" or "N" or use the Drop-Down List.

Log Flag

Click in the field.
Type in "Y" or "N" or use the Drop-Down List.

State Table Verify

Since the entries in the Display Table are free-format (and also allow Don't Care bits), it's easy to build a Display table that doesn't work like you thought it would. You can therefore verify how the MCN software will interpret the table by clicking the Verify button on the bottom right corner of the Display Table window. This will bring up a Display Table Verification window; which will show the states that result from each possible binary input value.

Comparator - Binary Table							
Index	St e e r	R x	D i s a b l e	V o t e	F a i l	State	Sound
1	0	0	0	0	1	Fail	sounds\RxFail.v
2	0	0	0	1	0	Vote	
3	0	0	0	1	1	Error	sounds>Error.w
4	0	0	1	0	0	Disable	sounds\RxDi.w
5	0	0	1	0	1	Disable	sounds\RxDi.w
6	0	0	1	1	0	Error	sounds>Error.w
7	0	0	1	1	1	Error	sounds>Error.w
8	0	1	0	0	0	Rx	
9	0	1	0	0	1	Fail	sounds\RxFail.v
10	0	1	0	1	0	Vote	
11	0	1	0	1	1	Error	sounds>Error.w
12	0	1	1	0	0	Disable	sounds\RxDi.w
13	0	1	1	0	1	Disable	sounds\RxDi.w
14	0	1	1	1	0	Error	sounds>Error.w
15	0	1	1	1	1	Error	sounds>Error.w
16	1	0	0	0	0	TX	
17	1	0	0	0	1	Fail TX	sounds\RxFail.v
18	1	0	0	1	0	Vote TX	
19	1	0	0	1	1	Error	sounds>Error.w
20	1	0	1	0	0	Disable TX	sounds\RxDi.w

OK

Display Table 'Right Mouse Click' Menu

Clicking the right mouse button over a cell will offer the following options:

Move Up

Moves a row up one position

Move Down

Moves a row down one position

Delete Row

Deletes a row

Delete Sound

Deletes the sound entry for the selected row.

Copy

Copies the highlighted cell(s) to the clipboard. Does not work with entire rows.

Paste

Pastes the clipboard to the current cell. If more than one cell is on the clipboard, the additional cells will be pasted to cells to the right.

Insert

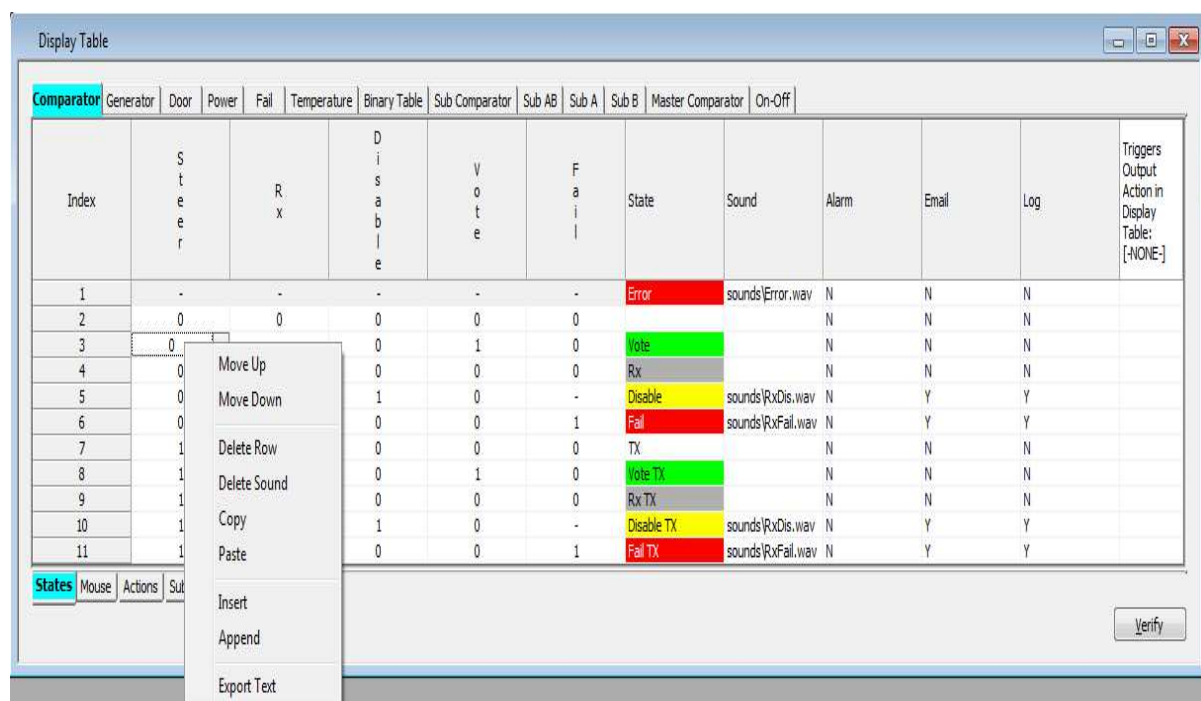
Inserts a blank row at the current location

Append

Appends a blank row to the end of the Display Table

Export Text

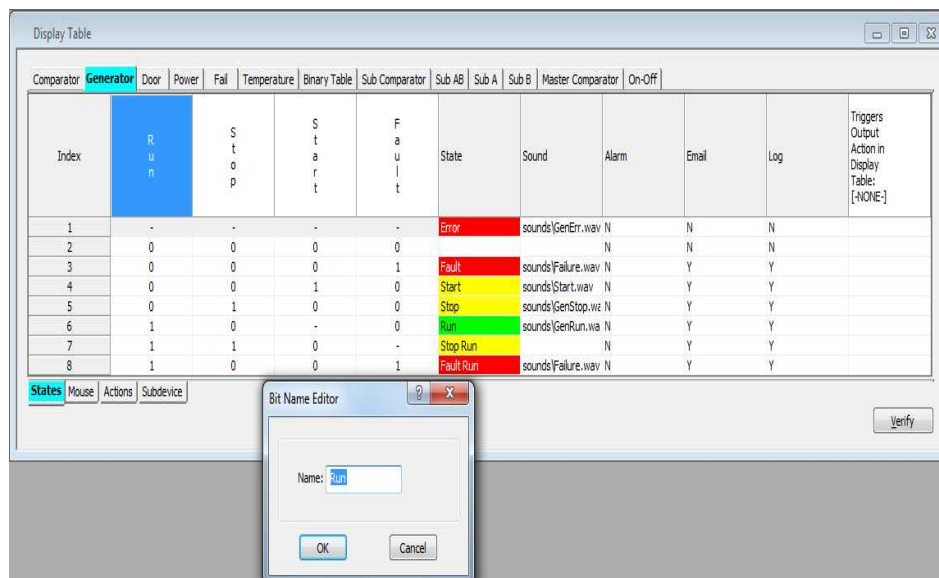
Will export a text file copy, of the contents for this window.



Editing Bit Names

To edit the Bit Names for a Display Table, **Double Click** on the Bit Name.

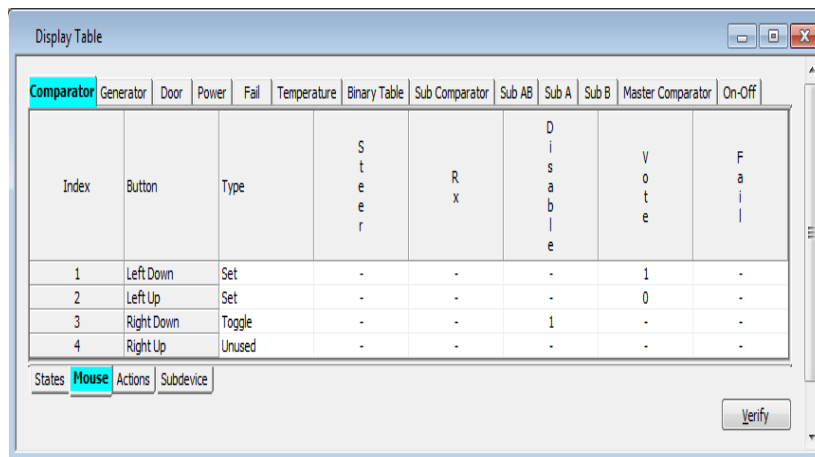
The Bit Names for the Comparator Display Table are fixed and cannot be edited.



Mouse Actions Tab

Four (4) mouse button actions are defined for each Display Table:

- 1) Left Mouse Button Down (Press)
- 2) Left Mouse Button Up (Release)
- 3) Right Mouse Button Down (Press)
- 4) Right Mouse Button Up (Release)



Mouse Event Fields:**Button**

Describes the mouse event

Type

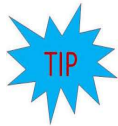
This is the action that will be taken when this mouse event occurs.

Choices are:

- Unused This Mouse Event does not generate an event.
- Set This Mouse Event explicitly sets defined bits to the states shown.
("0"bits are set to 0, "1" bits are set to 1, "-" bits are left alone.)
- Toggle This Mouse Event toggles the state of all the bits marked with a "1".

Bits

The bit names are taken from the States tab. They can be either "0", "1" or "-".
See the **Type** field for description of how each of these bits is handled.



Note that the bits that appear here may not all be output (control) bits, due to the actual device being controlled. In the example above, the only valid output bits are Vote and Disable.

Editing the fields**Type**

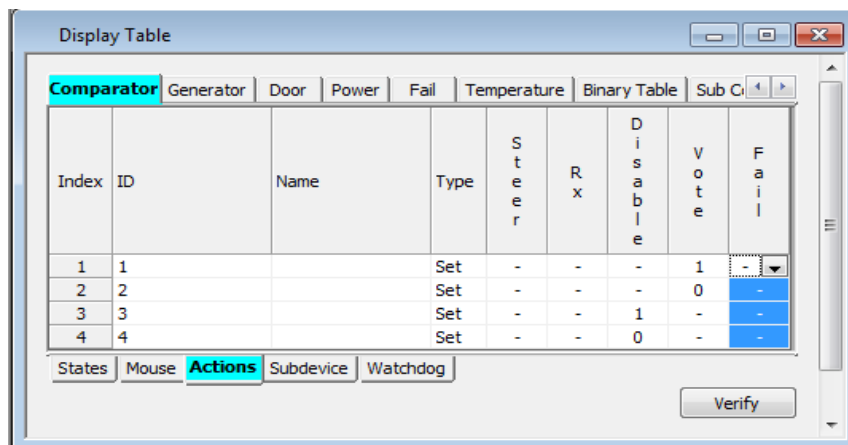
To edit, click in the field.
Select the type with the Drop-Down menu.

Bits

To edit, click in the bit value field.
You can either enter a value (0,1,-) or use the drop-down list.
You may need to widen the columns to see the drop-down list properly.

Actions Tab – Available in Advanced Server

The Actions Tab controls optional actions for the Display Table. These Actions are only available in the MCN Advanced Server software with Third Party Client options. It is similar to the Mouse tab and provides additional control functions that can be accessed by the Third Party Client. (Although the Actions tab is present on the MCNConfig Server software, the feature cannot be utilized by that particular program.)



The above Actions table provides a way to explicitly Disable (ID 2) and Enable (ID 3) a receiver (as compared to the toggle action in the Mouse table).

Actions Line contains the following fields:

ID

Numeric ID sent by the Third-Party Client to generate this action. The IDs must be unique.

Name

Will allow you to enter a descriptive name that is unique to the action it identifies.

Type

Same as Type in the Mouse Tab.

Bits

Same as the Bits field in the Mouse Tab.

Editing the fields

ID

To edit, click in the field.
Enter the ID number to use.

Type

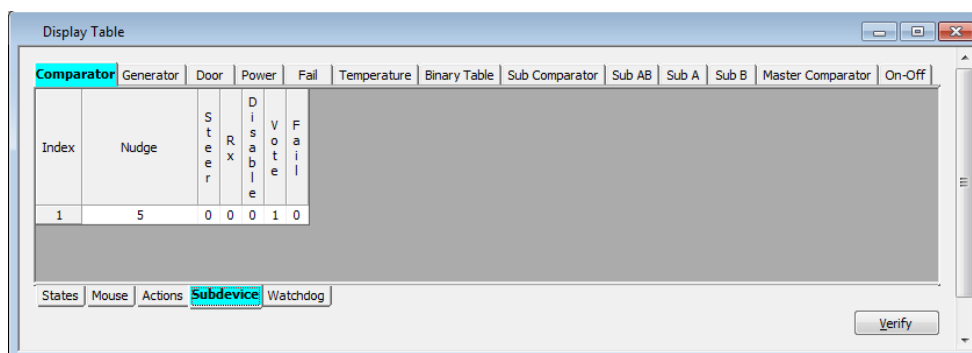
To edit, click in the field.
Select the type with the Drop-Down menu.

Bits

To edit, click in the bit value field.
You can either enter a value (0,1,-) or use the drop-down list.
You may need to widen the columns to see the drop-down list properly.

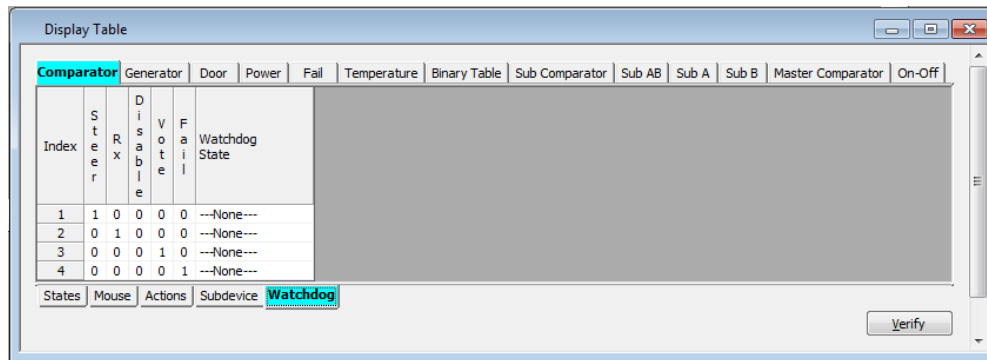
SubDevice Tab

The SubDevice Tab that is displayed below is only available when sub-comparators are enabled under the **View** Menu. It must be configured for use in conjunction with the Master Comparator option that passes the Master Vote down to the Sub-Comparator. For specific details about this Tabs' functions and options see Page **Error! Bookmark not defined..** For a deeper understanding about the Application, Configuration and Implementation of Master-Sub Comparators, refer to the Section **Error! Reference source not found.** on Page **Error! Bookmark not defined..**



Watchdog Tab – Only available in Advanced Server Software.

The Watchdog Tab shown below is for use with the System Performance Toolkit (SPT) license option. This Tab allows configuration options, for specified functions in the Display Table, to be monitored and logged by the SPT.



MCNConfig Program: Display Windows

Display windows are the screens that you build for the MCN Server program and MCN Client Remote Comparator Display program. Each Display Window can contain multiple Tabs and multiple channels.

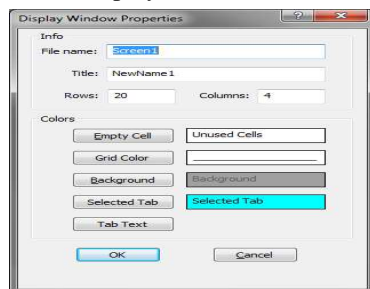
In this section, you will learn how to:

- Add a new Display window
- Add Labels
- Add Receivers (and I/O groups)
- Add Tabs
- Move & Modify Labels & Receivers

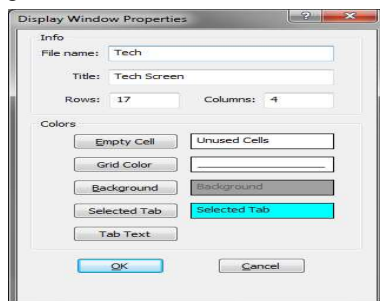
Adding a New Display Window



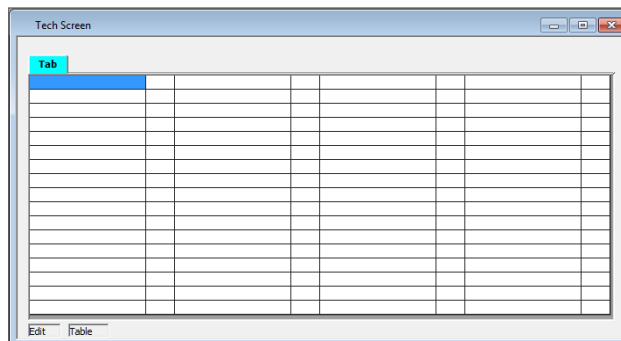
Add a new Display Window with the **Add Display Window** button.



Change the File Name, Title, Rows, and Columns as desired and click the **OK** button.



A blank Display Window with one Tab will appear



Adding Labels to the Display Window

Labels are used to identify and differentiate between multiple channels, if displayed in one tab.

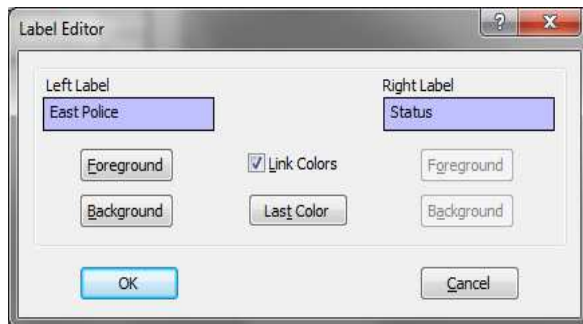


Add a new Label in the Display Window with the **Add Label** button.

In the Label Editor Dialog Box, enter the desired Right & Left Labels.

The left label will appear over the receiver names.

The right label will appear over the status column.

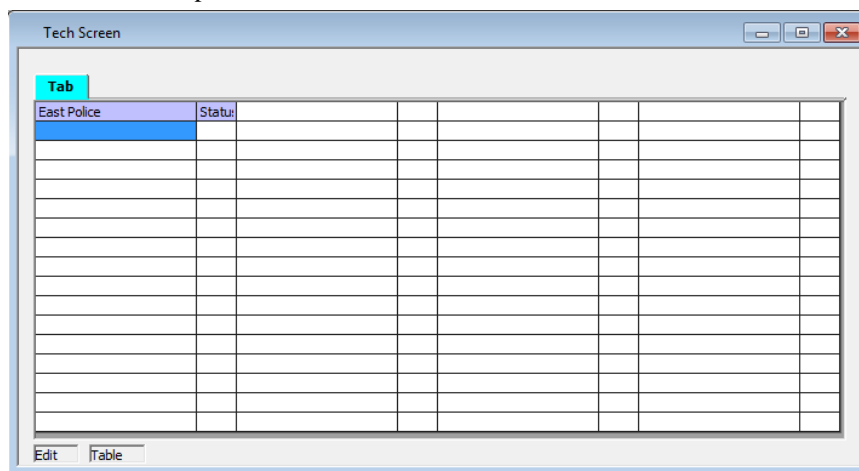


You can also change the Foreground (text) and Background colors at this time.

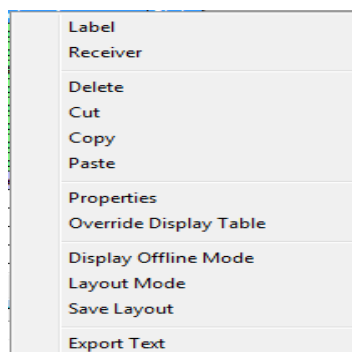
If the Link Colors box is checked, both the left & right labels will have the same color set.

Hit OK when you are done.

The label will be placed on the screen.



The properties for display window label, may be view by right clicking on the Label cell and selecting properties.



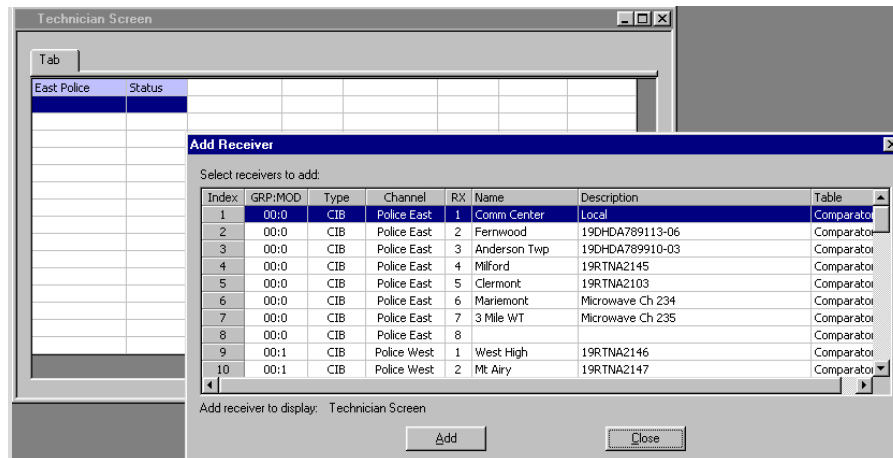
Adding Receivers & I/O Groups to the Display Window



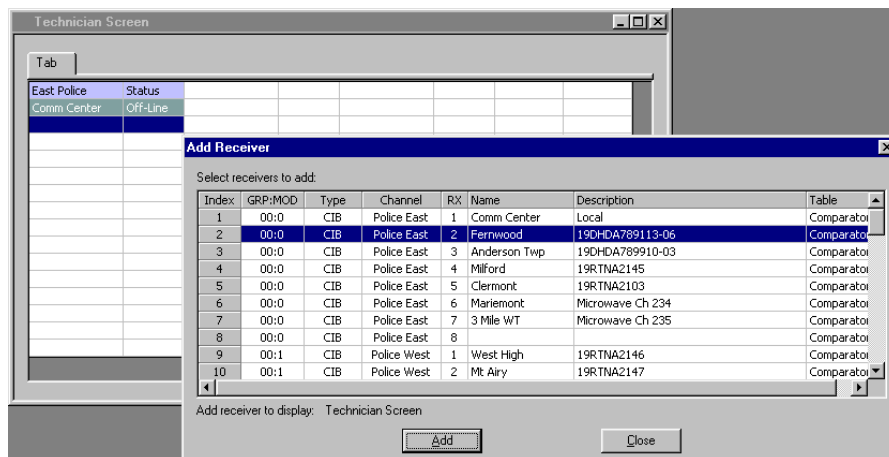
Add new Receivers or I/O Groups in the Display Window using the **Add Receiver** button from the Toolbar on the left.

An **Add Receiver** dialog box will appear.

This is similar to the Receiver Window, but it has additional buttons.



Select the receiver or I/O group that you want to add, and click the **Add** button.

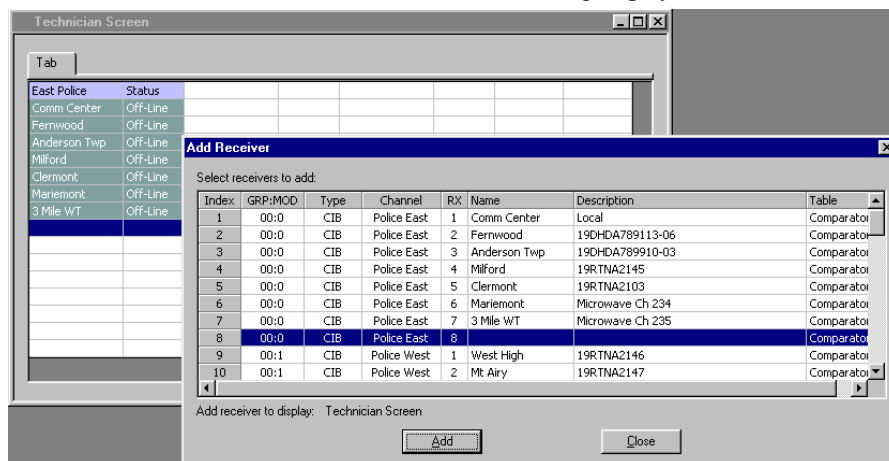


An **Add Receiver** dialog box will appear.

This is similar to the Receiver Window, but it has additional buttons.

MCNConfig Program: Display Windows (Screens)

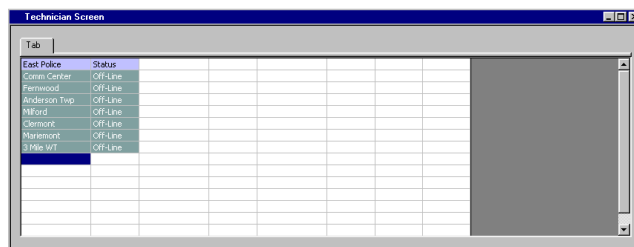
Press the **Add** button for each additional receiver or I/O groups you wish to add.



The program will continue adding receivers to the selected column in the Display Window.

If it reaches the bottom of a column, it will wrap to the top of the next column.

When you are finished adding a range of receivers or I/O groups, click the **Close** button.



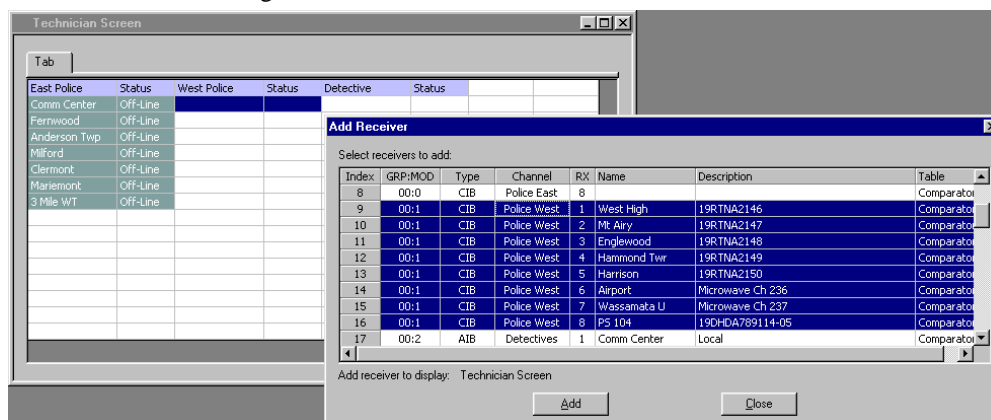
Move to the position for the next receiver and repeat until you have all the receivers added.

Adding a block of receivers or I/O points to the Display Window



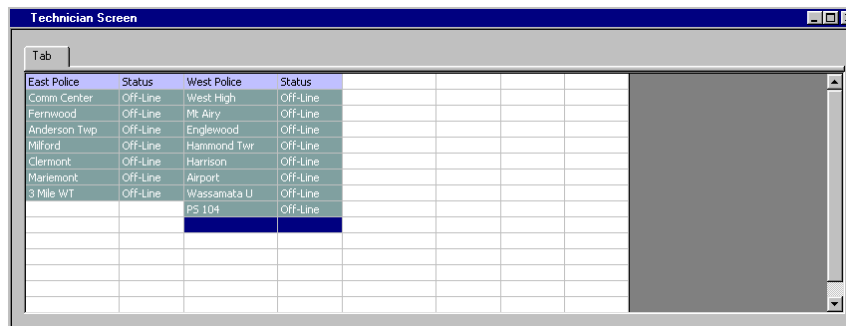
Press the **Add Receiver** button.

In the Add Receivers dialog box, select a block of receivers



Hit the **Add** button.

This will add the receivers all at once,



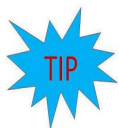
The screenshot shows a window titled "Technician Screen" with a tab labeled "Tab". Inside is a grid with columns for "East Police", "Status", "West Police", and "Status". The data is as follows:

East Police	Status	West Police	Status
Comm Center	Off-Line	West High	Off-Line
Fernwood	Off-Line	Mc Aery	Off-Line
Anderson Twp	Off-Line	Englewood	Off-Line
Willford	Off-Line	Hammond Twp	Off-Line
Clemmont	Off-Line	Harrison	Off-Line
Marlensmont	Off-Line	Airport	Off-Line
3 Mile Wt	Off-Line	Wassamata U	Off-Line
		PS 104	Off-Line

Automatic Linking to Receiver Window

As you select different cells in the Display Window, the receiver window scrolls so that that receiver or I/O group is visible.

Verifying Receiver Placement



Many systems have receivers from many channels at each site. Since only a Receiver site name or I/O Group name is present in the Display Window, it is not readily apparent which particular receiver or I/O point is in a particular cell. You can quickly check the contents of the Display Window by doing the following:

Open the Display Window

Open the Receiver Window.

Select the first Receiver in the Display Window.

The Receiver Window will show which receiver is at that cell.

Use the arrow keys to move through all the receivers on the Display Window.

Repeat for the other tabs in the Display Window.

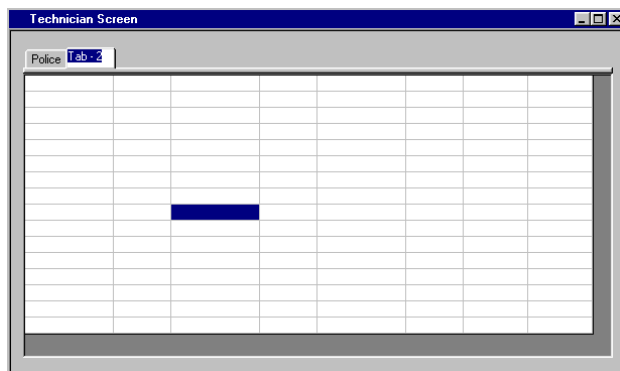
Adding Display Tabs



Press the **Add Tab** button.

Enter the name for the new tab.

A blank grid will appear.



The screenshot shows the "Technician Screen" window with a tab labeled "Police Tab: 2". The grid is mostly blank, with a single blue bar visible in the third row, second column.

Add Labels, Receivers, and I/O Groups for that tab.

[illegible]

Deleting Display Tabs

Right-click on the tab and select **Delete Tab** from the pop-up menu.

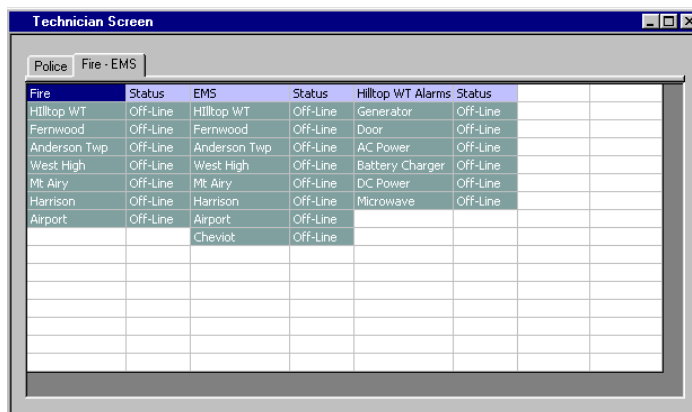
[illegible]

Changing Display Window Parameters

You can change the following properties of a Display Window.

- Display Window Title
- Number of Rows
- Number of Columns

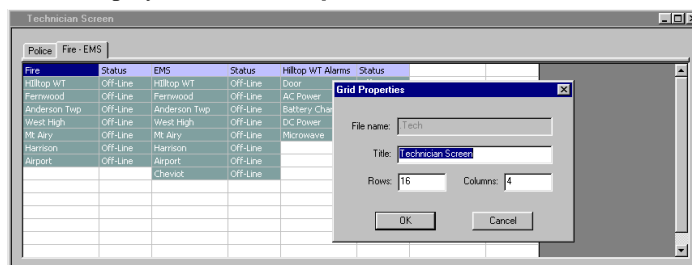
In this example, we want to get rid of the unused fourth column.



Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Generator	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	Door	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	AC Power	Off-Line
West High	Off-Line	West High	Off-Line	Battery Charger	Off-Line
Mt Airy	Off-Line	Mt Airy	Off-Line	DC Power	Off-Line
Harrison	Off-Line	Harrison	Off-Line	Microwave	Off-Line
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		



Press the Display **Window Properties** button.

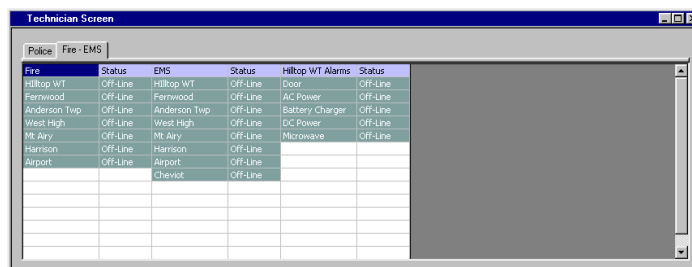


Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Door	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	AC Power	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	Battery Charger	Off-Line
West High	Off-Line	West High	Off-Line	DC Power	Off-Line
Mt Airy	Off-Line	Mt Airy	Off-Line	Microwave	Off-Line
Harrison	Off-Line	Harrison	Off-Line		
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		

Change the number of Columns from 4 to 3.

(You could also change the Title or number of rows at this point.)

Hit the **OK** button.



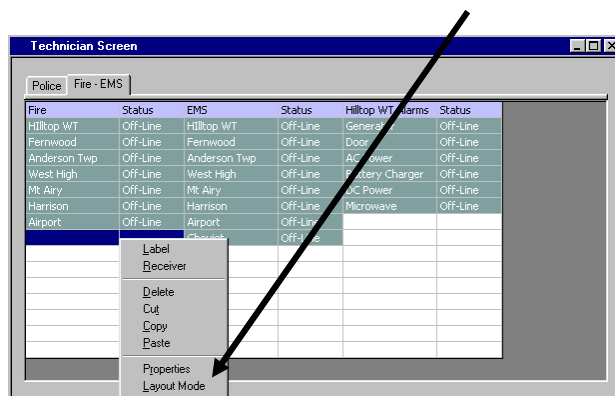
Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Door	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	AC Power	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	Battery Charger	Off-Line
West High	Off-Line	West High	Off-Line	DC Power	Off-Line
Mt Airy	Off-Line	Mt Airy	Off-Line	Microwave	Off-Line
Harrison	Off-Line	Harrison	Off-Line		
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		

The number of columns is reduced for all tabs. If you reduce the grid size, you may lose receivers or labels that fall outside the new range. Receivers and I/O Groups are still in the Receivers Window; they just disappear from the Display Window.

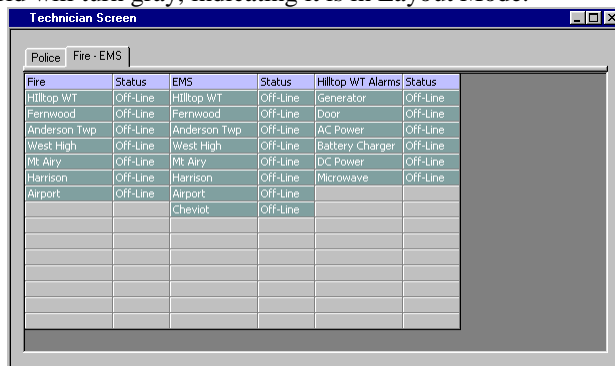
Changing Column Widths in Layout Mode

You can change the column width for the resulting Display Window. To do this, you must go into Layout Mode. This sets the column widths for just the MCN Config program. The column widths for run-time display in the Server & Client programs can be set in those programs.

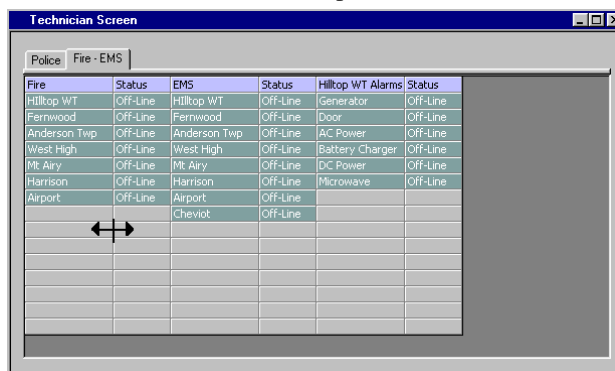
Right-click in the grid and select **Layout Mode**.



The grid will turn gray, indicating it is in Layout Mode.



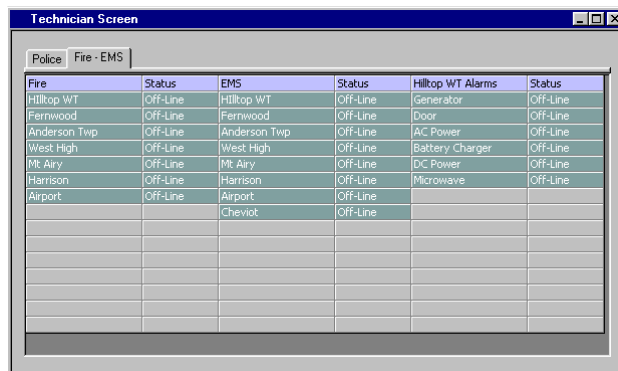
Move the cursor over a column separator line. The cursor will turn into a double-headed arrow.



MCNConfig Program: Display Windows (Screens)

Press the left mouse button and drag the column to the proper width.

Repeat with the right column separator for the Status column.



Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Generator	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	Door	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	AC Power	Off-Line
West High	Off-Line	West High	Off-Line	Battery Charger	Off-Line
Mt. Airy	Off-Line	Mt. Airy	Off-Line	DC Power	Off-Line
Harrison	Off-Line	Harrison	Off-Line	Microwave	Off-Line
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		

Column Width Note

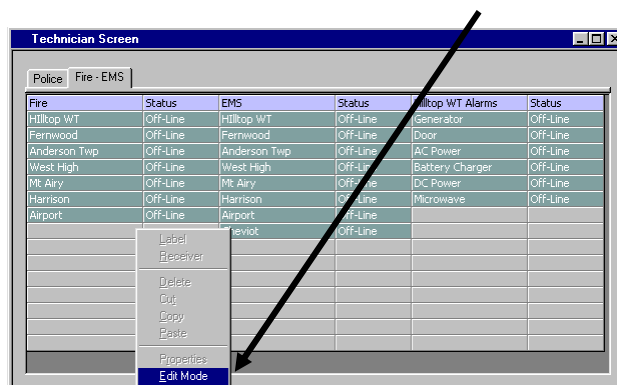
In MCN Config, the column widths are “Paired”.

- All the Receiver columns are the same width.
- All the Status columns are the same width.

Changing a column width will change the width of all the similar columns on all tabs.

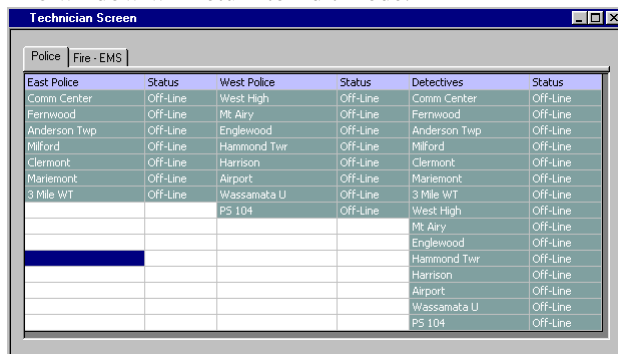
In the Server & Client software packages, the Pairing can be turned off so that the width of all columns can be set independently.

Right-Click in the grid and select **Edit Mode**.



Fire	Status	EMS	Status	Hilltop WT Alarms	Status
Hilltop WT	Off-Line	Hilltop WT	Off-Line	Generator	Off-Line
Fernwood	Off-Line	Fernwood	Off-Line	Door	Off-Line
Anderson Twp	Off-Line	Anderson Twp	Off-Line	AC Power	Off-Line
West High	Off-Line	West High	Off-Line	Battery Charger	Off-Line
Mt. Airy	Off-Line	Mt. Airy	Off-Line	DC Power	Off-Line
Harrison	Off-Line	Harrison	Off-Line	Microwave	Off-Line
Airport	Off-Line	Airport	Off-Line		
		Cheviot	Off-Line		

The window will return to Edit mode.



East Police	Status	West Police	Status	Detectives	Status
Comm Center	Off-Line	West High	Off-Line	Comm Center	Off-Line
Fernwood	Off-Line	Mt. Airy	Off-Line	Fernwood	Off-Line
Anderson Twp	Off-Line	Englewood	Off-Line	Anderson Twp	Off-Line
Milford	Off-Line	Hammond Twp	Off-Line	Milford	Off-Line
Clermont	Off-Line	Harrison	Off-Line	Clermont	Off-Line
Mariemont	Off-Line	Airport	Off-Line	Mariemont	Off-Line
3 Mile WT	Off-Line	Wassamata U	Off-Line	3 Mile WT	Off-Line
		PS 104	Off-Line	West High	Off-Line
				Mt. Airy	Off-Line
				Englewood	Off-Line
				Hammond Twp	Off-Line
				Harrison	Off-Line
				Airport	Off-Line
				Wassamata U	Off-Line
				PS 104	Off-Line

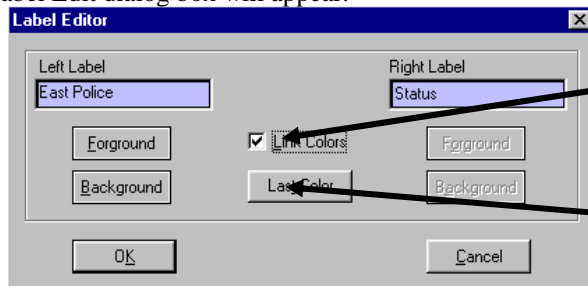
Changing Label Text & Colors

You can change a Label text or color by doing one of the following:

- Double click on a Label.
- Right-Click on the Label and select the **Label** menu item.
- Select a Label cell and press the **New Label** toolbar button.



The Label Edit dialog box will appear.

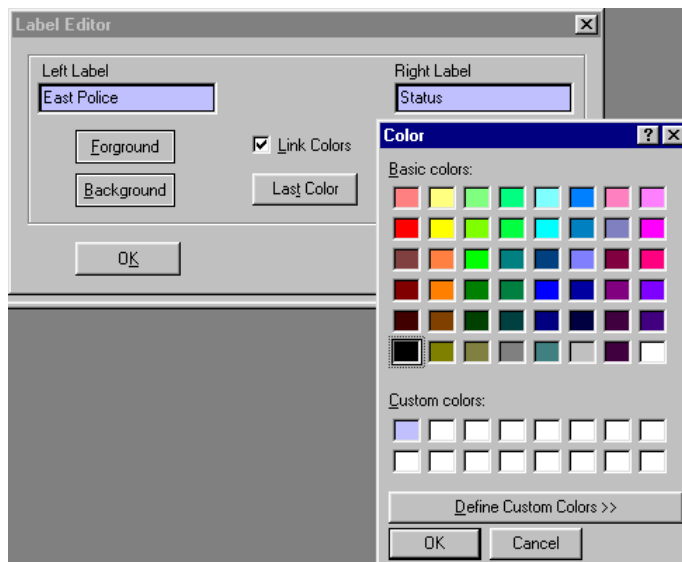


When the Link Color box is checked, the left & right labels will have the same colors.

When changing the color of a series of labels, press the Last Color button to set current label to the last color used.

You can edit the left & right text.

You can change the Foreground or Background color of the labels by hitting the **Foreground** or **Background** button below the label



Select a color and hit **OK**

If you want a color not shown, hit the **Define Custom Colors** button.

Moving Receivers & Labels in the Display Window

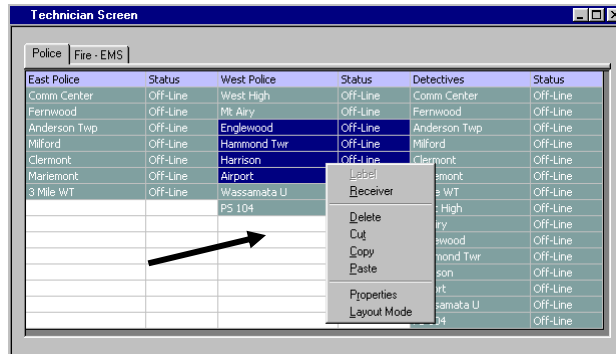
This section covers single column cuts & pastes. See the next section for cutting & pasting multi-column selections

To move Labels, Receivers, or I/O Groups:

Select the items to move

Right click and select the Cut menu item.

(Alternately, use the *Cut* toolbar button)

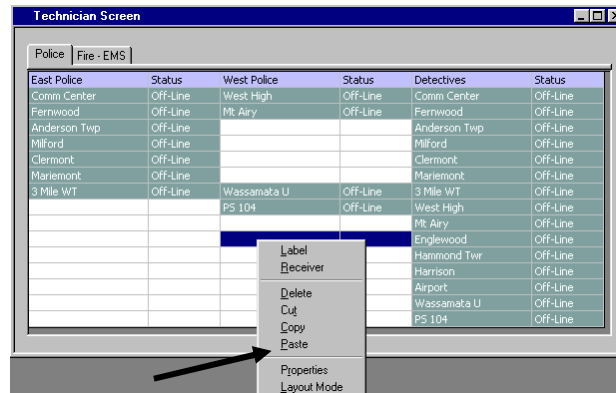


This cuts the selection and places it in the clipboard.

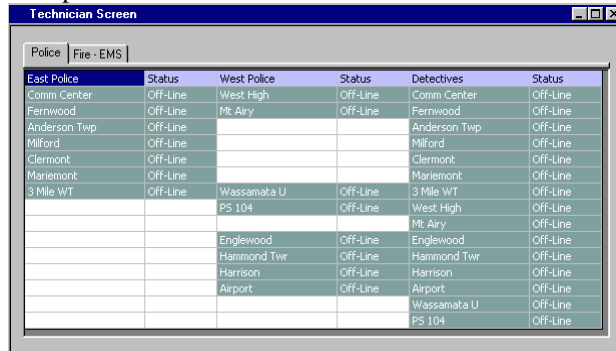
Move to the desired location

Right click and hit Paste.

(Alternately, use the *Paste* toolbar button)



This pastes the items into the new location.



Cutting & Pasting Multiple Columns

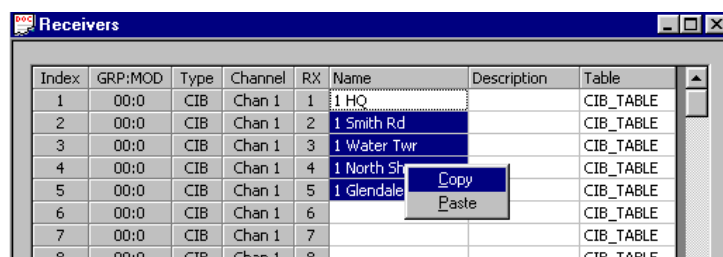
When you Cut & Paste or Copy & Paste cells in a Display Window, MCN Config program will paste a copy of those cells to the selected destination and will keep the same numbers of rows and columns in the pasted area (unless the pasted area would go beyond the grid boundaries). Earlier versions of the program required you to select how many columns the data would occupy in the Paste operation. Earlier versions of this manual describe how to do this.

Pasting a Row of Receivers Directly from the Receiver Window

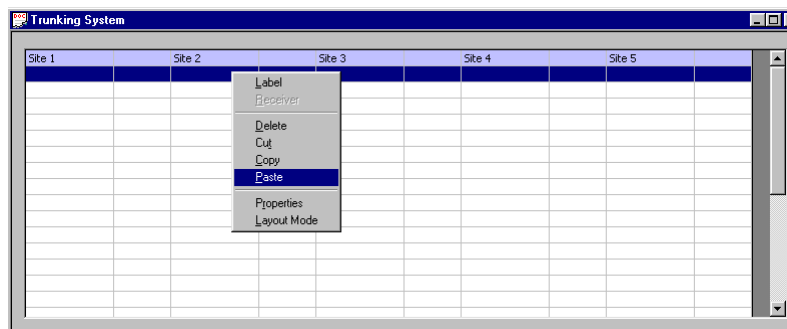
All the examples shown assume you have a system with many receiver sites and want to look at the sites in a column arrangement. If you have a trunking system with many channels but just a few sites, you may want to display each channel as a row with the sites going across from left to right.

You can do this by cutting and pasting a group of receivers directly from the Receiver Window into the Display Window.

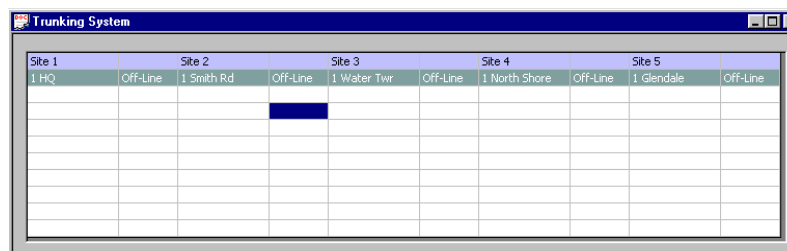
1. From the Receiver Window, highlight a group of receivers and Copy to clipboard.



2. Go to the Display Window.
Move the cursor to the starting position for the row of receivers.
Highlight the row and Paste the clipboard to the screen.



3. The receivers are pasted into the Display Window in a horizontal row:



4. A 10-Channel 5-Site System

Trunking System									
Site 1		Site 2		Site 3		Site 4		Site 5	
1 HQ	Off-Line	1 Smith Rd	Off-Line	1 Water Twr	Off-Line	1 North Shore	Off-Line	1 Glendale	Off-Line
2 HQ	Off-Line	2 Smith Rd	Off-Line	2 Water Twr	Off-Line	2 North Shore	Off-Line	2 Glendale	Off-Line
3 HQ	Off-Line	3 Smith Rd	Off-Line	3 Water Twr	Off-Line	3 North Shore	Off-Line	3 Glendale	Off-Line
4 HQ	Off-Line	4 Smith Rd	Off-Line	4 Water Twr	Off-Line	4 North Shore	Off-Line	4 Glendale	Off-Line
5 HQ	Off-Line	5 Smith Rd	Off-Line	5 Water Twr	Off-Line	5 North Shore	Off-Line	5 Glendale	Off-Line
6 HQ	Off-Line	6 Smith Rd	Off-Line	6 Water Twr	Off-Line	6 North Shore	Off-Line	6 Glendale	Off-Line
7 HQ	Off-Line	7 Smith Rd	Off-Line	7 Water Twr	Off-Line	7 North Shore	Off-Line	7 Glendale	Off-Line
8 HQ	Off-Line	8 Smith Rd	Off-Line	8 Water Twr	Off-Line	8 North Shore	Off-Line	8 Glendale	Off-Line
9 HQ	Off-Line	9 Smith Rd	Off-Line	9 Water Twr	Off-Line	9 North Shore	Off-Line	9 Glendale	Off-Line
10 HQ	Off-Line	10 Smith Rd	Off-Line	10 Water Twr	Off-Line	10 North Shore	Off-Line	10 Glendale	Off-Line

Display Window Tools

Display Window Tab Context Sensitive (Right Click) Menu

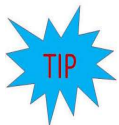
The following menu functions are available with a right click on a Display Window Tab.

Delete Tab
Insert New Tab
Append New Tab
Rename Tab
Move Tab Left
Move Tab Right
Tab Properties
Display Window Properties

Display Window Context Sensitive (Right Click) Menu

The following menu functions are available with a right click in the Display Window Grid.

Label
Receiver
Delete
Cut
Copy
Paste
Properties
Override Display Table
Display Offline Mode
Layout Mode
Save Layout
Export Text

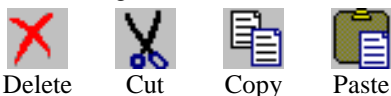


Quick Receiver & Label Changes

You can double-click on a Receiver or Label cell to change it. The “Add Receiver” or “Add Label” dialog box will open, allowing you to make changes to the cell.

Display Window Toolbar Buttons

The following toolbar buttons will also function in the Receiver Window:



Since the Display Window uses a fixed grid, functions such as Append, Insert, Sort, Up, & Down are not available in this window.

Copying Data from other Applications

Many people keep system data in other applications, such as Excel. You can cut and paste some of this data from the other application into the MCNConfig program to save typing time.

Various fields in the MCNConfig database have special properties and thus have restrictions as to whether or not you can paste data from other applications or other windows. See the following section for restrictions.

	A	B	C	D	E
1		Chan 1			
2		Chan 2			
3		Chan 3			
4		Chan 4			
5		Chan 5			
6		Chan 6			
7		Chan 7			
8		Chan 8			
9		Chan 9			
10		Chan 10			
11		Chan 11			
12		Chan 12			
13		Chan 13			
14		Chan 14			
15		Chan 15			
16		Chan 16			
17		Chan 17			
18		Chan 18			
19		Chan 19			
20		Chan 20			

Copy (Ctrl-C) a column of Names in Excel

Index	Group	Module	Type	Banks	Location	Name	Channel
1	00	1	AIB	2		Chan 1	None
2	00	2	AIB	2		Chan 2	None
3	00	3	AIB	2		Chan 3	None
4	00	4	AIB	2		Chan 4	None
5	00	5	AIB	2		Chan 5	None
6	00	6	AIB	2		Chan 6	None
7	00	7	AIB	2		Chan 7	None
8	00	8	AIB	2		Chan 8	None
9	00	9	AIB	2		Chan 9	None
10	00	A	AIB	2		Chan 10	None
11	00	B	AIB	2		Chan 11	None
12	00	C	AIB	2		Chan 12	None
13	00	D	AIB	2		Chan 13	None
14	00	E	AIB	2		Chan 14	None
15	00	F	AIB	2		Chan 15	None
16	01	0	AIB	2		Chan 16	None
17	01	1	AIB	2		Chan 17	None
18	01	2	AIB	2		Chan 18	None
19	01	3	AIB	2		Chan 19	None
20	01	4	AIB	2		Chan 20	None

And Paste (Ctrl-V) them into the MCNConfig Hardware List

	A	B	C
1	Channel	Site	Line / channel bank
2	1	HO	19RTNA2144
3	1	Smith Rd	19CHDA789910-03
4	1	Water Twr	19RTNA2145
5	1	North Shore	19RTNA2103
6	1	Glendale	Microwave Ch 234
7	1	Mercy Hosp	Microwave Ch 235
8	1	Waterworks	19RTNA2146
9	1	Mt. Nebo	19RTNA2147
10	1	White Bldg	19RTNA2148
11	1	Sears Twr	19RTNA2149
12	1	Arena	19RTNA2150
13	1	Gvt Bldg	Microwave Ch 236
14	1	Courthouse	Microwave Ch 237
15	1	Airport	19CHDA789114-05
16	1	Good Sam	19CHDA789113-07
17	1	Univ Cntr	19CHDA789124-09
18	1	Morgan Hill	19CHDA789101-05
19	1	PS 104	19RTNA2160
20	1	Alms Apts	19RTNA2161
21	1	PNC Bldg	19RTNA2162

Copy Receiver Site Names and Line Numbers from Excel

Index	GRP/PCD	Type	Channel	Name	Description	Table
1	00:0	AIB	Chan 1	HO	19RTNA2144	CIB_TABLE
2	00:0	AIB	Chan 1	Smith Rd	19CHDA789910-03	CIB_TABLE
3	00:0	AIB	Chan 1	Water Twr	19RTNA2145	CIB_TABLE
4	00:0	AIB	Chan 1	North Shore	19RTNA2103	CIB_TABLE
5	00:0	AIB	Chan 1	Glendale	Microwave Ch 234	CIB_TABLE
6	00:0	AIB	Chan 1	Mercy Hosp	Microwave Ch 235	CIB_TABLE
7	00:0	AIB	Chan 1	Waterworks	19RTNA2146	CIB_TABLE
8	00:0	AIB	Chan 1	Mt. Nebo	19RTNA2147	CIB_TABLE
9	00:0	AIB	Chan 1	White Bldg	19RTNA2148	CIB_TABLE
10	00:0	AIB	Chan 1	Sears Twr	19RTNA2149	CIB_TABLE
11	00:0	AIB	Chan 1	Arena	19RTNA2150	CIB_TABLE
12	00:0	AIB	Chan 1	Gvt Bldg	Microwave Ch 236	CIB_TABLE
13	00:0	AIB	Chan 1	Courthouse	Microwave Ch 237	CIB_TABLE
14	00:0	AIB	Chan 1	Airport	19CHDA789114-05	CIB_TABLE
15	00:0	AIB	Chan 1	Good Sam	19CHDA789113-07	CIB_TABLE
16	00:0	AIB	Chan 1	Univ Cntr	19CHDA789124-09	CIB_TABLE
17	00:1	AIB	Chan 2	Morgan Hill	19CHDA789101-05	CIB_TABLE
18	00:1	AIB	Chan 2	PS 104	19RTNA2160	CIB_TABLE
19	00:1	AIB	Chan 2	Alms Apts	19RTNA2161	CIB_TABLE
20	00:1	AIB	Chan 2	PNC Bldg	19RTNA2162	CIB_TABLE
21	00:1	AIB	Chan 2			CIB_TABLE
22	00:1	AIB	Chan 2			CIB_TABLE
23	00:1	AIB	Chan 2			CIB_TABLE
24	00:1	AIB	Chan 2			CIB_TABLE
25	00:1	AIB	Chan 2			CIB_TABLE
26	00:1	AIB	Chan 2			CIB_TABLE
27	00:1	AIB	Chan 2			CIB_TABLE
28	00:1	AIB	Chan 2			CIB_TABLE
29	00:1	AIB	Chan 2			CIB_TABLE
30	00:1	AIB	Chan 2			CIB_TABLE
31	00:1	AIB	Chan 2			CIB_TABLE
32	00:1	AIB	Chan 2			CIB_TABLE

Into the MCNConfig Receiver List

Restrictions on Using the Clipboard

Various fields in the MCNConfig database have special properties and thus have restrictions as to whether or not you can paste data from other applications or other windows.

In all List Windows, any column that is highlighted in gray is a static column and cannot be changed in that window.

You cannot copy items into a drop-down field, except items from an identical drop-down field.

Module List Window:

Group Field	This field accepts only hex data from 00 to FE. You can paste data from the clipboard, but it must be hex data in this range. For every non-valid entry, you will see an error dialog box.
Module Field	This field accepts only hex data from 0 to F. You can paste data from the clipboard, but it must be hex data in this range. For every non-valid entry, you will see an error dialog box.
Type	This is a drop-down entry that limits the data to pre-defined hardware types. You cannot paste into this column.
Banks	Bank numbers are limited by the Module Type used. CIBs can have only 1 bank. AIBs can have up to 8. You can paste into this column for AIB modules. Each entry must be between 1 & 8. You will get a warning if you try to reduce the number of banks in an AIB.
Location	This is a free-format text field. You can paste text into this column.
Name	This is a free-format text field. You can paste text into this column.
Channel	This field allows entry of only channels defined in the Channel List window. You can cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Receiver List Window

Name	This is a free-format text field. You can paste text into this column.
Description	This is a free-format text field. You can paste text into this column.
Table	This field allows entry of only display tables defined in the Display Table window. You can cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Channel List

Channel	This is a free-format text field. You can paste text into this column.
Email Group	This field allows entry of only Email Groups defined in the Email Groups window. You can cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Email Group

Recipient	This is a free-format text field. You can paste text into this column.
Type	This field allows entry of only Email Types (To: & CC:). You cannot cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Display Window (Screen Layout)

All Cells

The cells require either:

- Left & Right Labels or
- Valid Receiver or other I/O Function Block References.

You can paste receivers from Receiver List window.

You can cut & paste a range of labels & receivers from a Display Window.

You cannot paste other types of data into these cells.

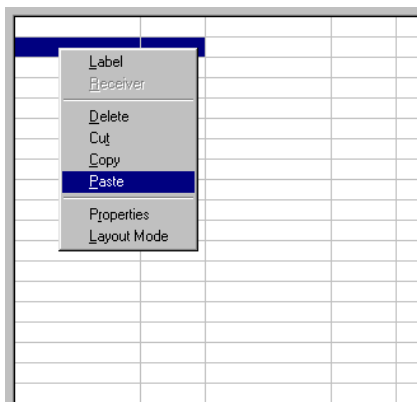
Pasting a Column of Receivers from the Receiver Window into the Display Window:

(Channels with a large number of sites)

1. From the Receiver Window, highlight a group of receivers and Copy to clipboard.

Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	04:F	AIB	Chan 1	1	HQ	19RTNA2144	CIB_TABLE
2	04:F	AIB	Chan 1	2	Smith Rd	19DHDA789910-03	CIB_TABLE
3	04:F	AIB	Chan 1	3	Water Twr	19RTNA2145	CIB_TABLE
4	04:F	AIB	Chan 1	4	North Shore	19RTNA2103	CIB_TABLE
5	04:F	AIB	Chan 1	5	Glendale	Microwave Ch 234	CIB_TABLE
6	04:F	AIB	Chan 1	6	Mercy Hosp	Microwave Ch 235	CIB_TABLE
7	04:F	AIB	Chan 1	7	Waterworks	19RTNA2146	CIB_TABLE
8	04:F	AIB	Chan 1	8	Mt. Nebo	19RTNA2147	CIB_TABLE
9	03:F	AIB	Chan 1	9	White Bldg	19RTNA2148	CIB_TABLE
10	03:F	AIB	Chan 1	10	Sears Twr	19RTNA2149	CIB_TABLE
11	03:F	AIB	Chan 1	11	Arena	19RTNA2150	CIB_TABLE
12	03:F	AIB	Chan 1	12	Gvt Bldg	Microwave Ch 236	CIB_TABLE
13	03:F	AIB	Chan 1	13	Courthouse	Microwave Ch 237	CIB_TABLE
14	03:F	AIB	Chan 1	14	Airport	19DHDA789114-05	CIB_TABLE
15	03:F	AIB	Chan 1	15	Good Sam	19DHDA789113-07	CIB_TABLE
16	03:F	AIB	Chan 1	16	Univ Cntr	19DHDA789124-09	CIB_TABLE
17	00:1	AIB	Chan 2	1	HQ	19DHDA789101-05	CIB_TABLE
18	00:1	AIB	Chan 2	2	Smith Rd	19RTNA2160	CIB_TABLE
19	00:1	AIB	Chan 2	3	Water Twr	19RTNA2161	CIB_TABLE
20	00:1	AIB	Chan 2	4	North Shore	19RTNA2162	CIB_TABLE
21	00:1	AIB	Chan 2	5	Glendale		CIB_TABLE
22	00:1	AIB	Chan 2	6	Mercy Hosp		CIB_TABLE
23	00:1	AIB	Chan 2	7	Waterworks		CIB_TABLE
24	00:1	AIB	Chan 2	8	Mt. Nebo		CIB_TABLE
25	00:1	AIB	Chan 2	9	White Bldg		CIB_TABLE
26	00:1	AIB	Chan 2	10	Sears Twr		CIB_TABLE

2. Go to the Display Window.
Move the cursor to the starting position for the column of receivers.
Paste the clipboard to the screen.



HQ	Off-Line		
Smith Rd	Off-Line		
Water Twr	Off-Line		
North Shore	Off-Line		
Glendale	Off-Line		
Mercy Hosp	Off-Line		
Waterworks	Off-Line		
Mt. Nebo	Off-Line		
White Bldg	Off-Line		
Sears Twr	Off-Line		
Arena	Off-Line		
Gvt Bldg	Off-Line		
Courthouse	Off-Line		
Airport	Off-Line		
Good Sam	Off-Line		
Univ Cntr	Off-Line		

The receivers are pasted to the Display Window in a column.

MCNConfig Program: Client Permissions

(MCNRCD Server and Advanced Server 4.24 and up)

If you have multiple client PCs and users, you can select which screens they will be able to use with the Client Permissions configuration. For example, you could set up the following restrictions:

User	Screens Allowed
PD Dispatch	Police East Police Central Police West
FD Dispatch	FD EMS
Supervisor	All the PD & FD Dispatch screens
Technician	All the above screens plus special Technician screens

The following shows the Client Permissions window for the example above.

The screenshot shows the 'Client Permissions' window with a tree view of users and their assigned screens. The window has a blue title bar and standard Windows window controls. The tree view is as follows:

- Grant Access** (Key icon)
 - Police Dispatch (192.168.1.10 - 192.168.1.19)** (Laptop icon)
 - Police East
 - Police Central
 - Police West
 - FD Dispatch (192.168.1.20 - 192.168.1.29)** (Laptop icon)
 - FD
 - EMS
 - Joe Administrator** (User icon)
 - Police East
 - Police Central
 - Police West
 - FD
 - EMS
 - Radio Technician** (User icon)
 - Technician Screen
 - Police East
 - Police Central
 - Police West
 - FD
 - EMS

Annotations on the right side of the window:

- Arrow pointing to Police Dispatch IP range: 10 Police Dispatch PCs
All PCs in this IP range have the same 3 screens
- Arrow pointing to FD Dispatch IP range: 10 FD Dispatch PCs
All PCs in this IP range have the same 2 screens
- Brace pointing to Joe Administrator's screens: Supervisor has all 5 Dispatch screens
He can log on from any PC.
- Brace pointing to Radio Technician's screens: Tech has Tech screens plus all the above.
He can log on from any PC.

Screens can be restricted on the basis of:

- User Name
- PC IP Address Range
- A combination of both User Name & PC IP Address Range

The above example shows a fairly simple system. You can develop even more complex Client Permissions.



Client Restriction Rules

By default, in an MCN Client-Server system, all clients can access all screens. The Client Permission function works on the basis of taking away rights. The following are the rules for Client Permissions:

Initial Configuration – Unrestricted Client Permissions

When building a new system database or loading an older database without permissions, Unrestricted Client Permissions will take effect. The top key icon will have a label saying "Unrestricted Access" on it. If you don't want to restrict the screens available to specific users or PCs, you don't have to modify the Client Permissions. Unrestricted Client Permissions means:

1. Users can log on from any PC at any IP address that can access the server over IP.
2. All user names will be accepted.
3. All users on all PCs can access all screens.

PC Configuration

1. If a PC (or range of PCs) is not listed with restrictions, it will be able to access all screens.
2. PCs can be added at the first level (root) of the tree.
3. Each PC icon can have a range of IP addresses. The screens authorized under that PC icon will pertain to all PCs in that IP address range.
4. Each PC icon must have a unique IP address range. It cannot overlap with the IP address range of any other PC icon.
5. When a PC icon has no screens or users under it, it has access to all screens. The label for the PC will show "All Screens".
6. A PC icon with screens or users below it will have restricted access.
7. When a PC icon is first added, it will All Screens access.

User configuration

1. Master Users are added at the first (root) level.
2. Sub Users can be added under a one or more PC icons.
3. Master Users can also be added as Sub Users under PC icons.
4. When a User icon has no screens under it, it has access to all screens. The label for the User will show "All Screens".
5. A User icon with screens below it will have restricted access.
6. When a User icon is added (either as a Master User or a Sub User), it will have All Screen access.

Screens

1. Screens can be entered under either:
 - Master User icons
 - PC icons
 - Sub User Icons
2. Screens may be entered under more than one icon.

Client Access Rights

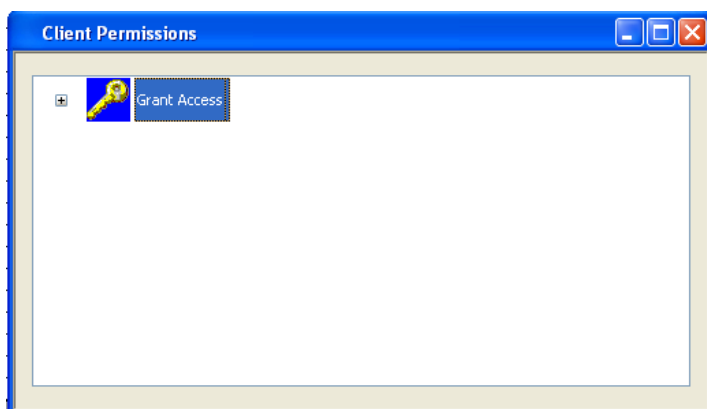
1. Master Users can access the system from a PC with any IP address (not just the address ranges associated with the PC icons).
2. If a user logs on to a PC that has either All Screens access or screens directly under its icon, that user can access those screens.
3. Sub Users can access the system only from PCs under which they appear.
4. The Server program will reject any unauthorized log-on attempt.

Client Screen Rights

1. Screens listed under Master User icons will be available to that user, no matter what PC he uses to log on. If a Master User has "All Screens access, he can access all screens from any PC.
2. Screens listed under PC icons will be available to any user logged on through that range of PCs.
3. Screens listed under a Sub User icon will be available to that user logged on to that range of PCs.
4. Screen rights are cumulative. A Sub User will have access to any screens under his icon plus any screens authorized for his parent PC icon.

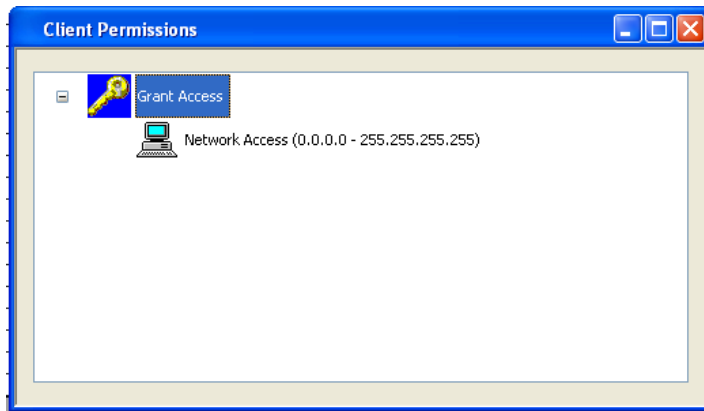
If a Master User logs in from a PC within the IP range of one of the PC icons, he will have access to all screens under his Master User icon plus all screens authorized to that PC icon.

From the **View** menu, select **View Client Permissions**.

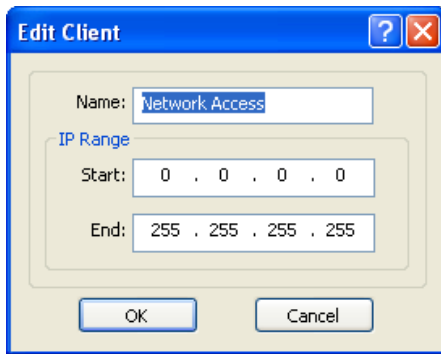


The initial Client Permissions screen is blank, with no restrictions for any users or PCs.

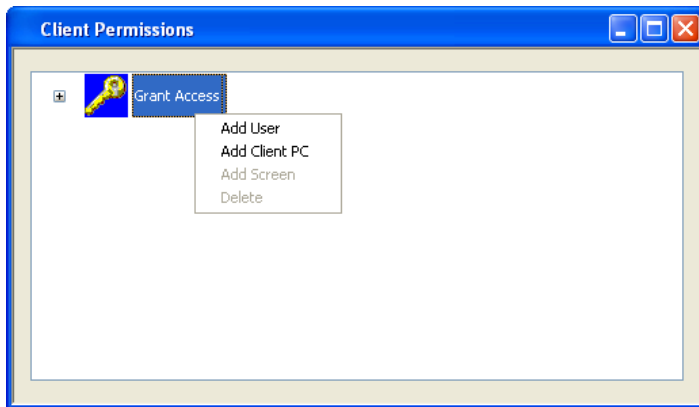
Clicking to expand the "+" gives you:



When you first build the system, access rights are granted to all PCs in the system as represented by the Network Access icon above. If you want to restrict access by IP address, click on the

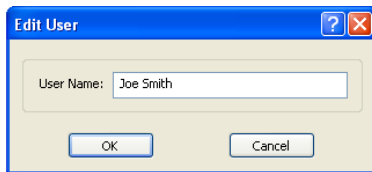


To add a User or Client PC, Right-Click on the Grant Access icon. Select **Add User** or **Add Client PC** from the menu.

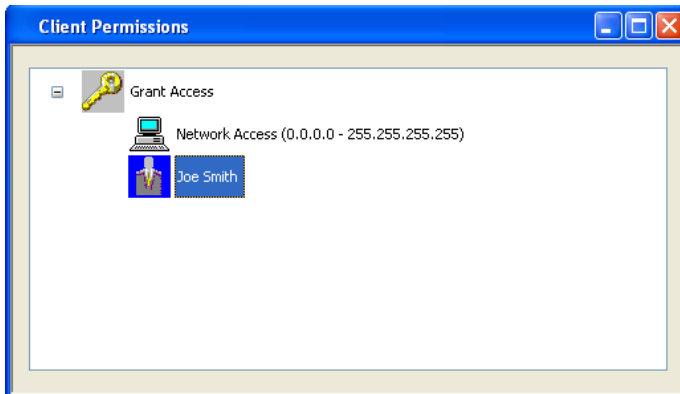


Add User

The **Add User** function lets you add an authorized user.



Enter the user name and hit OK.



The user will be added in the Permissions Tree under the icon you first selected.

In the case above, the user is added under the root. This makes him a Global User. He will be allowed to access the Server from any IP address that can reach the server.

Users can also be added as local users under specific PCs.

Add PC(s)

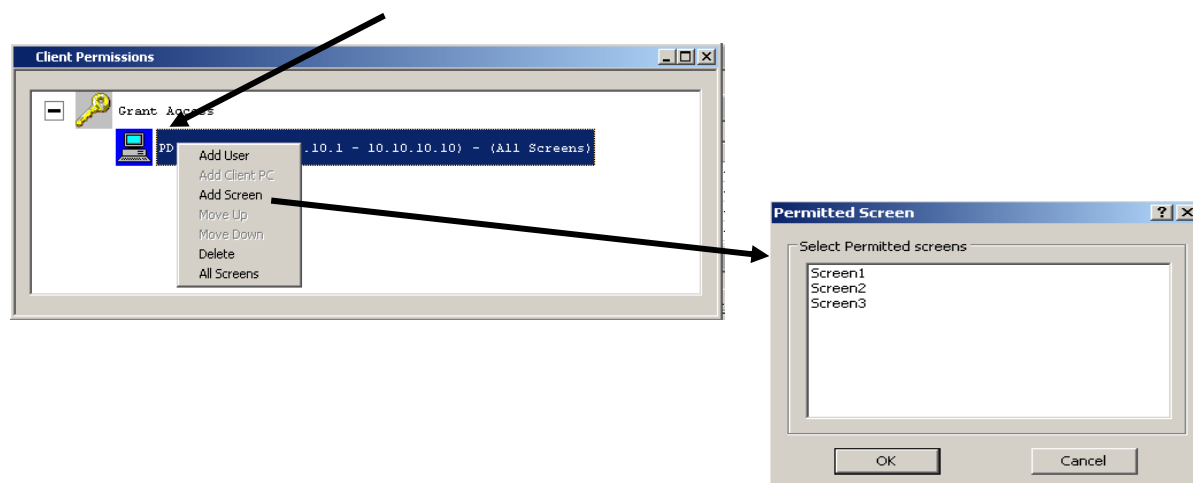
The **Add PCs** function lets you add a series of authorized Client PCs by using an IP address range. This allows you to assign the same rights to all PCs in the range. For example, you could set up two ranges, one for Police Dispatch and one for FD Dispatch:



Add Screen

Screens can be added under PCs or Users.

Right Click on a PC or User icon and select "Add Screen"



Select a screen from the list.

Windows User Names Note

Note that User Name is the Windows User name that was originally established for an account. If the User name is changed, Windows still reports the original User Name to the MCNRCD Server program.

Network and System Security Note

The Client Permission feature of the MCNRCD Server is intended to help organize screens for clients on a closed network. It is intended to be used in large systems with multiple screens to limit the screens available to dispatchers to the actual screens that pertain to that dispatcher, thus eliminating confusion.



The Client Permission features is not intended to provide network or system security. Network and system security to prevent access to the Client and Server PCs by unauthorized users should be addressed by the customer through standard methods.

Since the screen selection is based on the Client PC's IP address and the Windows User Name, users on PCs should be configured without administrative rights, thus not allowing them to add user accounts or change their IP addresses.

MCN Server Program

This is the software run on the MCN Server PC. It has a local display that displays the status of the devices on the MCN system (Comparators, I/O points, alarms, etc.). It allows the operator to control receivers (with Force-Vote and Disable functions) and other I/O devices (relays, etc.) from the MCN Server PC.

The MCN Server program also passes the status and control data to MCN Client PCs over an IP LAN or WAN.



Warning: Do not run the DOS version of MCNRCD and the MCN Server program at the same time on the same Network Interface!

This will cause sluggish operation. You may notice modules going off-line, responding very slowly, or even not responding at all to mouse presses.

First Time Setup

The MCN Server program needs to set up a number of parameters before it can function. When you run the software for the first time, it will ask you to enter some values.

Software Key

A Software Key is furnished with each MCN Server software package. It is entered in the HW Setup program. It includes the licensed feature set for the system and some identifying information that helps us provide product support. Each Software Key is locked to the Security Hardware Key that was shipped with the system.

The following features are encoded into the Software Key:

- Expiration Date
- Maximum number of Clients that can be active at one time (Overall)

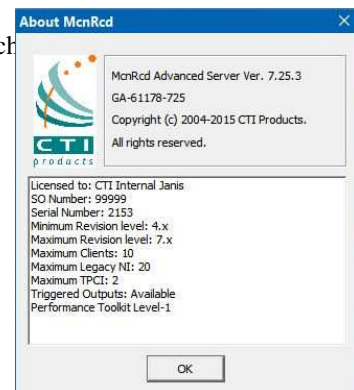
If you have entered an invalid software key (or it doesn't match the Security Hardware Key), the MCN Server software will bring up an error window when it starts up.

Re-Entering a Software Key

If an error is made when entering the Software Key, you can re-enter it using the HW Setup program. You may also make key corrections from within the MCN Server Program by clicking Software Key under the Help Menu.

Viewing the Licensed Features

After the program is running, you can use the **Help About** menu item to check the features enabled in your system.



Selecting an Ethernet NIC to talk to the HIB-IP units

Next, the program needs to know which Ethernet NIC card will be used to talk to the HIB-IP units. The Server IP Address window appears and asks you to select an IP address (associated with a NIC card in your PC) that you will use to talk to the HIB-IP units.

IP Configuration

Server IP Address to the Comparators and/or HIB-IP units: 192.168.1.128

Server IP Address to Client PCs: 192.168.1.128

Server Port: 49392

Multicast IP address to Client PCs: 228 . 4 . 15 . 224

Multicast Port: 49393

OK Cancel

Select an IP address and NIC card using the drop-down list. There will be an entry for each combination of IP addresses and NIC cards in your PC. If you have only one NIC card, you will probably have only one entry.

The program will ask for this information even if you don't have any HIB-IP units in your system. Humor the program and select an IP address and NIC card anyway.

Selecting an Ethernet NIC to talk to the MCN Client PCs

The program then needs to know which Ethernet NIC card will be used to talk to the MCN Client PCs. The Select IP Address window appears and asks you to select an IP address (associated with a NIC card in your PC) that you will use to talk to the Client PCs.

IP Configuration

NICs IP: 192.168.1.128

Index	Alias	IP	Port
1	Main Svr	192.168.1.50	4939

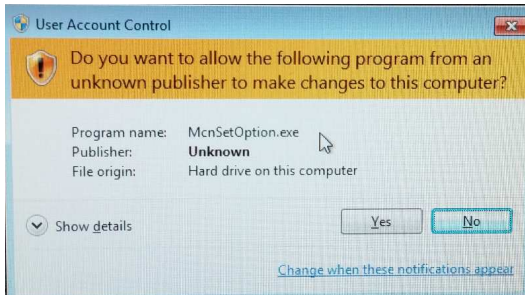
Add Server

OK Cancel

Again, select an IP address and NIC card from the drop-down list.

Windows UAC Permission

The MCN Server application needs to permission to make changes. If you have the UAC enabled, you will need to give the MCN Server program access.

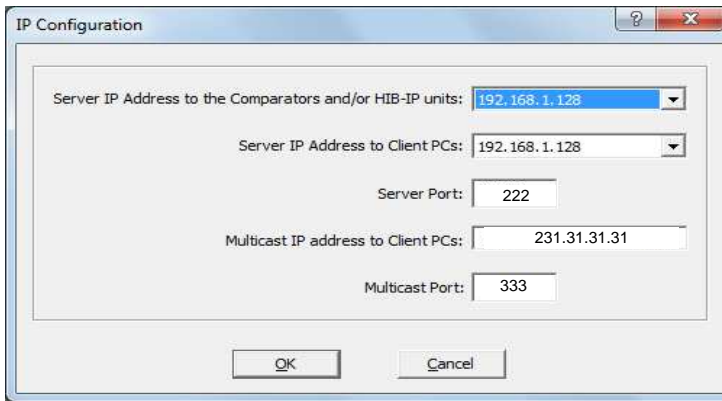


Select the **Yes** option.



Resetting IP Parameters

If you need to change the IP settings later, use the Options / IP Settings menu item. The IP Configuration window will appear.



The screen has the following fields:

Server IP Address to HIB-IP units

This is the IP address of the NIC (in the PC) that you want to use to talk to the HIB-IP units.

Server IP Address to Client PCs

This is the IP address of the NIC (in the PC) that you want to use to talk to the MCN Client PCs.

Server Port

This is the Port number in the MCN Server PC that the MCN Clients connect to. Default = 222

Multicast IP to Client PCs

This is the Multicast IP address that the MCN Server PC uses to send the real-time status data.

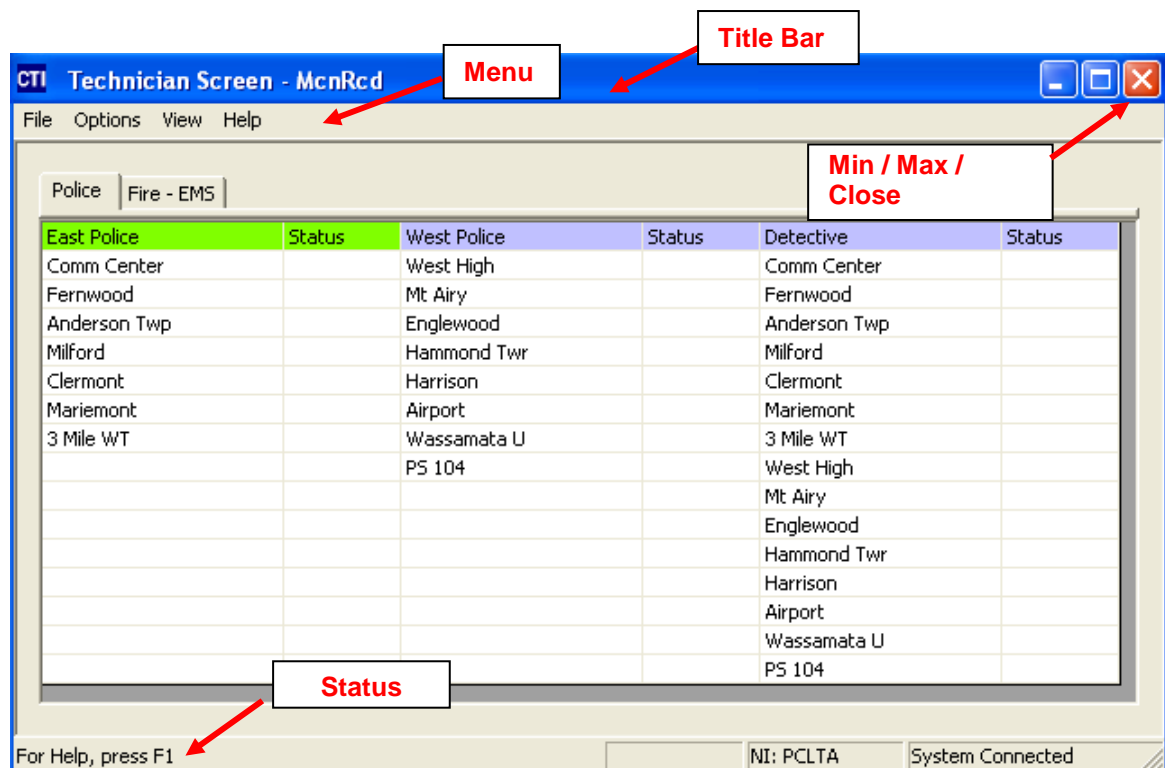
Multicast Port

This is the Port number that the MCN Server PC uses to send the real-time status data.
Default = 333



You must re-start the MCN Server program after you change IP parameters.

Screen Elements



Controlling the MCN Server Window

You can control the MCN Server window as follows:

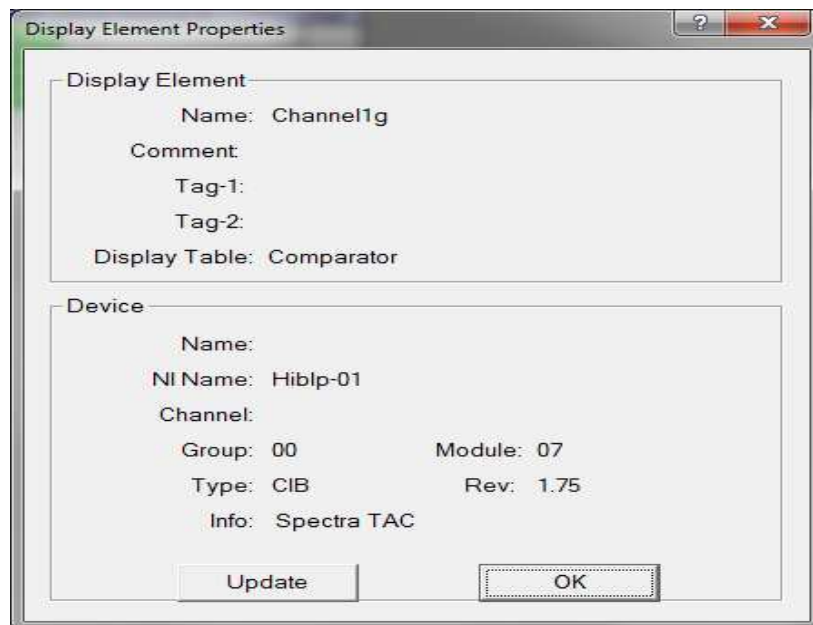
Move the window by grabbing its title bar and dragging it.

Re-size the window by grabbing an edge or corner and dragging it.

Minimize /Restore, Maximize and **Close** the window using the standard Windows buttons on the top right corner of each window.

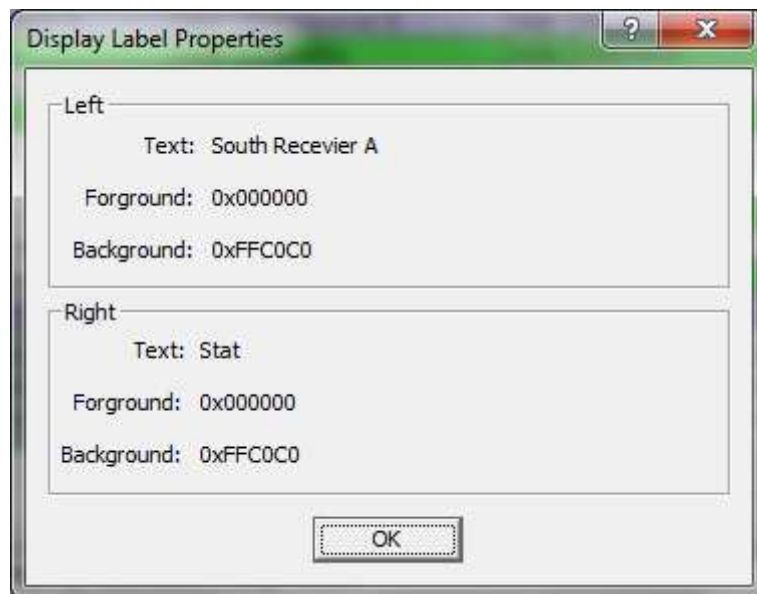
Display Element Properties

More information can be obtained about each specific receiver by performing a shift and left click over the particular screen element and bringing up the Display Element Window.



Display Label Properties

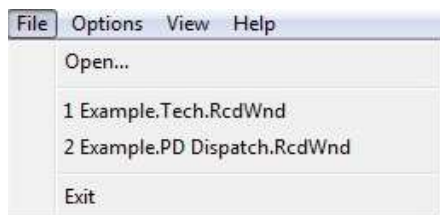
More information can be obtained about each Label, by performing a shift and left click over the particular screen Label and bringing up the Display Label Properties Window.



Menus

This program has many standard menu functions that are used in other Windows programs. For example, menus can be selected with the mouse or by hitting the **ALT** key & the underlined letter on the menu. Note that a menu's appearance may change, and various menu options may be disabled, depending on the current state of the system.

File Menu



Open

Opens a Display Window created in the MCNConfig program.

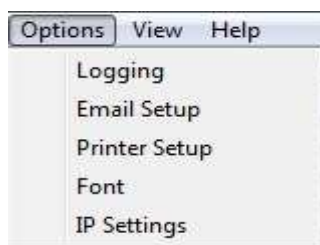
Recent Files

Allows you to quickly open a recently used Display Window.

Exit

Exits the program.

Options Menu



Logging & Sound

Alerts can be sent to the PC screen, printer, file, or email recipients. Alert sounds can also be enabled.

Email Setup

Email parameters must be entered before email alerts can be generated. See **Email Setup** on page 124 for other requirements for email alerts.

Printer Setup

Printer parameters must be entered before alerts are sent to a printer.

Font

Used to change the Font type or size for the display grid.

IP Settings

Lets you select the appropriate IP address to communicate with a HIB-IP unit (if you are using a HIB-IP for your Network Interface).

Enabling & Disabling Logging

Alerts generated by the MCN Server program can be sent to the PC screen, printer, file, or via email to selected recipients. Alert sounds can also be enabled.

The following window will be displayed when **Logging** is selected from the Options Menu.



Select the types of logging required, then click the **OK** button.

If logging to **File** is enabled, the file is named **MCNRCD.log** and is located in the MCN Server system directory. This is normally at:

C:\ProgramData\CTI Products Inc\McnRcd

If logging to **Screen** is selected, then logs are displayed for each detected system event appropriately configured in the display Table of the system configuration.

Sounds will only accompany alarm events, if configured in the Display Table of the system file.

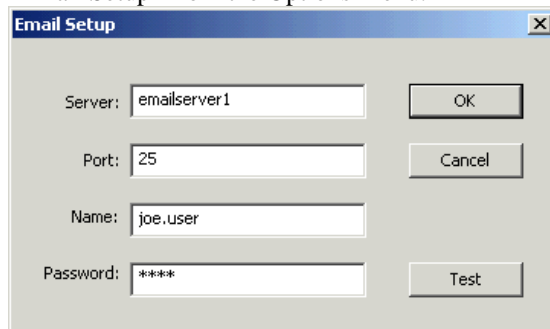


NOTE: Unnamed receivers and I/O points are considered unused by the program so that all transitions are ignored and will not generate alarms or logs.

Email Setup

For Email logging to occur, the following setup requirements must be met:

1. In the MCNConfig program, email groups and recipients must be specified in the "Email Groups Resource Window" on Page 76 for more information.
2. In the MCNConfig program, the "Email Group" must be specified for each Channel in the "Channels Resource Window" on Page 74 for more information.
3. In the MCNConfig program, the "Email" log flag must be set to "Y" in the Display Table States tab for those statuses you wish to be sent to the email. See page 85 for more information.
4. Enable Email alerts in the "Logging & Sound" window. To navigate to this window, select "Logging & Sound" from the Options Menu. See page 123 for more information.
5. Email parameters must be provided in the following window. To display this window, choose "Email Setup" from the Options Menu.



The "Email Setup" dialog box contains four input fields and three buttons. The "Server" field is labeled "Server:" and contains the text "emailserver1". The "Port" field is labeled "Port:" and contains the text "25". The "Name" field is labeled "Name:" and contains the text "joe.user". The "Password" field is labeled "Password:" and contains five asterisks "*****". To the right of the "Server" and "Port" fields are "OK" and "Cancel" buttons respectively. To the right of the "Name" and "Password" fields is a "Test" button.

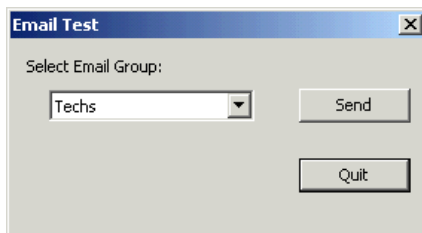
NOTE: The MCN Email Setup will only support Mail Servers using the legacy SMTP protocol, and does not support any authentication or encryption.

Parameters in the above window should be obtained from the email administrator at your facility.

Server	IP address or name of the email server at this facility. This can be either numeric address (such as 10.0.0.41) or a name that points to the email server through a Domain Name Server (DNS), as shown above.
Port	Email server port for accepting incoming mail messages, referred to as the "Listen Port"
Name	A valid email address that the above server services. MCN email alerts will be "From" this email address. The domain name (the portion of an email address after the "@" symbol) should not be included in this field.
Password	A valid password for the email address used in the "Name" field above.

Email Setup Verification

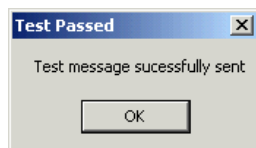
A "Test" button is provided in the "Email Setup" window to verify if all email parameters are set correctly. Click on this **Test** button to display the "Email Test" window shown below:



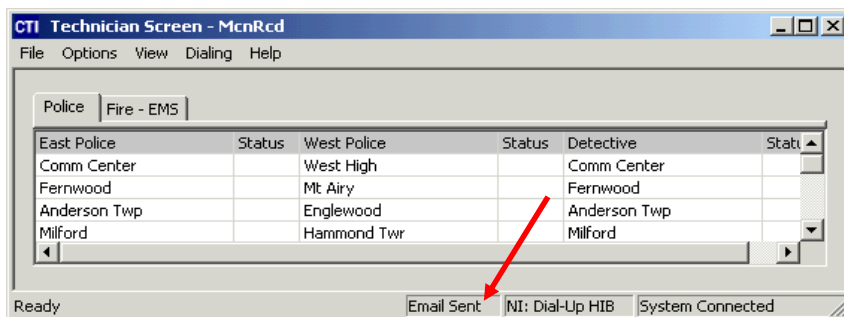
The "Email Test" dialog box contains a label "Select Email Group:" above a drop-down list. The drop-down list currently shows "Techs". To the right of the drop-down list is a "Send" button. Below the "Send" button is a "Quit" button.

To send a test email, select an Email Group from the drop-down list, then click **Send**. If successful, the following "Test Passed" window will be displayed.

MCN Server Program

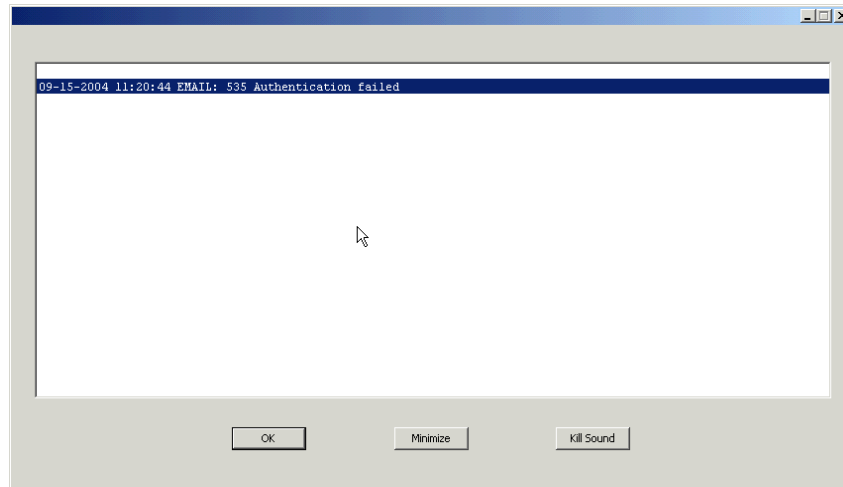


Another way to verify that the MCN Server program has successfully logged into the email server in the window above (and an email has been submitted for transmission), is to notice the Status Bar at the bottom of the MCN Server display window. If successful, the "Email Sent" status message will be displayed as shown below.



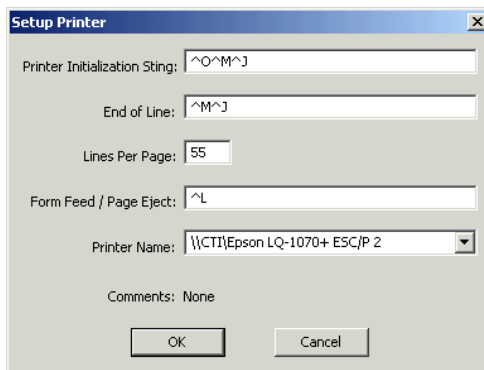
This email message will be delayed until the "Holdoff Time" specified in the "Email Group" properties window has expired. Navigate to this parameter in the MCNConfig program by right-clicking on a tab of the "Email Groups" Resource Window, then select **Email Group Properties**. See *Email Hold off Time* on page 76 for more information. This message will be visible for approximately 15 seconds.

If the MCN Server program was unsuccessful at logging into the email server, an error indication will be logged to screen as shown below. Screen logging does not have to be enabled for this type of screen log to occur.



Printer Setup

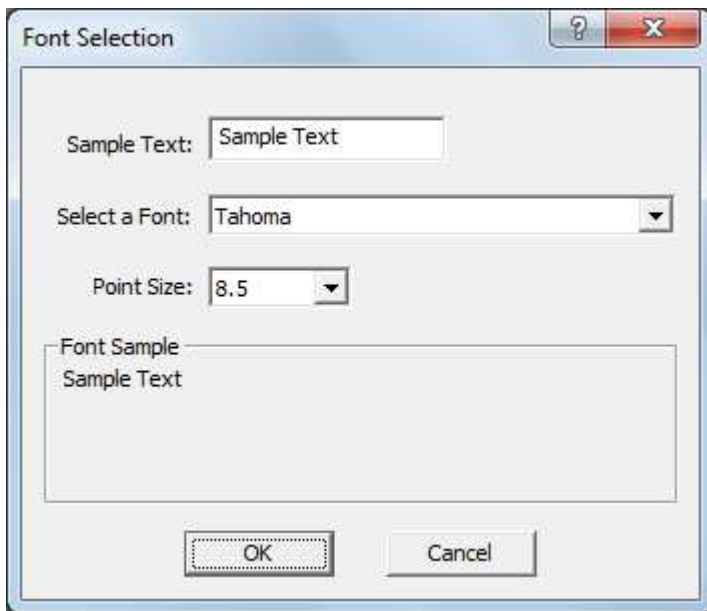
For alerts to be printed, printer parameters must be provided in the following screen. To display this window, choose “Printer Setup” from the Options Menu.



Parameters in the above window can be obtained from the specific printer documentation.

- **Printer Initialization String** This Escape character sequence is sent to the printer at the start of a new print job. In the example above, ^O instructs the printer to print without using a bottom margin, since continuous paper will be used. ^M selects 10.5 points for the font height and 12 characters per inch horizontally. And ^J specifies the line feed distance.
- **End of Line** This Escape character sequence is sent to the printer after each line of print. Normally, this should consist of escape characters for “line feed” and “carriage return”.
- **Lines per Page** Enter the number of lines to be printed on each page.
- **Form Feed/Page Eject** This Escape character sequence is sent to the printer after the number specified in “Lines per Page” above have been printed on a page.
- **Printer Name** A drop-down list is provided to select from the installed printers on this PC.

Font

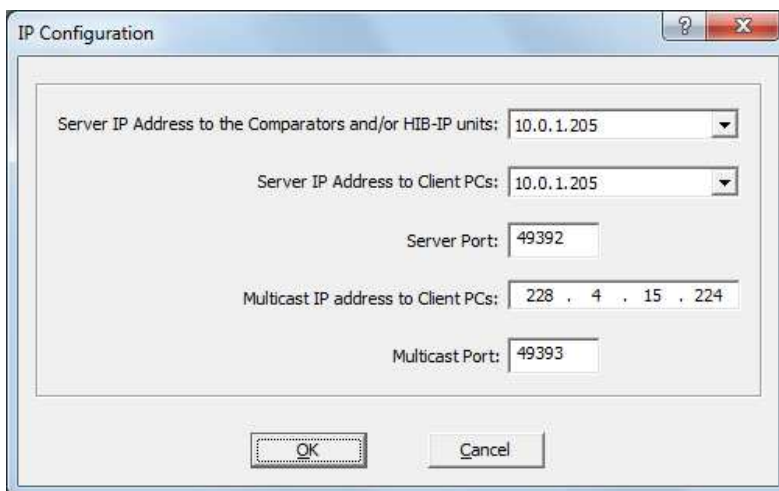


The Font Selection window is used to select a font and a font size for the Receivers and Function Blocks in the Display Window.

The row height will automatically stretch or shrink in response to font size changes. You may have to manually change the column widths after you make a change.

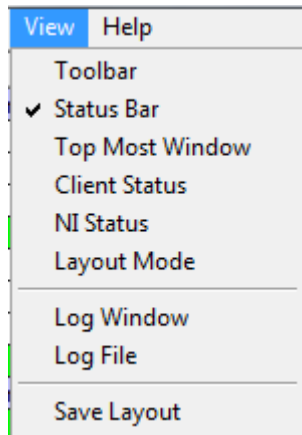
IP Settings

The window below is used to re-set the appropriate IP addresses on your PC to use to communicate with the HIB-IP unit(s) (if used) and the Client PCs.



See page 119 for details on the fields.

View Menu

**Toolbar**

When checked, enables the Toolbar.

Status Bar

When checked, enables the Status Bar (at the bottom of the MCN Server display window).

Top Most Window

When checked, ensures that the MCN Server display window is always the Top Most Window.

Client Status

Opens the Client Status window to display the status of all the client PCs currently logged into the MCN Server.

NI Status

Opens the Network Interface Status window to display the status of all Network Interfaces in use by the MCN Server.

Layout Mode

Opens the Layout Mode sub-menu that allows the user to change the column widths of the Display Window (Screen).

Log Window

Opens the Logging & Alarm (System Events) window.

Log File

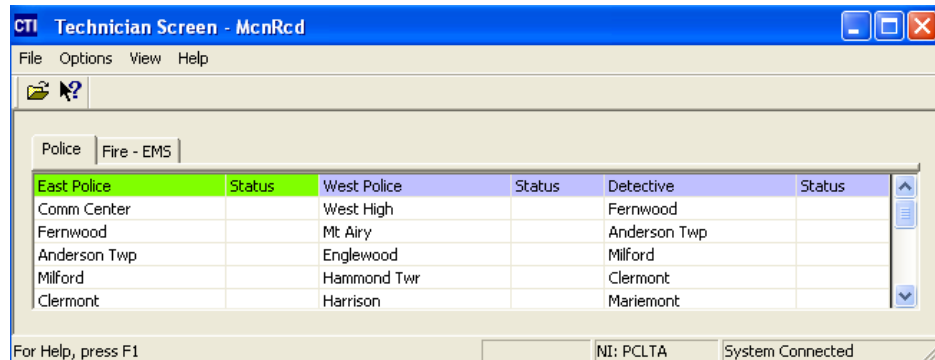
Opens the log file in a text viewer (typically Notepad)

Save Layout

Use this command to save column width changes performed when in Layout Mode.

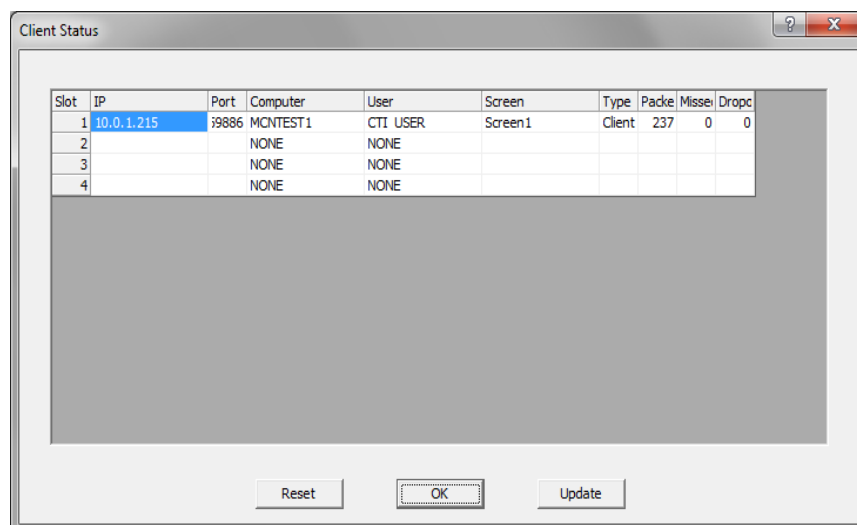
Toolbar & Status Bar

The following figure shows the Toolbar and Status Bar enabled.



Client Status Window

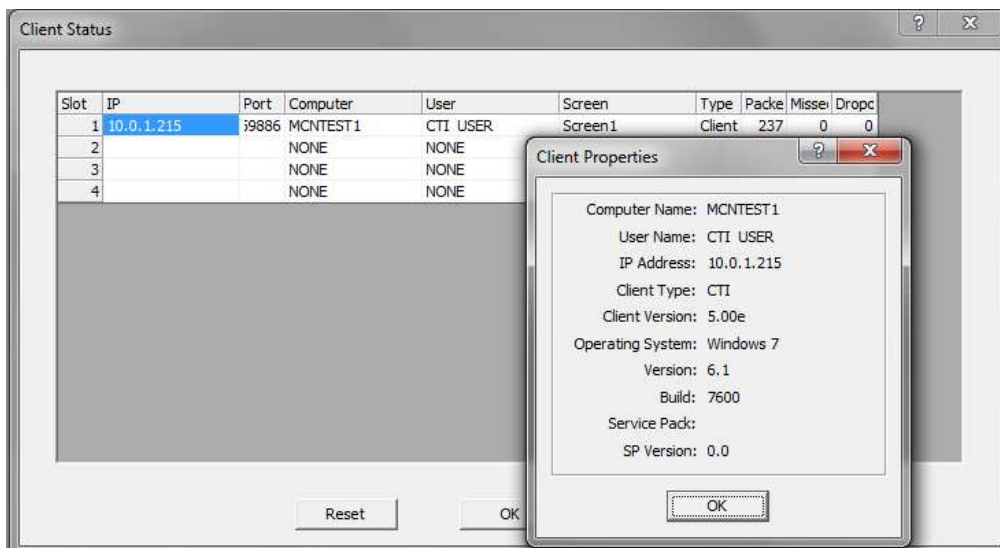
The Client Status window will show which clients are logged into the MCN Server program. It will also indicate whether they are TPCI clients or not. (TPCI is supported in the Advanced Server software only.)



To get more detail on a Client, double-click on one of the Client lines to bring up the Client Properties Window

Client Properties Window

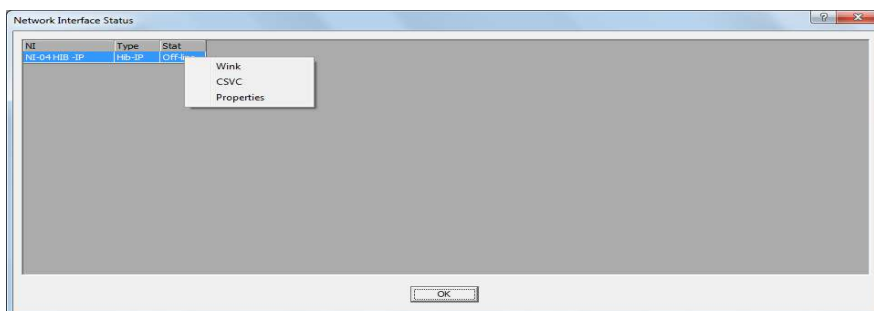
The Client Properties window displays detailed information on the selected client.



NI Status Window

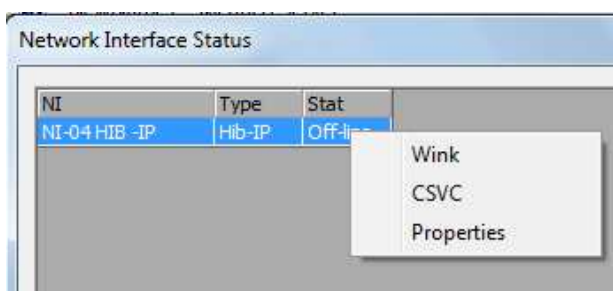
The NI Status Window shows the status of the Network Interfaces associated with this system.

The MCN Server software supports only a single Network Interface. The Advanced Server software supports multiple Network Interfaces.

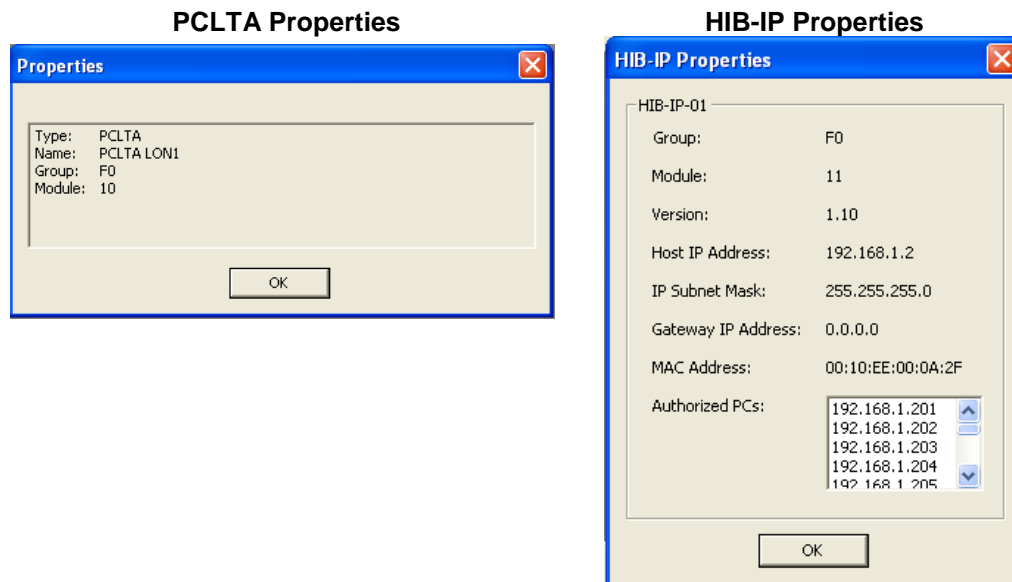


Network Interface Properties Display

For additional information on the Network Interface, right-click on the selected Network Interface and select the Properties menu item.

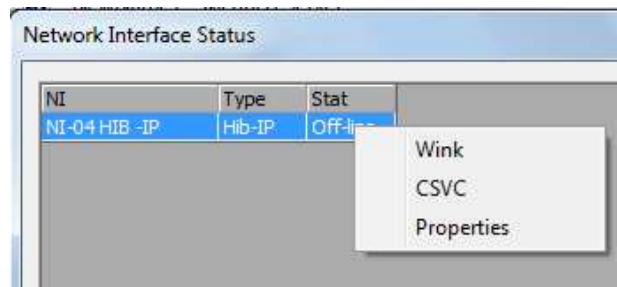


The Properties will vary, depending on what type of Network Interface is in use.



Additional HIB-IP Diagnostic Functions

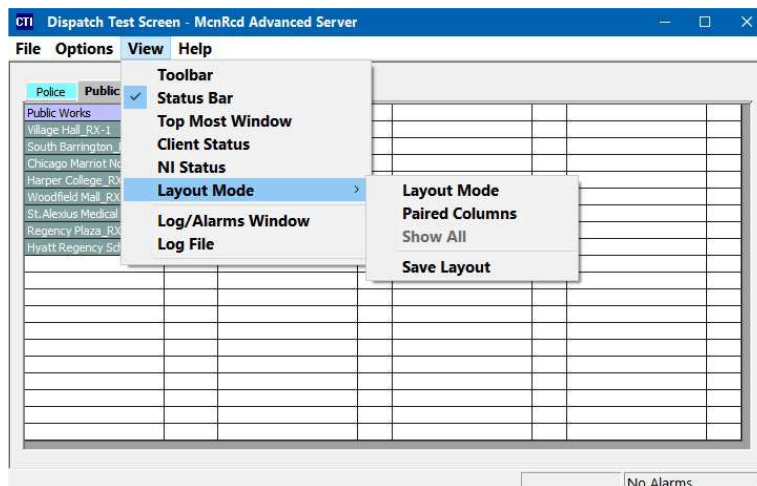
When you Right-Click on a HIB-IP Network Interface, you have two additional diagnostic options: Wink and CSVC.



- Wink This will blink the "Wink" LED on the front of the HIB-IP unit.
This can be helpful to identify a HIB-IP unit when you are using Advanced Server software with multiple HIB-IP units.
- CSVC This is the equivalent of pressing the CSVC button on the front of the HIB-IP unit.
In special instances a CTI engineer may instruct you to click on the CSVC function.

Layout Mode

Layout Mode allows you to set the column widths for the Display Window (Screen). To access the Layout Mode functions, select Layout Mode from the View menu item as shown..



The sub-menu contains the following items:

- Layout Mode** Check this to turn on Layout Mode. This allows you to set column widths.
- Paired Columns** (New feature in Version 7.25)
Check this to use the Paired Column mode (similar to older versions). This sets all the Receiver name columns to the same width and the Status columns to another width.

Changing the width of any of the Receiver name columns sets all the Receiver column widths.

Changing the width of any of the Status columns sets all the Status column widths.

When Paired Columns is unchecked, all column widths can be set independently.
- Show All** If column widths are set to zero, the **Show All** command will set all hidden columns to a minimum width so that a user can re-size them.
- Save Layout** This saves the current layout for this screen. Items saved include:
 - Fonttype & Size
 - Column Widths
 - Window Position.
 The layout parameters are saved to the registry on a per-user / per screen basis.

Log Window – Logging & Alarms

The history of Logs and Alarm Statuses are available under the System Events Window. The appropriate selections must first be configured in the States Tab of the Display Table with McnConfig. Then, if the logging to screen is enabled this window will automatically pop up and update for each valid Log and/or Alarm event.

When Screen Logging is enabled, status changes will be listed on the screen as shown below.

Time	Chan	RX	OLD	> NEW	GG:MR	Description
20:29:00	Chan 1	RX-7	Fail A	> Rx	00:1:07	RM
20:29:00	Chan 1	RX-8	Rx	> Fail A	00:1:08	RM
20:29:00	Chan 1	RX-9	Fail A	> Rx	00:1:09	RM
20:29:00	Chan 1	RX-10	Rx	> Fail A	00:1:10	RM
20:29:00	Chan 1	RX-11	Fail A	> Rx	00:1:11	RM
20:29:00	Chan 1	RX-12	Rx	> Fail A	00:1:12	RM
20:29:01	Chan 1	RX-5	Write	> Fail A	00:1:05	RM
20:29:01	Chan 1	RX-7	Rx	> Fail A	00:1:07	RM
20:29:01	Chan 1	RX-9	Rx	> Fail A	00:1:09	RM
20:29:01	Chan 1	RX-11	Rx	> Fail A	00:1:11	RM
20:29:01	Chan 1	RX-5	Fail A	> Rx	00:1:05	RM
20:29:01	Chan 1	RX-7	Fail A	> Rx	00:1:07	RM
20:29:01	Chan 1	RX-9	Fail A	> Rx	00:1:09	RM
20:29:01	Chan 1	RX-11	Fail A	> Rx	00:1:11	RM
20:29:01	Chan 1	RX-5	Rx	> Fail A	00:1:05	RM
20:29:01	Chan 1	RX-6	Fail A	> Rx	00:1:06	RM
20:29:01	Chan 1	RX-7	Rx	> Fail A	00:1:07	RM
20:29:01	Chan 1	RX-8	Fail A	> Rx	00:1:08	RM
20:29:01	Chan 1	RX-9	Rx	> Fail A	00:1:09	RM
20:29:01	Chan 1	RX-10	Fail A	> Rx	00:1:10	RM
20:29:01	Chan 1	RX-11	Rx	> Fail A	00:1:11	RM
20:29:01	Chan 1	RX-12	Fail A	> Rx	00:1:12	RM

- Hitting the OK button will close the window but keep the log entries.
- Hitting Clear will delete the log entries.

You can view the Log & Alarm window later by selecting **View / Log Window** from the menu.

Alarm Display – Log Tab / Alarms Tab

If a Receiver or I/O point is configured for Alarm operation, it will be displayed on the Alarms tab of the System Event window when it goes into an Alarm state.

Index	Time	Channel	RX Name	State	Desc	Tag1	Tag2	ACK	Ignore
1	09/27/101 22:08:15	East Police	Union Center	Disable				No	No
2	09/27/101 22:08:48	East Police	Monroe W.T.	Disable				No	No

This tab shows all alarms which are:

- Active and/or
- Unacknowledged.

The state shown will be the state at the latest time the alarm became active. It does not necessarily show the current status.

If an alarm state has a sound configured for it, that sound will be played when a point goes into the alarm state. For multiple alarms, the alarm sound will not be repeated unless 2 seconds has elapsed since the previous alarm.

Alarms must be acknowledged. They can be acknowledged with either:

- The **Ack All** button or
- The Ack drop-down field in the individual alarm line.

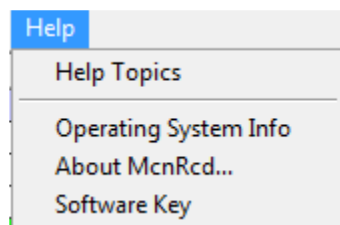
Alarms will be removed from the window when:

- The alarm is acknowledged and
- The state returns to normal

If there is a nuisance alarm, it can be placed on Ignore status with the Ignore field.

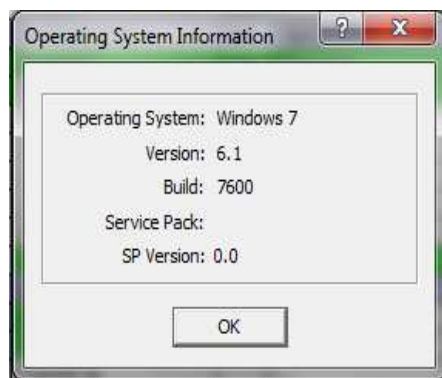
Receivers and I/O points can be configured for Alarm operation by selecting an appropriate Display Table. Alarm activity can also be enabled on an existing Display Table. See the Display Tables section starting on page **83** for instructions on how to enable alarms and sounds in the Display Tables.

Help Menu



Operating System Info

The operating system info will display relevant details about the OS on which the MCN Program is installed.



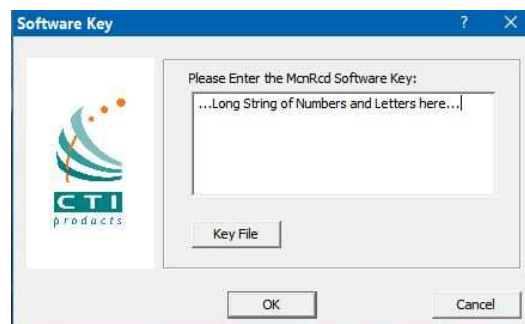
About McnRcd...

The about McnRcd menu item will display relevant details about the currently installed McnRcd Program and the licensed options.



Software Key

The Software Key menu item allows you to enter a new Software Key (similar to the function in HWSetup and MCN Config software). Changes will take effect after the program is closed and re-started.



MCN Client Program

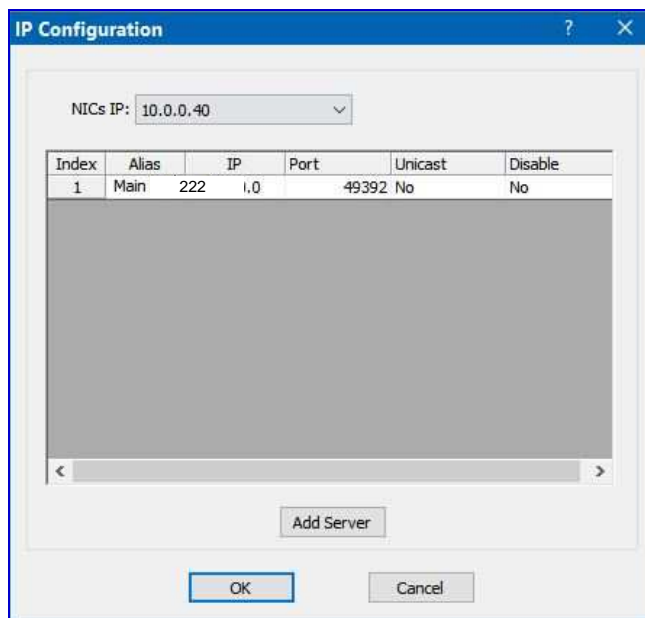
This is the Client program that runs on remote PCs to display the status of and control the MCN system. The MCN Client program runs on PCs connected to the MCN Server over an IP network, and thus do not need their own MCN Network Interface.

Note: Use elevated rights when running the Client program the first time

The Client program uses a list of MCN Servers to contact. This is normally set up once, the first time the Client program is run. For security purposes, it is recommended that normal users have only read-only access to the Server List. If you have set up the system this way, you must have Administrator rights to run the Client program the first time (to enter the Server List). Right-click on the program and select "Run As Administrator" to elevate your rights. If users have proper Read-only rights, they can then run the Client program with User permissions.

Selecting IP Parameters & Building a Server List

When you start the MCN Client program for the first time, it will ask for the IP parameters to use to connect to the MCN Server.

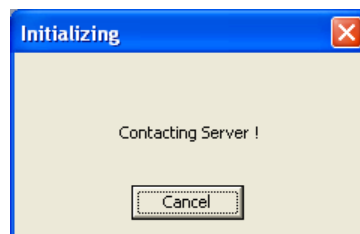


1. In the NICs IP drop-down box, select the IP address of the Client's NIC to use to connect to the MCN Server. (Normally there will be only NIC card and one IP address set up in a PC.)
2. Hit "Add Server".
3. For the first server:
 - a. Enter an Alias (Name) for the Server
 - b. Enter the Server IP address
 - c. Enter the Server's MCN UDP Control port number.
(Use the IP address and Port that were assigned and set up on the MCN Server.)
 - d. For normal Multicast operation, set the Unicast field to "No".
For Unicast operation, set it to "Yes".
 - e. Make sure Disable field is set to "No".

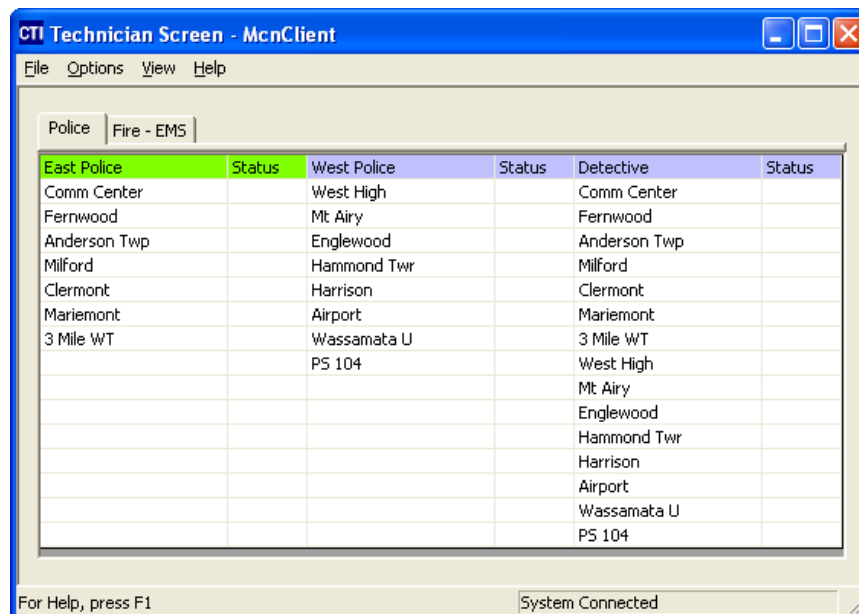
4. If you have backup servers, add them by repeating the above steps
5. Hit OK.
6. The list of clients will be saved in a file: ServerList.RcdCli and will be used the next time the Client is started.

Making Connection with the Server

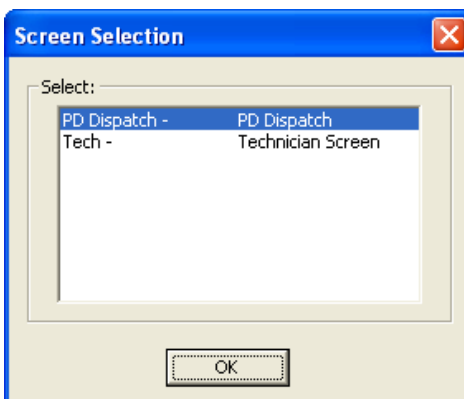
As the MCN Client program starts, it will try to contact the MCN Server.



If the MCN Client program has been run on this PC before, it will load and display the last loaded screen.

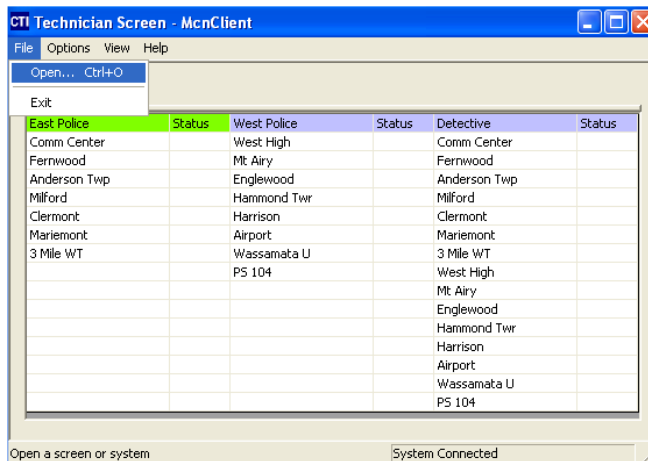


If it is the first time the MCN Client program is run, it will contact the MCN Server PC to get a list of available screens. Select from one of the screens.



Selecting Screens

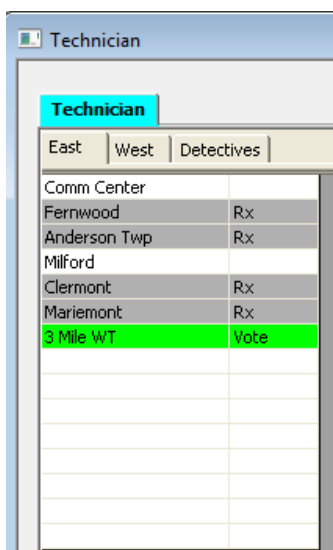
To load a different Display Window (screen), go to the **File ... Open** menu item.



A list of available screens will be displayed.



Select the desired screen from the list and it will be opened:

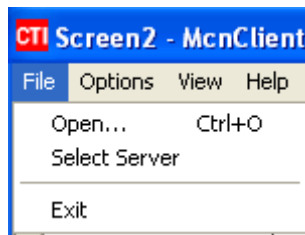


Different clients can display different screens.

File Menu

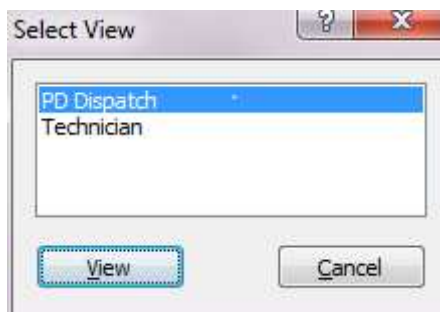
The File menu has the following menu items

- Open** Allows you to select a new screen on the current server.
- Select Server** Allows you to select a different server (if there is one)
- Exit** Allows you to exit the program

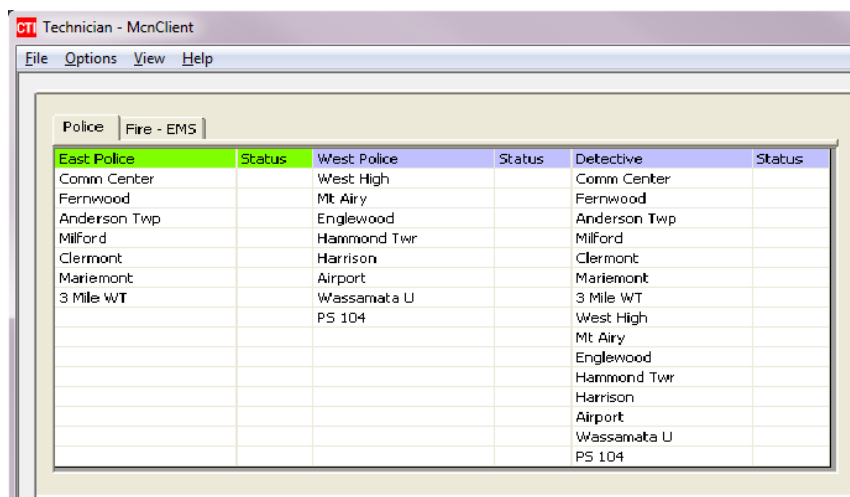


Open

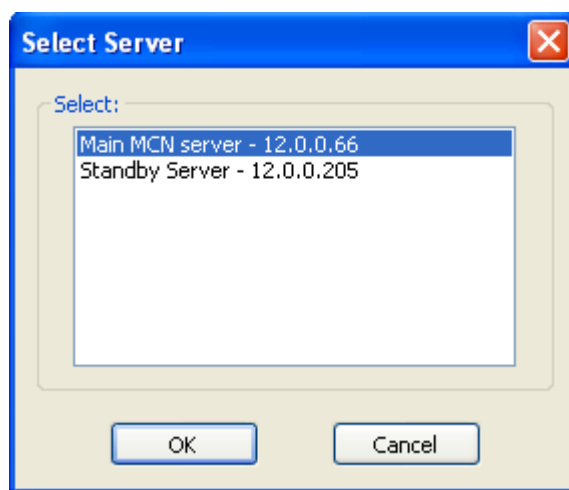
The Open window presents a list of screens present on the MCN Server.



- Select the appropriate screen from the list presented and hit OK.
- The new screen will appear:

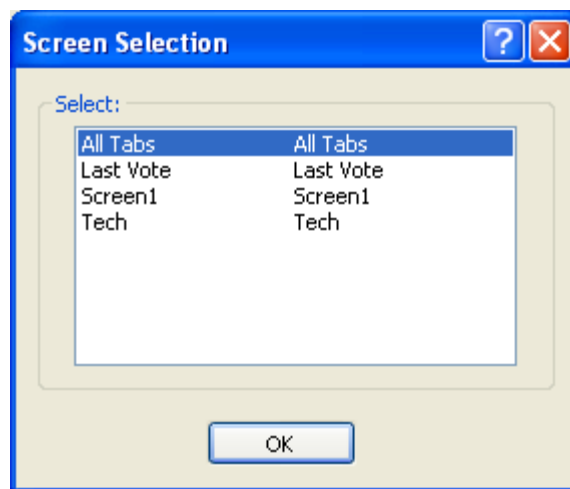


Select Server



The Select Server menu item presents a list of servers from which to select:

1. Select the appropriate server from the list presented and hit OK.
2. If the last screen you opened is present on the new server, it will be loaded automatically.
3. If the last screen is not present, a list of available screens on the new server will be shown:

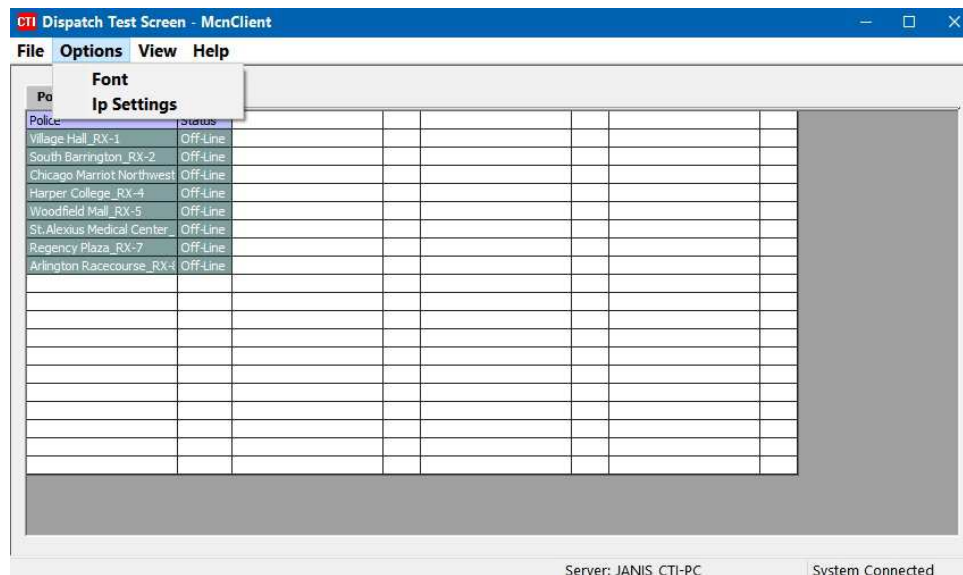


4. Select the desired screen and hit OK.

Options Menu

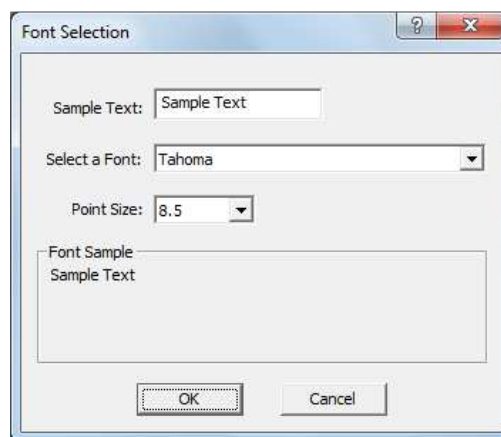
The Options menu has the following menu items:

- Font Allows you to adjust the font type and size for this screen.
- IP Settings Allows you to change the IP settings (as described earlier)



Font Window

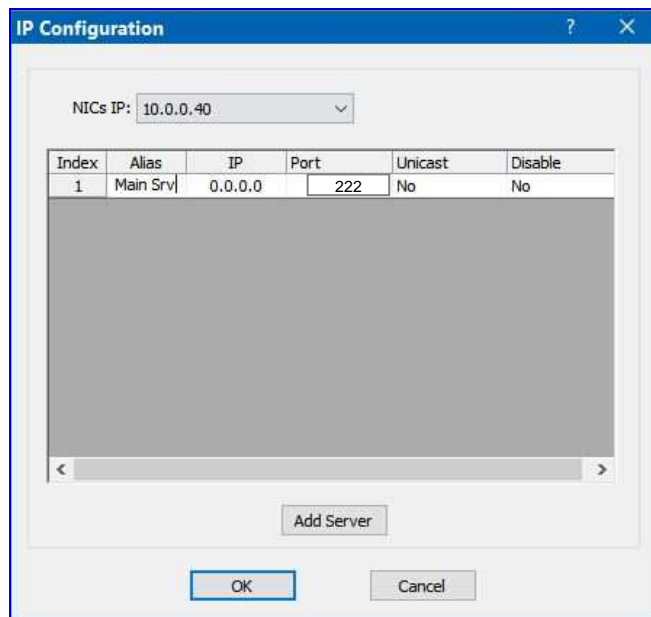
The Font Selection window is used to select a font and a font size for the Receivers and Function Blocks in the Display Window.



The row heights will automatically stretch or shrink in response to font size changes. You may have to manually change the column widths after you make a change. See page 144 for directions for setting column widths.

IP Settings

This IP Configurations window is the same window that appears when the MCN Client program is run for the first time.



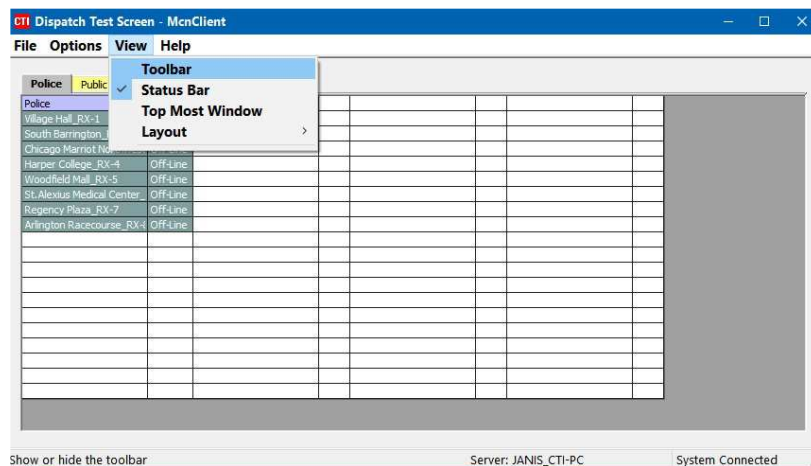
Enter the appropriate Server data as described in the *Selecting IP Parameters & Building a Server List* section on Page **136**.

If your system is set up with user account restrictions, you will not be able to save the settings from this window if you have only User Account rights. You will have to re-run the program as an Administrator.

If you change any of the settings, they will not take effect until you re-start the MCN Client program.

View Menu

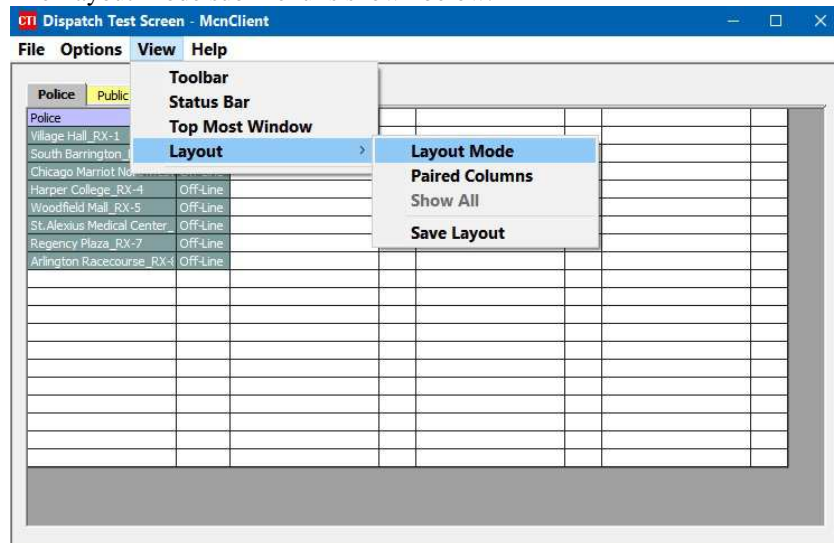
The View menu allow you to set viewing parameters.



Toolbar	Turns the Toolbar on & off.
Status Bar	Turns the Status Bar (at the bottom of the screen) on or off.
Top Most Window	Allows MCN Client window to stay on the top of other programs that are running.
Layout Mode	Opens the Layout Mode sub-menu. This allows you to edit the column widths.

Layout Mode

The Layout Mode sub-menu is shown below.



The Layout Mode sub-menu contains the following items:

- Layout Mode** Check this to turn on Layout Mode. This allows you to set column widths.
- Paired Columns** (New feature in Version 7.25)
Check this to use the Paired Column mode (similar to older versions). This sets all the Receiver name columns to the same width and the Status columns to another width.

Changing the width of any of the Receiver name columns sets all the Receiver column widths.

Changing the width of any of the Status columns sets all the Status column widths.

When Paired Columns is unchecked, all column widths can be set independently.
- Show All** If column widths are set to zero, the **Show All** command will set all hidden columns to a minimum width so that a user can re-size them.
- Save Layout** This saves the current layout for this screen. Items saved include:
Fonttype & Size
Column Widths
Window Position.
The layout parameters are saved to the registry on a per-user / per screen basis.

In Paired mode, all the Receiver columns have the same size and all the Status columns have the same size. If "Paired" mode is turned off, the width of all columns can be adjusted separately.

In Layout Mode
Click & Drag Column Separator lines to change column widths.

Layout Mode Indicators:
Gray Cells and Layout Mode status

When in Layout Mode, the program will not send mouse clicks to the MCN Server.
 Turn off Layout Mode to enable normal program operation.
 Save Layout to have the column widths be permanent for the current Display Window & user.

Client Normal Run-Time Operation

Status Display

When the Client is running and getting information from the Server, it will provide a Status Display for the individual receivers and I/O devices in the loaded system.

Control

The Client can control the receivers in the comparators and the generic Outputs if the system is configured for Control operation. On Comparators, the typical control features are:

- **Force-Vote** Left Mouse Click (momentary)
- **Disable / Enable** Right Mouse Click (latched)

Some systems may have the Control functions disabled for some clients. See your system administrator if you have questions.

See your system administrator about controls for other output devices.

Multiple Tab Systems

Some systems have multiple tabs. Use the mouse to select the tab you desire to view. If there are many tabs, use the Left & Right arrows on the top right of the Tab bar to scroll to the Left or Right.

Client Program Notes

Data Loading & Cache Files

The Client program gets its data from the MCN Server. The first time a Client connects to a server, it loads the system configuration files from the Server. Once it loads the data, it will save a copy of the data in a local data cache.

When the Client connects to a Server, it will check to see if its local cache is current. If so, it will use the local cache to speed up the connection. If the cache is not current, it will re-load the data from the server.

It may take a long time to load the data file the first time or after it has changed. This could take a matter of many minutes, especially with large systems, large Display Tables and when the Client is connected to the Server via routers.

Backup MCN Servers

The Client program can access backup MCN Servers (if present). When the connection to the main server is lost, the program will try to connect to the backup server(s).

IP Multicast Required

For normal operation, the MCN Server sends the real-time data to the Client software over IP Multicast. The network routers and switches between the Server and Client must support IP Multicast and must pass the IP Multicast Group and Port configured in the MCN Server.

IP Multicast Error Windows

Error windows, will be generated and displayed for the following IP Multicast errors:

1. If the network is blocking the IP Multicast traffic, the Client will display an error message indicating that it is not receiving Multicast traffic.
2. If the Client detects IP Multicast traffic from a different Server on the configured IP Multicast address, it will display a "Foreign Multicast" error window. (Each MCN Server must have its own Multicast IP address.)

Unicast Client Support (Version 7.x up)

MCN Server and ClientRcd Version 7.00 can also use Unicast IP for real-time transmissions from the Server to individual Client. This should be limited to (10) simultaneous Unicast Clients. Unicast and Multicast clients; can be mixed on the same system.

Differences between the Client and Server Programs

The Client program differs from the Server program in a number of ways:

- **MCN Network Connection:**
The Server connects to the MCN Network directly (or through a HIB-IP) unit.
The Client connects to the MCN network through the Server.
- **Logging:**
The Error Logging function (to the screen, printer, disk, and email) is a function of the Server only.
- **Sounds:**
The Sounds (on specific status conditions) are supported only on the Server.
(Sounds will only be heard on the PC running the server software.)
- **Client-Server Connections:**
The Server can have multiple Clients connected to it at a time (up to the limit of the license).
The Client can connect to only one Server at a time.
- **Configuration:**
The system configuration database is stored on the Server (and edited with MCNConfig).
The Client will retrieve the appropriate configuration data from the Server when it logs in.

Windows Event Logging

In addition to the logging described in *Appendix A: Error Logging* Definitions on Page 186, the MCN Server system logs significant events to the Windows Event Log, including:

MCN Config Server Program

- Program start and stop
- System Load
- Saving a System

MCN Server & Advanced Server Program

- Program start and stop
- System Load
- File Open Errors
- Connection to and disconnection from IP Comparators
- Connection to and disconnection from HIB-IP units
- Connections & Disconnections of MCN Client PCs
- Unauthorized Client log-on attempts
- Mouse actions (ex: Force-Vote & Disable) for MCN Server & Clients
- Log events ad defined in xxxx.RcdLog (typically Disables & Fails for receivers)
- Changes made to registry (HKLM)

ClientRCD Program

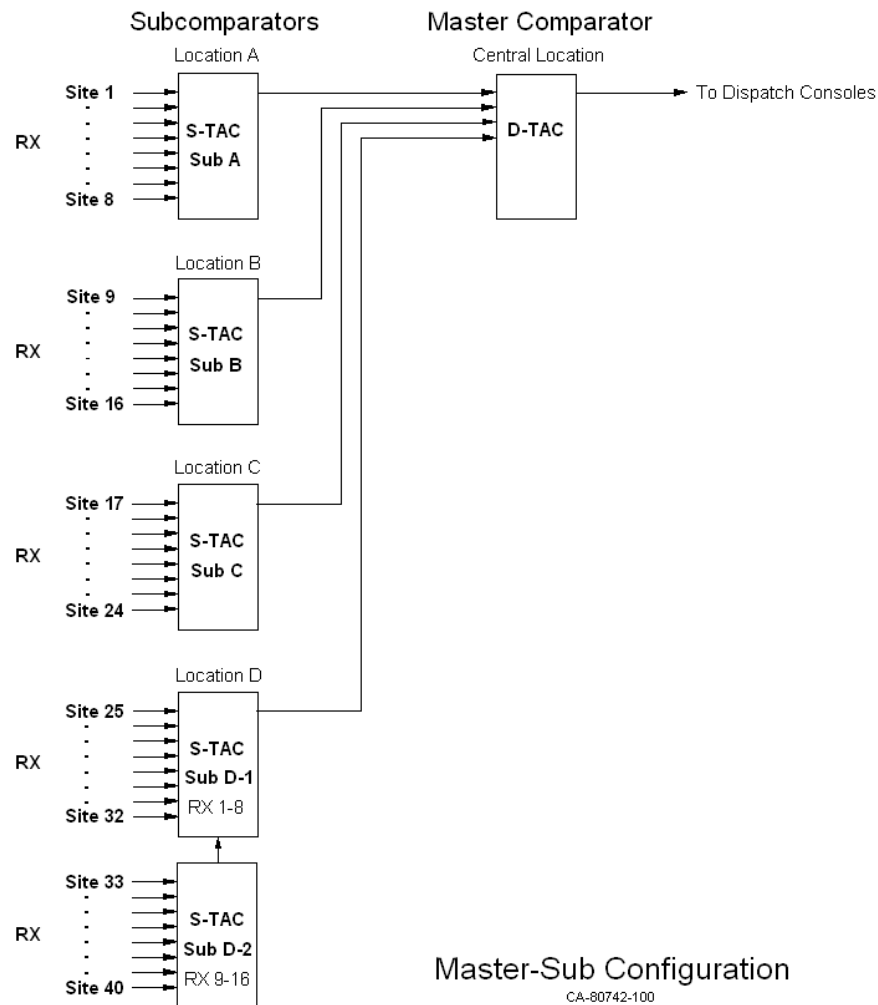
- Program start and stop
- Connection to and disconnection from Server PC
- Connection rejected by MCN Server
- Changes in Server List
- Changes made to registry (HKLM)

Advanced Configuration Topics

Configuring Master-Sub Comparator Systems

Master-Sub Comparator Overview

MCNRCD for Windows can handle systems in which comparators are arranged as Master Comparators and Sub Comparators. A group of comparators that are in a Master-Sub configuration can be depicted as in the following diagram.



In this case, eight receivers at Location A are fed into Sub Comparator A. Likewise, eight receivers at Location B are fed into Sub Comparator B, and additional locations may have comparators with their own receivers. The selected audio from each of these locations is fed to the Master Comparator at the Central Location. Finally, the selected audio from the Master Comparator is sent to the Dispatch Consoles. Each one of the comparator chassis would have a CIB module connected to it.

Equipment-Centric View

The following diagram shows an equipment-centric view of the system described above. It has the following:

- A display for each receiver for each Sub Comparator
- A display for the Master comparator, showing each of the Sub Comparators feeding it.

It does not use the special Master-Sub Comparator features in MCNRCD (discussed below).

Master Comparator						
Sub A	Rx					
Sub B	Rx					
Sub C	Vote					
Sub D	Rx					

Sub Comparator A	Sub Comparator B	Sub Comparator C	Sub Comparator D-1	Sub Comparator D-2
Site 1	Site 9	Site 17 Rx	Site 25	Site 33
Site 2 Rx	Site 10	Site 18 Vote	Site 26	Site 34
Site 3 Rx	Site 11 Rx	Site 19 Rx	Site 27 Vote	Site 35 Dis
Site 4 Vote	Site 12	Site 20	Site 28 Rx	Site 36
Site 5 Rx	Site 13	Site 21 Rx	Site 29	Site 37
Site 6 Rx	Site 14 Vote	Site 22	Site 30	Site 38
Site 7	Site 15 Rx	Site 23 Rx	Site 31	Site 39
Site 8 Dis	Site 16	Site 24	Site 32	Site 40

The above display indicates:

- The Master Comparator is voting Sub Comparator C.
- There are other Vote indications on Sub A, Sub B, Sub C, and Sub D.

Each comparator is shown as an independent comparator (although they are actually physically connected in a Master-Sub configuration).

To determine which audio is being heard by a dispatcher, you would have to go through a two-stage process:

1. Determine that the Master Comparator is voting Sub Comparator C
2. Sub Comparator C is voting Site 18

In other words, there is no immediate direct indication of which site's audio is being heard by the dispatcher. The Votes on Sites 4, 14, and 27 from Sub Comparators A, B, & D are not the signal being used by the Master Comparator at the moment, even though they have a "Vote" indication. This can be very confusing to a dispatcher

However, the equipment-centric display could be useful for a technician who is troubleshooting the system. If, for example, a Vote is stuck on a Sub Comparator, it would be readily apparent on this screen.

Virtual Comparator View

A dispatcher is not necessarily concerned with the details of master and sub comparators. They would only need to know which receiver is the one that is providing the audio. A System view or Virtual Comparator view is shown below.

Sub Comparator A	Sub Comparator B	Sub Comparator C	Sub Comparator D-1	Sub Comparator D-2
Site 1	Site 9	Site 17 Rx	Site 25	Site 33
Site 2 Rx	Site 10	Site 18 Vote	Site 26	Site 34
Site 3 Rx	Site 11 Rx	Site 19 Rx	Site 27 Rx	Site 35 Dis
Site 4 Rx	Site 12	Site 20	Site 28 Rx	Site 36
Site 5 Rx	Site 13	Site 21 Rx	Site 29	Site 37
Site 6 Rx	Site 14 Rx	Site 22	Site 30	Site 38
Site 7	Site 15 Rx	Site 23 Rx	Site 31	Site 39
Site 8 Dis	Site 16	Site 24	Site 32	Site 40

This view shows:

- A display for each receiver for each Sub Comparator
- No indication for the Master comparator
- A Virtual Comparator with 40 inputs.
- A single green "Vote" indication, showing the receiver being heard by the dispatcher.
- "Rx" indications for the receivers that are voted in the Sub Comparators but are not voted in the master.

The Virtual Comparator view uses a special Master-Sub Comparator feature of the MCNRCD software, and allows the use of a special Sub-Comparator display table. The Master-Sub feature in the MCNRCD software allows votes on sub comparators that are not being used by the Master Comparator to be modified to display "Rx" instead of "Vote". They will be modified to display "Rx" since their sub comparators are not the voted audio at the Master Comparator. In this display, there is an immediate direct indication of which site's audio (Site 18) is being heard by the dispatcher.

Enhanced Virtual Comparator View

An alternate Enhanced Virtual Comparator view is shown below:

Sub Comparator A	Sub Comparator B	Sub Comparator C	Sub Comparator D-1	Sub Comparator D-2
Site 1	Site 9	Site 17 Rx	Site 25	Site 33
Site 2 Rx	Site 10	Site 18 Vote	Site 26	Site 34
Site 3 Rx	Site 11 Rx	Site 19 Rx	Site 27 Rx V	Site 35 Dis
Site 4 Rx V	Site 12	Site 20	Site 28 Rx	Site 36
Site 5 Rx	Site 13	Site 21 Rx	Site 29	Site 37
Site 6 Rx	Site 14 Rx V	Site 22	Site 30	Site 38
Site 7	Site 15 Rx	Site 23 Rx	Site 31	Site 39
Site 8 Dis	Site 16	Site 24	Site 32	Site 40

This view:

- Is similar to the Virtual Comparator View
- Shows only one green "Vote" indication (the receiver whose audio is being used)
- Shows an "Rx V" indication for the sites that are voted in the Sub Comparators but are not voted in the master. The "Rx V" indication is shown in gray, so as not to be confused with the green "Vote" indication.

This provides a bit more information than the standard Virtual Comparator view. It also provides feedback to the user when he tries to Force-Vote a receiver. He will get an indication that the CIB received his command (by the "Rx V" status) even if the master comparator does not vote the receiver's Sub Comparator.

The Virtual Comparator and Enhanced Virtual Comparator views can be implemented with standard Display Tables that are shipped with the Master-Sub Comparator option. You may modify those display tables or create your own display tables to suit your system's needs.

Implementing the Virtual Comparators

To implement either of the above “Virtual Comparator” displays, the following steps should be taken:

1. **Enable Master-Sub features** of the MCNRCD for Windows software.
2. Setup the Network Interface, Channels, Hardware, and Receivers windows as instructed earlier in this manual
3. **Assign Display Tables** for the Master and Sub Comparator receivers and **Define the SubDevices** for each channel of a Master Comparator.
4. **Design the Display Window** for the Virtual Comparator.

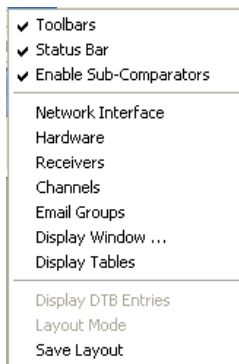
Optionally, if you want to customize the Master or Sub-Comparator display tables:

5. **Customizing Display Tables** for Master and Sub Comparators.

Each of these steps will be explained in detail in the following sections.

1. Enable Master-Sub features

From the **View** menu, click on *Enable Sub-Comparators* to display a “check mark” next to this menu item as shown below. This provides access to Master-Sub features of the MCNRCD for Windows software.



2. Setup Network Interface, Channels, Hardware and Receiver windows

The Network Interface, Channels and Hardware windows for this example system should look like the following. The generation of these tables has been explained in previous sections of this manual, and will not be discussed in detail here.

Network Interface					
Index	Name	Type	Address	Group	Module
1	PCLTA	Non-IP	MCN1	NA	NA

Channels		
Index	Channel	Email Group
1	Central Master	None
2	North	None
3	East	None
4	South	None
5	West	None

Hardware								
Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	PCLTA / MCN1	00	0	CIB	1	Central	Master	Central Master
2	PCLTA / MCN1	10	0	CIB	1	North	Sub A	North
3	PCLTA / MCN1	20	0	CIB	1	East	Sub B	East
4	PCLTA / MCN1	30	0	CIB	1	South	Sub C	South
5	PCLTA / MCN1	40	0	CIB	1	West	Sub D-1	West
6	PCLTA / MCN1	40	1	CIB	1	West	Sub D-2	West

The Receivers window will be discussed in the next section.

3. Assign Display Tables and Define the SubDevices

A. Assign Display Tables

In the “Receivers” window, double-click in the Display Table column and select the proper Display in the cell for each receiver as illustrated by the following Table Entry.

Receivers	Display Table
Master Comparator	"Master Comparator"
Sub Comparator	"Sub Comparator" (for Virtual Comparator) "Sub Comparator Enhanced" (for Enhanced Virtual Comparator)

3 A: Assign Display Tables for Master & Subs

Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	SubDevice	Display Table
1	PCLTA LON1	00:0	CIB	Central Master	1	Sub A		Yes	Master Comparator
2	PCLTA LON1	00:0	CIB	Central Master	2	Sub B		Yes	Master Comparator
3	PCLTA LON1	00:0	CIB	Central Master	3	Sub C		Yes	Master Comparator
4	PCLTA LON1	00:0	CIB	Central Master	4	Sub D		Yes	Master Comparator
5	PCLTA LON1	00:0	CIB	Central Master	5			No	Master Comparator
6	PCLTA LON1	00:0	CIB	Central Master	6			No	Master Comparator
7	PCLTA LON1	00:0	CIB	Central Master	7			No	Master Comparator
8	PCLTA LON1	00:0	CIB	Central Master	8			No	Master Comparator
9	PCLTA LON1	10:0	CIB	North	1	Site 1		No	Sub Comparator
10	PCLTA LON1	10:0	CIB	North	2	Site 2		No	Sub Comparator
11	PCLTA LON1	10:0	CIB	North	3	Site 3		No	Sub Comparator
12	PCLTA LON1	10:0	CIB	North	4	Site 4		No	Sub Comparator
13	PCLTA LON1	10:0	CIB	North	5	Site 5		No	Sub Comparator
14	PCLTA LON1	10:0	CIB	North	6	Site 6		No	Sub Comparator
15	PCLTA LON1	10:0	CIB	North	7	Site 7		No	Sub Comparator
16	PCLTA LON1	10:0	CIB	North	8	Site 8		No	Sub Comparator
17	PCLTA LON1	20:0	CIB	East	1	Site 9		No	Sub Comparator
18	PCLTA LON1	20:0	CIB	East	2	Site 10		No	Sub Comparator
19	PCLTA LON1	20:0	CIB	East	3	Site 11		No	Sub Comparator
20	PCLTA LON1	20:0	CIB	East	4	Site 12		No	Sub Comparator

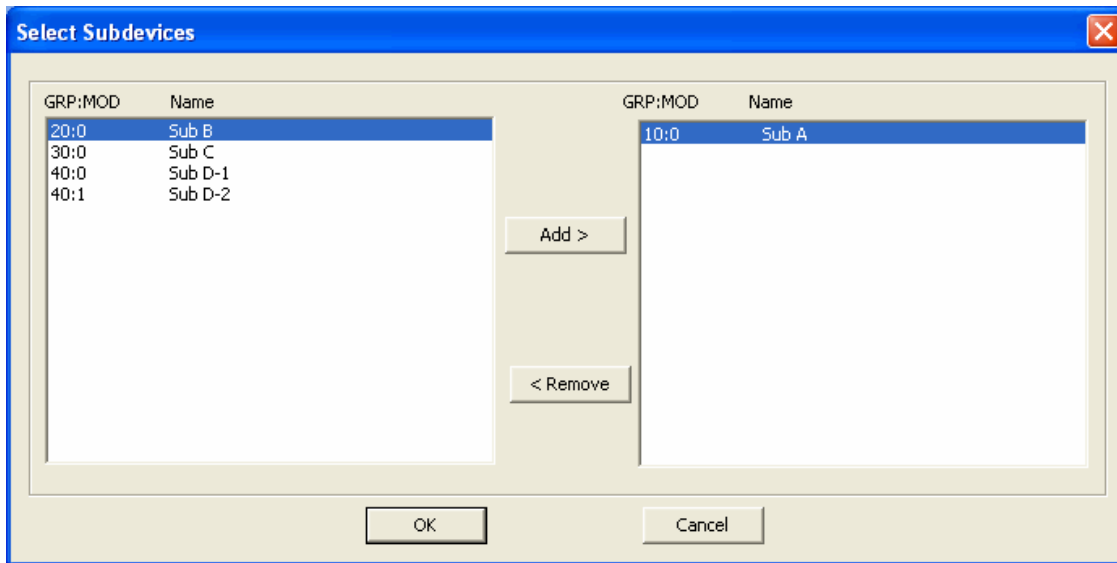
3 B: Define SubDevices for each receiver in Master comparator

B. Assign Sub Devices for each receiver in the Master Comparator

In the “Receivers” window, a “SubDevice” column will be displayed as shown below (only with Master-Sub features enabled as indicated above).

1. For each receiver of a Master Comparator, double-click its cell in the “SubDevice” column to display the following “Select SubDevices” window.
2. From the list of available SubDevices on the left side, “Add” the appropriate receivers to the right side of this window.

For the first Master Comparator receiver that is fed from Sub Comparator A, the “Select SubDevices” window should look like the following.



Click the **OK** button to close this window.

Notice that the cell in the “SubDevice” column of the “Receivers” window for this receiver is now set to “Yes”.

4. Design the Display Window for the Virtual Comparator

As shown in the following Display Window, all 40 site receivers of the Sub Comparators are included in the display. Note that the Master Comparator is not shown in this Virtual Comparator view.

Virtual Comparator Option 1						
Virtual Comparator Option 1						
Sub Comparator A	Sub Comparator B		Sub Comparator C		Sub Comparator D-1	
Site 1	Sub Comp.	Site 9	Sub Comp.	Site 17	Sub Comp.	Site 25
Site 2	Sub Comp.	Site 10	Sub Comp.	Site 18	Sub Comp.	Site 26
Site 3	Sub Comp.	Site 11	Sub Comp.	Site 19	Sub Comp.	Site 27
Site 4	Sub Comp.	Site 12	Sub Comp.	Site 20	Sub Comp.	Site 28
Site 5	Sub Comp.	Site 13	Sub Comp.	Site 21	Sub Comp.	Site 29
Site 6	Sub Comp.	Site 14	Sub Comp.	Site 22	Sub Comp.	Site 30
Site 7	Sub Comp.	Site 15	Sub Comp.	Site 23	Sub Comp.	Site 31
Site 8	Sub Comp.	Site 16	Sub Comp.	Site 24	Sub Comp.	Site 32
					Sub Comp.	Site 33
					Sub Comp.	Site 34
					Sub Comp.	Site 35
					Sub Comp.	Site 36
					Sub Comp.	Site 37
					Sub Comp.	Site 38
					Sub Comp.	Site 39
					Sub Comp.	Site 40

5. Customizing Display Tables

In the “Display Table” window, several types of devices have been predefined, including Comparator, Generator, Door, and others. Each device type has its own tab across the top of this window. The Master-Sub Comparator Option adds the following Display Tables:

- Master Comparator
- Sub Comparator
- Sub Comparator Enhanced

If these display tables suit your application, you can skip this section. If you need to modify them, read on.

Sub Comparator Display Table

The Sub Comparator display table **States** tab is shown below:

Index	Master	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	-	Error		N	Y
2	-	-	0	0	0	0			N	N
3	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	0	-	1	Fail		N	Y
5	0	-	1	0	-	0	Rx		N	N
6	1	-	-	0	1	0	Vote		N	N

This Sub Comparator **States** table has several basic differences from the basic Comparator display table:

- The Steer bit is a Don't Care (we're not using Transmitter Steering in this system)
- An additional Master (Master Vote) bit has been added (leftmost bit).
- The Vote state requires the Master bit (Master Vote) bit to be set (State 6)
- If the Rx bit is set and the Master (Master Vote) bit is not set, the display will show "Rx", even if the Vote bit (Sub Comparator Vote) is set (State 5)

The Master (Master Vote) bit is inherited from the Master comparator. It is only set when the Sub Comparator is voted in the Master Comparator.

Master Comparator Display Table

States Tab

The Master Comparator display table **States** tab is shown below:

Index	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	Error		Y	Y
2	-	0	0	0	0			N	N
3	-	-	1	0	-	Disable		Y	Y
4	-	-	0	-	1	Fail		Y	Y
5	-	1	0	-	0	Rx		N	N
6	-	-	0	1	0	Vote		N	N

This Master Comparator **States** table has a basic difference from the basic Comparator display table:

- The Steer bit is a Don't Care (we're not using Transmitter Steering in this system)

SubDevice Tab

The **SubDevice** tab has been added in the Master-Sub Comparator option. The Master Comparator display table **SubDevice** tab is shown below:

Index	Nudge	Steer	Rx	Dis	Vote	Fail
1	5	0	0	0	1	0

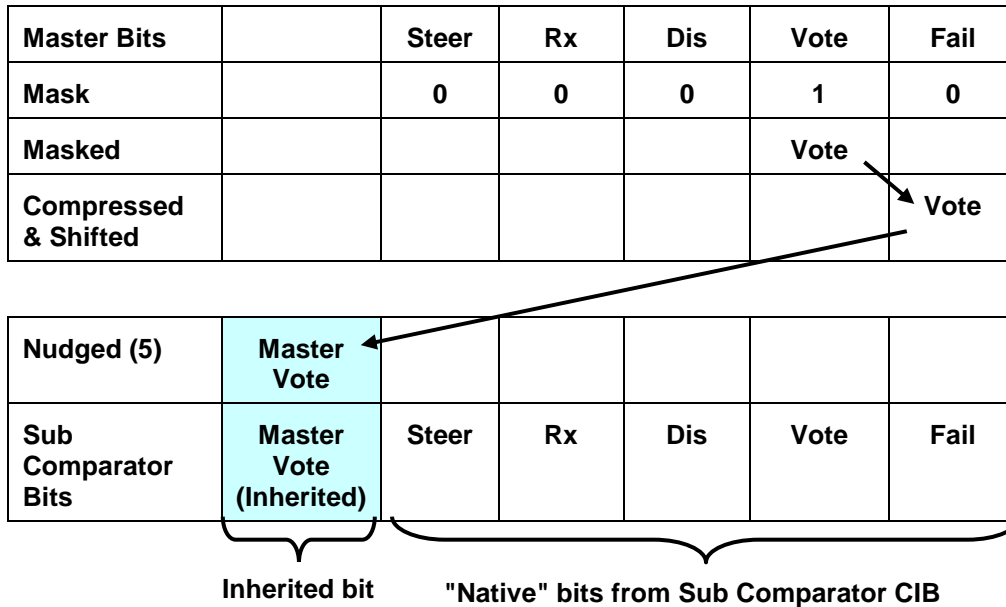
The **SubDevice** tab for the Master Comparator has the following items that are used to pass the Master Vote down to the Sub Comparator:

- Bit Mask for the Vote bit is a 1. This is the bit that will be passed on to the Sub Comparator devices.
- The Nudge field is set to 5. This tells the program how far to move the inherited bit(s) in the SubDevice. This number will depend on the SubDevice.

Bit Mask and Nudge Fields

The Bit Mask fields indicate which bit(s) is (are) used to pass to the SubDevice.

In general, the "Nudge" field should be the number of native bits in the destination SubDevice Table. (If there are Multi-dependencies – multiple Master Comparators for each Sub Comparator – you will need to specify special nudge values.)



The best way to understand how to set the Bit Mask and Nudge fields is to consider how the MCNRCD program processes the bits from the Master comparator as shown above:

1. The program masks out all bits that have a "0" in the mask field.
It passes only those bits that have a "1" in the Bit Mask field (Vote in this case)
2. All the bits with a "1" in the bit mask field are compressed and shifted to the right to fill the Least Significant Bits (right hand bits). In the above example, there is no compression going on – only shifting. The compression comes in when there are multiple non-contiguous mask bits set to "1". In that case, the program compresses the bit field by deleting all the unused bits. This is shown in the *Error! Reference source not found.* section on the next page **Error! Bookmark not defined.**
3. The Compressed & Shifted Bits will be nudged to the left by the number specified in the "Nudge" field (5 in this case).
4. The Nudged bit will be passed to all the receivers in the Sub Comparators.
5. The resultant bits (the inherited bit plus the "native" Sub Comparator bits) will be used in the Sub Comparator Display Table to determine the status to display.

Multi-Bit Mask

There may be times in which you need multiple bits from a master device to be passed to a sub device. The following table illustrates how to do this.

If, for example, you wanted to pass the "Rx" and the "Vote" bits from the Master comparator to the Sub Comparator, you would set the mask as shown:

Master Bits			Steer	Rx	Dis	Vote	Fail
Mask			0	1	0	1	0
Masked				Rx		Vote	
Compressed & Shifted						Rx	Vote
Nudged (5)	Master Rx	Master Vote					
Sub Comparator Bits	Master Rx	Master Vote	Steer	Rx	Dis	Vote	Fail

Inherited bits
"Native" bits from Sub Comparator CIB

For Multi-Bit Master-Sub Comparator, the MCNRCD program processes the bits from the Master comparator as shown above:

1. Both the "Rx" and "Vote" bits have a "1" bit set.
2. The "Rx" & "Vote" bits are compressed (unused bits are deleted) and shifted to the right to fill the Least Significant Bits (right hand bits)
3. The Compressed & Shifted Bits will be nudged to the left by the number specified in the "Nudge" field. (5 in this case)
4. The Nudged bits are passed to all the receivers in the Sub Comparators.

(Note that this is just an example of what could be done with multiple bits to show how multiple bits are handled.)

Multi-Level Inheritance – Sub-Sub Comparators

The Master – Sub Comparator feature allows you to pass bits down from a master device to a sub device as shown above. You can create multi-level systems as shown below:

Master Comparator

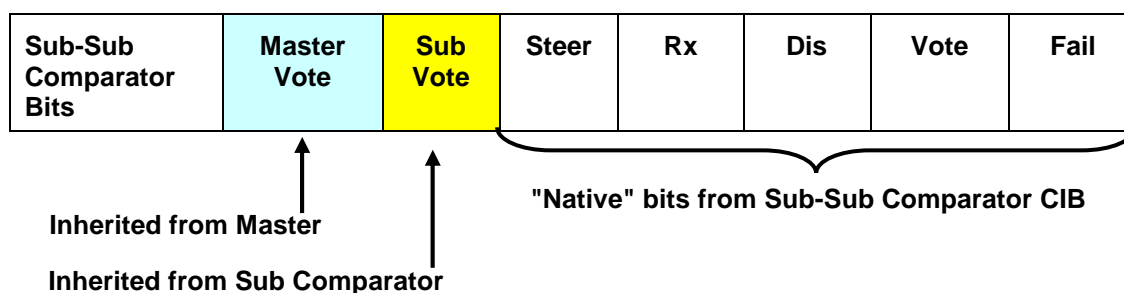
Sub Comparator

Sub-Sub Comparator

You can only pass down native bits, not inherited bits. In the example above:

- The Sub Comparator could pass its own Vote bit down to the Sub-Sub Comparator.
- It could not pass down the Master Vote bit that it inherited from the Master Comparator.

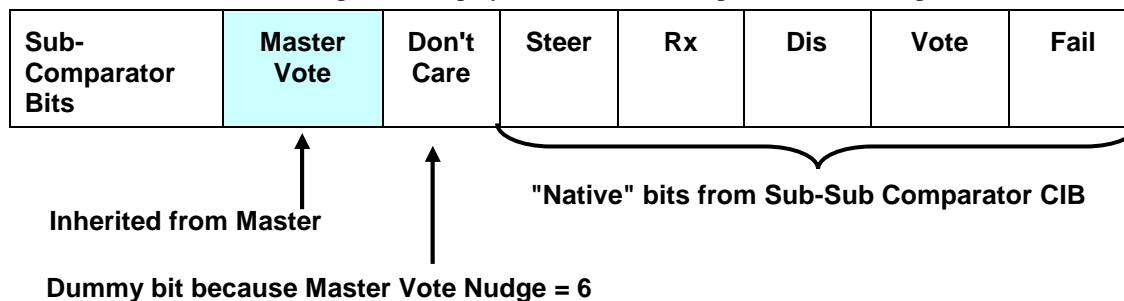
You might need a Master Vote and Sub Vote bit in the Sub-Sub Comparator as shown below:



To accomplish this, set up the following parameters:

- Master Vote Bit Nudge = 6
- Master Comparator Sub Devices: Sub Comparator & Sub-Sub Comparator
(This passes the Master Vote bit directly down to both sub-levels)
- Sub Comparator Vote Bit Nudge = 5
- Sub Comparator Sub Device: Sub-Sub Comparator
(This passes the Sub Vote bit down.)

Since the Master Vote bit is nudged 6 bits, it will be nudged the same amount in each of its SubDevices. Thus, the bits for the Sub Comparator Display Table for this example should be set up as follows:



When you fill out the States in this table, just make the Don't Care bit a "-" in all states.

*In this example, we were able to pass the Master Vote bit down two levels, but it was not passed through the Sub Comparator. It was passed **directly** from the Master comparator to the Sub Sub Comparator.*

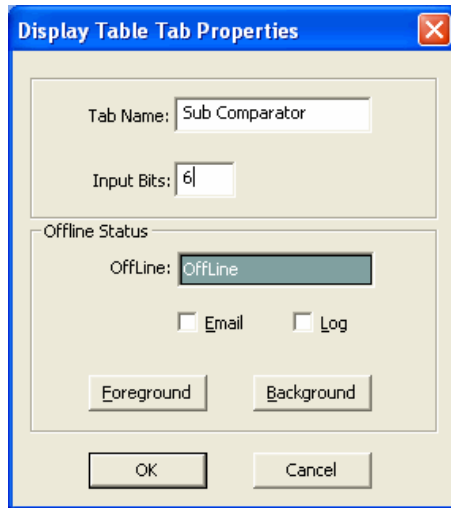
Creating New Display Tables for Master and Sub Comparators

This section shows how to add new display tables for Master or Sub Comparators. It assumes that you are familiar with the Master and Sub device bit interaction as described in the previous section.

Sub Comparator Display Table

To add a tab for a new device to properly display the four Sub Comparators in our “Virtual Comparator” example system from Page **Error! Bookmark not defined.**,

- Right-click on one of the existing tabs at the top of the Display Table window
- Click on **Append New Table**. The following window will be displayed.



- Type in a new **Tab Name** such as “Sub Comparator”.
- Select the number of status **Input Bits** that this new device will possess.

In addition to the 5 Input Bits of the predefined Comparator device, we will use an additional status bit to hold the Vote bit that will be inherited from the Master Comparator. So in this case, the number of **Input Bits** should be set to 6.

- Click on **OK** to close this window. A new blank display table will be entered with 6 bits.

States Tab

- Right-click anywhere on the States Table for this new “Sub Comparator” device, then click on **Append** to add lines for additional states.
- Modify each state line in the States Table to satisfy the display requirements for this system’s “Virtual Comparator. As shown in the following, a bright Green “Vote” will be displayed only when the Sub Comparator has voted (the Vote bit is set) and the Master Comparator has voted (the Master bit is set).

For our example of four Sub Comparators feeding into a Master Comparator, the **States** tab for a new “Sub Comparator” device may look like the following.

Index	Master	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	-	Error		N	Y
2	-	-	0	0	0	0			N	N
3	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	0	-	1	Fail		N	Y
5	0	-	1	0	-	0	Rx		N	N
6	1	-	-	0	1	0	Vote		N	N

Mouse Tab

Next, the **Mouse** tab for this “Sub Comparator” display table should be modified to appear as follows.

Index	Button	Type	Master	Steer	Rx	Dis	Vote	Fail
1	Left Down	Set	-	-	-	-	1	-
2	Left Up	Set	-	-	-	-	0	-
3	Right Down	Toggle	-	-	-	1	-	-
4	Right Up	Unused	-	-	-	-	-	-

SubDevice Tab

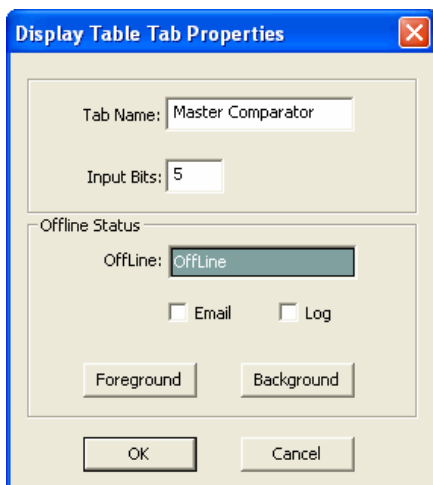
The Sub Comparator display table should have all bits set to "0" since we are not passing bits down from the Sub Comparator to a lower level device.

Index	Nudge	Master	Steer	Rx	Dis	Vote	Fail
1	0	0	0	0	0	0	0

Master Comparator Display Table

To add a tab for a new device to properly handle information from the Master Comparator in our example system, right-click on one of the existing tabs, then click on **Append New Table**. The following window will be displayed. Type in a new **Tab Name**, such as “Master Comparator”.

Then select the number of status **Input Bits** that this new device will possess. This Master Comparator display table will have nearly the same function as the predefined “Comparator” Display Table, so in this case, the number of **Input Bits** should be set to 5. Click on **OK** to close this window.



States Tab

After the table is shown, we have to add the bit names as shown below. Note that the bit order is not random; it must match the bits as they are received from the CIB modules.

Index	S t e e r	R x	D i s a b l e	V o t e	F a i l	State	Sound	Email	Log
1	-	-	-	-	-	Default		N	N

If the Master Comparators will never be displayed in an Equipment-Centric view, we could live with a minimalistic state table as shown above. No additional lines would need to be added to define states,

However, we've filled out the Master Comparator table as shown below so that a Master Comparator can be displayed in an equipment-centric view.

Index	S t e e r	R x	D i s a b l e	V o t e	F a i l	State	Sound	Email	Log
1	-	-	-	-	-	Error		N	Y
2	-	0	0	0	0			N	N
3	-	-	1	0	-	Disable		N	Y
4	-	-	0	-	1	Fail		N	Y
5	-	1	0	-	0	Rx		N	N
6	-	-	0	1	0	Vote		N	N

Mouse Tab

Next, the **Mouse** tab for this “Master Comparator” display table should be modified to appear as follows.

The screenshot shows a window titled "Display Table" with a tabbed interface. The tabs are: Comparator, Generator, Door, Power, Fail, Temperature, Binary Table, Sub Comparator, and Master Comparator. The "Master Comparator" tab is selected. It contains a table with the following data:

Index	Button	Type	St e e r	R x	D i s a b l e	V o t e	F a i l
1	Left Down	Set	-	-	-	1	-
2	Left Up	Set	-	-	-	0	-
3	Right Down	Toggle	-	-	1	-	-
4	Right Up	Unused	-	-	-	-	-

Below the table, there are three tabs: States, Mouse, and Subdevice. The "Mouse" tab is selected. A "Verify" button is located at the bottom right of the window.

SubDevice Tab

Finally, the **SubDevice** tab for this “Master Comparator” display table must be altered to correctly pass its “Vote” bit to the Sub Comparator display table created earlier. Since the “Vote” of the Master Comparator must be passed to properly display status of the “Virtual Comparator”, that bit should be masked by setting it to “1” as in the following window.

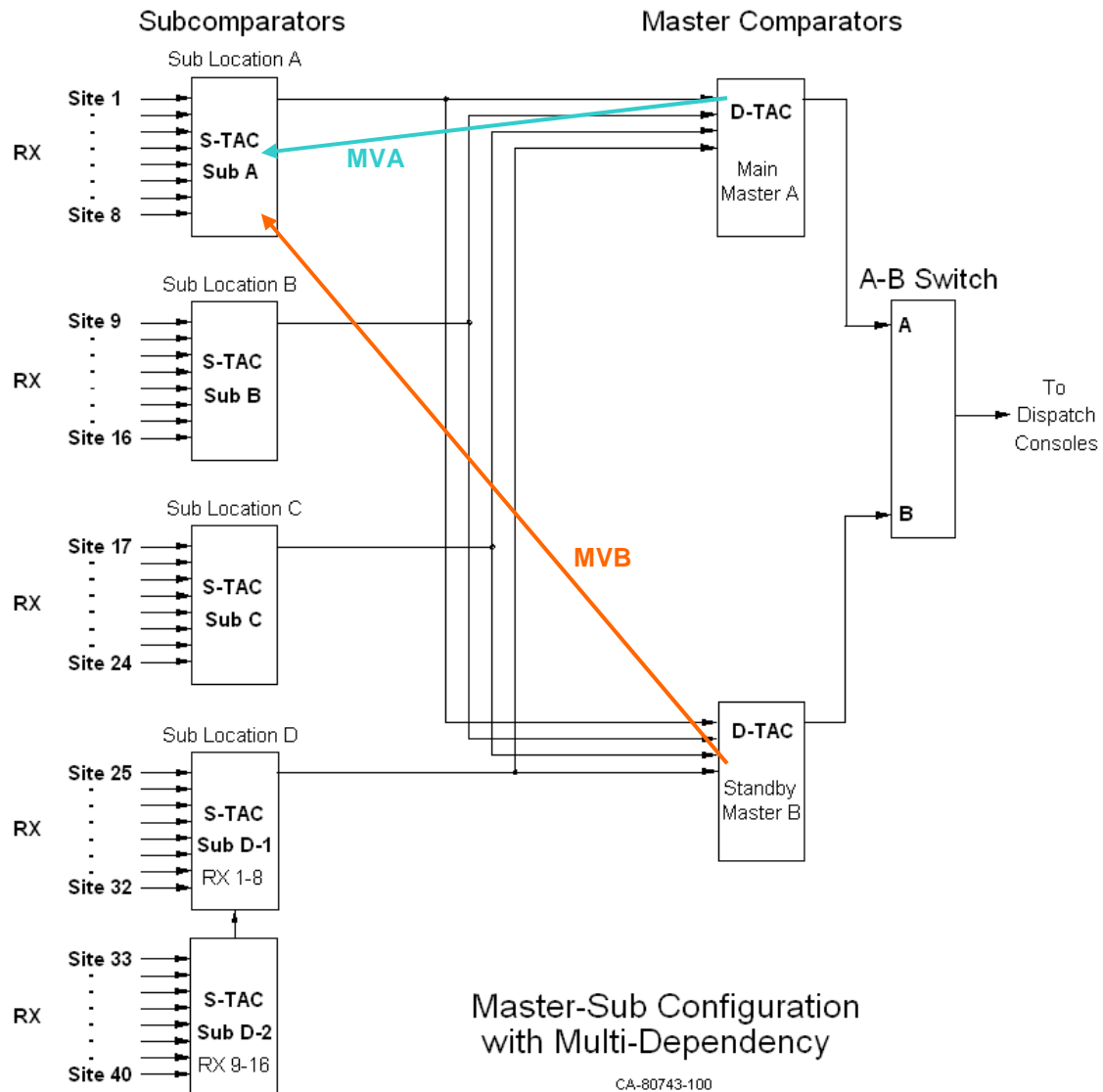
Before the Master Comparator status information is sent to the Sub Comparator status information for proper display of a “Virtual Comparator”, this Master Comparator data is altered in two ways.

- First, the data for any single status bit that is masked in the “SubDevice” tab will be promoted to the least significant (right-most) bit of the status word.
- Second, the data in that least significant bit (Bit 0) will be “Nudged” a number of places to the left (specified in the “Nudge” column) so that it appears in the correct bit location for the Sub Comparator status.

For this example, the **States** tab for the “Sub Comparator” was modified earlier to specify that Bit 5 will hold the “Vote” status from the Master Comparator. So the bit must be “Nudged” from Bit 0 to Bit 5. Since the Bit is being nudged 5 places to the left, the “Nudge” parameter in the following display is set to 5.

Master-Subs with Multi-Dependency

The features described in the previous “Master-Sub Comparator Configuration” section can be used in a more complex arrangement which adds “Multi-Dependency”. Multi-Dependency can be defined as the ability of a Sub Comparator to inherit status bits from multiple Master Comparators. This arrangement provides a level of redundancy and is depicted in the following diagram.



With multiple masters as in this example, Sub Comparator status bits will be inherited from both Master Comparators. The above diagram illustrates this for the first Sub Comparator with Master Vote A (MVA) and Master Vote B (MVB) vectors. Likewise, the other Sub Comparators in this system will also inherit status bits from both Master Comparators.

Multidependency will let you display this system as two virtual comparators:

- Virtual Comparator A using the Sub Comparators and Master A and
- Virtual Comparator B using the Sub Comparators and Master B.

The previous discussion under the section *Error! Reference source not found.* on page **Error! Bookmark not defined.** will be used to build the Display Tables for this system.

First we need to get the Vote bits from Master A and Master B passed down to the Sub Comparators. The diagram below shows that the Master Vote bit will be masked and passed to the SubDevice. The Master A Vote will be nudged 5 bits, and the Master B Vote will be nudged 6 bits.

Master Comparator B

Master B Bits			Steer	Rx	Dis	Vote	Fail
Mask			0	0	0	1	0
Masked						Vote	
Compressed & Shifted							Vote

Master Comparator A

Master A Bits			Steer	Rx	Dis	Vote	Fail
Mask			0	0	0	1	0
Masked						Vote	
Compressed & Shifted							Vote

Sub Comparators

Master A Nudged (5) Master B Nudged (6)	Master B Vote	Master A Vote					
Sub Comparator Bits	Master B Vote (Inherited)	Master A Vote (Inherited)	Steer	Rx	Dis	Vote	Fail

Inherited bits

"Native" bits from Sub Comparator CIB

To accomplish the above, set up the following parameters:

- Sub Comparator Display Table(s) with slots for Master Vote A & B
- Master A Display Table with Vote Bit Nudge = 5
- Master B Display Table with Vote Bit Nudge = 6
- Master A Comparator Receiver slot Sub Devices: Sub Comparators
- Master B Comparator Receiver slot Sub Devices: Sub Comparators

Composite Sub Comparator Display Table

A Composite Sub Comparator display table can be built as shown below:

Index	M V B	M V A	S t e e r	R x	D i s	V o t e	F a i l	State	Sound	Email	Log
1	-	-	-	-	-	-	-	Err		N	Y
2	-	-	-	0	0	0	0			N	N
3	-	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	-	0	-	1	Fail		N	Y
5	-	-	-	1	0	-	0	Rx		N	N
6	0	0	-	1	0	1	0	Rx V		N	N
7	-	-	-	0	0	1	0	Sub Force Vote		N	N
8	0	1	-	-	0	1	0	Vote A		N	N
9	1	0	-	-	0	1	0	Vote B		N	N
10	1	1	-	-	0	1	0	Vote A B		N	N

This can be used for somewhat of an equipment-centric view, but with added information about whether or not this sub comparator is also voted by the master comparator(s). This display might be useful for a technician.

Multiple Views of the Virtual Comparators

For a dispatcher, it is helpful to be able to display the example system as two virtual comparators:

- Virtual Comparator A using the sub comparators and Master A and
- Virtual Comparator B using the sub comparators and Master B.

To do this, we need a Sub Comparator Display Table for both virtual comparators as shown below:

For Virtual Comparator A:

Display Table												
Comparator Generator Door Power Fail Temperature Binary Table Sub Comparator Sub A Sub B Master												
Index	M V B	M V A	S t e e r	R x	D i s	V o t e	F a i l	State	Sound	Email	Log	
1	-	-	-	-	-	-	-	Err		N	Y	
2	-	-	-	0	0	0	0			N	N	
3	-	-	-	-	1	0	-	Disable		N	Y	
4	-	-	-	-	0	-	1	Fail		N	Y	
5	-	-	-	1	0	-	0	Rx		N	N	
6	-	-	-	0	0	1	0	Sub Force Vote		N	N	
7	-	1	-	-	0	1	0	Vote		N	N	

States Mouse Subdevice Verify

For this view, the dispatcher is interested only in what receiver is being used through the Master A comparator. This Display table shows a "Vote" only when the Master A comparator has selected the sub comparator. It ignores what the Master B comparator is doing.

For Virtual Comparator B:

Display Table												
Comparator Generator Door Power Fail Temperature Binary Table Sub Comparator Sub A Sub B Master												
Index	M V B	M V A	S t e e r	R x	D i s	V o t e	F a i l	State	Sound	Email	Log	
1	-	-	-	-	-	-	-	Err		N	Y	
2	-	-	-	0	0	0	0			N	N	
3	-	-	-	-	1	0	-	Disable		N	Y	
4	-	-	-	-	0	-	1	Fail		N	Y	
5	-	-	-	1	0	-	0	Rx		N	N	
6	-	-	-	0	0	1	0	Sub Force Vote		N	N	
7	1	-	-	-	0	1	0	Vote		N	N	

States Mouse Subdevice Verify

For this view, the dispatcher is interested only in what receiver is being used through the Master B comparator. This Display table shows a "Vote" only when the Master B comparator has selected the sub comparator. It ignores what the Master A comparator is doing.

Master Comparators

For the Master A Comparator, the SubDevices Tab of the Display Table should appear as in the following.

Index	Nudge	Steer	Rx	Dis	Vote	Fail
1	5	0	0	0	0	0

And for the Master B Comparator, the SubDevices tab of the Display Table should appear as in the following.

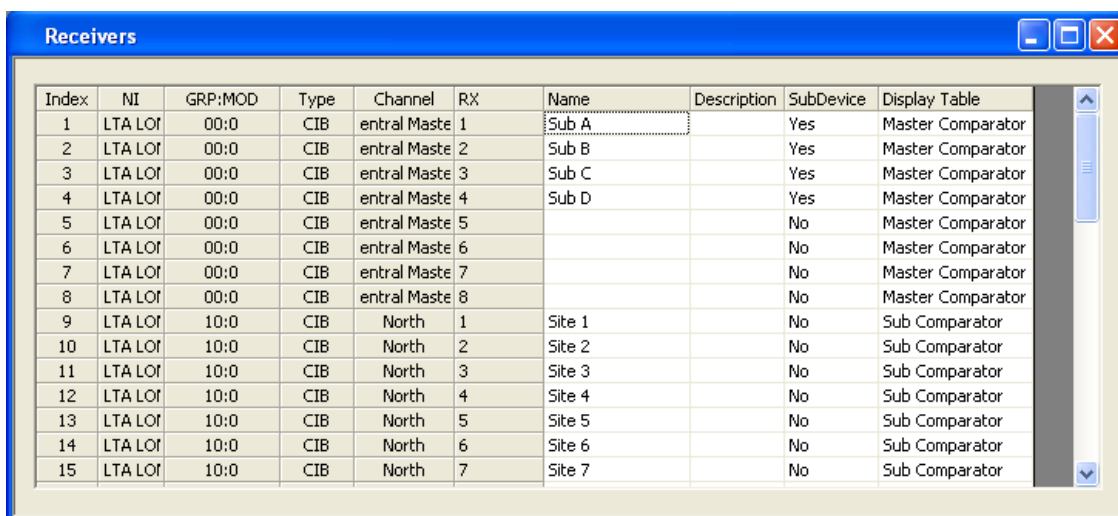
Index	Nudge	Steer	Rx	Dis	Vote	Fail
1	6	0	0	0	0	0

Multiple Views: Display Table Override

So we may have a number of Display Tables set up to view a master or sub comparator, for example:

- Equipment-Centric
- Virtual Comparator
- Enhanced Virtual Comparator
- Composite Sub Comparator
- Sub A
- Sub B

Looking at the Receiver window below, you'll see only one value for Display Table for each receiver.



Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	SubDevice	Display Table
1	LTA LOI	00:0	CIB	entral Maste	1	Sub A		Yes	Master Comparator
2	LTA LOI	00:0	CIB	entral Maste	2	Sub B		Yes	Master Comparator
3	LTA LOI	00:0	CIB	entral Maste	3	Sub C		Yes	Master Comparator
4	LTA LOI	00:0	CIB	entral Maste	4	Sub D		Yes	Master Comparator
5	LTA LOI	00:0	CIB	entral Maste	5			No	Master Comparator
6	LTA LOI	00:0	CIB	entral Maste	6			No	Master Comparator
7	LTA LOI	00:0	CIB	entral Maste	7			No	Master Comparator
8	LTA LOI	00:0	CIB	entral Maste	8			No	Master Comparator
9	LTA LOI	10:0	CIB	North	1	Site 1		No	Sub Comparator
10	LTA LOI	10:0	CIB	North	2	Site 2		No	Sub Comparator
11	LTA LOI	10:0	CIB	North	3	Site 3		No	Sub Comparator
12	LTA LOI	10:0	CIB	North	4	Site 4		No	Sub Comparator
13	LTA LOI	10:0	CIB	North	5	Site 5		No	Sub Comparator
14	LTA LOI	10:0	CIB	North	6	Site 6		No	Sub Comparator
15	LTA LOI	10:0	CIB	North	7	Site 7		No	Sub Comparator

How do we use all these different Display Tables to take a different view of the comparators?

The secret is to use the **Display Table Override** in the **Display Windows**.

When a receiver is placed in a Display Window, you can use a special Display Table *for that instance* of the receiver by using the Display Table Override.

For example, if you want to display a system in two ways:

- Virtual Comparator A (using Master A comparator)
- Virtual Comparator B (using Master B comparator)

You would set up a one tab for each Virtual Comparator as shown below:

Virtual Comparator A

Sub Comparator A	Sub Comparator B	Sub Comparator C	Sub Comparator D-1	Sub Comparator D-2
Site 1	Site 9	Site 17 Rx	Site 25	Site 33
Site 2 Rx	Site 10	Site 18 Vote	Site 26	Site 34
Site 3 Rx	Site 11 Rx	Site 19 Rx	Site 27 Rx	Site 35 Dis
Site 4 Rx	Site 12	Site 20	Site 28 Rx	Site 36
Site 5 Rx	Site 13	Site 21 Rx	Site 29	Site 37
Site 6 Rx	Site 14 Rx	Site 22	Site 30	Site 38
Site 7	Site 15 Rx	Site 23 Rx	Site 31	Site 39
Site 8 Dis	Site 16	Site 24	Site 32	Site 40

Virtual Comparator B

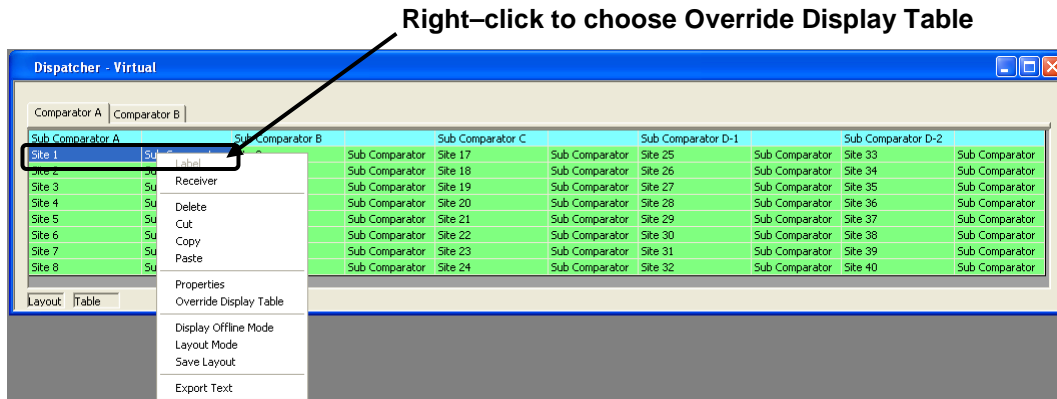
Sub Comparator A	Sub Comparator B	Sub Comparator C	Sub Comparator D-1	Sub Comparator D-2
Site 1	Site 9	Site 17 Rx	Site 25	Site 33
Site 2 Rx	Site 10	Site 18 Rx	Site 26	Site 34
Site 3 Rx	Site 11 Rx	Site 19 Rx	Site 27 Rx	Site 35 Dis
Site 4 Vote	Site 12	Site 20	Site 28 Rx	Site 36
Site 5 Rx	Site 13	Site 21 Rx	Site 29	Site 37
Site 6 Rx	Site 14 Rx	Site 22	Site 30	Site 38
Site 7	Site 15 Rx	Site 23 Rx	Site 31	Site 39
Site 8 Dis	Site 16	Site 24	Site 32	Site 40

The Display Windows are similar, with the following differences:

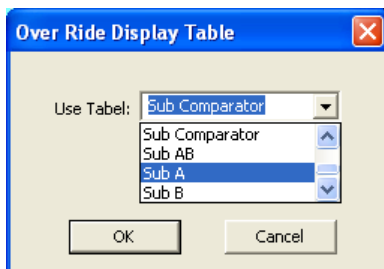
- Master Comparator A is voting Sub Comparator C and using Rx 18.
- Master Comparator B is voting Sub Comparator A and using Rx 4.

If the Dispatcher had the A-B switch in position "A", he would hear audio from Rx 18. If he had it in the "B" position, he would be hearing Rx 4.

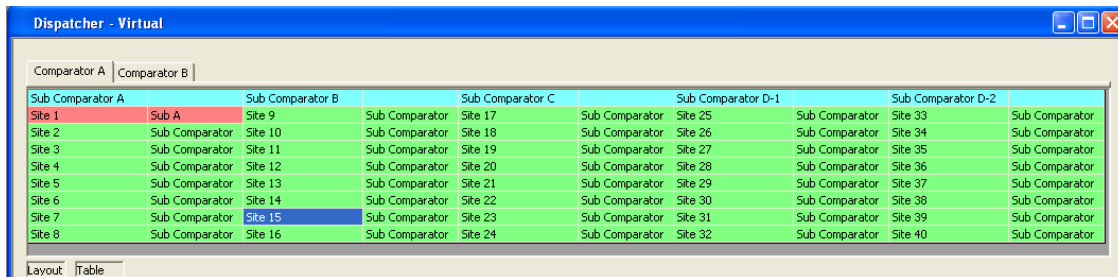
To build this display we use the Display Table Override feature. For each receiver in a Display Window that will use a different Display Table than chosen in the Receivers Window, right-click its cell in the Display Window as shown below.



Then click the **Override Display Table** menu item to display the following window.



Choose **Sub A**, and then click **OK**. The Display Window will indicate receivers with Display Table Overrides with a Reddish background as shown below. The cells for other receivers using their default Display Table will have a green background.



Repeat this procedure for each receiver that should have an override for the default Display Table.

The Display Table for all receivers of a comparator can be overridden. And taking it a step further, the Display Table for all receivers in a Display Window can be overridden. To make Display Table Overrides apply to many receivers at once, perform the following steps:

- Select all receivers that you wish to override with a type of Display Table.
- Right-click the selection, then click the **Override Display Table** menu item to display the Override Display Table window.
- Select the proper Display Table from the list, then click **OK**.

If all receivers in the above Display Window were selected to be overridden with Sub A Display Table, the Display Window would appear as follows.

Dispatcher - Virtual

Comparator A | Comparator B

Sub Comparator A	Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2		
Site 1	Sub A	Site 9	Sub A	Site 17	Sub A	Site 25	Sub A	Site 33	Sub A
Site 2	Sub A	Site 10	Sub A	Site 18	Sub A	Site 26	Sub A	Site 34	Sub A
Site 3	Sub A	Site 11	Sub A	Site 19	Sub A	Site 27	Sub A	Site 35	Sub A
Site 4	Sub A	Site 12	Sub A	Site 20	Sub A	Site 28	Sub A	Site 36	Sub A
Site 5	Sub A	Site 13	Sub A	Site 21	Sub A	Site 29	Sub A	Site 37	Sub A
Site 6	Sub A	Site 14	Sub A	Site 22	Sub A	Site 30	Sub A	Site 38	Sub A
Site 7	Sub A	Site 15	Sub A	Site 23	Sub A	Site 31	Sub A	Site 39	Sub A
Site 8	Sub A	Site 16	Sub A	Site 24	Sub A	Site 32	Sub A	Site 40	Sub A

Layout | Table

Likewise, for Comparator B, the result would look like:

Dispatcher - Virtual

Comparator A | Comparator B

Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2		
Site 1	Sub B	Site 9	Sub B	Site 17	Sub B	Site 25	Sub B	Site 33	Sub B	
Site 2	Sub B	Site 10	Sub B	Site 18	Sub B	Site 26	Sub B	Site 34	Sub B	
Site 3	Sub B	Site 11	Sub B	Site 19	Sub B	Site 27	Sub B	Site 35	Sub B	
Site 4	Sub B	Site 12	Sub B	Site 20	Sub B	Site 28	Sub B	Site 36	Sub B	
Site 5	Sub B	Site 13	Sub B	Site 21	Sub B	Site 29	Sub B	Site 37	Sub B	
Site 6	Sub B	Site 14	Sub B	Site 22	Sub B	Site 30	Sub B	Site 38	Sub B	
Site 7	Sub B	Site 15	Sub B	Site 23	Sub B	Site 31	Sub B	Site 39	Sub B	
Site 8	Sub B	Site 16	Sub B	Site 24	Sub B	Site 32	Sub B	Site 40	Sub B	

Layout | Table

Note that in this system, the default Display table for these sub comparators was "Subcomparator". We would probably use the default for an equipment-centric view. For this dispatcher display, however, both views use Display Table Overrides.



Note: Default Display Tables

The MCNRCD program passes bits downstream from a Master device to sub devices using the Display table that is in the Receiver window. You must use the proper Display Table (the one with the Sub Device Bit Mask & Nudge) as the default Display Table in the Receiver window.

Triggered Output Actions Option

The Triggered Output Actions is a licensable option in the MCN Server software that provides the means for an Input Event to trigger an Output Action. This option can be used, for example, to provide alarm outputs (from a CIB or GPIO module) to an external device when a failure on one or more input devices occurs.

Typical uses would include:

Input Events	Output Action
Failed receivers on a channel	Turn on Channel Failure Alarm Output
Microwave Alarm	Turn on Microwave Failure Alarm Output
Any abnormal condition at a site	Turn on composite Site Alarm Output
Alarm Acknowledgement input	Turn off Alarm Relay

An output can be triggered by one or many input events, but an input event can trigger only one output action.

Setting up Triggered Output Actions involves configuring the following items:

- Triggered Output Types
- Triggers
- Output Function Blocks (the specific physical outputs on a CIB or GPIO module)
- Linkages between specific inputs and specific output function blocks.

Triggered Output Types

Set up the Triggered Output Types in the Display Table window. Each Triggered Output Type is defined in its own Display Table tab. Normally, only one or two Triggered Output Types are defined. You will use the Triggered Output Type as the Display Table for the specific Output Function Blocks. Things to define for Triggered Output Types are:

- Triggered Output Type Name (Display Table Name)
- Number of Bits:
Usually just a single bit is used for alarm outputs, but you could implement multi-bit alarms such as Major and Minor alarms or Fail and Disable alarms for comparators.
- Bit Names:
Typically "Alarm" in a one-bit Output Type
In a multi-bit output type, the bits could be named "Major" and "Minor", etc.
- States to display on the PC (ex: "Normal" & "Alarm") and their colors
- Mouse Functions (typically to reset or acknowledge an alarm)
- Actions for the Input Event to trigger
ex: Set Alarm or Reset Alarm
 Set Major, Set Minor, Reset Major, Reset Minor, Reset All

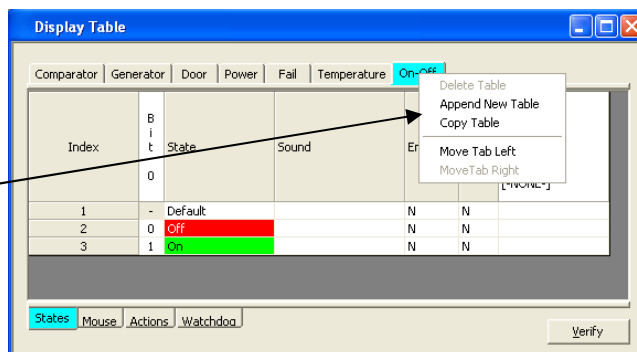
In most systems, one Triggered Output Type can be used for all the alarm Output Function Blocks. You would need to make multiple Triggered Output Types if:

- You needed different status texts or colors to be displayed for different Output Types or
- You need both single bit and multi bit Triggered Output Types

Building a New Triggered Output Type

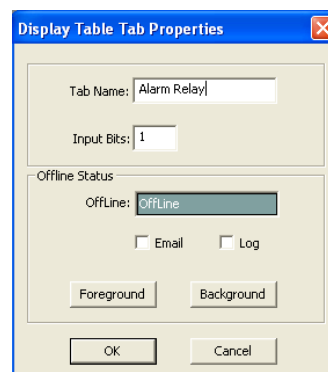
New Triggered Output Types are built just like normal Display Tables.

1. Start in the Display Table Window.



2. Right-Click on the top Display Table tabs and select **Append New Table**.

3. Enter the Triggered Output Type (Display Table) in the **Tab Name** field.
Set up the number of bits in the **Input Bits** field.
Hit **OK**.



4. Select the **States** tab on the bottom of the window.

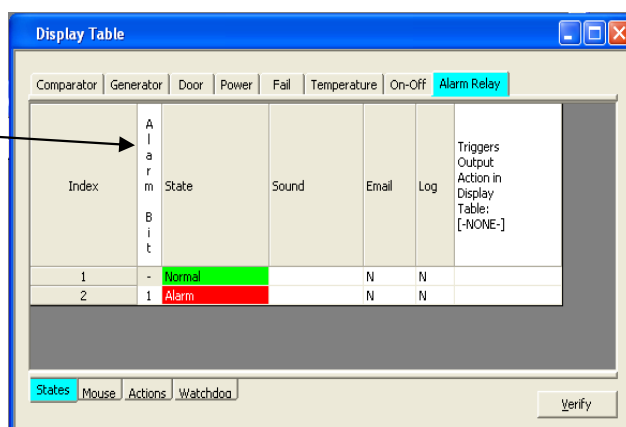
Enter the Bit Names

Enter the State values, texts and colors

(Add new states by right-clicking and selecting **Append**.)

Enable logging if desired.

Do not enter anything in the **Triggers Output Action** column. (This is an output that *receives* a trigger.)

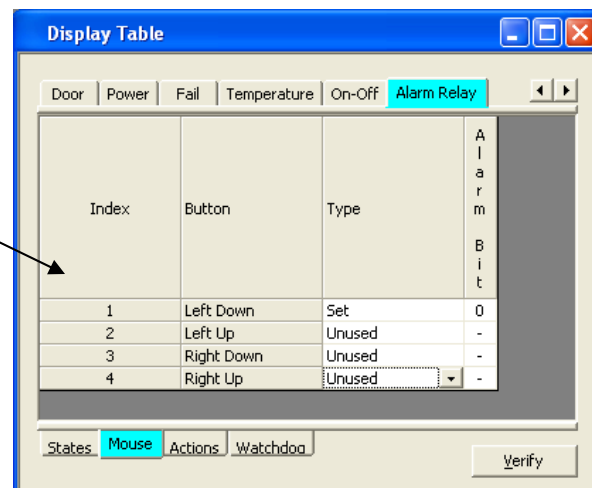


- Select the **Mouse** tab at the bottom of the window.

Enter appropriate Mouse function(s)

We have added the ability to reset the alarm relay with the left mouse button (**Set** the state to **0**).

You could also set up a mouse function to set the alarm (Set to 1) if you desire.



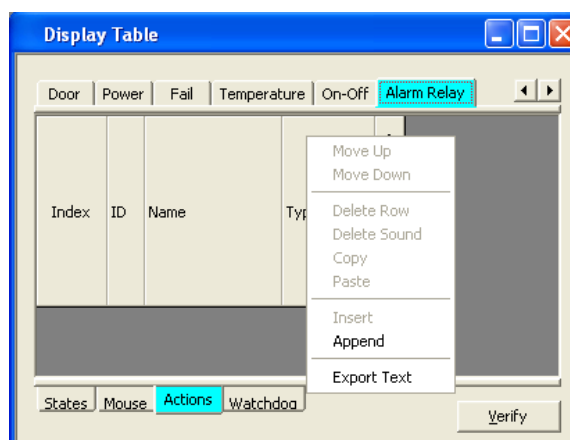
At this stage, we've set up a standard single-bit Display Table entry.

We'll now add the Output Actions that make a standard Display Table a Triggered Output Type.

- Select the **Actions** tab on the bottom of the window. This is where we enter the Output Actions.

A new Display Table starts out with no Output Actions.

Right-Click on the header row and select **Append** from the menu.



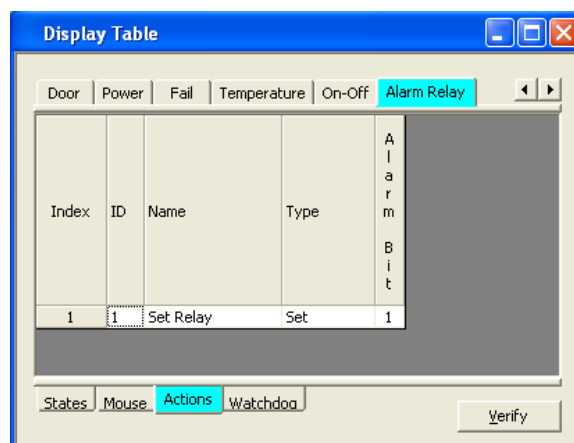
- Enter an ID number, and a descriptive Name

The Output Actions are very similar to the Mouse functions. You can Set a bit to a 1 or 0, Toggle a bit, or ignore a bit.

Select an Action type (Set, Toggle, or Unused).

Select a bit Value (1, 0, or Don't Care)

The Set action type sets a bit to either a 1 or 0 as selected in the bit field.

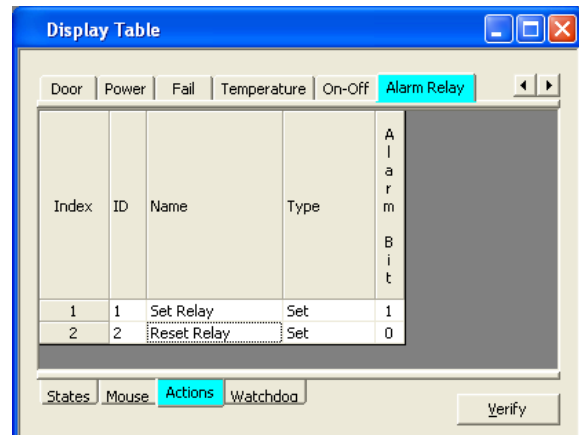


8. Repeat the above to add any additional actions required.

Normally when using Triggered Outputs, you would only Set (to 1) outputs when an input event occurs. You'll normally reset the alarm bit manually.

You can, however, set up both a Set and Reset action that can be used with input events as shown to the right.

To reset a bit, select **Set** and a bit value of 0.



Display Table					
Door Power Fail Temperature On-Off Alarm Relay					
Index	ID	Name	Type	Alarm Bit	
1	1	Set Relay	Set	1	
2	2	Reset Relay	Set	0	

States Mouse Actions Watchdog Verify

This completes the definition of a Triggered Output Type.

Triggers

Triggers are set up in the State tab of the Input Display Table for the inputs that will be generating the trigger events. You will normally just be adding triggers to existing input Display Tables. For each Input Display Table you'll need to:

- Select an Output Device Type to associate the Input Display Table with and
- Select an Output Action to trigger for various input states.

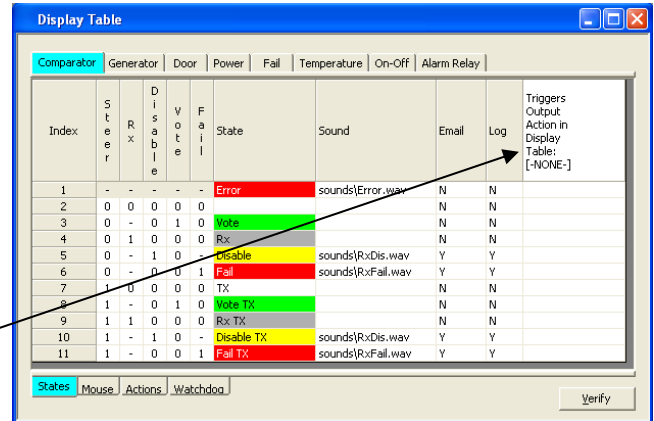
Setting up Triggers

1. Start in the **Display Table** window.

Select the **States** tab on the bottom tabs.

Select the desired Input Display Table on the top tabs.

Double click on **Triggers Output Action Display Table** cell.

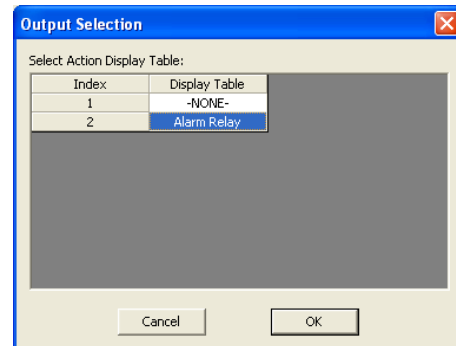


2. The **Output Selection** window will open.

The Output Device Types you have configured with Actions will show up in the list of Display Tables.

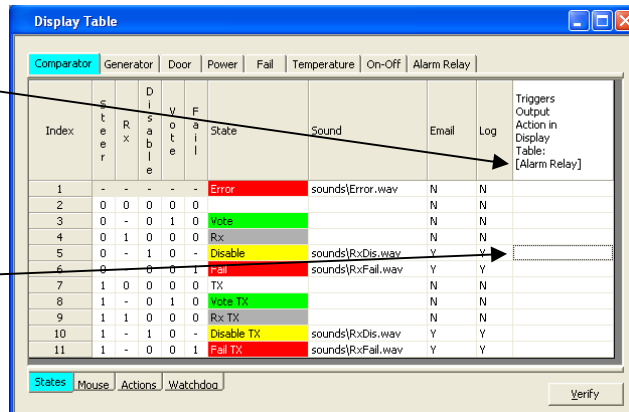
Select the appropriate **Display Table** for your Output Device type.

Hit **OK**



3. The selected Output Device Type will be displayed in the **Triggers Output Action Display Table** cell.

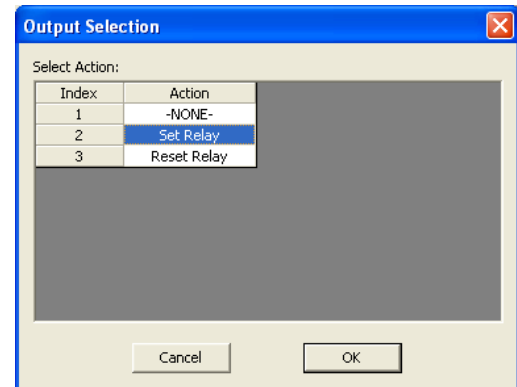
Select a Trigger State and double-click in the far right column



- The Actions from the selected Output Display Table will be displayed.

Select the desired Output Action

Hit **OK**.



- The Output Action will be displayed in the far right column

Index	State	Sound	Email	Log	Triggers Output Action in Display Table: [Alarm Relay]
1	Error	sounds\Error.wav	N	N	
2	Vote		N	N	
3	Rx		N	N	
4	Disable	sounds\RxDs.wav	Y	Y	Set Relay
5	Fail	sounds\RxFail.wav	Y	Y	
6	TX		N	N	
7	Vote TX		N	N	
8	Rx TX		N	N	
9	Disable TX	sounds\RxDs.wav	Y	Y	
10	Fail TX	sounds\RxFail.wav	Y	Y	

- Repeat the above steps for each of the states in the Input Device Table that you want to trigger an Output Action.

In this example we just set up triggers for the **Set Relay** output action. (We will manually reset the alarm relay.)

You could use one or more input states to trigger the **Reset Relay** action if required.

Index	State	Sound	Email	Log	Triggers Output Action in Display Table: [Alarm Relay]
1	Error	sounds\Error.wav	N	N	
2	Vote		N	N	
3	Rx		N	N	
4	Disable	sounds\RxDs.wav	Y	Y	Set Relay
5	Fail	sounds\RxFail.wav	Y	Y	Set Relay
6	TX		N	N	
7	Vote TX		N	N	
8	Rx TX		N	N	
9	Disable TX	sounds\RxDs.wav	Y	Y	Set Relay
10	Fail TX	sounds\RxFail.wav	Y	Y	Set Relay

This completes the definition of a Trigger.

You can add triggers to other Input Display Tables as required.

Linking Inputs to Outputs

In the previous steps we've set up Output Types and Trigger types. We now need to link actual inputs to actual outputs. To link an input to an output, we need to do the following:

1. Set up the actual Alarm Output Points on a device that supports outputs (CIB, GPIO module). Each Alarm Output Point must use an Output Display Table (that has an Action set in it).
2. Set up the actual input points (receivers, alarm input points, etc.) that will trigger the Output Actions. Each Input Point must use an Input Display Table that has one or more Triggers in it.
3. Link the actual input point to the actual output point.

The Input Display Table in step 2 must point to the Output Display Table in step 1.

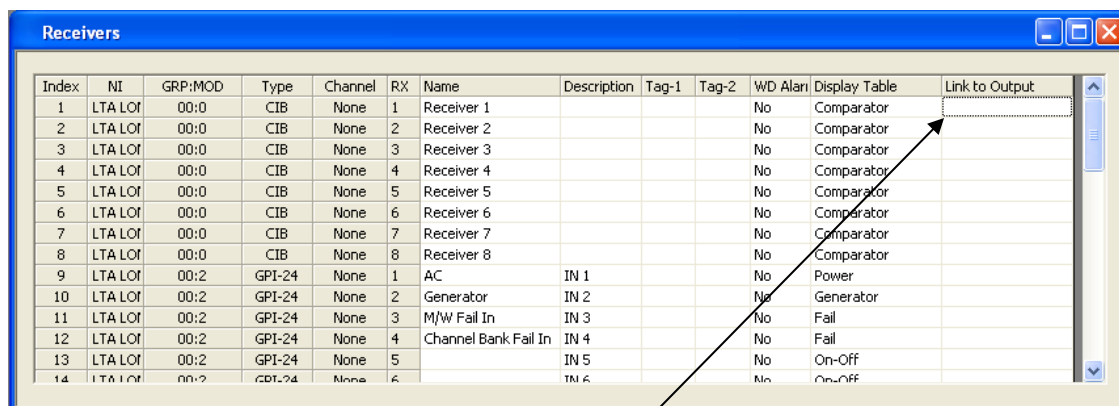
(Although we refer to Input Display Tables and Output Display Tables, they are not specifically identified as such in the program – they are all Display Tables. The difference is that Input Display Tables have Triggers and Output Display Tables have Actions.)

Setting up the Links

In this section, it is assumed that you have already:

- Set up the appropriate Input Modules (CIBs, AIBs, GPIO modules) in the Hardware window,
- Named the input points (receivers, alarm inputs, etc.) in the Receiver window,
- Selected an appropriate Input Display Table for each of the Input Points,
- Set up the appropriate Output Modules (CIBs, GPIO Modules, etc.) in the Hardware window,
- Named the Output Points (Alarm relays, etc.) in the Receiver window,
- Selected an appropriate Output Display Table for each of the Output Points

1. Start in the **Receiver** window.



Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	Tag-1	Tag-2	WD Alarm	Display Table	Link to Output
1	LTA LOF	00:0	CIB	None	1	Receiver 1				No	Comparator	
2	LTA LOF	00:0	CIB	None	2	Receiver 2				No	Comparator	
3	LTA LOF	00:0	CIB	None	3	Receiver 3				No	Comparator	
4	LTA LOF	00:0	CIB	None	4	Receiver 4				No	Comparator	
5	LTA LOF	00:0	CIB	None	5	Receiver 5				No	Comparator	
6	LTA LOF	00:0	CIB	None	6	Receiver 6				No	Comparator	
7	LTA LOF	00:0	CIB	None	7	Receiver 7				No	Comparator	
8	LTA LOF	00:0	CIB	None	8	Receiver 8				No	Comparator	
9	LTA LOF	00:2	GPI-24	None	1	AC	IN 1			No	Power	
10	LTA LOF	00:2	GPI-24	None	2	Generator	IN 2			No	Generator	
11	LTA LOF	00:2	GPI-24	None	3	M/W Fail In	IN 3			No	Fail	
12	LTA LOF	00:2	GPI-24	None	4	Channel Bank Fail In	IN 4			No	Fail	
13	LTA LOF	00:2	GPI-24	None	5		IN 5			No	On-Off	
14	LTA LOF	00:2	GPI-24	None	6		IN 6			No	On-Off	

Double click in **Link to Output** field for an input point.

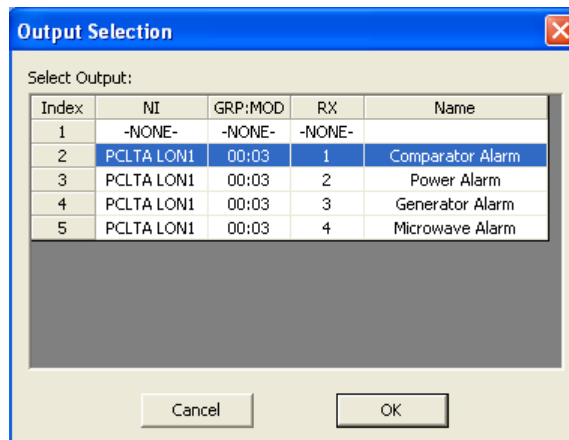
- An Output Selection window will appear.

In this system we have 4 output alarms set up.

Select the proper Output Point.

(This is a receiver input to a comparator, so we will choose "Comparator Alarm".

Hit **OK**



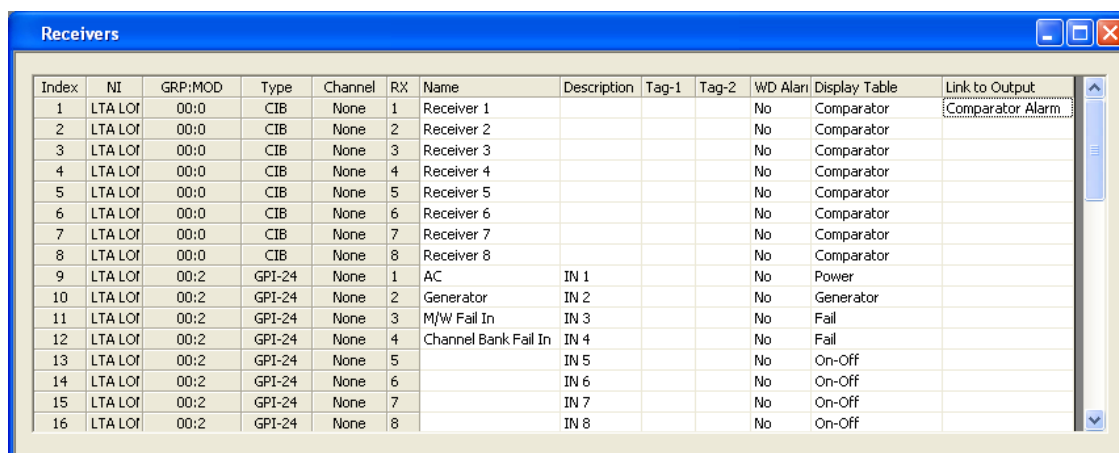
Output Selection

Select Output:

Index	NI	GRP:MOD	RX	Name
1	-NONE-	-NONE-	-NONE-	
2	PCLTA LON1	00:03	1	Comparator Alarm
3	PCLTA LON1	00:03	2	Power Alarm
4	PCLTA LON1	00:03	3	Generator Alarm
5	PCLTA LON1	00:03	4	Microwave Alarm

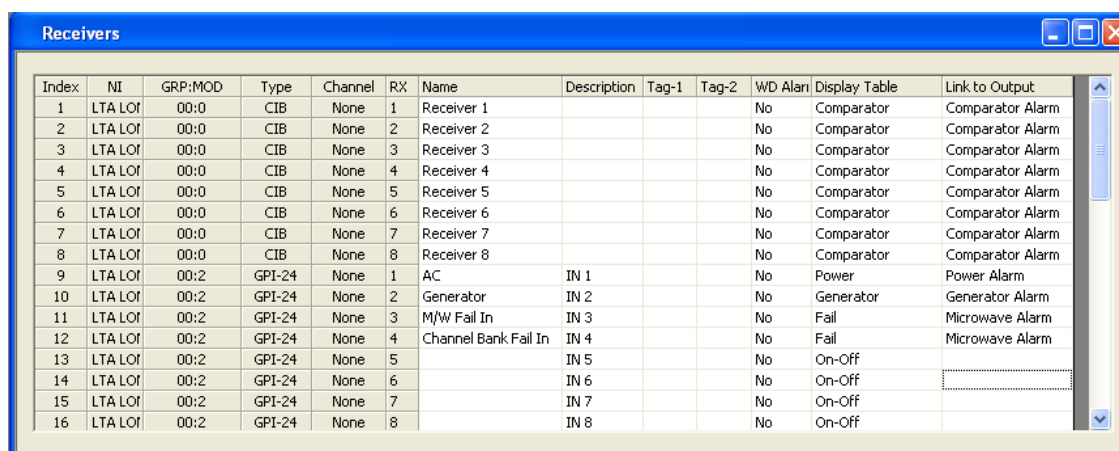
Cancel OK

- The Output Point will appear in the **Link To Output** field



Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	Tag-1	Tag-2	WD Alarm	Display Table	Link to Output
1	LTA LOI	00:0	CIB	None	1	Receiver 1				No	Comparator	Comparator Alarm
2	LTA LOI	00:0	CIB	None	2	Receiver 2				No	Comparator	
3	LTA LOI	00:0	CIB	None	3	Receiver 3				No	Comparator	
4	LTA LOI	00:0	CIB	None	4	Receiver 4				No	Comparator	
5	LTA LOI	00:0	CIB	None	5	Receiver 5				No	Comparator	
6	LTA LOI	00:0	CIB	None	6	Receiver 6				No	Comparator	
7	LTA LOI	00:0	CIB	None	7	Receiver 7				No	Comparator	
8	LTA LOI	00:0	CIB	None	8	Receiver 8				No	Comparator	
9	LTA LOI	00:2	GPI-24	None	1	AC	IN 1			No	Power	
10	LTA LOI	00:2	GPI-24	None	2	Generator	IN 2			No	Generator	
11	LTA LOI	00:2	GPI-24	None	3	M/W Fail In	IN 3			No	Fail	
12	LTA LOI	00:2	GPI-24	None	4	Channel Bank Fail In	IN 4			No	Fail	
13	LTA LOI	00:2	GPI-24	None	5		IN 5			No	On-Off	
14	LTA LOI	00:2	GPI-24	None	6		IN 6			No	On-Off	
15	LTA LOI	00:2	GPI-24	None	7		IN 7			No	On-Off	
16	LTA LOI	00:2	GPI-24	None	8		IN 8			No	On-Off	

- Repeat the above to select the appropriate Output Points for the remaining Input Points.



Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	Tag-1	Tag-2	WD Alarm	Display Table	Link to Output
1	LTA LOI	00:0	CIB	None	1	Receiver 1				No	Comparator	Comparator Alarm
2	LTA LOI	00:0	CIB	None	2	Receiver 2				No	Comparator	Comparator Alarm
3	LTA LOI	00:0	CIB	None	3	Receiver 3				No	Comparator	Comparator Alarm
4	LTA LOI	00:0	CIB	None	4	Receiver 4				No	Comparator	Comparator Alarm
5	LTA LOI	00:0	CIB	None	5	Receiver 5				No	Comparator	Comparator Alarm
6	LTA LOI	00:0	CIB	None	6	Receiver 6				No	Comparator	Comparator Alarm
7	LTA LOI	00:0	CIB	None	7	Receiver 7				No	Comparator	Comparator Alarm
8	LTA LOI	00:0	CIB	None	8	Receiver 8				No	Comparator	Comparator Alarm
9	LTA LOI	00:2	GPI-24	None	1	AC	IN 1			No	Power	Power Alarm
10	LTA LOI	00:2	GPI-24	None	2	Generator	IN 2			No	Generator	Generator Alarm
11	LTA LOI	00:2	GPI-24	None	3	M/W Fail In	IN 3			No	Fail	Microwave Alarm
12	LTA LOI	00:2	GPI-24	None	4	Channel Bank Fail In	IN 4			No	Fail	Microwave Alarm
13	LTA LOI	00:2	GPI-24	None	5		IN 5			No	On-Off	
14	LTA LOI	00:2	GPI-24	None	6		IN 6			No	On-Off	
15	LTA LOI	00:2	GPI-24	None	7		IN 7			No	On-Off	
16	LTA LOI	00:2	GPI-24	None	8		IN 8			No	On-Off	



Note that we have a number of Receivers in the comparator feeding the Comparator Alarm. Likewise, both the Microwave Fail and Channel Bank Fail feed the Microwave Alarm.

We have now configured the Input to Output Link.

Triggered Output Notes

Things to remember about Triggered Outputs are:

- Any input (Receiver, General Purpose I/O, etc.) device type that needs to trigger an output must use a Display Table that has Triggers in it.

For example, if a comparator needs to trigger an alarm relay, you must add Triggers to its Display Table (typically the Comparator Display Table).

If a generator device needs to trigger an alarm relay, you must add one or more Triggers to its Display Table (typically the Generator Display Table).

- Different input device types (Comparators, Generators, Microwave Alarms, etc.) can trigger the same type of Triggered Output Type (typically an Alarm Relay). They can trigger different explicit Alarm Points, but you may need only one Output Device Type. In our example above, all alarm outputs shared the same Output Device Type.
- Each input Display Table can trigger only one Output Device Type
- Multiple states in the Input Display Table can trigger the same Output Action. (ex: Disable and Fail on a receiver can both trigger a Set Alarm action.)
- Different states in the Input Display Table can trigger different actions in the Output Device Type.

ex: Set Alarm, Reset Alarm in a single-bit Output Device Type
 Set Major Alarm, Set Minor Alarm, or Reset Alarms in a multi-bit types.

- Even if you've set up multiple Output Actions in the Output Device Type, you don't need to use all of them in any particular input Display Table. (In our example we defined a Reset action, but never triggered it from any of the Input Display Tables.)
- Each Input Display Table can point to only Output Device Type. If you have a multi-bit Input Display Table and you need to trigger multiple alarm relays from different states in that Display Table, you must set up a multi-bit Output Device Type to receive those triggers.
- If you need to have the same type of input trigger actions in different Output Device Types (ex: one set of comparators triggering a single-bit Output Device Type and another set of comparators triggering a multi-bit Output Device Type), you will need to set up two similar Input Display Tables (like Comparator1 and Comparator 2), each pointing to the different Output Device Types.

Appendix A: Error Logging Definitions

Logging is a feature of the MCN and the RCD Programs to assist with System Hardware Status, trouble shooting and Diagnostics. The messages to be logged are formatted for general text output.

```

MCNRCD.log - Notepad
File Edit Format View Help
Date      Time      Chan      RX      OLD      > NEW      GG:M:RR Description
04-01-2016 14:18:52 NI On-Line NI-01
04-01-2016 14:19:29 Device Offline CIB 00:1 (null) - CIB_1 on NI-01
04-01-2016 14:19:45 NI Off-Line NI-01
04-01-2016 14:19:53 Device Offline CIB 00:1 (null) - CIB_1 on NI-01
04-01-2016 14:19:53 NI On-Line NI-01
  
```

The formatting of messages to be logged to the screen, printer, file, or email is defined in a system configuration file with a name similar to:

SystemName.RcdLog

where System Name is the name you used to save your system files in MCN Config Server.

You may edit that file with a text editor to change the items that are logged.

Logging to a File

The typical logging definitions for a file are shown in the example below.

```
LogFile("MCNRCD.log")
{
    StartDly(10)
    Header("Date          Time          Chan          RX
OLD      > NEW      GG:M:RR Description")
    Field(0,date,1,10)
    Field(11,time,1,9)
    Field(20,channel,1,15)
    Field(40,rxname,1,15)
    Field(57,oldstate,1,10)
    Field(67,">",1,10)
    Field(69,newstate,1,10)
    Field(80,gmr,1,7)
    Field(88,desc,1,20)

    FlField(0,date,1,10)
    FlField(11,time,1,9)
    FlField(20,flstatus,1,30)
    FlField(40,fldesc,1,100)
```

LogFile Line - Log File Name & Location & Size

The LogFile line specifies the Log File name. It may include a fully qualified path name. If the Log File parameter above does not include an explicit path reference, the log file location will be determined by the Windows version being used. For Windows 7 the location is

C:\ProgramData\CTI Products Inc\McnRcd.

LogFile Maximum Size

The default Log File size is 16 MB.

When a log file reaches its limits, it is re-named with an "Old" extension and a new log file is created.

The maximum Log File size is set in the Windows Registry. If a different log file size is required, use Regedit to go to the following key in the registry.
(for Windows 7):

HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\CTI Products\MCNRCD\Logs

Enter the following DWord entry: MaxLogSize

Enter the value (in Decimal bytes) for the maximum log size. Restart MCN Server 8000 for the change to take effect.

Logging to a Printer

Typical logging definitions for printing are in the LogPrint section as shown in the example below.

```
LogPrint("device")
{
    StartDly(0)
    Header("Date      Time      Chan      RX
OLD      > NEW      GG:M:RR Description")
    Field(0,date,1,10)
    Field(10,time,1,9)
    Field(19,channel,1,15)
    Field(39,rxname,1,15)
    Field(56,oldstate,1,10)
    Field(66,">",1,10)
    Field(68,newstate,1,10)
    Field(80,gmr,1,7)
    Field(88,desc,1,20)

    FlField(0,date,1,10)
    FlField(10,time,1,9)
    FlField(19,flstatus,1,30)
    FlField(39,fldesc,1,40)
}
```

Logging to the PC Screen

Typical logging definitions for screen are in the LogWindow section as are shown in the example below.

```
LogWindow("System Events")
{
    StartDly(10)
    Header("Time      Chan      RX
OLD      > NEW      GG:M:RR Description")
    Field(0,time,1,9)
    Field(9,channel,1,15)
    Field(29,rxname,1,15)
    Field(46,oldstate,1,10)
    Field(56,">",1,10)
    Field(58,newstate,1,10)
    Field(69,gmr,1,7)
    Field(78,desc,1,20)

    FlField(0,time,1,12)
    FlField(9,flstatus,1,30)
    FlField(29,fldesc,1,100)
}
```

“Field” lines are logging that can be turned on & off from the Logging menu in the Server program.

“FlField” lines are Forced-Log Fields that are always active and pertain to system events.

Logging to Emails

The typical logging definitions for email logging are shown in the example below.

```
Email("MCNRCD Status")
{
    StartDly(10)
    Header("Status from MCNRCD")
    Field(0,time,1,8)
    Field(9,"\013",1,1)
    Field(10,channel,1,16)
    Field(26,"\013",1,1)
    Field(28,rxname,1,16)
    Field(45,"\013>",1,2)
    Field(47,newstate,1,16)

    FlField(0,time,1,8)
    FlField(9,"\013",1,1)
    FlField(10,flstatus,1,30)
    FlField(41,"\013",1,1)
    FlField(42,fldesc,1,40)

    Group("Techs",1,482)
    {

    }

    Group("Supervisors",1,483)
    {

    }

}
```

Error Logging Definition File Parameters

StartDly	Delay time (in seconds) before logging starts for the appropriate section. This timer starts when a system is loaded or re-loaded in MCN Server software. This prevents error messages from being generated for the error states that are present on program start-up or initial system load.
Group	Information in this section includes the "Email Groups" specified in the MCNConfig program and should not be edited.
Log File Name	The text between quotes is the file name that logs will be saved to.
Printer Device Name	The text between quotes is the default printer device name "device". This should not be edited
Log Window Title	The text between quotes on this line will appear in the title block of the displayed log window.

Header (column titles)	The text between quotes on this line will be the first line in the body of the file, printout, or screen. In the Email section, the text in the Header field will appear in the subject line of email alerts.
Field	<p>These are the fields to log for normal errors.</p> <p>For each field to be logged, the following four parameters must be specified:</p> <ul style="list-style-type: none"> ▪ Column for start of field ▪ Field Name, or text enclosed in quotes (see Field Name table below) ▪ Beginning character position to be printed for field ▪ Ending character position to be printed for field
FIField	These are the fields to log for Forced Log errors and are described in the next section..

Field names are defined below.

Field Name	Description
Date	Date of state change. Format is mm-dd-yyyy
time	Time of state change. Format is hh:mm:ss
Old state	State of signal prior to change
Newstate	Current state of signal
Gmr	Group, Module, Receiver address of signal. Format is gg:m:rr
Channel	Channel name
Rxname	Receiver name
Desc	Description of Receiver name
“text”	Text between quotes will be logged as written
NI_Name	Network Interface Name
NI_GMR	Network Interface Group Module Receiver
Tag 1	User configurable descriptor used by TPCI to pass along details.
Tag 2	User configurable descriptor used by TPCI to pass along details.

Force Log Subsections

Each of the above sections includes a Force Log subsection as shown below:

```
LogWindow("System Events")
{
    StartDly(0)
    Header("Time      OLD    > NEW    GG:M:RR  Chan          RX          Description")
    Field(0,time,1,9)
    Field(9,oldstate,1,7)
    Field(16,">",1,10)
    Field(18,newstate,1,7)
    Field(26,gmr,1,10)
    Field(35,channel,1,16)
    Field(52,rxname,1,15)
    Field(68,desc,1,22)

    F1Field(0,time,1,12)
    F1Field(9,flstatus,1,30)
    F1Field(26,fldesc,1,100)
```

The Force Log section is for events related to the Network Interfaces, link On-Line and Off-Line. The F1Field lines are formatted similarly to the Field lines as described above.

The Force Log Fields are:

- **flstatus** Force Log Status (Online, Offline, etc.)
- **fldesc** Force Log Description (NI information)

Appendix B: Backup & Restore Procedures

This section covers the following standard Backup & Restore operations:

- The MCN Server and MCN Client software
- The MCN Server Software Key File
- The Custom MCN Server System Configuration files
- HIB-IP settings
- MCN Server IP Configuration settings
- MCN Client IP Configuration settings.

The backup and restoration instructions for the following items are beyond the scope of this manual. The appropriate documentation should be consulted for those procedures:

- Server and Client PC Operating Systems
- Server and Client PC User Accounts
- Server and Client PC OS Hardening
- Other (non- MCN Server) user files on the Server & Client PC
- IP Network infrastructure
- Legacy MCN equipment
- Other non-related hardware or software

MCN Server and Client Software Backup

1. If needed, use a commercially available method to make a backup copy of the MCN Server distribution media (up to the limit of copies allowed by the license).

This media includes the MCN Server 8000 software, the MCN Config Server software, and the MCN Client software.

2. Store the original distribution media and the backup media in safe places.

MCN Server Software Key Backup

1. If needed, use a commercially available method to make a backup copy of the MCN Server 8000 Software Key File CD or Software Key File itself. The Key file will have the form: KF-xxxx-yyy zzzzzzzzzzzz.MCNKey

Where: xxxx is a number that matches the Hardware Key Serial Number
 yyy is the Key File Version number and
 zzzzzz is an optional descriptive text string.

2. Store the original distribution media and the backup media in safe places.

Custom MCN Server System Configuration Files Backup

The Custom MCN Server System Configuration Files are the files have been configured to describe your system. They include files with the following types of file names:

- *SystemName.McnSys*
- *SystemName.RcdDtb*
- *SystemName.RcdHrd*
- *SystemName.RcdLog*
- *SystemName.RcdSec*
- *SystemName.ScreenName1.RcdWnd*

Where:

SystemName is the name you used when you saved your system and
ScreenName1 is the name you used for your first Display Window (Screen).

Note 1: Each system has a minimum of the above 6 file types.

Note 2: If you have more Display Windows (Screens) you will have more RcdWnd files; one for each screen

Backup Instructions

1. Use Windows Explorer to find the current set of files that you are using for your system.
2. Use Windows Explorer or a commercially available method to make a backup copy of the files.
(It may be helpful to use a program to Zip them up into a single file.)
3. Store the backup copy in safe places.

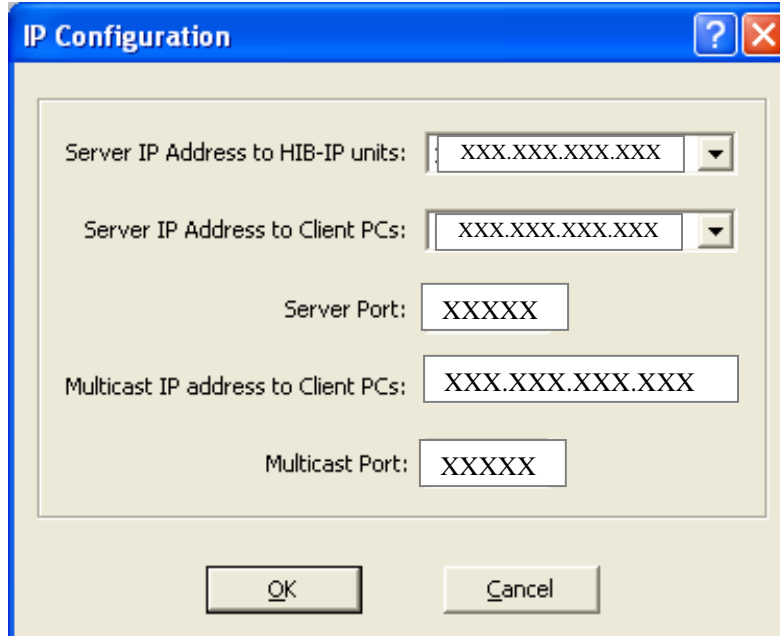
HIB-IP Settings Backup

The HIB-IP settings (if your system uses a HIB-IP unit) are stored in the Custom MCN Server 8000 System Configuration Files and will be backed up with the previous step.

MCN Server IP Configuration Backup

The IP Configuration parameters for the MCN Server software that will have to be re-entered when the system is restored. Make a backup of those values:

1. Run **MCN Server**.
From the menu, select **Options / IP Settings**.
2. The IP Configuration window will open similar to the one below:



The screenshot shows a window titled "IP Configuration" with a blue title bar and standard Windows window controls (minimize, maximize, close). The window has a light beige background. It contains five input fields arranged in a vertical stack. The first two fields are for IP addresses and have dropdown arrows on the right. The next two fields are for ports. The last field is for a multicast IP address. At the bottom of the window are two buttons: "OK" and "Cancel".

Server IP Address to HIB-IP units:	XXX.XXX.XXX.XXX
Server IP Address to Client PCs:	XXX.XXX.XXX.XXX
Server Port:	XXXXXX
Multicast IP address to Client PCs:	XXX.XXX.XXX.XXX
Multicast Port:	XXXXXX

OK Cancel

3. Make a backup copy of the information found in the IP Configuration window.
This can be on paper, or in a text file, or possibly a screen capture of the IP Configuration window.
4. Store the backup copy in safe places.

MCN Client IP Configuration Backup

The IP Configuration parameters for the MCN Client software that will have to be re-entered when the system is restored. Make a backup of those values:

1. Run **ClientRCD**
From the menu, select **Options / IP Settings**.
2. The IP Configuration window will open similar to the one below:

IP Configuration

NICs IP: XXX.XXX.XXX.XXX

Index	Alias	IP	Port	Disable
1	Main MCN server	xxx.xxx.xxx.xxx	XXXXX	No
2	Standby Server	xxx.xxx.xxx.xxx	XXXXX	No

Add Server

OK Cancel

There will be a line for each MCN Server that the Client can use.

3. Make a backup copy of the information found in the IP Configuration window.
This can be on paper, or in a text file, or possibly a screen capture of the IP Configuration window.
4. Store the backup copy in safe places.

Restoring the MCN Server Software & IP Settings

1. Use the original or backup MCN Server software distribution media
2. Install the MCN Server software by following the steps in the Installation section of this manual.
3. Select the **Server** installation option
4. When prompted for the Key File, use the original or backup Key File or Key File Media.
5. When prompted to enter IP parameters, enter the parameters saved in the MCN Server IP Configuration Backup procedure.

Restoring the Custom System Configuration Files

1. Use the backup copy of the Custom MCN Server System Configuration Files
2. Using Windows Explorer, copy the backup files into a folder that has the following access levels:

Administrator	Read & Write
User	Read (and Write if desired)
3. If the files were previously Zipped, un-Zip them.

Restoring the HIB-IP Configuration

The Custom System Configuration Files restored above will have the configuration information for the HIB-IP unit(s) (if used). If the HIB-IP needs to be restored (for example, if the HIB-IP unit is replaced), follow this procedure:

1. Run MCN Config Server software.
2. Load the system that was restored above.
3. Program the HIB-IP Unit(s) as per the *Error! Reference source not found.* section on page *Error! Bookmark not defined.* of this manual.

Restoring the Client Software & IP Settings

1. Use the original or backup MCN Server software distribution media
2. Install the MCN Server software by following the step in the Client Installation section of this manual.
3. Select the **Client** installation option
4. When prompted to enter IP parameters, enter the parameters saved in the MCN Client IP Configuration Backup procedure.

Appendix C: Running LonScript under Debug

LonScript:

This is an Engineered System Custom Configuration Programming feature, which can be used to program the Routers and EXB modules with special custom address forwarding tables.

ROUTER and EXB module scripts will typically only be used during initial system installation, system expansions, and/or spare replacements. During initial system installation the scripts could be used to verify that the ROUTER configurations match the units contained in that ROUTER network.

Warning: Any of the operations mentioned or described, may only be performed under the direction of CTI Products.

Custom Configuration

A Custom configuration that is specific for each system can be programmed in to the Routers of EXB modules as required to segment traffic flow, so as to pass only the required traffic and not overload the lower speed channels in the system. For instance, routers may be programmed to *pass* traffic from CIBs on the 78K side to the 1.25M side, but to *block* CIB traffic from the 1.25M side to the 78K side.

Enabling LonScript

The LonScript feature is available and accessible from within all MCNRCD program versions except for McnServer 8000. The feature is enable through the software by adding ‘ / debug’ to the Desktop Shortcut path that runs the application. e.g. (“C:\Program Files (x86)\CTI Products Inc\McnRcd Server\McnRcd Server.exe” /debug).



A Special Custom Script file is required. If the system has been qualified for custom configuration, a CTI Products Disk will be included with your order. Please contact CTI Products if the disk is missing as this is the only way to acquire the appropriate files.

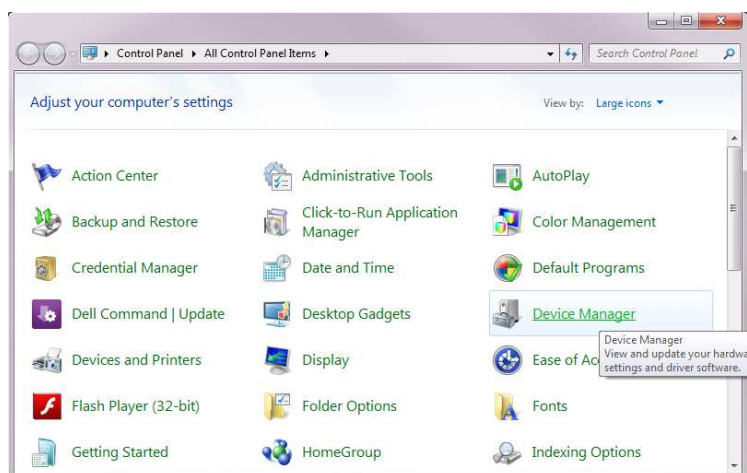


Note: Misuse of this feature could permanently disable your hardware. Always contact CTI Products for assistance.

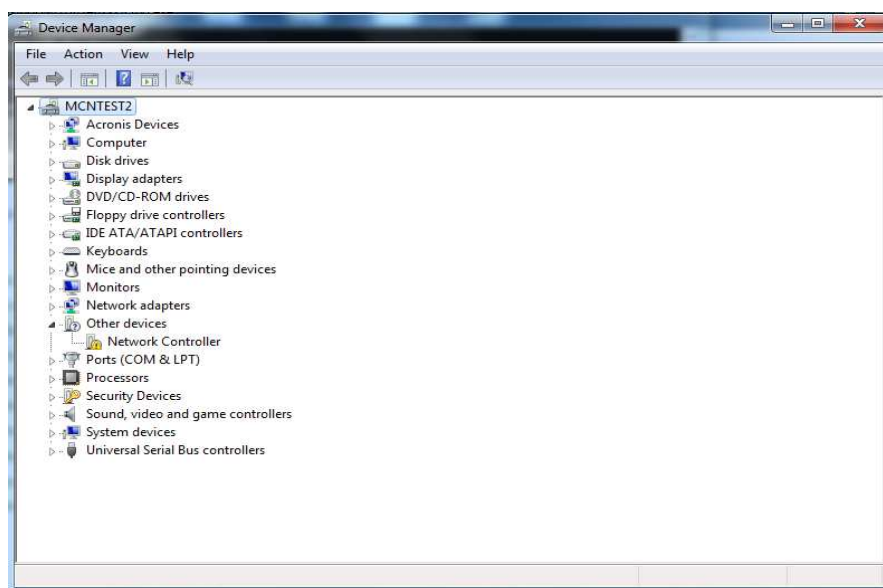
Appendix D: Fixing PCLTA Installation Problems

The PCLTA drivers must be loaded prior to installing the PCLTA card. If the PCLTA card was installed first, and an attempt was made by the Windows operating system to load the drivers, follow these steps to re-install the drivers correctly:

Navigate to the Control Panel from the **Start** Menu, then click the “Device Manager” icon from the window as shown below. (If the icons are not visible, change the Control Panel to “View by: Large Icons”).)



In the “Device Manager” window Check the hardware list under Network adapters. If the driver for PCLTA network interface is not installed correctly, “Other Devices” will be listed (instead of “LonWorks Network Interface”). Expand the “Other Devices” icon so that “Network Controller” is listed as shown below.



Select “Network Controller” with an “!” through its icon, then from the **Action** Menu, select “Disable”. Follow any additional prompts, and restart the PC.

The PCLTA driver can now be reinstalled from the distribution CD (S2-61502).

Appendix E: Importing a DOS System from MCNRCD

The MCNConfig Server program can still import configuration files from the older and now obsolete DOS version MCNRCD program:

- ***.GCF** Group Configuration Files (Receiver Names & Notes)
- ***.MCF** Module Configuration Files (Module Names & Status Table pointers)
- **MCNRCD.CFG** Custom Status Tables

This saves the majority of the work required to re-build a system for the MCN Server.

Since there is a significant difference in screen files between the two programs, the Import command will not import the *.MSF screen files.

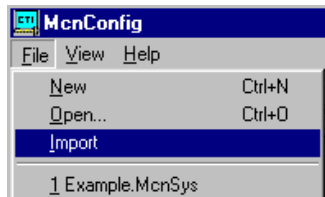
It's easy to create the Display Window Screens. We didn't want to take all the fun out of the import process! Some of the new configuration features in the Windows program that you'll want to look at are:

- Selectable numbers of Rows & Columns
- Variable length Receiver Names & Descriptions
- Cutting & Pasting from Excel
(especially good for receiver names and phone line / T1 Line information)
- User adjustable column widths
- Multi-tabbed display screens for faster switching between systems
- Selectable colors for labels
- Better support of alarms & general purpose I/O's
- Support of more than 8 receivers in AIBs for Astrotac comparators
- Channel grouping
- Email logging

Importing the System

Start the Config program or close the current system.

From the File Menu, select **Import**.



Appendix E: Importing a DOS system from MCNRCD

Navigate to the correct Program Directory for your DOS version of MCNRCD.

This is typically either:

c:\CTI\
c:\MCN\ or
c:\Program Files\CTI Products Inc\

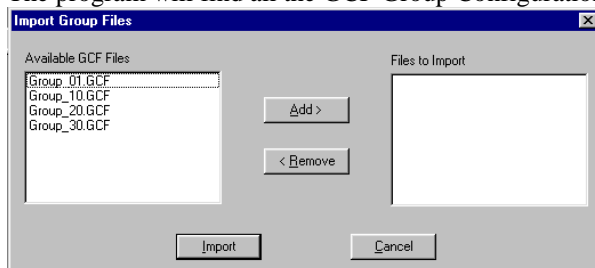
This window will display only files named **MCNRCD.CFG** as shown below:



Select the **MCNRCD.CFG** file and click the **Open** button.



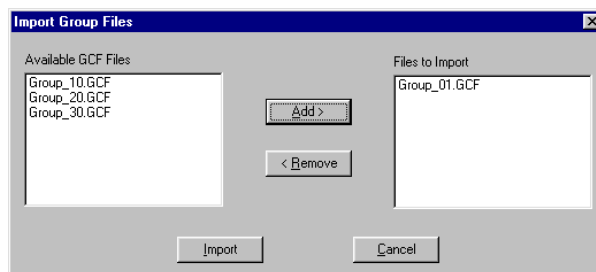
The program will find all the GCF Group Configuration files.



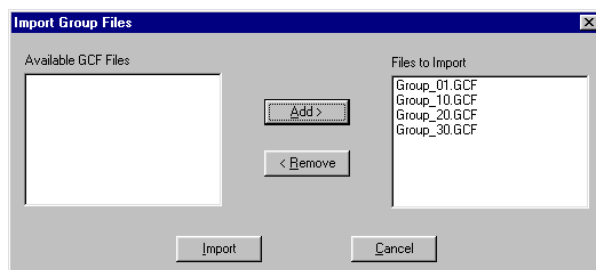
Note that there may be stray example files in the working directory, such as the MCNGRP0.GCF and MCNGRP1.GCF files that were shipped with the system.

You will want to import only the files that contain your current system data.

Select the first Group File to load and click the **Add** button.
Or, **Double Click** on a GCF File on the left side to add.



Repeat until you have added all the Group files that you want to import.



Click the **Import** button.

The program will build a Hardware Window and a Receivers Window.

Saving Imported Systems

The import function will convert any special Display Table (Custom Status) information and colors from your old DOS system.

The DOS program used a blue background, whereas the Windows program uses a White background.

The MCNConfig program gives you the ability to use either the imported Display Table information or the Default Windows Display Table information.

If you DO NOT have custom status table data in the MCNRCD.CFG file:

You will probably want to use the new Default Windows Display Table.

1. Save the system now (before you make a Display Window).
2. Close the system.
3. Re-open the system. The program will use the default Display Table.
4. Build your Display Windows.
5. Re-save the system.

If you DO HAVE custom status table data in the MCNRCD.CFG file:

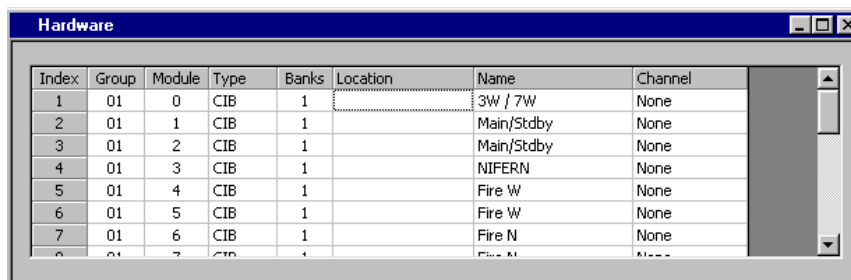
You will probably want to use the converted Display Table.

1. Build a Display Window before you save the system
2. The system will use the converted Custom Status information.
3. Save the System
4. If you want to change the status colors (this can be done later),
 - Save the system
 - View the Display Table Window.
 - Edit the appropriate Display Table entries.

**Save Now
or
Save Later?**

Imported Hardware Window

The program gets the Hardware information from the .GCF and .MCF files.



Index	Group	Module	Type	Banks	Location	Name	Channel
1	01	0	CIB	1		3W / 7W	None
2	01	1	CIB	1		Main/Stdby	None
3	01	2	CIB	1		Main/Stdby	None
4	01	3	CIB	1		NIFERN	None
5	01	4	CIB	1		Fire W	None
6	01	5	CIB	1		Fire W	None
7	01	6	CIB	1		Fire N	None
8	01	7	CIB	1		Fire N	None

Type

All modules are imported as CIBs.
Change as required if the old modules are AIBs or IOBs.
If you have IOBs, select IOB STD, since this was the only IOB supported in the old program.

Banks

The DOS version of the program supported only 1 bank.
For AIB modules, if you upgrade the Astro-tac comparator to more than 8 receivers, change this field.

Location

There was no Location field in the old program. Add a location description if desired.

Name

The module Name was part of the *xxx.MCF* file. You probably won't see a name unless you have hand-edited that file. Enter a name for this module if you desire.

Channel

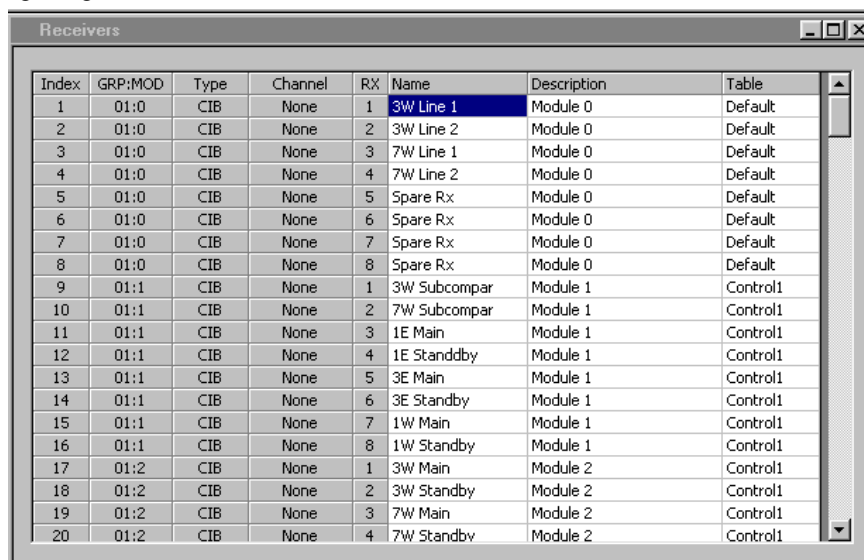
The DOS program did not support an explicit Channel field. Many people put Channel information in the Receiver Description field in the DOS version.

-Open the Channel Window and add channels as appropriate.

-Select the appropriate channel for each module.

Imported Receivers Window

The program gets the Receivers information from the .GCF and .MCF files.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	Control1
10	01:1	CIB	None	2	7W Subcompar	Module 1	Control1
11	01:1	CIB	None	3	1E Main	Module 1	Control1
12	01:1	CIB	None	4	1E Standby	Module 1	Control1
13	01:1	CIB	None	5	3E Main	Module 1	Control1
14	01:1	CIB	None	6	3E Standby	Module 1	Control1
15	01:1	CIB	None	7	1W Main	Module 1	Control1
16	01:1	CIB	None	8	1W Standby	Module 1	Control1
17	01:2	CIB	None	1	3W Main	Module 2	Control1
18	01:2	CIB	None	2	3W Standby	Module 2	Control1
19	01:2	CIB	None	3	7W Main	Module 2	Control1
20	01:2	CIB	None	4	7W Standby	Module 2	Control1

Name

This is taken from the *Receiver Name* from the .GCF file.

Description

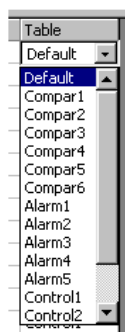
This is taken from the *Corresponding Channel Name / Notes* field in the .GCF file.

Table

This is the Status Table used by the old DOS program. It is based on the entry in the .MCF file. In the DOS program, Status Tables were assigned on a module (CIB, IOB, etc.) basis. In the new Windows program, the Status Tables are assigned per receiver (or I/O Block).

Imported Status Tables

The program gets the Status Tables from the **MCNRCD.CFG** file. Normally, you will just have the Default entry. If you have a specially modified **MCNRCD.CFG** file, you may see additional entries in the Status Table drop-down list in the Receivers Window.



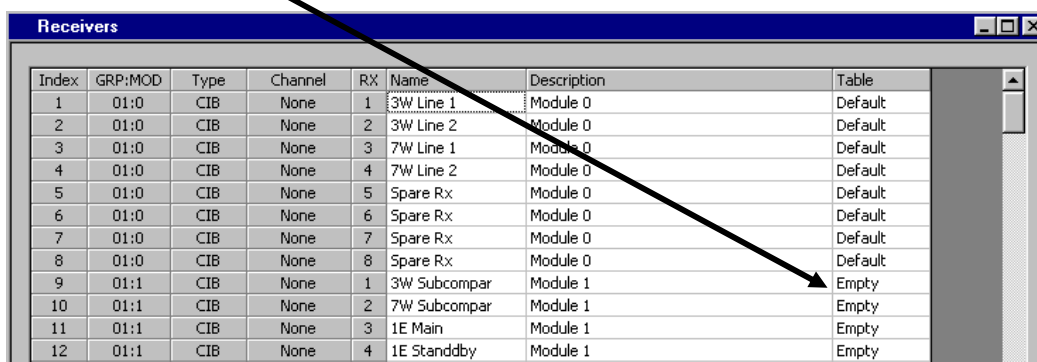
The above example is from a customer who uses a lot of alarms & controls in his system. He has 17 custom Status Tables! (Thanks, John!)

Missing MCF Files

If there is no MCF file to match a GCF file, the program sets the Status Table to the first Status Table in the *MCNRCD.CFG* file (typically "Default"). This matches how the MCNRCD for DOS program handles a missing MCF file.

Empty Status Table Entries

If the .MCF file points to a non-existent Status Table in *MCNRCD.CFG*, the Table entry will be "Empty" as shown below.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	Empty
10	01:1	CIB	None	2	7W Subcompar	Module 1	Empty
11	01:1	CIB	None	3	1E Main	Module 1	Empty
12	01:1	CIB	None	4	1E Standby	Module 1	Empty

This will normally not occur, since the DOS version of MCNRCD will exit if it sees this condition.

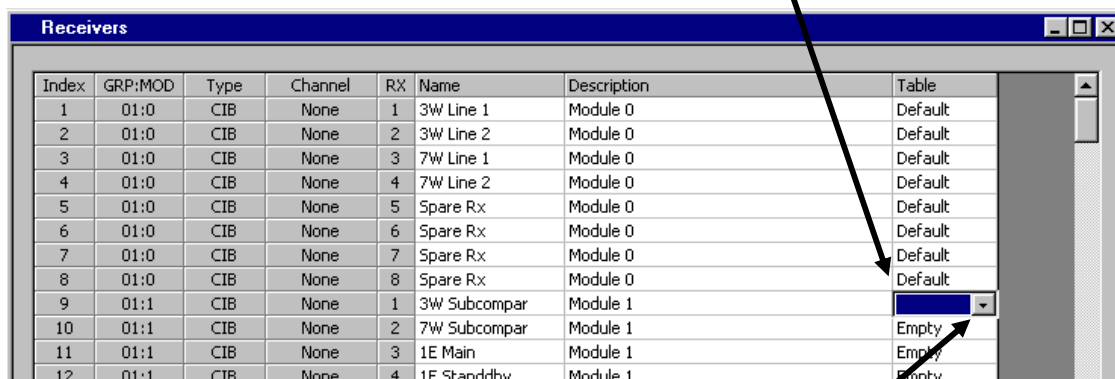
If you see "Empty" in the Table column, it usually means:

- You have imported a GCF file that is not normally used in your system
- You have modified the MCF or *MCNRCD.CFG* file so that the Status Tables (custom categories) don't match.

To correct the "Empty" problem, either:

- Close the current system and re-import without the extra GCF file or
- Modify the MCF or MCNRCD file so that all the Status Table entries are valid or
- For the receivers showing "Empty", select an appropriate Status Table from the drop-down list. (To speed this up, after you have changed a few entries, use the Copy & Paste commands to copy a range of entries.)

When there is an "Empty" entry, the drop-down list will initially show a blank.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	Empty
10	01:1	CIB	None	2	7W Subcompar	Module 1	Empty
11	01:1	CIB	None	3	1E Main	Module 1	Empty
12	01:1	CIB	None	4	1E Standby	Module 1	Empty

To bring up the list, click again on the Down Arrow in the drop-down list.

This will bring up the full list of available Status Tables.

Receivers							
Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	
10	01:1	CIB	None	2	7W Subcompar	Module 1	Default
11	01:1	CIB	None	3	1E Main	Module 1	Compar1
12	01:1	CIB	None	4	1E Standby	Module 1	Compar2
13	01:1	CIB	None	5	3E Main	Module 1	Compar3
14	01:1	CIB	None	6	3E Standby	Module 1	Compar4
15	01:1	CIB	None	7	1W Main	Module 1	Compar5
16	01:1	CIB	None	8	1W Standby	Module 1	Compar6
17	01:2	CIB	None	1	3W Main	Module 2	Alarm1
18	01:2	CIB	None	2	3W Standby	Module 2	Alarm2
19	01:2	CIB	None	3	7W Main	Module 2	Alarm3
20	01:2	CIB	None	4	7W Standby	Module 2	Alarm4
							Alarm5
							Control1
							Control2

Finishing up the Import

After you have imported data and cleaned up various fields as described above, you'll need to do the following:

- Save the data (File Save)

- Add Email Groups & Email Recipients if desired

- Link Channels to Email Groups if desired

- Add new Display Window

- Place Receivers & Labels in Display Window

- Add Tabs in the Display Window if desired

- Save the data (File Save)

- Set up Sound Files if desired

The MCN Server program plays .WAV files for alarms. Various alarm sounds are included in the \sounds directory under the working directory (typically c:\Program Files\CTI Products Inc\McnRcd\sounds). The Import function will not convert the alert tones from your *MCNRCD.CFG* file. (See *Editing the fields* on page 87 for details on editing the sounds to play for alarm conditions.)

Display Window differences between the DOS and Windows programs

Display Grid

The old MCNRCD for DOS program used a fixed grid of 22 rows x 4 columns.

The new MCN Server program has user-settable grid size.

You can now fit more receivers in one Display Window.

Alternately, you can make the Display Window smaller if you wish.

Tabs vs. Screens

To see a new screen in the old program, you would load a new screen file.

The Display Window in the new program lets you switch between "screens" quicker.

In the new Config program you can also create multiple Display Windows for use by different users. For Technicians, build all your desired screens as tabs in one Display Window. For Dispatchers, build Display Windows with tabs as required depending on which channels they need to see. You can build different Display Windows for different dispatchers.

Appendix F: HIB-IP 8002 USB Driver Installation

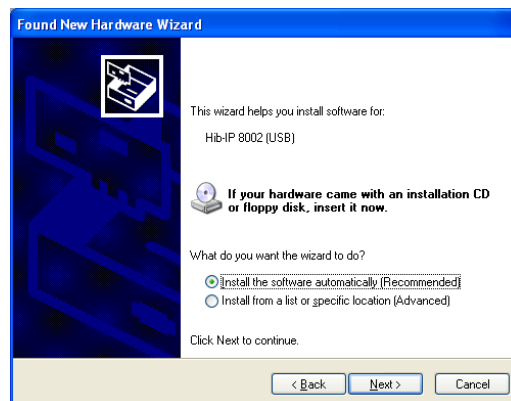
Windows 7 New Installation or XP Normal Installation

The Windows 7 installation process will normally fully install the HIB-IP 8002 USB driver if the option is selected. The Windows XP installation process will copy the appropriate file to the hard drive. However, the driver itself is not fully installed until the HIB-IP 8002 unit is connected to the PC for the first time. If this is a new driver installation for Windows 7 or for Windows XP, install the driver using the following steps:

1. Check for and disable any real-time virus protection that are running (ex: McAfee Antivirus Access Protection & On-Access scanners).
2. Connect the HIB-IP 8002 module to the PC with a USB cable.
3. When the HIB-IP 8002 is connected, the Found New Hardware Wizard appears:



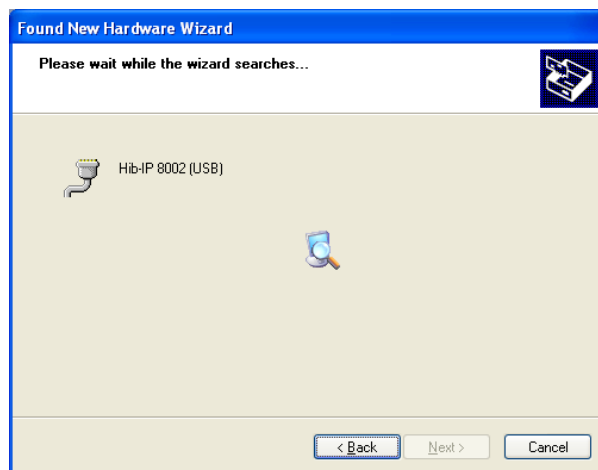
4. Windows Update does not have any HIB-IP 8002 drivers. Select "No, not this time" to the Windows Update prompt. Hit "Next".



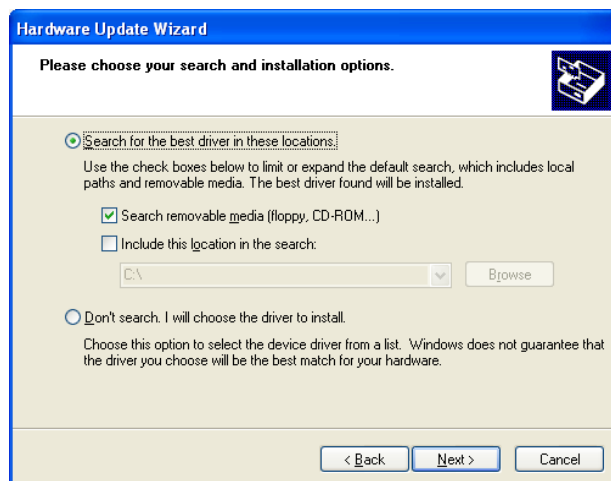
5. It is recommended to select "Install software automatically".

If the HIB-IP 8002 driver files weren't originally installed, insert the MCN software CD in the PC and select "Install from a list or specified location".

6. For Automatic installations, Windows will search for the files.



7. For manual installations, or if Windows can't find the file, the following dialog box will appear.



Verify that the MCN software CD is inserted in the PC and select the removable media option as shown above and hit *Next*.

Alternately, select the "Don't search, I will choose the driver to install" option.

Then navigate to the following folder on the installation CD:

HibVCom\X86 for 32 Bit Windows installations or
HibVCom\X64 for 64 Bit Windows installations or

8. When Windows finds the file, it may complain that the driver is not signed.

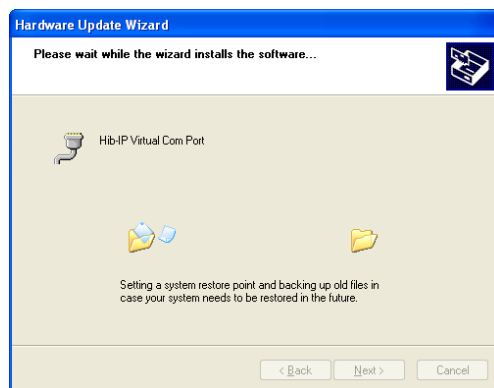


Windows 7



Windows XP

If you wish to proceed, select the appropriate option.
Windows will proceed to install the driver:

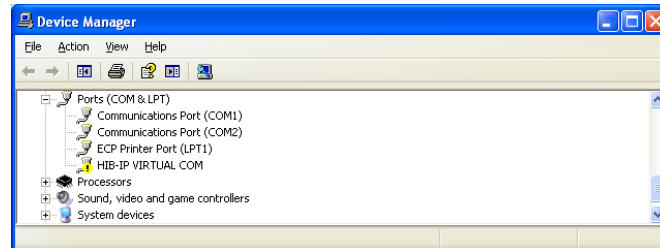


9. When the HIB-IP 8002 driver is properly installed, it will be shown in the Device Manager without an error indication:



Driver Installation Problems – Manual Installation

The HIB-IP 8002 unit will be displayed with an error indication in the Device Manager:



If this happens, you can manually install the driver:

1. Check for and disable any real-time virus protection that are running (ex: McAfee Antivirus Access Protection & On-Access scanners).
2. Load the MCN Server 8000 software CD in your PC.



3. Double-click on the HIB-IP VIRTUAL COM port in the Device manager.

Select "Reinstall Driver".

4. Proceed as shown in the previous section.
5. In some rare cases, you might have to un-install the driver and then re-install it.

Appendix G: IP traffic priority: TOS / QoS / DSCP Settings

IP Traffic Prioritization

Some IP networks support traffic prioritization for various types of IP packets. This is typically done through the following IP packet fields:

- TOS Type of Service
- QoS Quality of Service
- DSCP Differentiated Services Code Point

The TOS, QoS and DSCP fields actually use the same byte in the IP packet as defined by the appropriate RFCs. Different network devices will interpret the byte differently depending on how they are configured. Some routers may be configurable for prioritization based on TOS. Others may be configurable based on QoS. Others may be configurable based on DSCP. Others may use a combination of two or more of the above.

Do not assume that a higher value will always give you higher priority. Consult your network administrator for the proper value to use.

Example System

Although the MCN Server and MCN Advanced Server software is not certified for MSI Astro® 25 systems, the enhanced MCN Server 8000 software is. For systems running the MCN Server 8000 software on ASTRO® 25 Version 7.16 Systems and above, traffic priority is established for the following traffic paths:

- The MCN Server 8000 PC to the HIB-IP 8002 module
(Controlled by a Windows Group Policy Object (GPO) that is settable using a Motorola Solutions Inc. Supplemental CD.)
- The HIB-IP 8002 module to the MCN Server PC (using a TOS value in the HIB-IP 8002 module).

HIB-IP 8002 Type of Service Field:

The HIB-IP 8002 module supports a configurable IP Type of Service or TOS field. MCN software version 7.20 and later (in particular in the MCN Config program) is required to configure this field.

The HIB-IP 8002 module uses the TOS setting since it is the most configurable. It can take on a value of 0 to 255 (decimal).

Typical TOS values used with the HIB-IP 8002 module are:

- 0** No Priority (default)
- Other** As appropriate for your network.

If your network uses the QoS or DSCP interpretation, you can convert those values to the proper TOS value and enter it into the HIB-IP 8002 configuration. Contact your system administrator or see http://en.wikipedia.org/wiki/Type_of_service for more information on converting between these values.

MCN Server DSCP Field:

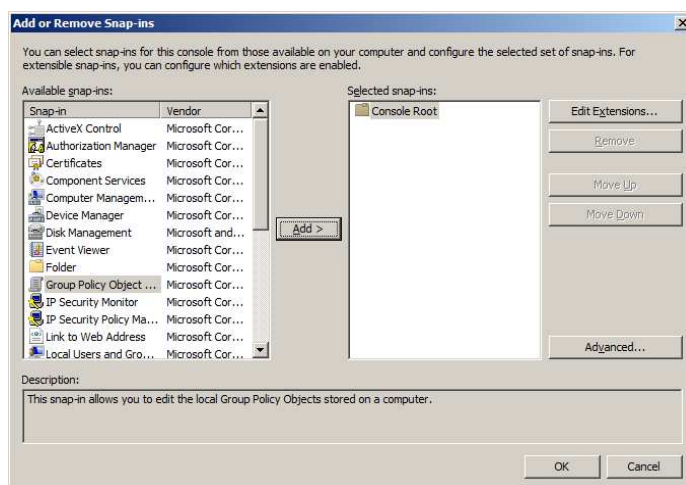
Traffic priority for packets from the MCN Server PC to the HIB-IP 8002 module is controlled in Windows 7.x by a configurable Differentiated Services Code Point (DSCP) field. This is done through a Group Policy Object. In order for the DSCP to work, the following conditions must be met:

1. A Group Policy Object must be created (see below),
2. The MCN Server PC must be joined to a Windows Domain and
3. The IP hardware interface (NIC) in use must be the one that is connected to the above Windows Domain.

Manually Setting the Group Policy Object in Windows

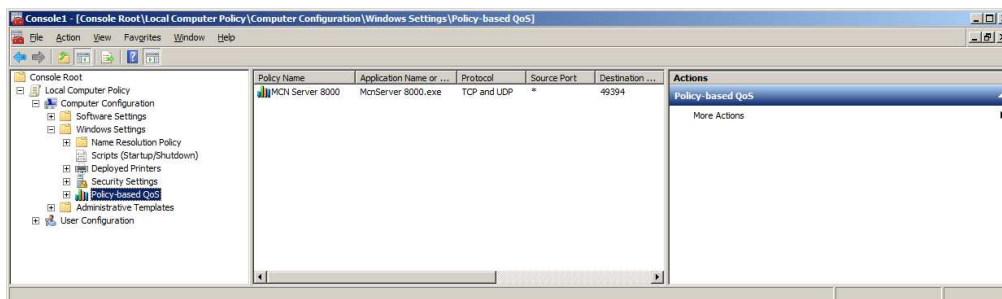
If you don't have the appropriate MSI Supplemental CD, you can use the following steps to manually set the Group Policy Object:

1. Run Microsoft Management Console (Start / Run / MMC)
2. Add the Group Policy snap-in (Menu: File / Add/Remove Snap-in)



- Select the Group Policy Object.
- Hit "Add" button
- Hit the "Finish" button.
- Hit the OK button.

3. Expand the tree in the left pane to:
Local Computer Policy / Computer Configuration / Windows Settings / Policy-based QoS



- Highlight the Policy-based QoS item.

4. Create a new Policy:
Menu: Action / Create new policy
5. Follow the wizard and enter the following values:

Policy Name	MCN_Server
DSCP Value	16
Outbound Throttle Rate	Unchecked
Application Name	McNServer.exe or MCN Advanced Server (include the space)
Source IP Address	Any
Destination IP Address	Any
Protocol	UDP
Source Port	Any
Destination Port	Set for UDP Port that is used on the HIB-IP 802 module in your network

6. Hit the Finish button
7. Close the MMC

Glossary

1250	1.25mbps high speed backbone Network Rate
78K	78kbps standard network rate for CIB, HIB, AIB, IIB, and IOB modules.
AIB	ASTRO-TAC™ Comparator Interface Module connects a Motorola ASTRO-TAC™ comparator to the MCN Network. It extends the comparator lights and switches over the network to a remote display position (either a PC or console display).
CIB	Comparator Interface Module connects a voting system comparator to the MCN Network. It extends the comparator lights and switches over the network to a remote display position (either a PC or console display).
CTI	Shorthand for our full company name, "CTI Products, Inc." The initials "CTI" come from our parent company - Combined Technologies, Inc. "CTI" is used in some circles -- but not in this manual -- to mean "Computer Telephony Integration"; but we, were using this acronym first!
EXB	Legacy System Extender Module is used in pairs to connect two MCN networks together or to extend the length of an MCN network beyond 4000 feet. Allows control and monitoring of multiple remote comparators from a central site.
Group	Equivalent to the Subnet portion of the network address, less one. Valid values are from 00 to FE (hexadecimal).
HIB-232	This Host Computer Interface Module connects a PC to the MCN Network over an RS-232 connection. It can be local to the PC or connected through leased-line modems or an equivalent full-time RS-232 channel.
HIB-IP	This Host Computer Interface Module connects a PC to the MCN Network over an IP network. It is configured over an RS-232 port.
HIB-IP 8000	This is an updated version of the HIB-IP module. It uses the same hardware, but has configurable UDP ports.
HIB-IP 8002	This is a new version of the HIB-IP module. It uses a new hardware platform. It is configured over a USB port.
IIB	Input/Output Interface Module connects a parallel operator display device (such as a console) to the MCN Network. Can be used with AIB ASTRO-TAC™ Comparator Interface Modules to provide voting status indications (Vote, Receive, Disable, and Fail) to a console. Also can be used with CIB Comparator Interface Modules to extend the comparator display and control for other comparators over a long distance.
IOB	Input/Output Control Module connects I/O devices such as relays to the MCN Network. Used with a HIB to create an I/O control system.
IP	Internet Protocol

IP Address	Any node connected to an IP (Internet Protocol) network must be identified with a unique 32-bit address. These 32-bit addresses are commonly written in <i>dotted decimal</i> notation as four decimal numbers (referred to as octets because each decimal number represents 8 bits) separated by decimal points. Each octet can be a number from 1 to 255. For example, 131.9.1.2 is a valid IP address.
IP Subnet	A portion of an IP network that encompasses a specific range of IP addresses (ex: from 10.1.1.0 to 10.1.1.255). All IP devices on the same subnet talk to each other directly (or through hubs or switches). They do not need a router between them. (See also Subnet Mask.)
MCN	Monitoring and Control Network
Module	Equivalent to the Node portion of the network address, less one. Valid values are from 00 to 7E (hexadecimal) for MCN modules.
Multicast	An IP protocol that sends a single IP packet to a number of IP units at the same time. All receiving devices must be members of a Class D IP Multicast Group (224.x.x.x – 239.x.x.x) IP Multicast protocol is used between the MCN Server and the Clients.
NIC	Network Interface Card – Interface card between the PC and the Ethernet network.
PBX	Private Branch Exchange (In-house telephone system switch)
PCLTA	Legacy internal MCN Network Interface for PC
Port (IP)	A number indicating a logical connection within an IP device. Ports allow multiple types of messages (email, HTTP, FTP, etc.) to be sent to the same IP address. The IP device decides what to do with each message depending on which port it is addressed to.
PSTN	Public Switched Telephone Network (Dial-Up phone system)
RCD	Remote Comparator Display
Subnet Mask	<p>The bits that define the Subnet range. A portion of the IP Address Bits (normally the upper bits) are used to define the subnet range. The subnet mask identifies the “NetID” and “HostID” portions of the IP address in a bitwise fashion. The mask is constructed by placing a “1” in any bit that is part of a subnet (NetID) address. So subnet mask bits that are SET define the NetID, and CLEARED subnet mask bits define the HostID.</p> <p>A subnet mask of 255.255.255.0 defines the NetID as the first three octets, and the HostID as the last octet. For example, for the address 192.47.73.111 and the subnet mask of 255.255.255.0, the subnet can be identified as 192.47.73.0.</p>

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