Flex-Net Phase II Application Guide

1.0 Purpose

The purpose of this document is to describe the major changes from the Flex-Net Phase I Fire Alarm Control System to the Flex-Net Phase II Fire Alarm Control System. It is intended primarily for application engineers who build and configure these fire alarm control systems. Familiarity with the Flex-Net Phase I Fire Alarm Control System is assumed. The following topics will be discussed:

- Ethernet Port Usage for Network Capability
- Setting up and using a Web Server
- BACnet implementation and functionality
- Mass Notification System implementation and functionality
- Use of Boolean Equations to operate Virtual Zones
- Voice Evacuation and Digital Message Preparation
- Relay Pulsing
- Zone Latching
- Autonomous Control Unit (ACU) and Local Operating Consoles (LOCs)
- Firmware Loading
- Configuration Loading
- Hardware Layouts

2.0   Ethernet Port Usage

The Flex-Net FACP has built in network capability which can connect to larger networks via Ethernet. This capability allows for further annunciation and control of the system through the Open Graphical Network (OpenGN) software, the integrated web server and Building Automation and Control Networks (BACnet) software. It is recommended that connections only be made to secure networks.

2.1   Wiring/IP Settings

An Ethernet connection can be found in each node on the main board (MD-871A). The port is labelled P7 and can be found in the bottom left corner of a mounted board. An Ethernet cable can be connected from here directly to the required network through a router or switch.

Each node connected directly to the network requires its own Internet Protocol (IP) address to identify it. The IP address must be unique to the node and it must not be used by any other terminal or device on the network. This information is configured in the job file using the configurator. Refer to the figure below.
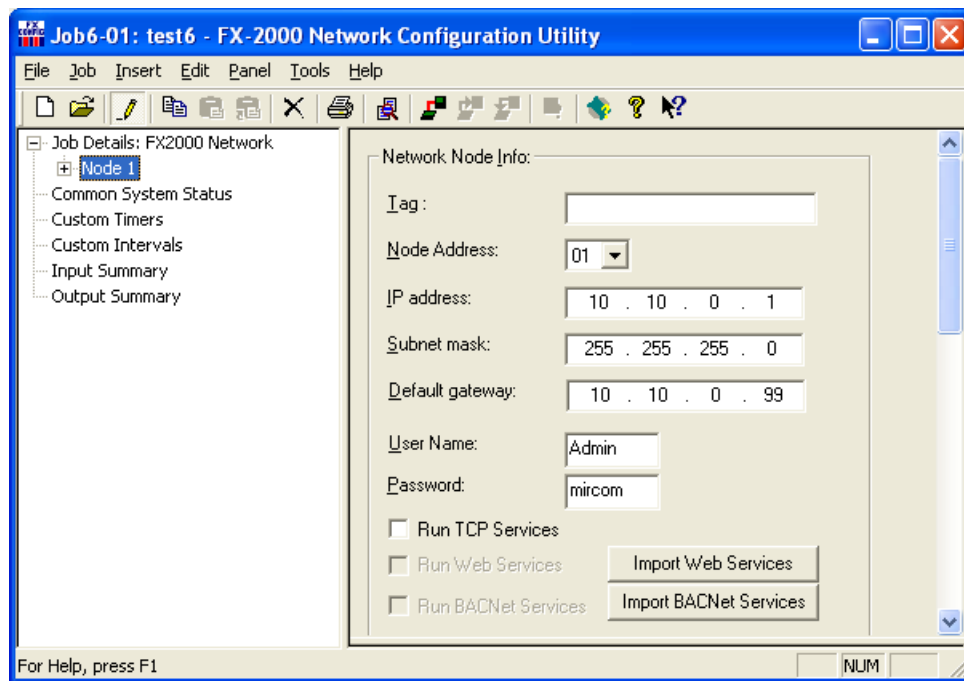
In the configurator select the node from the Job Details tree on the left to display the Network Node Info on the right. Each node requires a separate reserved static IP. Enter the IP address, subnet mask and default gateway to complete the required networking information. The subnet mask is a number that combined with the IP address identifies which network segment the node resides on. The default gateway is the address of the router that the node connects to. Contact your network administrator if you require assistance setting up a reserved static IP or inputting correct values for the subnet mask and default gateway.

To allow an application, such as OpenGN or BACnet explorer, to connect and receive events ensure that the check box "Run TCP Services" is selected.

To actively monitor the Ethernet connection for connectivity scroll down and select the "Supervise Ethernet Connection" check box. This will create a trouble event if the node does not detect an Ethernet connection.

3.0   Web Server

The web server feature allows monitoring of the system remotely using any PC that resides on the same network as the FACP. The web server displays much of the same information that appears on any annunciator connected to the FACP.

3.1   Web Browser Setup

Before this feature can be accessed the job file must be configured to include the network information described above in 2.1 Wiring/IP Settings and the "Run Web Services" check box needs to be selected. If this box is greyed out then a CodeMeter key must be used to activate a license using the Import Web Services button. A user name and password may also be set in the configuration job file under the Network Node Info. If a user name and password are not set the user name will be "admin" and the password will be "mircom" by default.

For optimal performance use the Internet Explorer browser version 6 or later, although other web browsers are also supported. The web browser used to access the server must be set to not cache web pages. Requiring the browser to request new information each time the server page is accessed will ensure that the browser will not display old information that may be out of date. To remove web site caching in Internet Explorer:

1. Go to the browser's menu bar and select Tools, then select Internet Options at the bottom of the drop down menu. The Internet Options dialogue box appears.

2. Under the General tab there is a section called Browsing History. From the Browsing History section press the Settings button. A Temporary Internet Files and History Settings dialogue box appears.

3. This dialogue box offers several options for when to check for newer versions of stored pages. Select "Every time I visit the webpage" and press OK.

To access the webpage in an Internet Explorer web browser:

1. Enter the IP assigned to the specific panel followed by "/index.html" in the address bar. For example if the IP address was "192.168.0.1" the full address would be "192.168.0.1/index.html".

2. Press enter and a prompt to enter the user name and password appears.

3. Enter the user name and password and press enter. The FACP can now be monitored remotely.

3.2   Using the Web Server

The Web Server displays multiple pages that provide various types of information about the function and operation of the Flex-Net system. In addition, there is information that is primarily intended for network administrators. It allows them to access the Flex-Net system remotely for monitoring or troubleshooting purposes. Each of these pages are described below with accompanying screenshots.

3.2.1 Queue Status

The Queue Status selection under Panel Info/Status displays the Display Queue Status page. The Display Queue Status page shows the alarm, supervisory, trouble and monitor queues. To browse through these queues press the corresponding button to display the list of events.
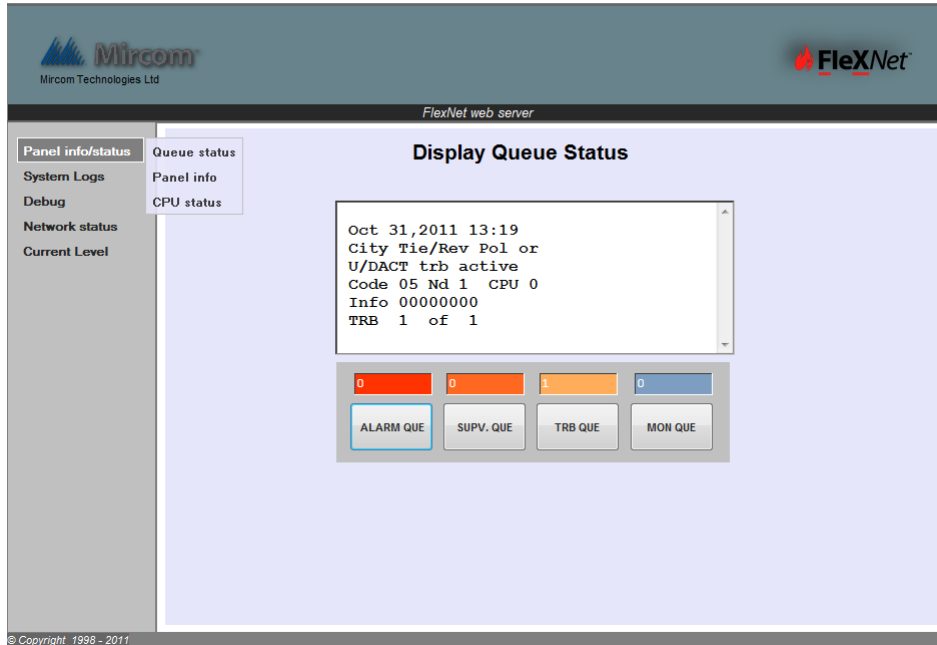
3.2.2 Panel Info

The Panel Info selection under Panel Info/Status displays the Advanced Panel Info page. The Advanced Panel Info page shows information about the CPUs connected to each node in the system including firmware version and the current job via the GUID.
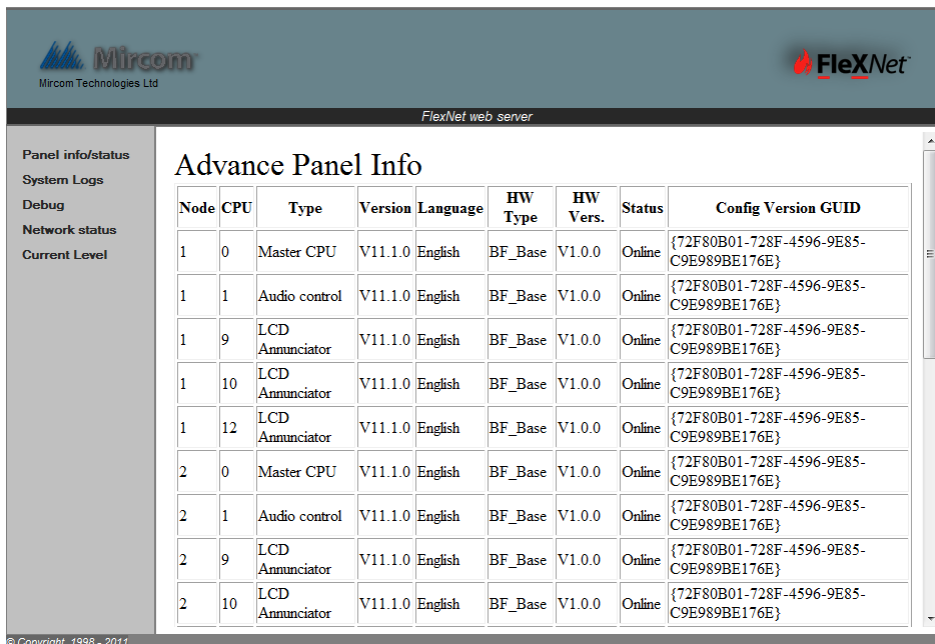
3.2.3 CPU Status

The CPU Status selection under Panel Info/Status displays the Configuration Status: Types page. This page shows a list of the nodes that comprise the Flex-Net system. For each node the CPUs that are in use are indicated by a CPU number beside their associated node.

3.2.4 Alarm Logs

The Alarm Logs selection under System Logs displays the Alarm Log page. This page displays the list of all Alarms that occur including network and system restarts. This log can be saved to a file or printed using the appropriate buttons at the top of the page. Note that there is a delay of a few minutes before the logs update, they are not updated in real time.

3.2.5 General Logs

The General Logs selection System Logs displays the Event Log page. This page displays a list of all events that occur including troubles and alarms/ This log can be saved to a file or printed using the appropriate buttons at the top of the page. Note that there is a delay of a few minutes before the logs update, they are not updated in real time.
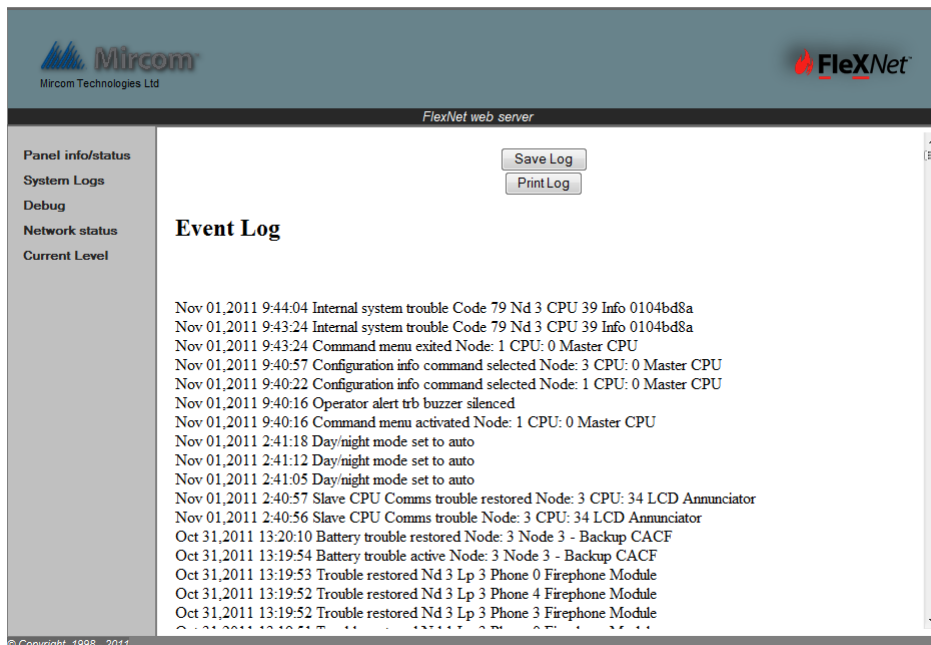
3.2.6 Live Trace

The Live Trace selection under Debug displays a page that can be used by developers to remotely monitor and debug the Flex-Net system. The type of trace can be selected from the drop down menus and the level of the trace can be set by using the Toggle Trace button. Press Get Trace to initiate the trace. The trace data can be saved or printed using the Save Trace and Print Trace buttons respectively.
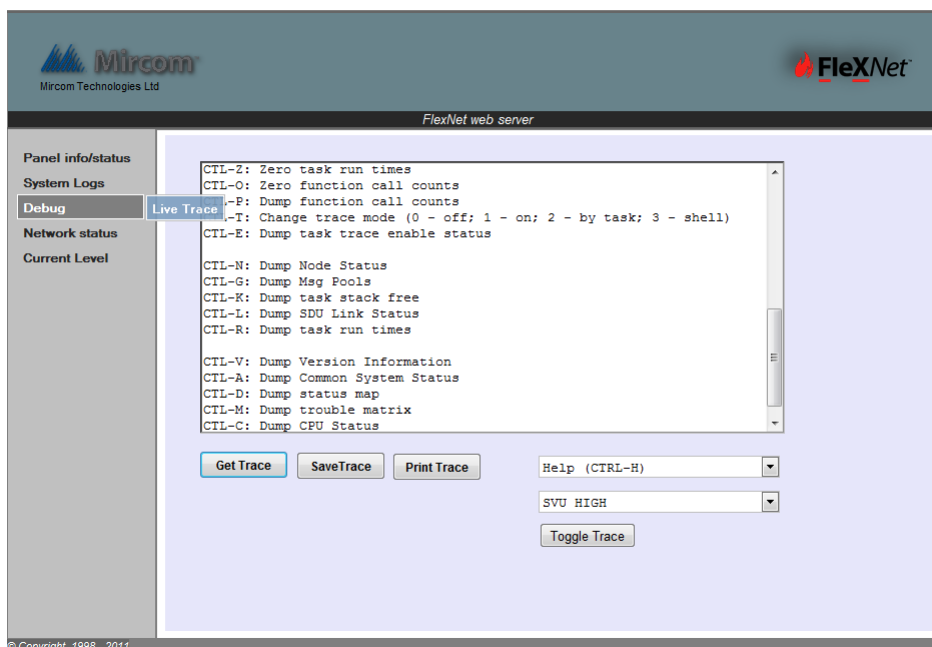
3.2.7 Network Status - TCP

The TCP selection under Network Status displays the TCP Socket Table page. This page displays a list containing all the connections currently being made to the web server from remote locations. Each entry after the first represents a unique connection to the web server.

3.2.8 Network Status - UDP

The UDP selection under Network Status displays the UDP Socket Table page. This page displays a list containing all the BACnet applications currently connecting to the Flex-Net system from remote locations. Each entry after the first represents a unique connection to the web server.

3.2.9 Network Status - ARP, Route and Devices

The ARP, Route and Devices selections under Network Status display the ARP Table, Routing Table and Device Table pages respectively. Each of these pages contain information intended to aid network administrators in remotely monitoring, troubleshooting and configuring the network connection of the Flex-Net system.

ARP Table

IPAddress	HwAddress	HWtype	HWL	Refs	Iface	State	TTL
192.168.0.164	00:21:28:6E:9B:06	ether	6	1	BF537.1	IPV4	600000
192.168.0.211	00:23:AE:AC:AF:DC	ether	6	2	BF537.1	IPV4	600000

Routing Table

Destination	Gw	Refs	Mhome	Iface	mtu	hops	ttl	flags			
127.0.0.0/8	127.0.0.1	1	0	LOOPBACK	1500	1	INF	U	G	J	S
127.0.0.1/32	127.0.0.1	2	0	LOOPBACK	1500	0	INF	UH			
192.168.0.0/24	*	1	0	BF537.1	1500	0	INF	U	C		
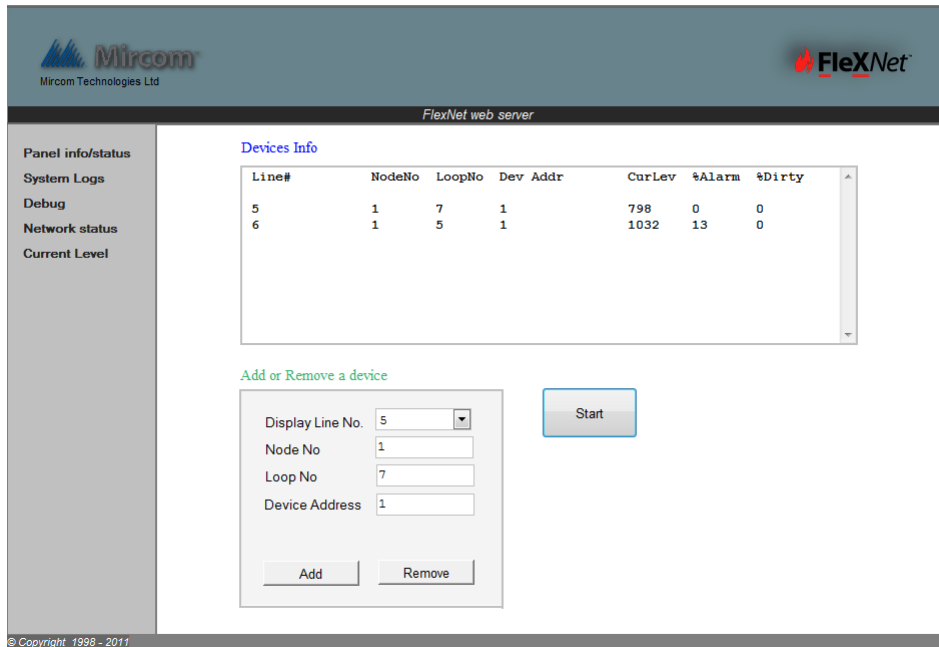
Device Table

Name	PhysAddr	Status			
BF537.1	00:04:A3:2F:0F:F9	connected			
Family	mHome	Type	IPAddress	Status	
IPv4	0	manual	192.168.0.56/24	configured	
LOOPBACK	NA	connected			
Family	mHome	Type	IPAddress	Status	
IPv4	0	manual	127.0.0.1/32	configured	

3.2.10 Current Level

The Current Level selection displays a page that can monitor individual devices. To add a device for current level monitoring:

1. Use the Display Line No. drop down to select the line for the device to be placed on.

2. Then enter the values for the node the device is on, the loop on that node it is on and the device address in the fields labelled Node No, Loop No and Device Address respectively.

3. Press Add and enter information for a second device or press Start to begin monitoring.

4. The Device Info window will update with current level readings and the percentage that the current level is at before it reaches alarm level at or beyond 100%.

4.0   BACnet

BACnet stands for Building Automation and Control NETworks (http://www.bacnet.org). It is an object-oriented communications protocol designed to consolidate different building regulation systems to allow for collective monitoring and control through a single application. Building regulation systems that can support the BACnet standard include heating, ventilation, lighting control, access control as well as fire detection and alarm systems.

The Flex-Net system is capable of interfacing with other systems that communicate through BACnet to provide centralized control and monitoring of a building's regulation systems. The BACnet protocol works by adapting different communication systems into a common communication format.

The consolidation of different communication systems is accomplished through the use of "objects". An object is defined as a collection of information related to a particular function that can be uniquely identified and accessed over a network in a standardized way. The BACnet protocol represents all information using these object data structures. Each object is defined by a set of properties.

A confusion of terminology may arise when describing Flex-Net under the BACnet model. Traditionally in the fire alarm industry the term "device" refers to things such as detectors, strobes and alarms. For BACnet implementation, the entire Flex-Net system is modeled as a "device" with many "objects". The term "objects" refers to all the fire devices, system statuses and switches connected to the Flex-Net system. This is illustrated in the figure below.
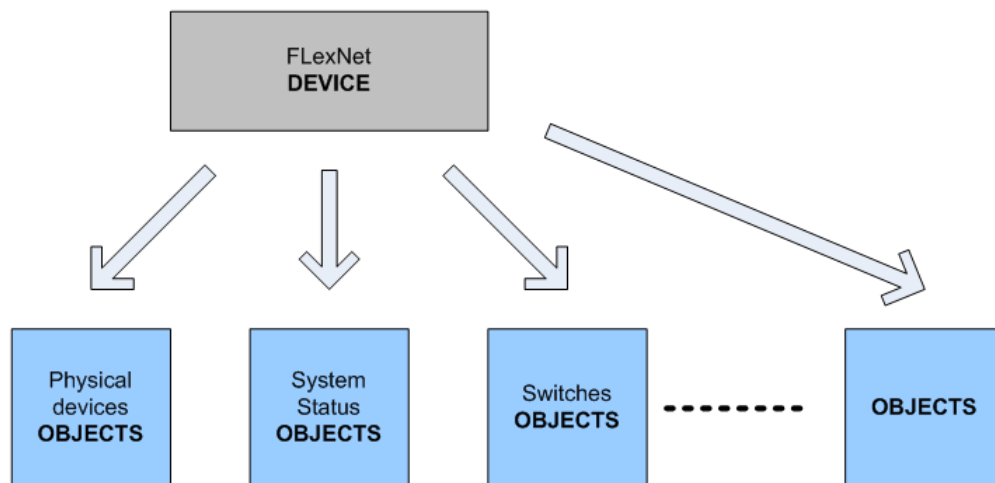
Objects are all assigned properties that help define them and allow them to be monitored and controlled. Objects can be classified into one of several different types. For example fire devices can be subdivided into categories such as binary inputs, binary outputs, analog inputs and analog outputs. In addition to an object type every object must be assigned an object identifier and an object name. Depending on the type of BACnet device that the object is associated with there will be more required properties that need to be assigned and others that are optional.

BACnet uses a peer to peer architecture where any device can send service requests to any other device. Protocol services include Who-Is, I-Am, Who-Has and I-Have for the purpose of BACnet device and object discovery. These discovery service requests can be performed by any BACnet device or object. BACnet services can provide event notifications such as troubles or input activations. The services can also request current values from the Flex-Net system.

4.1   Flex-Net Configuration for BACnet

Note that the Flex-Net system is treated as a BACnet field panel and not a workstation. It does not poll or query other BACnet field panels. Instead it replies to requests from workstations or sends out notifications of new events.

Before BACnet services can be used with the Flex-Net system, the system must be configured correctly. Network settings must first be set up as explained in 2.1 Wiring/IP Settings. The rest of the configuration is performed using the configurator. In the configurator select the node from the Job Details tree on the left to display the Network Node Info on the right.

From the Network Node Info window pane on the right select Run BACnet Services and Run TCP Services to enable BACnet. If Run BACnet Services is greyed out then a CodeMeter key must be used to activate a license using the Import BACnet Services button. Enter a Device ID and a Base ID in the fields that become available. The value for the Base ID is where object ID values will start from. To ensure that the value entered for the Device ID is outside the range of possible object IDs enter a value lower than that of the Base ID. The Device ID defines the ID of a BACnet device meaning the FACP. Refer to the figure below.
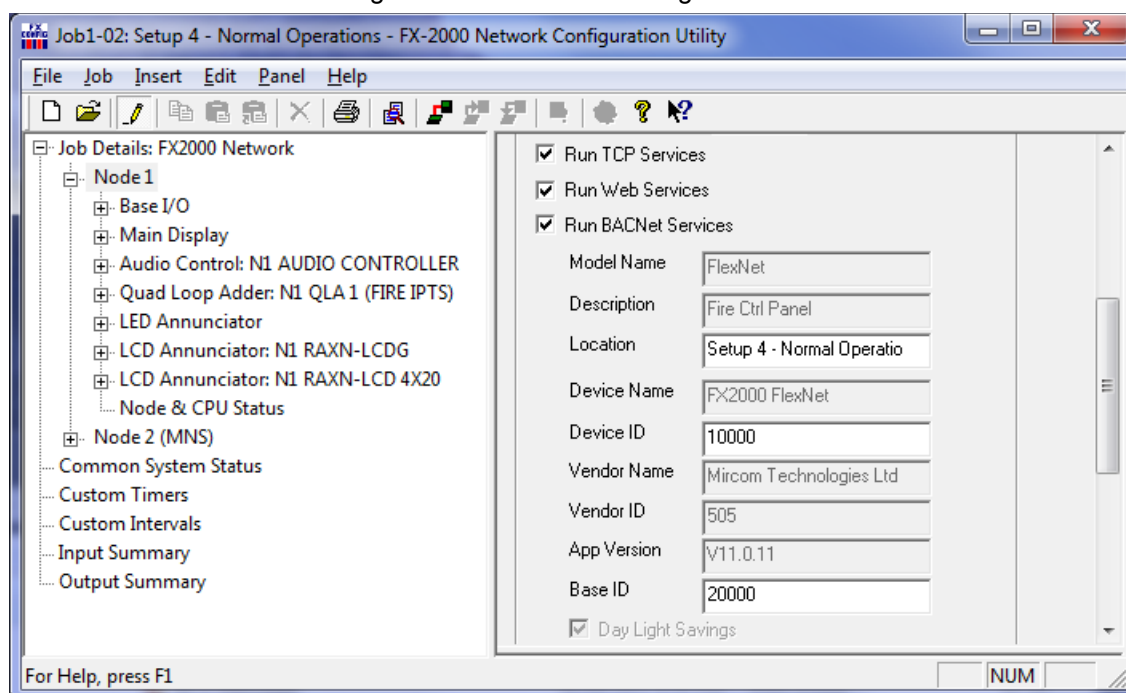
As an example, the following points describe how addresses are assigned to addressable devices by the configurator:

- The BACnet protocol specifies (2^{22} - 1) or 4,194,303 available address IDs.

- Out of these, each FACP node reserves 24,000 IDs.

- Out of these 24,000 IDs, 13,000 are reserved for physical devices and 11,000 are for statuses and switches.

- Node numbering starts from 0.

- Each node can support 7 CPUs (0-6) with 1,600 IDs available per CPU.

- Each CPU can support 4 loops (0-3) with 400 IDs available per loop.

- The method for identifying fire device address IDs is described by the following:
  Base ID + (Node# x 24000) + (CPU# x 1600) + (Loop# x 400) + Fire Device ID

This is for informational purposes only and is not intended to be used to identify objects or their location. Instead the configurator can generate a BACnet XML report that includes the address ID of each object as well as other identifying information such as node, CPU and loop number. To generate an XML report:

1. Navigate to the configurator menu bar and select the Job drop down menu. From the drop down menu select Export Job, the Export Current Job to a File window appears.

2. In this new window choose a location to save the file under the "Save in" drop down menu.

3. Enter a name for the file under the "File name" drop down menu, and select "XML files (*.xml)" under the "Save as type" drop down menu.

4. Press Save and a new window appears. In this new window select "BACnet Report - Excel" and press OK.

The report will appear as shown below. The first column will list the BACnet ID of each object in the Flex-Net system. Following this column other identifying information for the object will be listed. The **NodeNo**, **CPUNo** and **LoopNo** columns describe which Node, CPU and Loop each object exists on. The **Node Tag** and **CPU Tag** columns are descriptions of the Node and CPU respectively. The **Address** column lists the fire device address and the **Tag** column provides a description of the object. The **CktType**, **CktTypeTag** and **CktNo** columns contain information that is used internally by the Flex-Net firmware to identify the object.

	A	B	C	D	E	F	G
1	BACNET ID	CktType	CktTypeTag	CktNo	NodeNo	Node Tag	CPUNo
149	46002	0	OUTPUT CIRCUITS	2	2	Node 2 (MNS)	1
150	46003	0	OUTPUT CIRCUITS	3	2	Node 2 (MNS)	1
151	46004	0	OUTPUT CIRCUITS	4	2	Node 2 (MNS)	1
152	46005	0	OUTPUT CIRCUITS	5	2	Node 2 (MNS)	1
153	46008	0	OUTPUT CIRCUITS	6	2	Node 2 (MNS)	1
154	46012	0	OUTPUT CIRCUITS	7	2	Node 2 (MNS)	1
155	47301	0	INPUT CIRCUITS	0	2	Node 2 (MNS)	2
156	47302	0	INPUT CIRCUITS	3	2	Node 2 (MNS)	2
157	47701	0	INPUT CIRCUITS	1	2	Node 2 (MNS)	2
158	48101	0	INPUT CIRCUITS	2	2	Node 2 (MNS)	2
159	48501	0	OUTPUT CIRCUITS	0	2	Node 2 (MNS)	2

	A	G	H	I	J	K
1	BACNET ID	CPUNo	CPU Tag	LoopNo	Address	Tag
149	46002	1	Audio Control: N2.	4	2	N2 A0.0.2 15 WATT ZONE 3 AMP FIRE
150	46003	1	Audio Control: N2.	4	3	N2 A0.0.3 15 WATT ZONE 4 AMP FIRE
151	46004	1	Audio Control: N2.	4	4	N2 A0.1.0 30 WATT ZONE 5 AMP FIRE
152	46005	1	Audio Control: N2.	4	5	N2 A0.1.1 30 WATT ZONE 6 AMP FIRE
153	46008	1	Audio Control: N2.	4	8	N2 A0.2.0 60 WATT ZONE 7 AMP MNS
154	46012	1	Audio Control: N2.	4	12	N2 A0.3.0 60 WATT BACKUP AMP
155	47301	2	Quad Loop Adder:	5	101	MNS INPUT
156	47302	2	Quad Loop Adder:	5	102	4-20 MA IPT NONLATCHMNS INPUT
157	47701	2	Quad Loop Adder:	6	101	MNS INPUT
158	48101	2	Quad Loop Adder:	7	101	MNS INPUT
159	48501	2	Quad Loop Adder:	8	101	MNS OUTPUT

The object types that Flex-Net uses are binary input, analog input, multi-state input, life safety point and binary output. The following table identifies which fire devices are classified under which BACnet object types.

Object Type	Fire Device Types
Binary Input	Conventional Input, System Status, Page Select Switches, Manual Control Switches, Miscellaneous Input Circuits
Analog Input and Multi-State Input	Ion Detector, Photo Detector, Heat Detector, Laser Detector, COPTIR, 4-20mA Module, Acclimate Detector
Life Safety Point	Fire Phone, Telephone Line, Generic Input
Binary Output	Amplifier, Addressable Relay, Conventional Relay, Conventional Signal, Control

Each of these object types have an associated set of properties. These properties identify the object and the state it is in. The table below lists the properties associated with each BACnet object that are used by the Flex-Net system. Some of the properties below are static, while others are dynamic and are used to determine the state the object is in. The dynamic properties in the table are bolded.

Object Type	Binary Input	Analog Input	Multi-State Input	Life Safety Point	Binary Output
Object Properties	Object Identifier Object Name Object Type **Present Value** **Status Flags** **Event State** Out of Service Polarity Description	Object Identifier Object Name Object Type **Present Value** **Status Flags** **Event State** Out of Service Units Description	Object Identifier Object Name Object Type **Present Value** **Status Flags** **Event State** Out of Service Number of States Description State Text	Object Identifier Object Name Object Type **Present Value** **Status Flags** **Event State** Out of Service Reliability Mode Accepted Modes Silenced Operation Expected Description	Object Identifier Object Name Object Type **Present Value** **Status Flags** **Event State** Out of Service Polarity Priority Array Relinquish Default Description Active Text Inactive Text

Each dynamic object property uses different types of information to describe the state of the property. The type of information reported can also vary between different object types for the same object property. The following discussion describes the different values each dynamic object property can have for the different object types.

BINARY INPUTS: The **Present Value** property can be in one of two states: active or inactive. For the **Status Flags** property a Boolean array [_,_,_,_] is displayed with each value in the array representing the presence (1) or absence (0) of an Alarm, Fault, Override or Out of Service respectively. For example a signal of 1,1,0,0 indicates the presence of an alarm and a fault. Note that for Flex-Net override is never used. For the **Event State** property one of three states is possible: normal, fault or off normal.

ANALOG INPUTS: The **Present Value** property is represented by a raw analog value in the form of a pulse width PW4 signal. For the **Status Flags** property a Boolean array [_,_,_,_] is displayed with each value in the array representing the presence (1) or absence (0) of an

Alarm, Fault, Override or Out of Service respectively. Note that for Flex-Net override is never used. For the **Event State** property one of three states is possible: normal, fault or off normal.
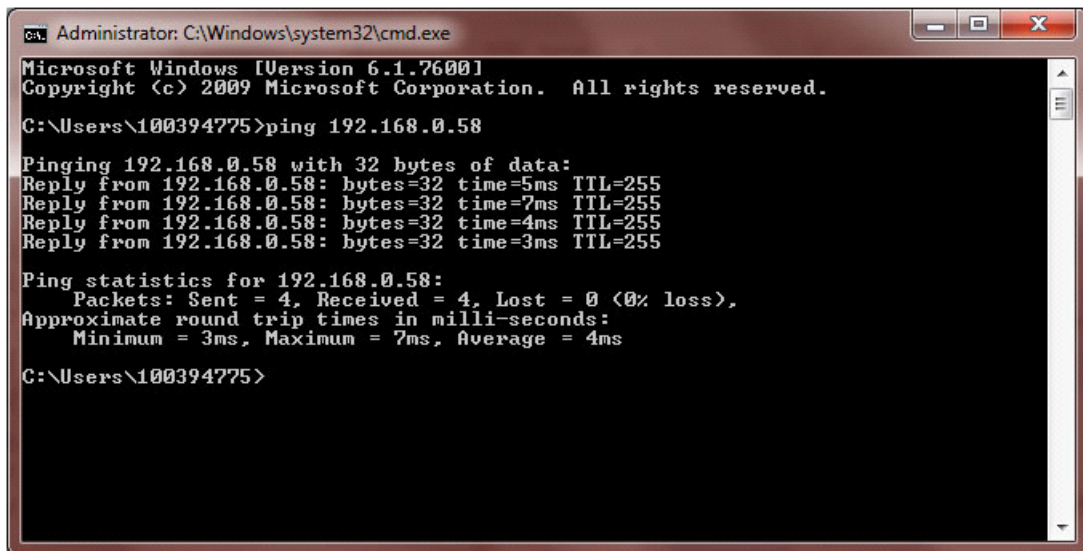
MULTI-STATE INPUTS: The **Present Value** property ranges from 0-7 and each value indicates one of the eight possible states. For the **Status Flags** property a Boolean array [_,_,_,_] is displayed with each value in the array representing the presence (1) or absence (0) of an Alarm, Fault, Override or Out of Service respectively. Note that for Flex-Net override is never used. For the **Event State** property one of three states is possible: normal, fault or off normal.

LIFE SAFETY POINTS: The **Present Value** property can be in one of three states: quiet, fault or alarm. For the **Status Flags** property a Boolean array [_,_,_,_] is displayed with each value in the array representing the presence (1) or absence (0) of an Alarm, Fault, Override or Out of Service respectively. Note that for Flex-Net override is never used. For the **Event State** property one of three states is possible: normal, fault or off normal.

BINARY OUTPUTS: The **Present Value** property can be in one of two states: active or inactive. The **Status Flags** property a Boolean array [_,_,_,_] is displayed with each value in the array representing the presence (1) or absence (0) of an Alarm, Fault, Override or Out of Service respectively. Note that for Flex-Net override is never used. For the **Event State** property one of three states is possible: normal, fault or off normal.

Now that BACnet has been enabled and configured in the job file to be sent to the panel other software can be used to monitor and interact with the Flex-Net system using BACnet.

Before attempting to connect to the Flex-Net system using BACnet software ensure that there is a network connection between the computer the software is located on and the FACP. To do this open a command prompt window using your computer. Press Start, select Run, type "cmd.exe" and press OK. In the command prompt window type "ping " followed by the IP of the FACP. If the destination host is unreachable check the network connection and make sure that the computer and the FACP are on the same subnet with different IPs.

```
Administrator: C:\Windows\system32\cmd.exe

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\100394775>ping 192.168.0.58

Pinging 192.168.0.58 with 32 bytes of data:
Reply from 192.168.0.58: bytes=32 time=5ms TTL=255
Reply from 192.168.0.58: bytes=32 time=7ms TTL=255
Reply from 192.168.0.58: bytes=32 time=4ms TTL=255
Reply from 192.168.0.58: bytes=32 time=3ms TTL=255

Ping statistics for 192.168.0.58:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 7ms, Average = 4ms

C:\Users\100394775>
```

4.2   CAS BACnet Explorer

There are many applications that can interface with BACnet devices. Three of these programs will be described. The first program is called CAS BACnet Explorer. This program is useful for testing, debugging and discovering BACnet networks and devices. The program can be downloaded from the internet from: http://www.chipkin.com/cas-BACnet-explorer but it requires a license to use. The license comes in the form of a USB key which must be plugged into the computer the software is being used on. When installing the software the installer will prompt for the installation of WinPcap. Allow this to install as it is part of the CAS BACnet Explorer package.

Once CAS BACnet Explorer is installed start the program. Some settings require configuration:

1. Press the Settings button and a Settings dialogue box will appear.

2. In the Settings dialogue box press the Network tab on the left and check the BACnet IP and the BACnet Ethernet check boxes.

3. Select the network card being used and then press OK.

The Discover function of the program identifies all objects associated with the Flex-Net system. These objects include inputs, outputs, switches and system statuses. This function is useful for confirming the presence and availability of all the objects associated with the FACP and it must be performed before any FACP devices can be monitored.

1. Press the Discover button and a Discover dialogue box will appear.

2. Ensure that all check boxes on the left are selected. Select the All check box beside the Network field.

3. In the Low Device Instance field enter the Device ID of the FACP that was set in the configuration.

4. In the High Device Instance field enter a value one greater than the Device ID. Setting this range ensures that only objects associated with the FACP will be discovered.

5. Press Send to begin the discovery process.

Note that sometimes the software will report errors while discovering, this will not affect the outcome of the discovery. Once the discovery is complete the main window should display a populated tree consisting of all the objects associated with the FACP. If the list does not appear or is incomplete repeat the discovery process with all options selected.

The CAS BACnet explorer can also be used to monitor any changes in the properties of any of the objects associated with the FACP. Once objects have been discovered the populated tree can be expanded and individual objects can be selected. Each object can be expanded to view its parameters and properties. To monitor an object right click on it and select "Add this object to monitor list". Repeat this for each object that needs to be monitored.

Objects will be monitored using default properties however the list of default properties may not included all required properties. To set properties to be monitored click on the settings icon and the Settings window appears. Use the Add and Remove buttons to select properties. Press OK to confirm the settings.

Once objects and properties to be monitored are selected press the Monitor button in the main window. All the objects to be monitored will be displayed in a new window titled Monitor List. This window will display any changes in properties as they happen in real time.

4.3 Visual Test Shell

The Visual Test Shell (VTS) is an application that is able to monitor BACnet objects and communicate with BACnet devices to acknowledge alarms. It is freeware and can be downloaded from: http://sourceforge.net/projects/vts/. Once the zip file package has been downloaded extract the files and launch the application using the executable VTS.exe. Note that WinPcap must be installed in order for the VTS application to launch.
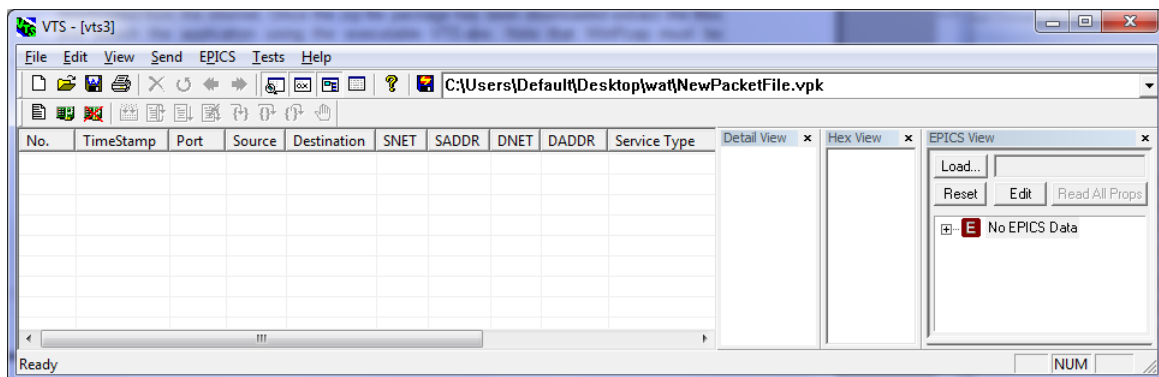
4.3.1 Configuring Device, Port and Name Settings

1. From the taskbar select Edit then select Device. The Device Configuration window appears.

2. Enter a name for the BACnet device in the Name field and its Device ID in the Instance field.

3. Press OK to confirm your settings.

4. From the task bar select Edit then select Ports. The Port Configuration window appears.

5. Press the New button and in the Name field enter a name for the port.

6. Select the Enable check box and use the Network drop down box to select the device that was configured in the Device Configuration window.

7. Press the IP tab and ensure that the Interface drop down box displays the correct network adapter.

8. Press OK to confirm your settings.

9. From the task bar select Edit then select Names. The Names window appears.

10. Press the New button and set the Address Type to Local Station if the FACP is on the same subnet.

11. Use the Port drop down box to select the port created using the Ports menu. Enter a name for the FACP. Enter the IP address assigned to the FACP in the configuration in the Address field along with the port number.

12. Press OK to confirm your settings.

4.3.2 Setting up Filters

Navigate to the Edit menu and select either Capture Filter or Display Filter. The setup for each filter type is the same, the difference being that the display filter changes what is displayed and does not affect the log file while the capture filter directly affects what appears in the log file. To create a new filter:

1. Click the New button in the Filters window.

2. Select options for accepting or rejecting packets and set the Port, Address and Address Type as before in 4.3.1 Configuring Device, Port and Name Settings.

3. Press OK to confirm your settings.

4.3.3 Acknowledging Alarms

1. Navigate to the menu bar and select Send. From the drop down menu navigate to Alarm and Event then Acknowledge Alarm. The Acknowledge Alarm dialogue box will appear.

2. The majority of information to be filled in under the Acknowledge Alarm tab is only for log file purposes and can be replaced with placeholder information. For the Acknowledging Process Identifier, Event Object Identifier and Acknowledgement Source fields enter placeholder text such as "1".

3. Press both Time Stamp buttons and the Time Stamp window appears, enter placeholder text such as "1" in the Time field for both windows and press OK.

4. For the Event State Acknowledged drop down select normal.

5. Select the IP tab in the Acknowledge Alarm window and select the destination FACP using the Destination drop down menu.

6. Press Send to Acknowledge the alarm.

4.3.4 Monitoring Objects

Objects can be monitored by retrieving the current value of any property associated with an object. This is accomplished by sending read property commands. To send a read property to the FACP:

1. Navigate to the menu bar and select Send. From the drop down menu navigate to Object Access then Read Property. The Read Property dialogue box will appear.

2. Under the Read Property tab press the ID button beside the Object ID field. The Object ID dialogue box appears.

3. In this dialogue box select the Object Type using the drop down menu and enter the object's BACnet ID under the Instance field. This is the ID described by the expression in 4.1 Flex-Net Configuration for BACnet.

4. Press OK and switch to the IP tab in the Read Property dialogue box.

5. Select the destination FACP using the Destination drop down menu.

6. Press Send to send the read property request. The request should be responded to by the FACP with information about the object in the main VTS window.

4.4 Wireshark

Wireshark is an application that monitors and analyzes network packets. As streams of data pass through a network the application captures the data and decodes the information contained therein. This function can be used to troubleshoot and analyze network information. The software is free and can be downloaded from http://www.wireshark.org/download.html. Once the software is installed run the Wireshark application. From the menu bar select Capture and from the drop down menu that appears select Interfaces. A new window will appear where the network device being used can be selected. Select the appropriate network card and press Start.

All packets traveling through the network will now be monitored and displayed in the main application window. To monitor BACnet packets only type "bacnet" into the filter field below the menu bar and press Enter on your keyboard. Now only BACnet packets will be shown and all other network traffic will be filtered out.
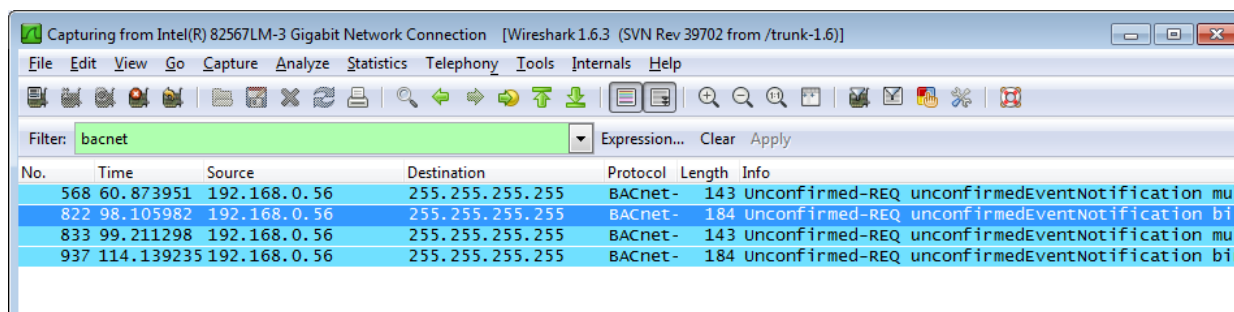
Select any packet to view details on its contents. The information in these packets can now be used for troubleshooting or debugging purposes.

5.0   Job Details XML Report

The job details XML is a representation of the job created in the configurator. It contains all the CPUs and fire devices that make up the job as well as the correlations between them. The XML format allows the job configuration to be read by a wider range of applications and provides an alternative way to present the details of the configured job.

5.1   Generating an XML Report

1. Navigate to the configurator menu bar and select the Job drop down menu. From the drop down menu select Export Job, the Export Current Job to a File window appears.

2. In this new window choose a location to save the file in under the "Save in" drop down menu, enter a name for the file under the "File name" drop down menu, and select "XML files (*.xml)" under the "Save as type" drop down menu.

3. Press Save and a new window appears. In this new window select "Job Details". Select the types of correlations to include in the job details XML by selecting from the check boxes and press OK to generate and save the file.
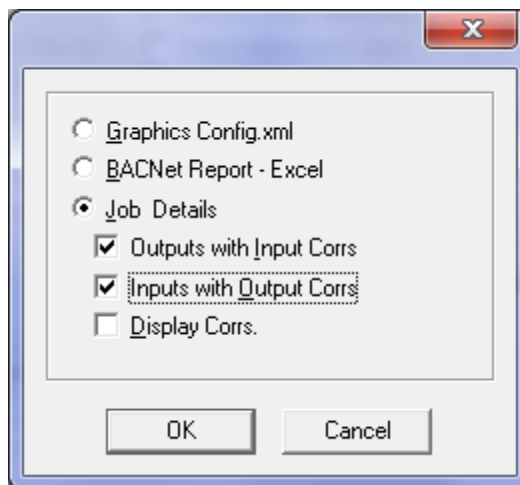
6.0 Mass Notification System Introduction

The Flex-Net Mass Notification System (MNS) allows announcements and notifications to be made to the occupants of a facility. It is intended for notification outside of regular fire evacuation messages and signals. The MNS is able to override the fire control system in case there is a need to communicate higher priority information. Conversely, it is possible for the fire control system to have communication priority over MNS.

The MNS comes integrated with the fire control and monitoring system. A single MNS panel can display both MNS and fire events but each type of event will appear separately on different annunciator displays. The modules on the MNS panel used for MNS and fire functionality are arranged independently from each other and are accessed via two separate doors on the same panel. Refer to the figure below.
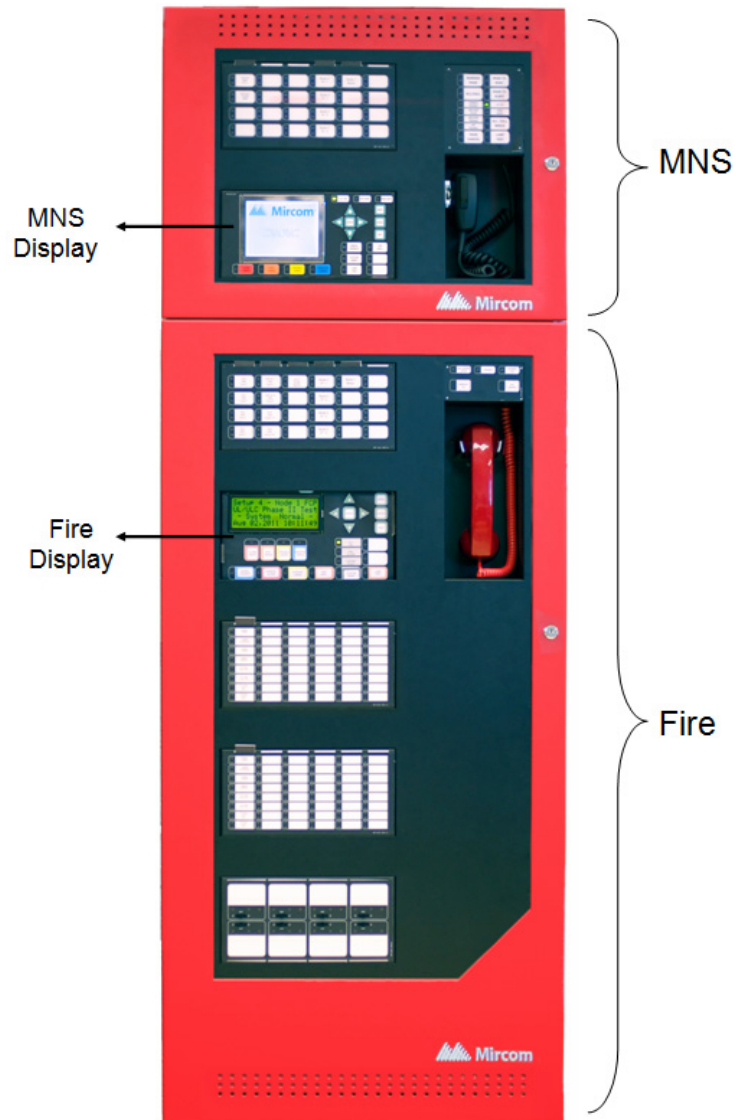
Even though the MNS panel has a fire monitoring component, fire devices cannot be controlled by the MNS panel. Inputs for the MNS and the fire control system must reside on loops connected to their respective nodes.

MNS and the fire control and monitoring systems exist together on a single network, but it is required that they be grouped separately on a software level. The input and output devices for fire and MNS must be assigned to different zones and these zones must be in different groups. Since input zones cannot activate outputs directly across a group, the MNS input zones will not activate fire output signals and fire input zones will not activate MNS output signals.

To assign a group to a node select the node in the configurator using the Job Details tree on the left. Create a new group or add it to an existing group by using the Network Node Info window that appears on the right. Once the node has been assigned to a group membership, common control switches such as system reset and total evacuation should be assigned to the appropriate groups. This can be accomplished by selecting the node group that the switch has been assigned to and selecting the appropriate group.

However, sometimes inputs from one group require the use of hardware present in a different group. For example, the fire group may have inputs that require the use of amplifiers present in the MNS panel. To communicate to the output zone across a group, virtual zones must be used.

A virtual zone is a zone that is not correlated to any physical devices but is instead used to communicate across groups through the use of advanced logic. Virtual zones are local to the group that contains the outputs they intend to signal. They can monitor inputs across groups and activate their associated outputs if the required conditions are met. The advanced logic that drives these virtual zones consists of Boolean equations.

However, there may be situations where conflicts can occur. For example, two inputs may attempt to activate the same output simultaneously. This is remedied by assigning priority to either MNS or fire such that one will take precedence over the other. For example, if MNS has a higher priority and a fire input is activated first then the fire output will remain active until an MNS input is activated in which case the MNS output will take over and silence the fire output. Fire output will resume to completion once the MNS output is cleared. Refer to the supplementary diagram below.

FIRE GROUP PRIORITY LEVEL 1

Fire Input
- Manual Stations
- Switches
- Detectors

Fire Zone

Output Hardware
- Speakers
- Horns
- Strobes

MNS Virtual Zone

Advanced Logic Equations

MNS GROUP PRIORITY LEVEL 2

Fire Virtual Zone

MNS Input
- Manual Stations
- Switches
- Other

MNS Zone

Output Hardware
- Speakers
- Horns
- Strobes
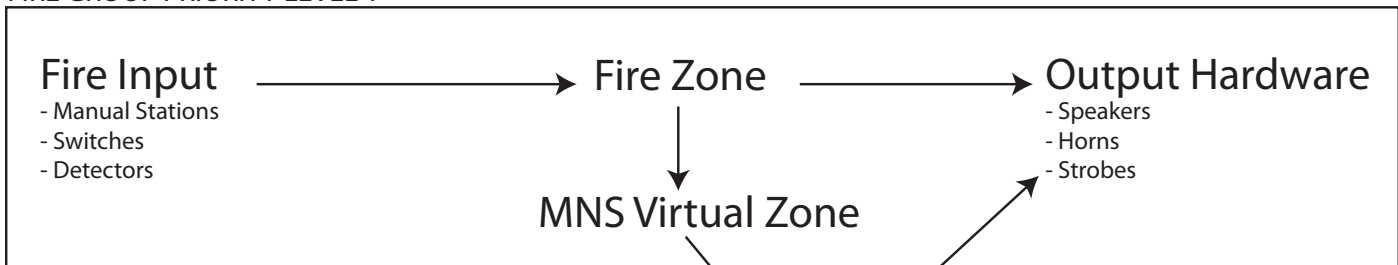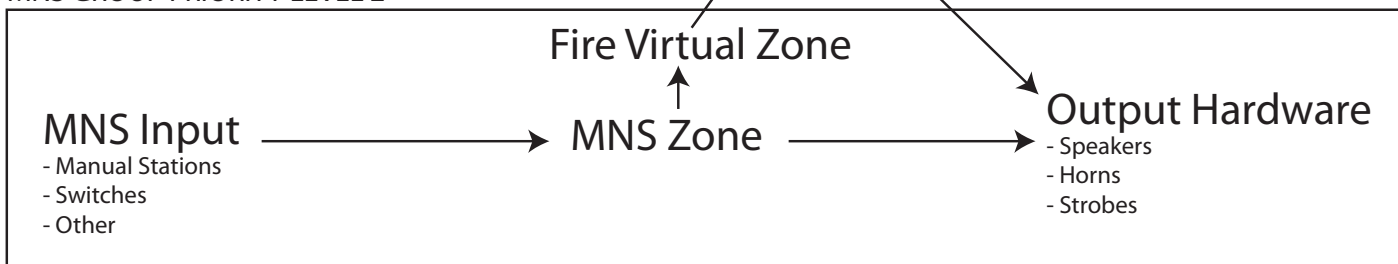
7.0 Boolean Equations for Mass Notification

Boolean equations are used to control the virtual zones that drive the activation of outputs across groups. Using the Advanced Logic Editor dialog, an equation can be composed and applied to an output circuit or a local input zone. This is done by specifying any number of local and remote inputs zones and local input circuits (operands) and Boolean expressions (operators).

When the result of the equation from an evaluation of the TRUE/FALSE state of all inputs is TRUE the associated output will be energized. Note that applying an equation directly to an output bypasses all of the regular input to output correlation processing.

Also note that the use of advanced logic does not modify the code at an executive level. These equations are parsed and checked for syntax before being sent to the panel. The virtual input is correlated to signals or other outputs as usual and the standard fire alarm processing is performed by the executive control routine.

7.1 Advanced Logic Editor

The following image is a screen capture of the Advanced Logic Editor dialogue.
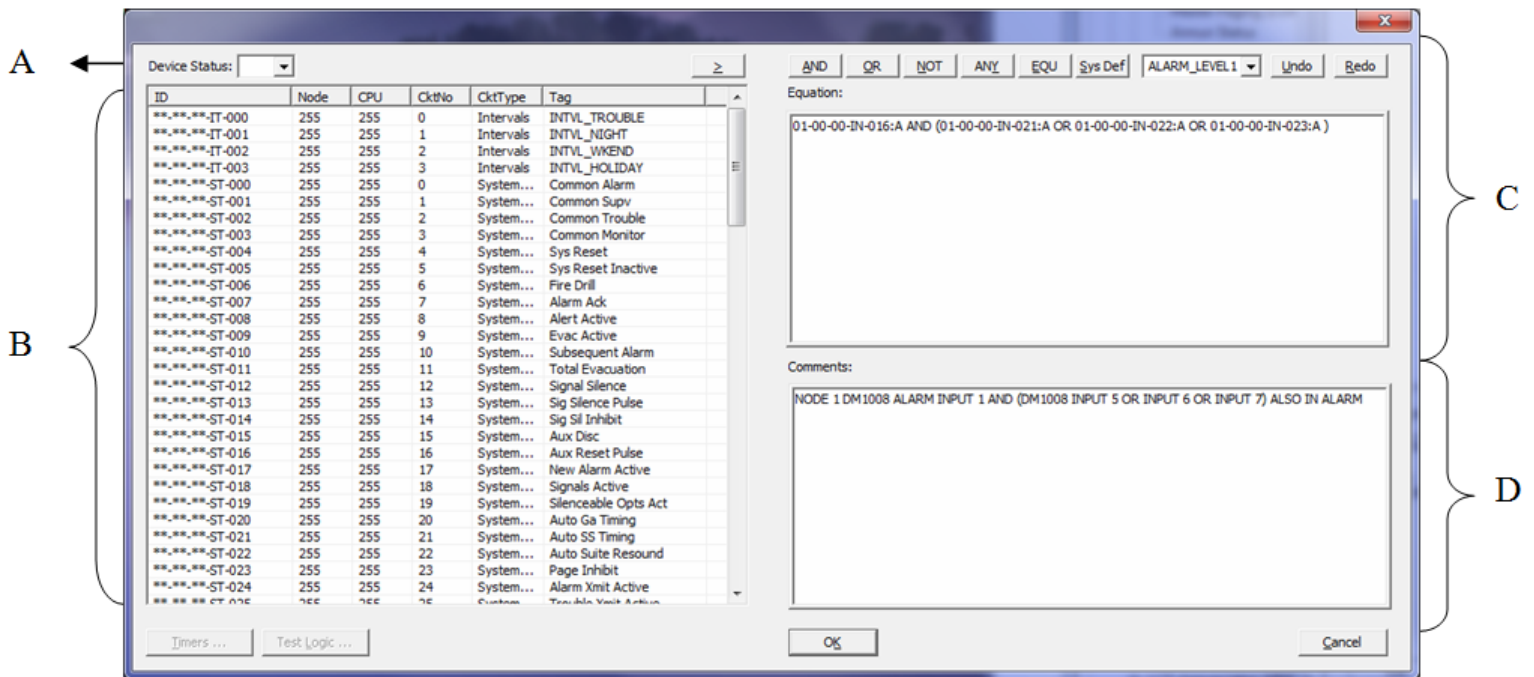
A - Device Status ‖ B - Eligible Input List ‖ C - Equation Dialogue Box ‖ D - Comment Box

To access the Advance Logic Editor select any zone or output such as a relay and click the Advanced Logic tab in the bottom right window then press the Edit button. The Advanced Logic Editor dialogue appears.

7.1.1 Device Status

The Device Status allows a user to apply a mask to any device. Masks include:

":A" – Alarm

":B" – Bypass

":F" – Fault

":L" – Level

If a mask is applied to a device then the equation will only become TRUE when the specific status changes. For Example "07-02-01-IZ-001:B", this alarm zone will only become TRUE when this zone is bypassed.

To apply a mask, use the drop down and select the desired mask before moving the input into the Equation Dialog Box. If no mask is applied, any change in status will result in the equation becoming TRUE.

7.1.2 Eligible Input List

A list of all eligible inputs that can be referenced by equations. The list consists of local input circuits and zones, remote zones, intervals, timers, and switches.

The ID column lists identification values for all eligible inputs. An ID is assigned to each input, interval, timer, or switch to aid in identification when referenced in the equation dialog. The address of each is used to structure the ID.

The ID is structured in the following manner:

Node No._CPU No._Loop No._CKt Type_CKt No.

Node No. – The numerical value assigned to the node.

CPU No. – The numerical value assigned to the CPU within the node

Loop No. – The numerical value assigned to the SLC where the device is physically connected, if applicable

CKt Type – The circuit type. This is used to distinguish between an input circuit, zone, interval, timer or status. The following are the abbreviations used for each circuit type:

> IN – Input circuit
>
> IZ – Input zone
>
> SW – Switch
>
> ST – System status
>
> IT – Interval
>
> TM – Timer

CKt No. – The numerical value assigned to each status, switch, timer, interval, zone or input by the Flex-Net Configurator

A double asterisk "**" is used if there is no applicable value for certain ID components such as a Loop No. for a system status.

The Node and CPU columns list the numerical value of the node pertaining to each input device or zone. A default value of 255 is applied to system statuses, control switches, timers, and intervals as they are global inputs which apply to the entire network.

The Ckt No column consists of numerical values assigned by the Flex-Net Configurator to each input.

The Ckt Type column identifies the type of input. Inputs can vary from system statuses, switches, intervals, timers, input devices, and input zones.

The Tag column includes a general description of each input that helps identify it. This aids in constructing an equation.

7.1.3 Equation Dialog Box

The Equation Dialog Box is where the logic equations are structured. To insert an input, select the input from the Eligible Input List and click the > button above the list.

To insert an operand, select the appropriate button above the Equation Dialog Box. To insert a System Define, use the drop down to select the appropriate system define and then click the Sys Def button. The Undo button removes the last change to the equation. The Redo button reapplies the last removed change to the equation.

7.1.4 Comment Box

The comment box is used to attach comments to the advanced logic equation. Comments are important for quickly explaining the intended function of an equation. This will allow for easier troubleshooting and quicker review of the configuration later on.

7.2 Advanced Logic Example
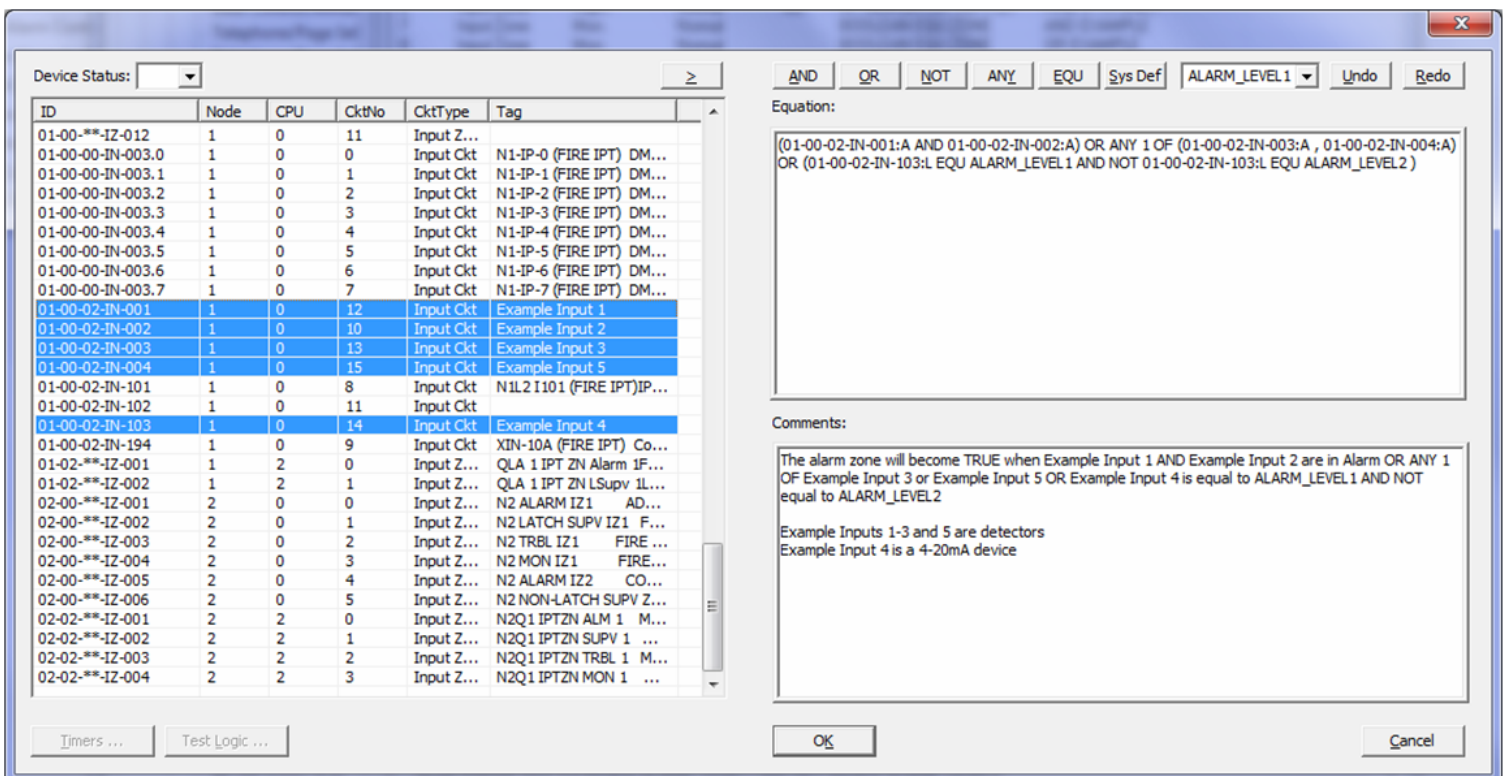
7.2.1 Objective

To create an advanced logic equation using a combination of operators. The advanced logic equation will be part of a virtual input zone. It will reference inputs that exist in a separate group from the equation's virtual input zone. This virtual input zone will be referenced by an output in its group that will activate when the equation that drives the zone becomes true.

7.2.2 Procedure

1. Create an alarm input zone in the same group as the outputs that are to be activated. Tag the zone "Virtual Alarm Zone 1".

2. Create three input devices and tag them appropriately.

3. Select the alarm input zone and then select the Advanced Logic tab. Click the Edit button and the Advanced Logic Dialog Box appears.

4. Select the Device Status mask ":A" for alarm.

5. Select the device tagged Example Input 1 and the device tagged Example Input 2 by holding down the CTRL key and press the **AND** operator. Complete with brackets.

6. Press the **OR** operator

7. Select the devices tagged Example Input3 and Example Input 5 by holding down the CTRL key followed by the **ANY** operator. The number in the **ANY** operator can be modified to require more than 1 input state to become true. Change this value to 2.

8. Press the **OR** operator and insert an open bracket.

9. Select the Device Status mask ":L" for level.

10. Select the device tagged Example Input 4 and press the chevron [≥] button.

11. Press the **EQU** operator then select ALARM_LEVEL1 and press the **Sys Def** operator.

12. Press the **AND** operator and then press the **NOT** operator.

13. Select the device tagged Example Input 4 and press the chevron button.

14. Press the **EQU** operator then select ALARM_LEVEL2 and press the **Sys Def** operator.

15. Insert a close bracket.

16. Add a comment in the comment box and press OK.

The alarm zone will become TRUE when Example Input 1 AND Example Input 2 are in Alarm OR ANY 1 OF Example Input 3 or Example Input 5 OR Example Input 4 is equal to ALARM_LEVEL1 AND NOT equal to ALARM_LEVEL2. Example Inputs 1-3 and 5 are detectors and example Input 4 is a 4-20mA device.

17. Select an output in the same group as the virtual zone, right click on it and Add Correlations.

18. Select the virtual input zone and press Add. This output will now activate every time the virtual input zone activates due to the equation being satisfied.

8.0 Digital Messages

Digital messages can be created in the Job Details section of the configurator. To create a digital message go to the Audio section of the Job Details window and press the Set Up button. The Audio Setup window appears. In this window press the Manage Messages button.

The Manage Messages menu lists each of the digital messages that can be used for the job being configured. A new digital message can be created and added to the list using the Add button. An existing digital message can be modified by selecting it and pressing the Edit button. A digital message can be deleted from the list by pressing the remove button.

In the Manage Messages window press the Add button or select a message to edit then press the Edit button. Refer to the figure below.
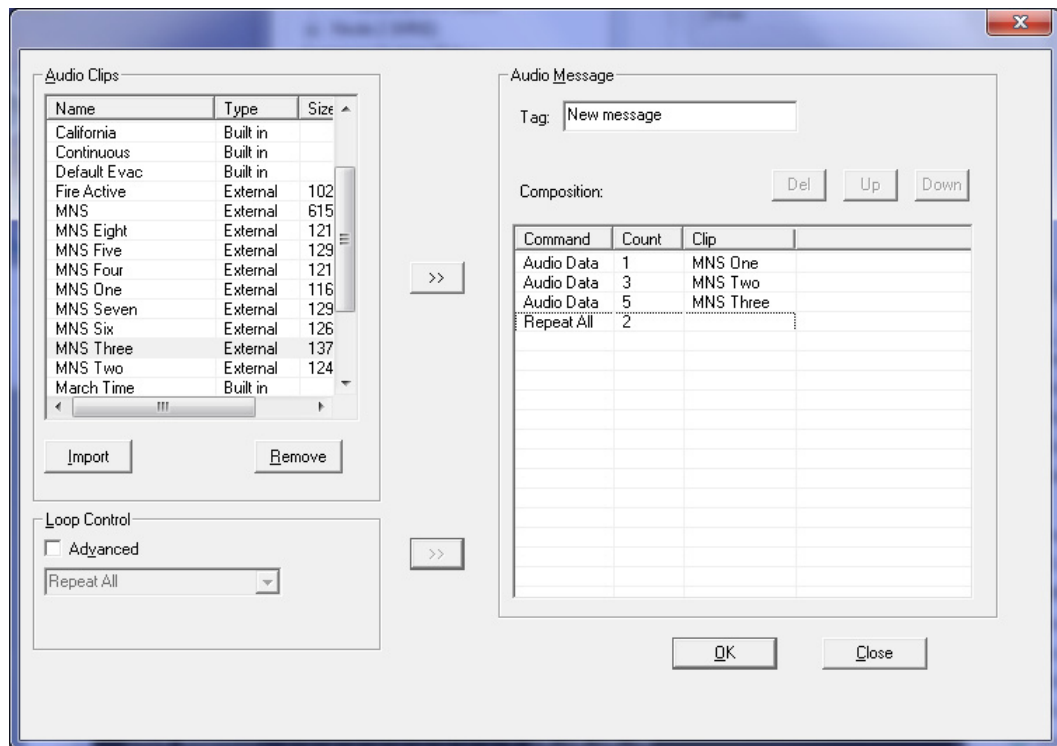
In the new window either press the Import button and select an audio file to include in the message or select an audio clip from the files already imported into the Audio Clips menu. All audio files must be in .wav format. The .wav format must be sampled at 11.025 KHz, 16-bit mono, ADPCM 4-bit. This format is suited for compressing voice. Alternatively, PCM (RAW) 16-bit mono can be used for non-voice messages such as a whoop signal or sweep. A program called Audacity is able to convert most audio file formats into the required .wav format. The software is freeware and can be downloaded from http://audacity.sourceforge.net/.

Once an audio clip has been imported into the Audio Clips list it can be used to compose a message. A message can be composed out of a single or out of multiple audio files. Select the audio clip and move it over to the Composition list by pressing the dual chevron button beside the Audio Clips list. The audio files in the Composition list can be reordered by selecting them in the list and pressing the Up and Down buttons. The audio clips can be removed from the Composition list by selecting them and pressing the Del button. An audio clip can also be set to repeat a certain number of times, to do this double-click on the count column beside the audio clip in the Composition list and enter the number of times to repeat it. The entire

composition can also be set to repeat by pressing the dual chevron button beside the Loop Control menu.

More advanced methods of ordering audio files in a composition exist. Check the Advanced option under Loop Control to enable it. With Advanced mode selected the Loop Control drop down now has 4 loop levels that can be applied to audio clips in a nested loop format. The Advanced mode also adds the Seq and Loop Base columns to the Composition window on the right.

The inner most loop command is the highest loop level used in the composition. As audio clips and loop commands are added to the composition they are given a sequence number in the Seq column starting from 0. Loop commands are applied to audio clips above them starting from the sequence number specified in the Loop Base column. Loop commands that are at an outer level compared to the inner most used loop are applied to the entire composition above that contains inner level loops. Loop levels and audio clips can be reorganized in the composition window using the Up and Down buttons. They can be removed using the Del button. Enter a name for the audio message in the Tag field and press OK to finalize the composition, add it to the list of messages and to exit the menu. Refer to the figure below where the entire composition is repeated once more.
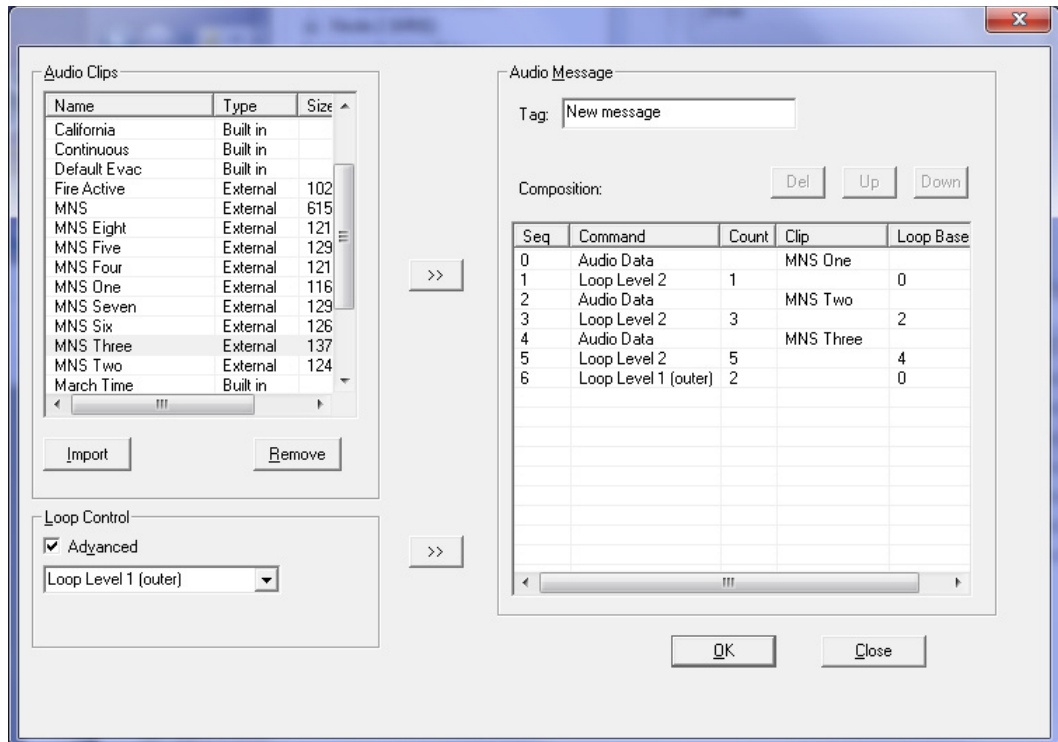
9.0   Relay Pulsing

Relay pulsing may be required for various setups where a relay will turn ON (close) and then OFF (open) after a single switch press. An example of relay pulsing is to activate a pre-recorded digital message using the first pulse and then to deactivate the message with the second pulse, simulating a maintained switch.

9.1   Relay Pulsing Sequence

The sequence is initiated by either a switch or input circuit changing to an active state. The changing of state from standby to active satisfies the first condition resulting in an input zone tagged "Latch A" to become active and maintain its state. Maintaining the state or latching is performed through advanced logic. See 10.0 Zone Latching.

Once "Latch A" is active, a timer called "Latch A Timer" is started. The timer is used to turn ON the output relay once it starts running. Once the timer expires, the output relay will turn OFF. Therefore, the timer is usually set for a short period of time in order to simulate a pulse such as 3 seconds.

The second pulse is generated by the second press or the input circuit changing state to inactive standby. This will satisfy the second condition and activate "Latch B". "Latch B" will start a second timer called "Latch B timer" in a similar manner as before. This will pulse the relay for the second time.

9.2   Producing a Relay Pulsing Sequence

1. Create a monitor input zone. This zone will be activated based on the status of the switch or input circuit. It will also be referenced in the advanced logic equations for both latching zones. Tag the zone appropriately such as "Input Switch"

2. Create two (2) timers; Latch A timer and Latch B timer. Specify a time in seconds, for example 3 seconds. Tag each timer appropriately

3. Create another monitor input zone. This zone will be "Latch A". Highlight the zone and select the advanced logic tab. Create an equation as shown:

    01-00-**-IZ-007 OR (01-00-**-IZ-011 AND NOT **-**-**-TM-021 EQU TIMER_EXPIRED)

    Where,
    01-00-**-IZ-007 – Input Switch Zone
    01-00-**-IZ-011 – Latch A Zone
    --**-TM-021 – Latch B Timer

    Note – Latch B timer is referenced in the equation in order to un-latch the zone during the second pulse

4. Create another monitor input zone. This zone will be "Latch A". Highlight the zone and select the advanced logic tab. Create an equation as shown:

    --**-TM-020 EQU TIMER_EXPIRED AND (NOT 01-00-**-IZ-007 OR 01-00-**-IZ-012)

    Where,
    --**-TM-020 – Latch A Timer

01-00-**-IZ-007 – Input Switch Zone
01-00-**-IZ-012 – Latch B Zone

5. Highlight Latch A Timer and click the edit button for Advanced Logic. Select the Latch A Zone. This will start the timer once the Latch A Zone becomes active.

6. Highlight Latch B Timer and click the edit button for Advanced Logic. Select the Latch B Zone. This will start the timer once the Latch B Zone becomes active.

7. Highlight the output relay and select the Advanced Logic tab. Create an equation that will be true if either Latch A Timer or Latch B Timer is running.

   --**-TM-020 EQU TIMER_RUNNING OR **-**-**-TM-021 EQU TIMER_RUNNING

   Where,
   --**-TM-020 – Latch A Timer
   --**-TM-021 – Latch B Timer

8. Correlate the input ckt or switch to the monitor zone "Input Switch". If multiple switches are to be used, an equation can be added to the monitor zone to reduce interference between switches. Refer to the example below:

   01-00-00-IN-008 AND NOT ANY 1 OF (01-00-**-IZ-007 , 01-00-**-IZ-009 , 01-00-**-IZ-010)

   Where,
   01-00-00-IN-008 – Input ckt 1
   01-00-**-IZ-007 – Input Switch 2
   01-00-**-IZ-009 – Input Switch 3
   01-00-**-IZ-010 – Input Switch 4|

   This equation is optional however this will reduce interference between switches. For example, if the first switch is pressed generating the first pulse and then, while switch 1 is maintained, switch 2 is pressed. This could cause issues if the pulses were turning ON/OFF digital messages as the first message would be overridden

10.0   Zone Latching

Zone latching is a useful technique that can be applied to latch normally non-latching zones such as monitor, trouble, and non-latching supervisory zones. Latching zones can be used to maintain outputs or timers even if the original input is no longer active.

An example of when a latching zone is used would be to add a strobe delay for a period of time after a page has occurred. The input being the page active status would initially activate a zone. This zone is correlated to the output strobes that would activate with the activation of the zone. However, the zone would need to remain active once the page active status is deactivated therefore latching the zone is required. A timer can also be used to unlatch the zone upon expiring.

10.1 Zone Latching Sequence

The basic sequence involves an initiating device, status, or zone and the zone used to latch itself. The "latching zone" must have multiple methods of becoming active, either by the activation of the initiating device/status/zone or by the "latching zone" itself. This is done through advanced logic. Refer to the example below.

The equation shown is specified in the advanced logic tab of the latching zone, 01-00-**-IZ-011

01-00-00-IN-007 OR 01-00-**-IZ-011

01-00-00-IN-007 – Initiating device
01-00-**-IZ-011 – Latching Zone

Note: the latching zone is referenced in the advanced logic equation for the latching zone. This allows the zone to latch itself.

Once the initiating device becomes active, the latching zone will become active as the advanced logic equation would be satisfied. If the initiating device becomes de-active or is restored, the latching zone will remain active as the equation would still be satisfied. Thus the zone is latched. A system reset would be required to unlatch the zone similar to a normally latching zone such as alarm.

By modifying the advanced logic equation with a timer, the latch can be set to unlatch upon the expiration of the timer. For example,

01-00-00-IN-007 OR (01-00-**-IZ-011 AND NOT **-**-**-TM-021 EQU TIMER_EXPIRED)

The equation would remain satisfied as long as timer 21 does not expire. Upon expiration of timer 21, and the initiating device is restored, the equation will no longer be satisfied and the latching zone would be restored.

10.2 Producing a Zone Latching Sequence

1. Create an initiating device. This can be a monitor zone, input circuit, or a status such as All Call.

2. Create a non-latching zone such as a monitor zone. This will be used as the "Latching" zone.

3. Highlight the "Latching" zone, and select the Advanced logic tab.

4. Create an equation that will activate the "Latching" zone by the initiating zone, input, or status OR by the "Latching" zone itself.

   Advanced Logic Equation shown for the "Latching" zone, 01-00-**-IZ-011

   --**-SW-017 OR 01-00-**-IZ-011
   --**-SW-017 – All Call Common switch
   01-00-**-IZ-011 – Latching Zone

   The Latching Zone, 01-00-**-IZ-011, will latch once the All Call switch is activated. If the All Call is restored, the latch will remain latched until a system reset is initiated.

11.0 Autonomous Control Unit and Local Operating Consoles

The Flex-Net Mass Notification System (FX-MNS) interfaces with the user through the use of the Autonomous Control Unit (ACU) or any one of multiple Flex-Net Local Operating Consoles (FX-LOCs). Each FX-LOC is located remotely from the main FX-MNS panel allowing messages to be sent from multiple locations in a building. The ACU and FX-LOCs are able to monitor FX-MNS events and can broadcast announcements and pre-recorded digital messages throughout a building.

Each FX-LOC contains switching and input module combination to broadcast pre-recorded digital messages. The ACU contains a switch adder module to broadcast pre-recorded digital messages. In addition to this each unit contains a paging module to broadcast announcements and a display to monitor FX-MNS events.

11.1 Broadcast Priority

Broadcasting announcements or digital messages using an ACU overrides any broadcast already in progress by an FX-LOC. Broadcasting announcements or digital messages using an FX-LOC occurs on a first come first serve basis between the different FX-LOC terminals. If one FX-LOC is being used to broadcast, another FX-LOC cannot be used until the first is no longer in use. The following list identifies broadcast priorities from highest to lowest.

1. ACU announcement via paging microphone

2. ACU highest priority digital messages (priority is set on a software level)

3. ACU lowest priority digital messages (priority is set on a software level)

4. FX-LOC announcement via paging microphone

5. FX-LOC highest priority digital messages (priority is set on a software level)

6. FX-LOC lowest priority digital messages (priority is set on a software level)

11.2 ACU and LOC Configuration

The paging microphone for the ACU connects directly to the main board through a ribbon cable connection and is given priority over the FX-LOC paging microphones and all digital messages on a firmware level.

The ACU broadcasts digital messages using an IPS switch adder module. Each button on the switch adder module can be configured as a zone switch in the configurator. For each zone switch a priority level can be assigned and a digital message can be attached. The switch adder module takes precedence over the switching and input module combination used by the FX-LOC. For example, a priority of 10% assigned to a zone switch on the IPS switch adder module used by the ACU will have a higher priority than a priority of 90% assigned to a zone correlated to the input module used by the FX-LOC. Refer to the figure below.
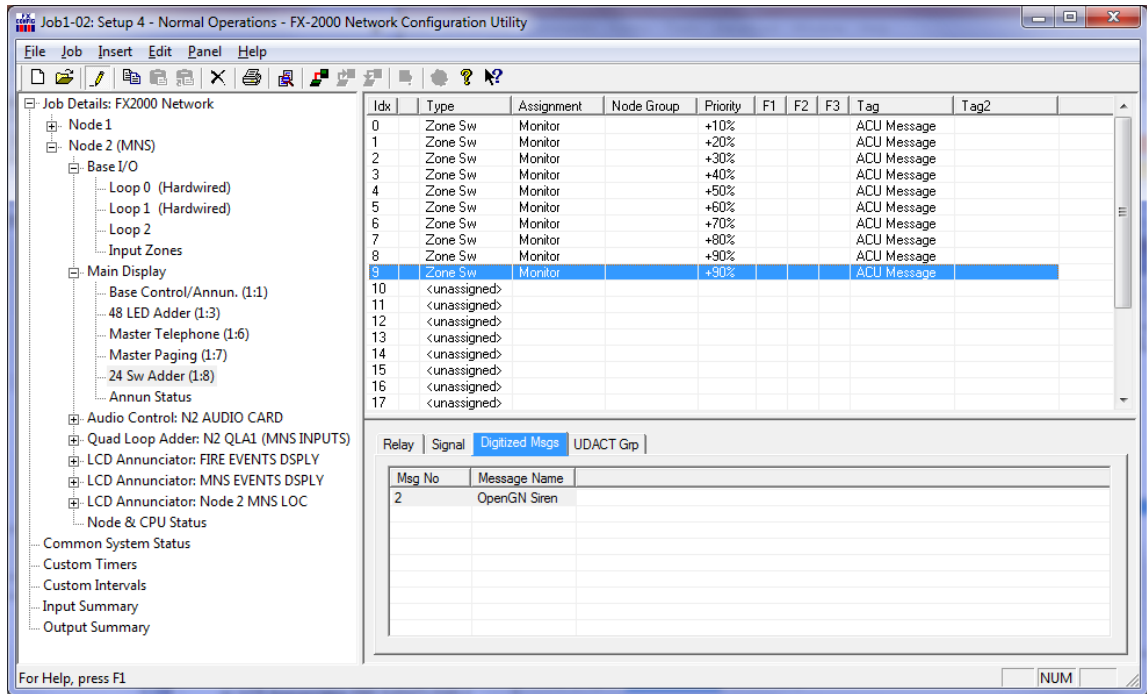
The paging microphones used by the FX-LOCs are hardwired to the board belonging to the ACU paging microphone. Their hierarchy is configured on a firmware level to have lower priority than the IPS switch adder module messages used by the ACU but a higher priority than the FDS switching module messages used by the FX-LOC.

The FX-LOC broadcasts digital messages using an FDS switching module. Each switch on this switching module is hardwired to inputs on an input module that are correlated to input zones in the configuration. Each input is correlated to its own input zone with a digital message attached to each zone. Priority for FX-LOC digital messages is set between the input zones. For example, an input zone with an assigned priority of 70% will over ride an input zone with an assigned priority of 50%. Refer to the figure below.
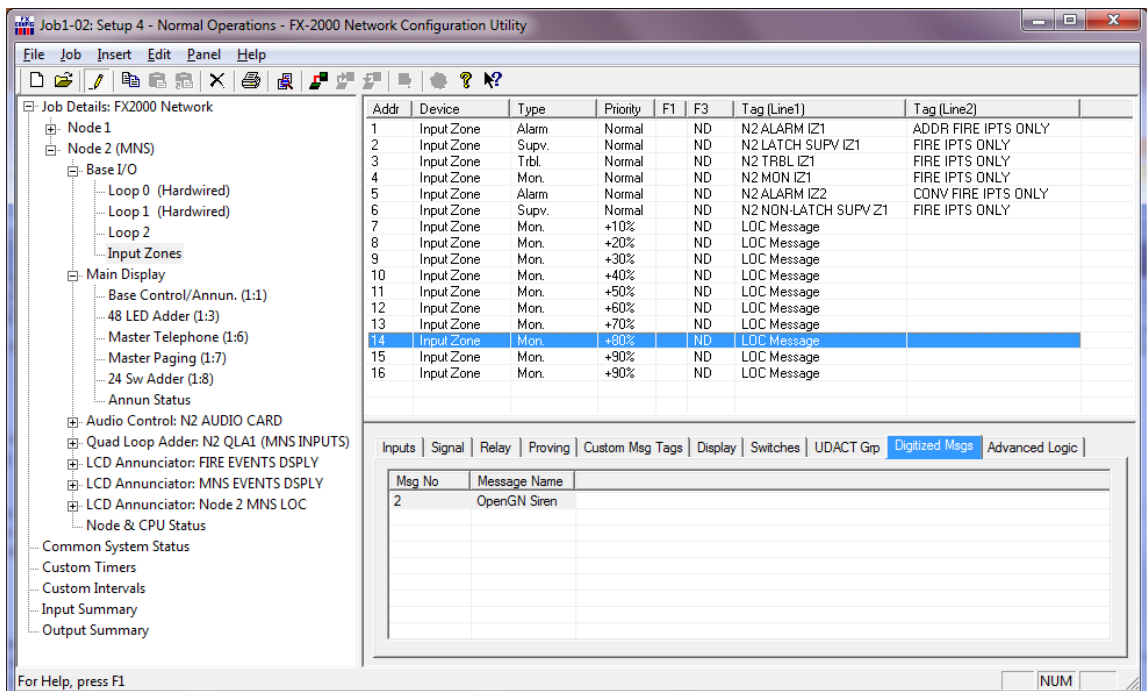
11.3 ACU Operation

To broadcast a pre-recorded digital message press a button on the selector with the appropriate message. Buttons should be labelled to indicate the content of the message that will play. The message will be broadcasted and loop continuously until the system is reset or a higher priority operation is performed.

To broadcast an announcement remove the paging microphone from its receiver and key the microphone to activate the amplifiers. Speak into the microphone to broadcast the announcement. The Page Ready LED will be on to indicate it is in use as soon as the microphone is keyed. The ACU paging microphone has the highest priority and will override all other operations upon activation.

11.4 LOC Operation

To broadcast a pre-recorded digital message select a switch with the appropriate message and move it to the ON position. Switches should be labelled to indicate the message that they will play. The message will be broadcasted and loop continuously until the system is reset or a higher priority operation is performed.

To broadcast an announcement remove the paging microphone from its receiver and key the microphone to activate the amplifiers. Speak into the microphone to broadcast the announcement. Only one microphone can be used at a time.

If the Page Ready LED is on before the microphone is removed from the receiver then another microphone is in use. If the LED is off then there isn't a microphone in use indicating that they are all available. If the LED turns on only after the paging microphone is removed then that microphone is now active.

12.0   Firmware Loading

The following items are required in order to load the firmware onto a panel:

- PC with a serial port
- Serial Cable
- QX-5000N RS-232 Debug Tool
- HyperTerminal

Before loading a new firmware onto the panel ensure that the PC being used has HyperTerminal installed. Firmware needs to be individually loaded onto each board that contains a CPU: the main board, the audio card, the quad-loop adder and the RAXN-LCD. Refer to Appendix A: Hardware Changes for information about changes in component positions from Flex-net Phase I.

12.1 Main Board Firmware

1. Connect the serial cable from the PC directly to the main board.

2. Run the HyperTerminal software on the PC.

3. In the HyperTerminal start up prompt set the correct communications port and select a baud rate of 115200.

4. Reset the processor on the main board by shorting the reset jumper. The jumper only needs to be shorted momentarily, it should be normally open. During the reset process press any key in HyperTerminal to enter the Flex-Net shell.

5. Input the following set of commands after the "flexnet>" prompt appears and press enter after each one: "sf probe 1", "sf erase 0x200000 0x600000", and "run sflash".

6. Navigate to the HyperTerminal menu bar and select Transfer, then select Send File. A Send File window appears.

7. Specify the location of the binary file that contains the new main board firmware by entering the file path or by pressing the Browse button and searching for the file. Set the Protocol to "Ymodem" and press Send.

8. When the "flexnet>" prompt reappears type in "reset" and press enter.

12.2 Audio Card Firmware

1. Connect the serial cable from the PC to the QX-5000N RS-232 Debug Tool and connect the 8-pin head to the P4 RS-232 Debug port on the audio card. Ensure that the keyed extrusion on the connector lines up with the one on the port.

2. Run the HyperTerminal software on the PC.

3. In the HyperTerminal start up prompt set the correct communications port and select a baud rate of 115200.

4. Reset the processor on the audio card by shorting the reset jumper, JW4. The JW4 jumper is the closest one to the 8-pin port and only needs to be shorted momentarily, it should be normally open. During the reset process press any key in HyperTerminal to enter the Flex-Net shell.

5. Input the following set of commands after the "flexnet>" prompt appears and press enter after each one: "sf probe 1", "sf erase 0x200000 0x600000", and "run sflash".

6. Navigate to the HyperTerminal menu bar and select Transfer, then select Send File. A Send File window appears.

7. Specify the location of the binary file that contains the new audio card firmware by entering the file path or by pressing the Browse button and searching for the file. Set the Protocol to "Ymodem" and press Send.

8. When the "flexnet>" prompt reappears type in "reset" and press enter.

12.3 Quad-Loop Adder Firmware

1. Connect the serial cable from the PC to the QX-5000N RS-232 Debug Tool and connect the 8-pin head to the P5 RS-232 Debug port on the quad loop adder board. Ensure that the keyed extrusion on the connecter lines up with the one on the port.

2. Run the HyperTerminal software on the PC.

3. In the HyperTerminal start up prompt set the correct communications port and select a baud rate of 115200.

4. Reset the processor on the quad-loop adder by shorting the reset jumper JW1 on the quad-loop adder main board. The jumper only needs to be shorted momentarily, it should be normally open. During the reset process press any key in HyperTerminal to enter the Flex-Net shell.

5. Input the following set of commands after the "flexnet>" prompt appears and press enter after each one: "sf probe 1", "sf erase 0x200000 0x600000", and "run sflash".

6. Navigate to the HyperTerminal menu bar and select Transfer, then select Send File. A Send File window appears.

7. Specify the location of the binary file that contains the new quad-loop adder firmware by entering the file path or by pressing the Browse button and searching for the file. Set the Protocol to "Ymodem" and press Send.

8. When the "flexnet>" prompt reappears type in "reset" and press enter.

12.4 RAXN-LCD and RAXN-LCDG Firmware

1. Connect the serial cable from the PC directly to the main board.

2. Run the HyperTerminal software on the PC.

3. In the HyperTerminal start up prompt set the correct communications port and select a baud rate of 115200.

4. Reset the processor on the quad-loop adder by shorting the reset jumper JW1. The jumper only needs to be shorted momentarily, it should be normally open. During the reset process press any key in HyperTerminal to enter the Flex-Net shell.

5. Input the following set of commands after the "flexnet>" prompt appears and press enter after each one: "sf probe 1", "sf erase 0x200000 0x600000", and "run sflash".

6. Navigate to the HyperTerminal menu bar and select Transfer, then select Send File. A Send File window appears

7. Specify the location of the binary file that contains the new annunciator firmware by entering the file path or by pressing the Browse button and searching for the file. Set the Protocol to "Ymodem" and press Send.

8. When the "flexnet>" prompt reappears type in "reset" and press enter.

13.0   Configuration Loading

The following items are required in order to load a configuration onto a panel:

- PC with a serial or USB port
- Serial Cable or USB Cable
- UIMA Tool
- Registered CodeMeter Key
- FX-2000 Network Configuration Utility V11 or greater

Before loading a configuration job ensure that the PC being used has the FX-2000 Network Configuration Utility software installed. Plug in the registered CodeMeter key to the PC and start the Configuration Utility.

If an RS-232 cable is used in conjunction with a serial port to communicate between the panel and the PC then the correct communications port needs to be set. To set the communications port open the Network Configuration Utility and select File from the menu bar and select User Preferences from the drop down menu. A new dialogue box appears. In the drop down box labelled Serial Port select the port the RS-232 uses to connect to the PC. Press OK to confirm the selection.

Connect the RS-232 cable or the USB cable to the UIMA then connect the 10-pin head of the UIMA to the last CPU in the CPU chain that starts from the main board.

Establish a connection between the CPUs in the FACP and the PC. To do this press the Connect icon in the task bar or navigate from the menu bar to Panel then select Connect from the drop down menu. Once this connection has been established the configuration can be loaded onto the panel. To load the active configuration onto the panel select the Send icon in the task bar or navigate to the menu bar and select Panel then from the drop down menu select Send Job. Specify which node to send the job to in the dialogue box that appears. Once the job is verified and sent the software will prompt if you wish to make it the active job on the panel. Each CPU on the panel can hold up to 3 jobs, if there are already 3 jobs on a CPU one must first be removed to make room for the new one. To remove one of the 3 jobs stored on a CPU use the configurator and select Panel from the menu bar. From the drop down menu select Manage Jobs. Use the new dialogue box to delete one of the jobs.

If a job is not set as the active job from the configuration loading stage it can later be set to be the active job using the interface on the FACP. To change the active job using the FACP access the main display on any node or an annunciator for any node in the system. Press the Menu button and scroll down using the arrow keys to the option titled "11 Choose Config". Scroll through the available configurations using the arrow keys and confirm a selection by pressing the Enter button. This will use change the configuration for all the nodes in the system. To set configurations for individual nodes the Network Configuration Utility must be used.

14.0 Hardware Layouts

The Flex-Net Phase II Fire Alarm Control System contains two major types of nodes: Fire Nodes and Mass Notification Nodes. The entire system is modular and any number of combinations are possible when building a system. The Fire Nodes can use the BBX-1024, the BBX-1072, the BB-5008 and the BB-5014 model backboxes. The Mass Notification Node uses the BBX-FXMNS model backbox.

The system can also include Audio-Signalling Enclosure Cabinets that are able to connect to either node and use the QBB-5000XT backbox. Local Operating Consoles use the FX-LOC backbox and are used with Mass Notification Nodes.

14.1 Display Modules

These modules can be installed on the door of any node with display module slots. The specific number and combination of display modules varies depending on the application and requirements of the job.

Display Modules

Each of these Display Modules occupy one display position and mount to the display cutouts on the following chassis:
FX-2017-12N *Mid-Size Main Chassis*
FX-2009-12N *Large Main Chassis*
ECX-0012 *Expander Chassis for FX-2009-12*
These modules can also be mounted in the standard BB-5000 cutouts (with brackets), as well as in the BB-1000 enclosures (requires RAX-LCD as a driver).
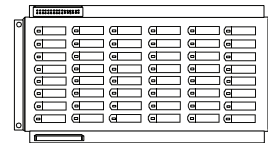
RAX-1048TZ
Programmable Zone
LED Annunciator Module
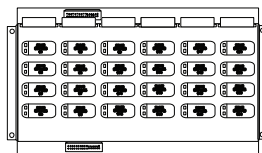
IPS-2424
Programmable Input
Switches Module
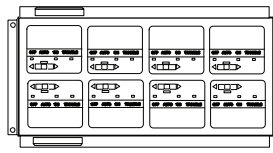
FDX-008
Fan Damper Module
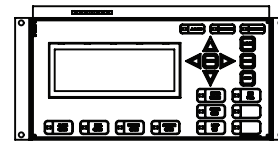
DSPL-420
Narrow Main
Display Module
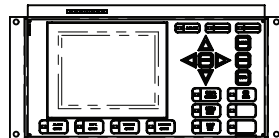
DSPL-2440
Narrow Graphic
Display Module
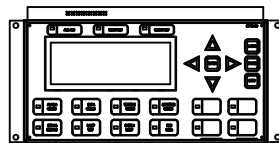
RAXN-LCD
Network Remote LCD
Annunciator Module
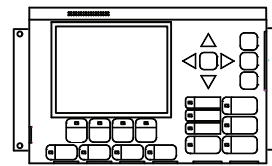
RAXN-LCDG
Graphic Remote LCD
Annunciator Module

14.2 Paging and Fire Fighter Telephone Modules

These modules can be installed on the door or inside any node with paging module slots. The specific number and combination of paging and fire fighter telephone modules varies depending on the application and requirements of the job.

Paging and FireFighter Telephone Modules

QMP-5101N
Network Paging
Control Unit

QAZT-5302
Addressable Telephone
Selector Module

QMT-5302NV
Vertical Network
Telephone Control Unit

QMP-5101NV
Vertical Network
Paging Control Unit
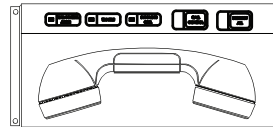
QMT-5302N
Network Telephone
Control Unit

14.3 Adder Modules

These modules can be installed inside any node with adder module slots. The specific number and combination of adder modules varies depending on the application and requirements of the job.

Adder Modules

ALCN-792M
Quad Loop Adder
Motherboard*
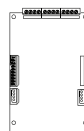
ALCN-792D
Quad Loop Adder
Daughter Board*
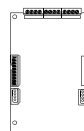
FNC-2000
Network Interface
Controller Module

FOM-2000-SP
Single Port Digital
Network Fiber
Optic Module
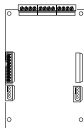
DM-1008A
Eight Initiating
Circuit Module
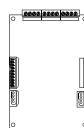
SGM-1004A
Four Indicating
Circuit Module

RM-1008A
Eight Relay
Circuit Module

UDACT-300A
Digital Alarm
Communicator
Module

PR-300A
Polarity Reversal/City Tie Module
(Mounts above the ribbon cable on the Main Board)

Each of these Adder modules occupy one module slot and mount inside the following chassis unless otherwise specified:
FX-2003-12N *Compact Main Chassis*
FX-2017-12N *Mid-Size Main Chassis*
FX-2009- 12N *Large Main Chassis*
ECX-0012 *Expander Chassis.for FX-2009-12*

*The ALCN-792D mounts directly onto the ALCN-792M

14.4 BBX-1024 Fire Node Backbox

The BBX-1024 is the smallest enclosure available. It contains the FX-2003-12N Compact Main Chassis along with batteries for emergency operation. The FX-2003-12N Compact Main Chassis contains the main display, mother board, adder modules and the transformer. It fits directly into the BBX-1024 backbox. The outer dimensions of the BBX-1024 fit within 26.3" X 14.8" X 4.6".

FX-2003-12N Compact Main Chassis
(Mounts in the BBX-1024 Enclosure)

Exterior View

Interior View

Slot is reserved for PR-300A. If none is required, this slot can be used to mount any of the adder modules.

3   2   1

FleXNet Main Board

Supports 3 Adder Modules.
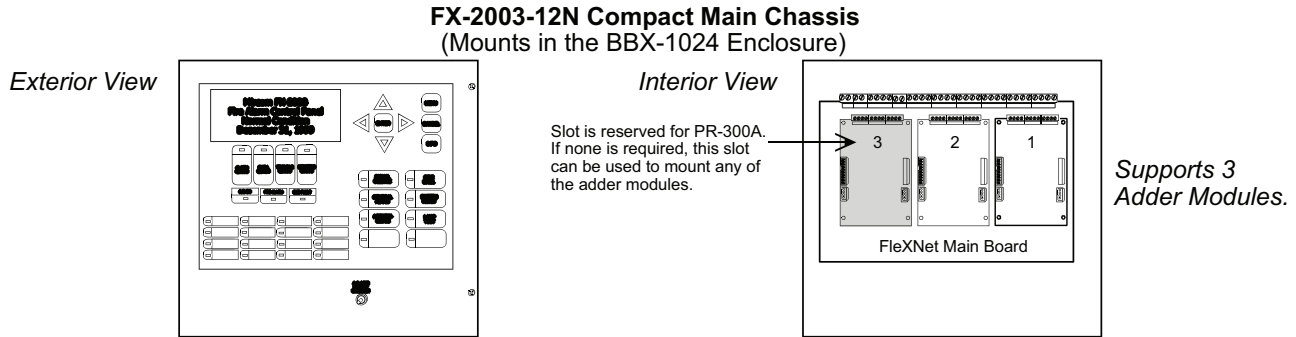
14.5 BBX-1072 Fire Node Backbox

The BBX-1072 enclosure is larger than the BBX-1024. It contains the FX-2017-12N Mid-Size Main Chassis along with the batteries for emergency operation. The FX-2017-12N Mid-Size Main Chassis contains the main display, mother board, adder modules and the transformer. It fits directly into the BBX-1072 backbox. The outer dimensions of the BBX-1072 fit within 33.9" X 26.4" X 6.5".

FX-2017-12N Mid-Size Main Chassis
(Mounts in the BBX-1072 Enclosure)

Exterior View

Cutout to mount display module

Cutout to mount display module

Cutout to mount display module

Interior View

12   11   10   9   8
17   16   15   14   13

Slot is reserved for PR-300A. If none is required, this slot can be used to mount any of the adder modules.

3   2   1   5   4
                   7   6

FleXNet Main Board

Supports 3 Display Modules.

Supports 17 Adder Modules.

14.6 BB-5008 Fire Node Backbox

The BB-5008 enclosure is larger than the BBX-1072. It can use the FX-2009-12N Large Main Chassis combined with ECX-0012 Expander Chassis for additional display modules and the CCH-5008/CCH-5014 Custom Mounting Kits for paging and fire fighter telephone modules. The FX-2009-12N Large Main Chassis can be substituted for two ECX-0012 Expander Chassis with the main display being replaced by the DSPL-420 Narrow Main Display module. The outer dimensions of the BB-5008 fit within 38.0" X 32.5" X 7.5".

FX-2009-12N Large Main Chassis
(Mounts and occupies 4 display positions in BB-5008 or BB-5014 Enclosures)

Exterior View

Slot is reserved for PR-300A. If none is required, this slot can be used to mount any of the adder modules.

Interior View

Supports 2 Display Modules.

Supports 9 Adder Modules.

ECX-0012 Expander Chassis for FX-2009-12N
(Mounts and occupies 2 display positions in BB-5008 or BB-5014 Enclosures)

Exterior View

Interior View

Supports 2 Display Modules.

Supports 12 Adder Modules.

The backplate can support 12 Adder Modules or any 2 of the following 3 options: 6 Adder Modules, 1 Main Board and 3 Adder Modules, 1 Telephone Network Card and 1 Audio Network Card

Mounting of Paging and FireFighter Telephone Modules

The Paging and FireFighter Telephone Modules mount in the BB-1000 or BB-5000 series enclosures. These modules require brackets for mounting. The brackets are attached to the backplates of the enclosures. The FX-2017-12N Mid-Size Main Chassis does not have provisions for these brackets since adder module are mounted to the backplate. The same is true for the FX-2009-12N Main Chassis and ECX-0012 Expander Chassis since there are adder modules mounted on the backplate. In order to mount the Paging and FireFighter Telephone modules, order the CCH-5008 or CCH-5014 Custom Mounting Kits which will provide the proper dead front as well as the brackets on the backplate. These modules can also be mounted int he BB-1000 enclosures.

Exterior View

Interior View

The modular nature of a fire node allows for many different configurations and combinations of modules depending on the requirements of the job. The figure below is a sample layout for the BB-5008 although many other layouts are possible.

BB-5008 Sample Layout

Exterior View   *Interior View*
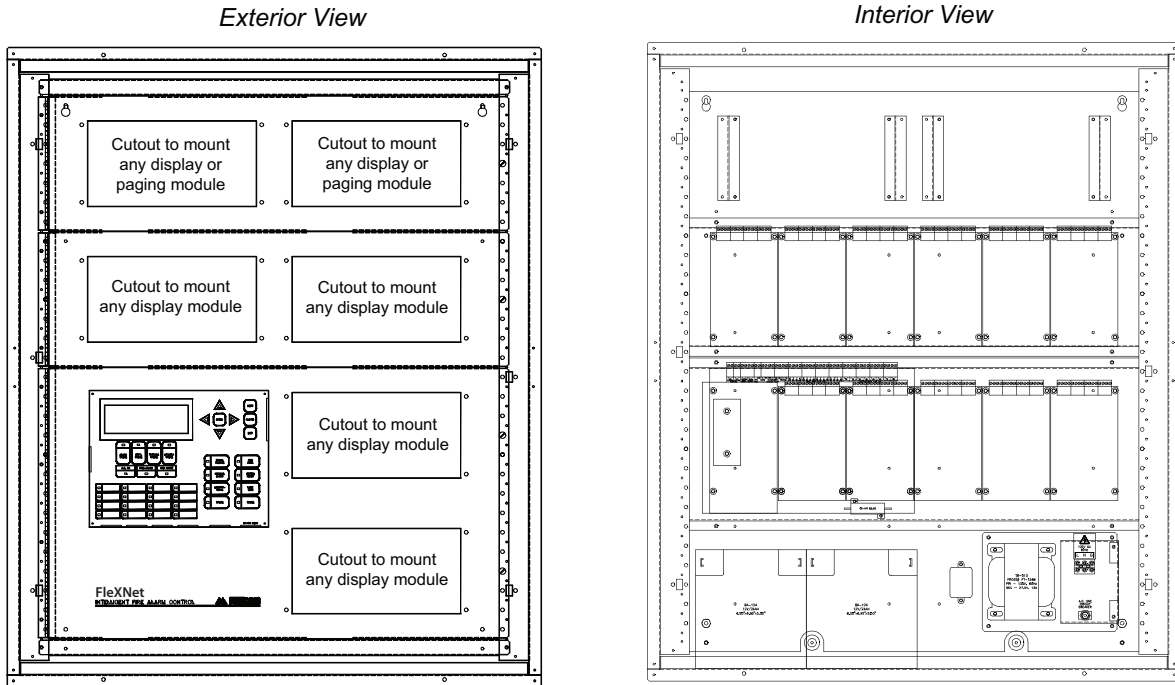
14.7 BB-5014 Fire Node Backbox

The BB-5014 enclosure is the largest available backbox. It can use the FX-2009-12N Large Main Chassis combined with ECX-0012 Expander Chassis for additional display modules and the CCH-5008/CCH-5014 Custom Mounting Kits for paging and fire fighter telephone modules. The FX-2009-12N Large Main Chassis can be substituted for two ECX-0012 Expander Chassis with the main display being replaced by the DSPL-420 Narrow Main Display module. The outer dimensions of the BB-5014 fit within 61.5" X 32.5" X 7.5".

FX-2009-12N Large Main Chassis
(Mounts and occupies 4 display positions in BB-5008 or BB-5014 Enclosures)

Slot is reserved for PR-300A. If none is required, this slot can be used to mount any of the adder modules.

Exterior View   *Interior View*

Supports 2 Display Modules.   *Supports 9 Adder Modules.*

ECX-0012 Expander Chassis for FX-2009-12N
(Mounts and occupies 2 display positions in BB-5008 or BB-5014 Enclosures)

Exterior View   *Interior View*

Supports 2 Display Modules.   *Supports 12 Adder Modules.*

The backplate can support 12 Adder Modules or any 2 of the following 3 options: 6 Adder Modules, 1 Main Board and 3 Adder Modules, 1 Telephone Network Card and 1 Audio Network Card

Mounting of Paging and FireFighter Telephone Modules

The Paging and FireFighter Telephone Modules mount in the BB-1000 or BB-5000 series enclosures. These modules require brackets for mounting. The brackets are attached to the backplates of the enclosures. The FX-2017-12N Mid-Size Main Chassis does not have provisions for these brackets since adder module are mounted to the backplate. The same is true for the FX-2009-12N Main Chassis and ECX-0012 Expander Chassis since there are adder modules mounted on the backplate. In order to mount the Paging and FireFighter Telephone modules, order the CCH-5008 or CCH-5014 Custom Mounting Kits which will provide the proper dead front as well as the brackets on the backplate. These modules can also be mounted int he BB-1000 enclosures.

Exterior View   *Interior View*

The modular nature of a fire node allows for many different configurations and combinations of modules depending on the requirements of the job. The figure below is a sample layout for the BB-5014 although many other layouts are possible.

BB-5012 Sample Layout

Exterior View   *Interior View*
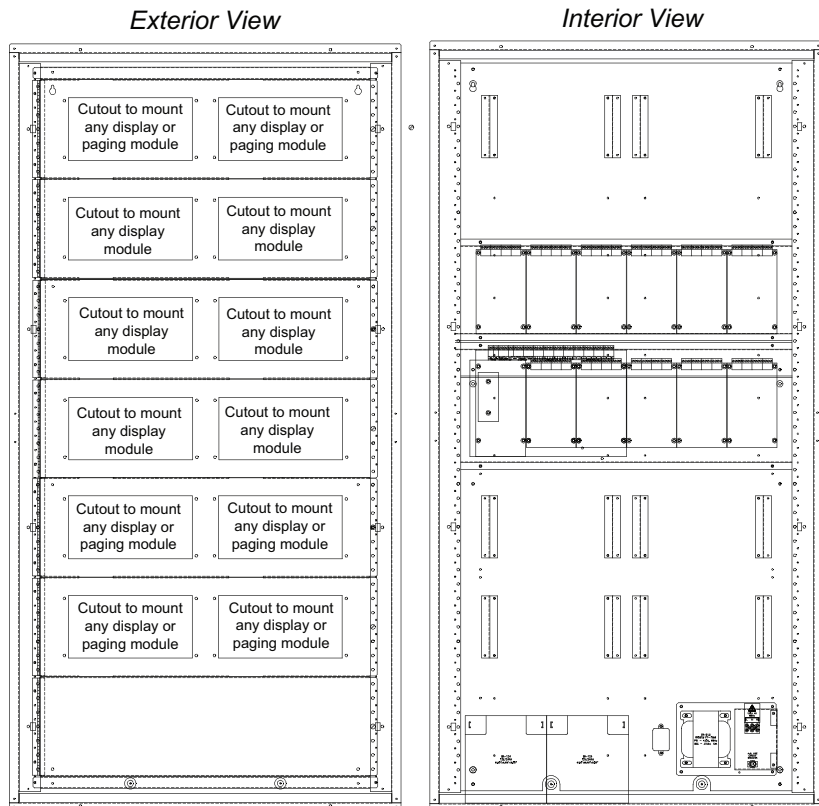
14.8 BBX-FXMNS Mass Notification Node Backbox

The BBX-FXMNS backbox is used for the mass notification node. It can be populated with 2 paging modules, 9 adder modules and 7 display modules as indicated by the figure below. It also supports the addition of 4 audio amplifiers along with audio and telephone networking cards. The outer dimensions of the BBX-FXMNS fit within 63.5" X 22.5" X 9.5".

FX-MNS Sample Layout

Exterior View   *Interior View*
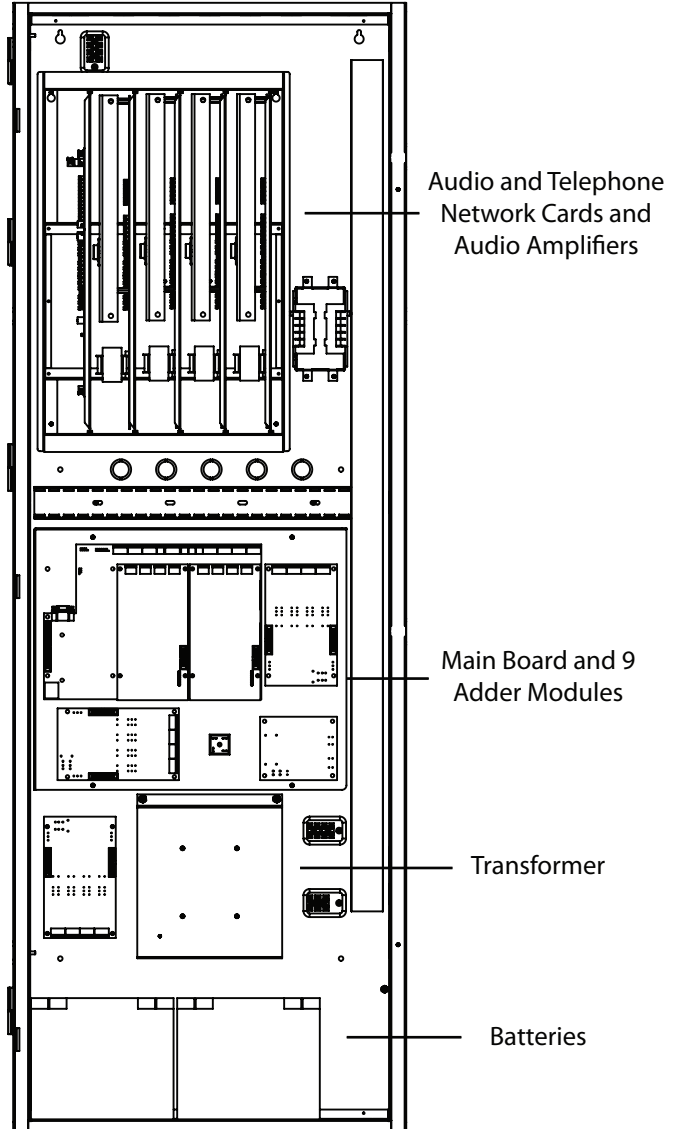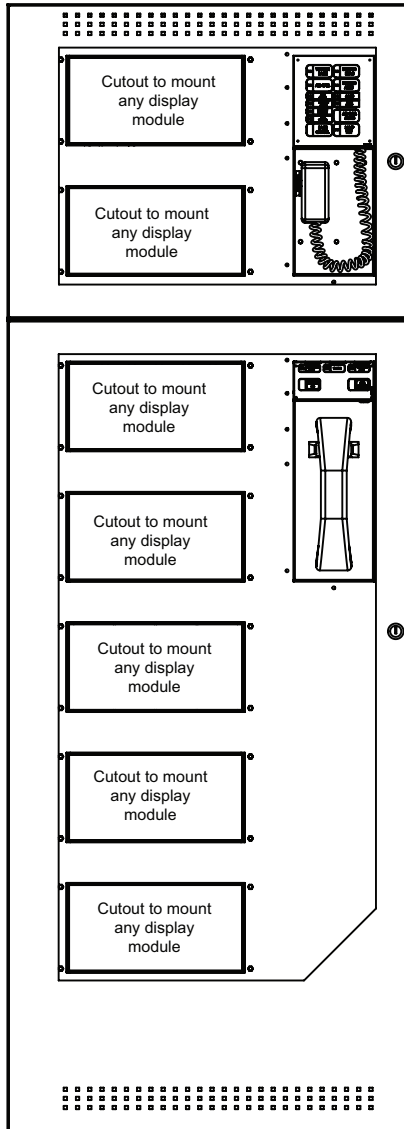
14.9 QBB-5000XT Audio Signalling Cabinet

This future audio cabinet can provide additional audio amplification for speakers using audio amplifiers and increased power output for strobes and other signalling devices using a booster power supply. It can be connected to and controlled by any other node. The outer dimensions of the QBB-5000XT fit within 63.5" X 28.0" X 9.5".

Audio and Telephone Network Cards and Audio Amplifiers

INX-10AC Booster Power Supply
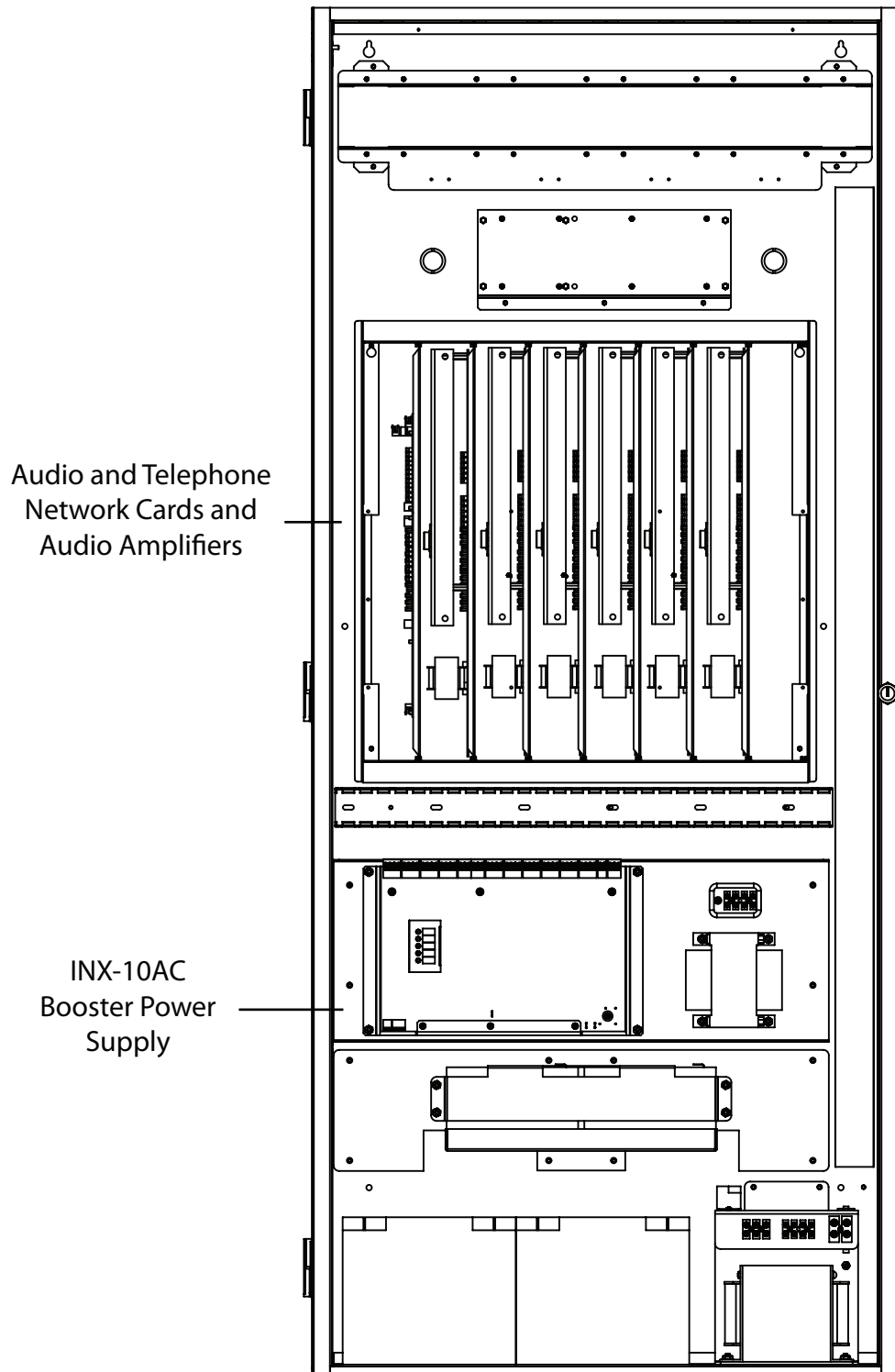
14.10 FX-LOC Local Operating Console

These operating consoles are intended for use in mass notification. They can mount 3 modules on the deadfront door. These modules are usually a RAXN-LCD annunciator and a QMP-5101N paging microphone in conjunction with either a QAZT-5302 selector panel or a FDS-008 switch module and IM-10 input module combination. The paging microphone is for broadcasting announcements, while pre-recorded digital messages can be played using the selector panel or the switch/input module combination. The figure below shows the setup with the switch/input module combination.

Note that the deadfront and door can be installed such that they open either to the left or to the right as required. The outer dimensions of the FX-LOC fit within 25.0" X 15.0" X 7.0".

RAXN-LCD
LCD Network
Annunciator

FDS-008
Fan/Damper
Switching Module

QMP-5101N
Network Paging
Microphone

IM-10
Input Module
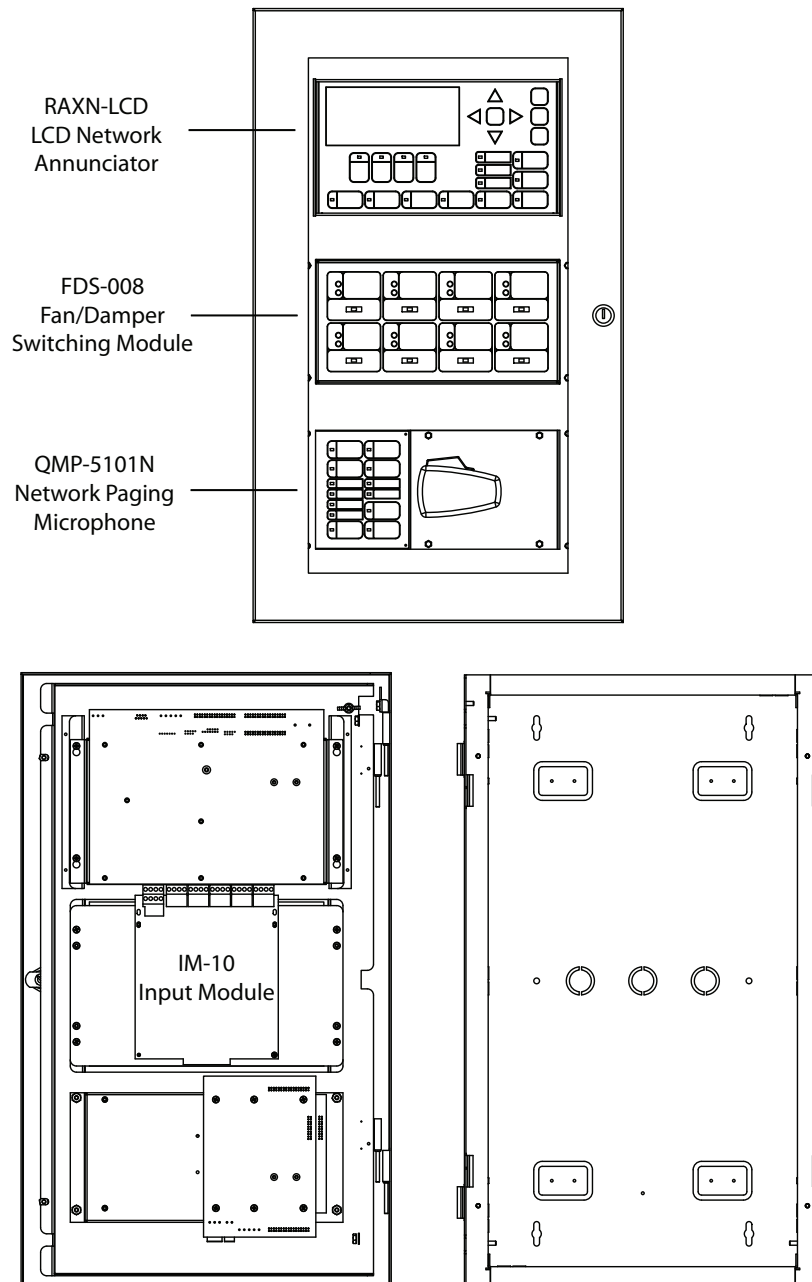
Appendix A: Hardware Changes

Flex-Net Phase II brings along both new modules and expanded capabilities for existing ones. Some components involved in loading of the configuration or troubleshooting operations have been moved to new locations on some of the boards. Updates have been made to the RAXN-LCD Annunciator and the ANC-5000 Audio Network Controller. The ALCN-792M Quad Loop Adder is a new module which will also be described.

RAXN-LCD Annunciator

The two terminal blocks labelled P6 and P7 each require a jumper to prevent a display mismatch trouble. The jumper locations are outlined in the figure below.

Jumper Locations
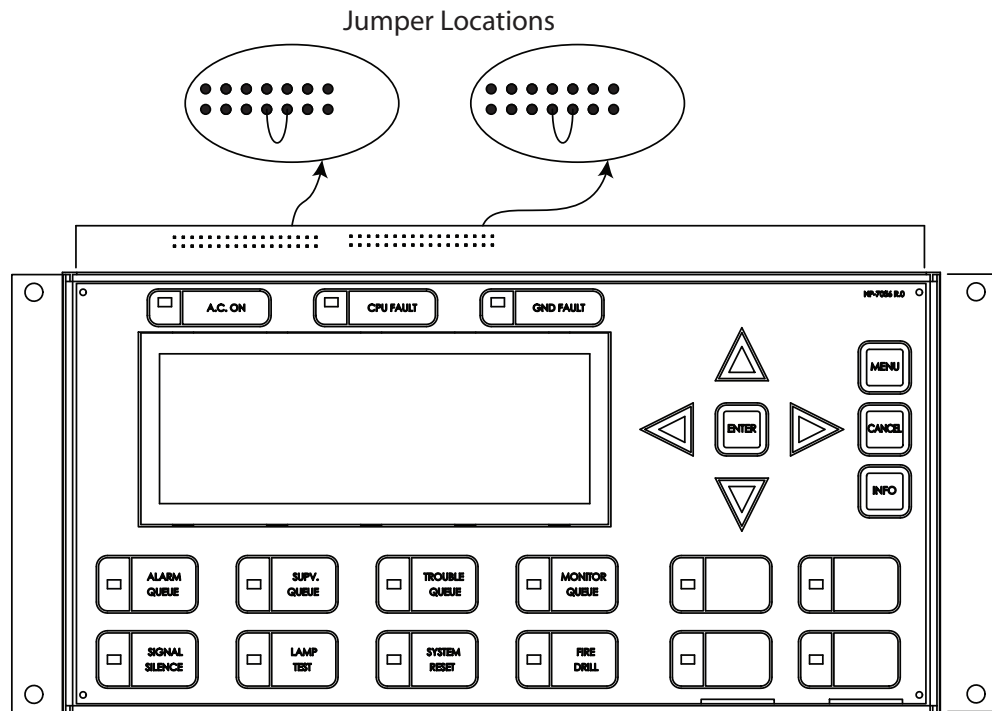
RAXN-LCD
Network Remote LCD
Annunciator Module

ANC-5000 Audio Network Controller

The main change to this module is the addition of an Ethernet port. Affected components are the DIP switch, the watchdog jumper and the reset jumper. The DIP switch has been reversed from its previous position such that switch 1 is where switch 8 used to be. The positions of the watchdog jumper and the reset jumper have been swapped with each other. Refer to the figure below.

NOTE: All connectors not shown on this drawing are for factory use only.
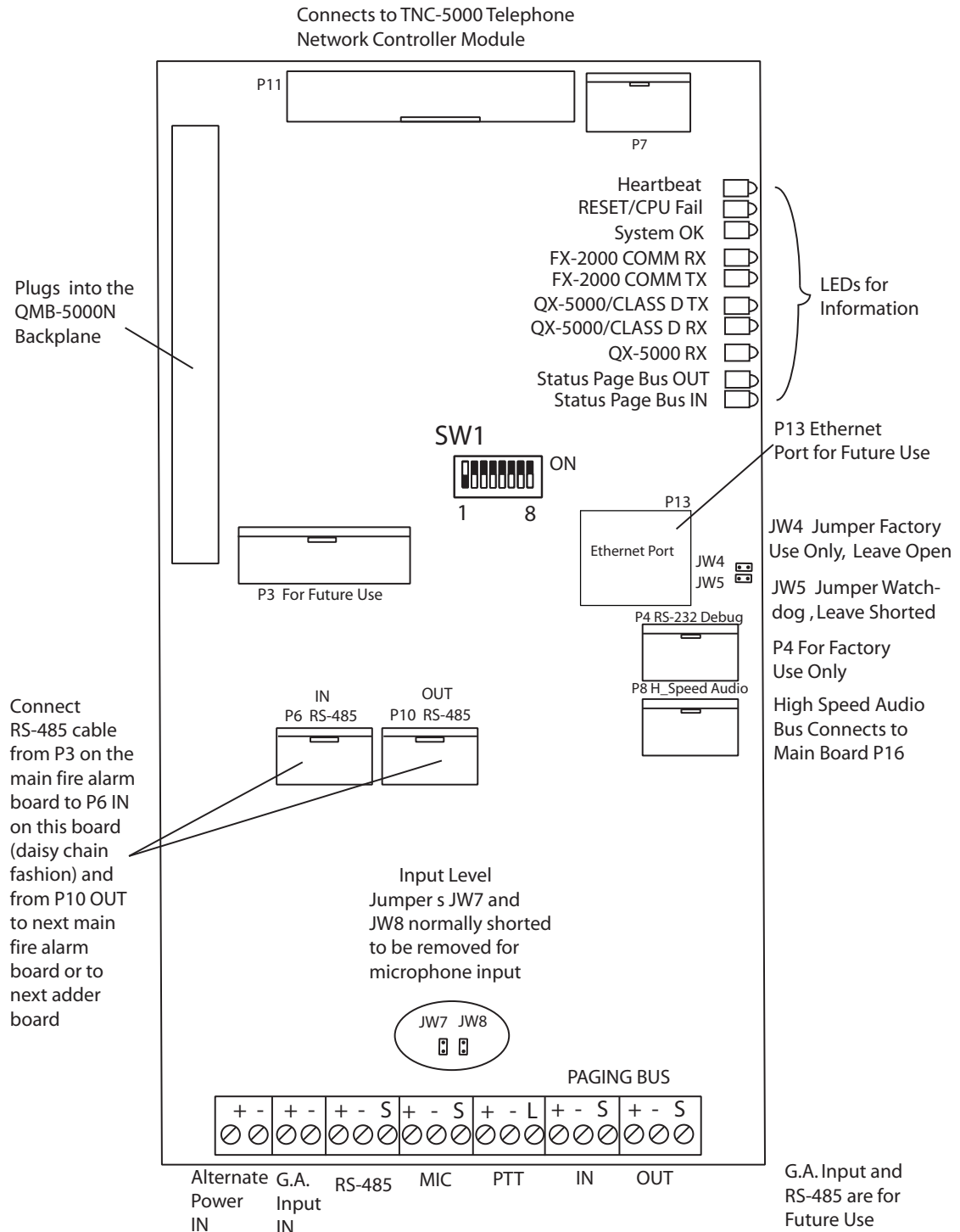
ALCN-792M Quad Loop Controller Module

This is a new module that supports four loops as opposed to the two loops that were be supported by the ALC-396S Dual Loop Controller Module. The changes described are compared to the ALC-396S. The P2 Power OUT connector has been moved. The watchdog and the rest jumpers have also been relocated. There are module additions that did not exist before such as the JTAG port and the RS-232 Debug Interface. The ALCN-792M is paired with another board called the ALCN-792D. This is a daughter board which mounts on top of and connects directly to the ALCN-792M. Refer to the figure below for component positions on the ALCN-792M.
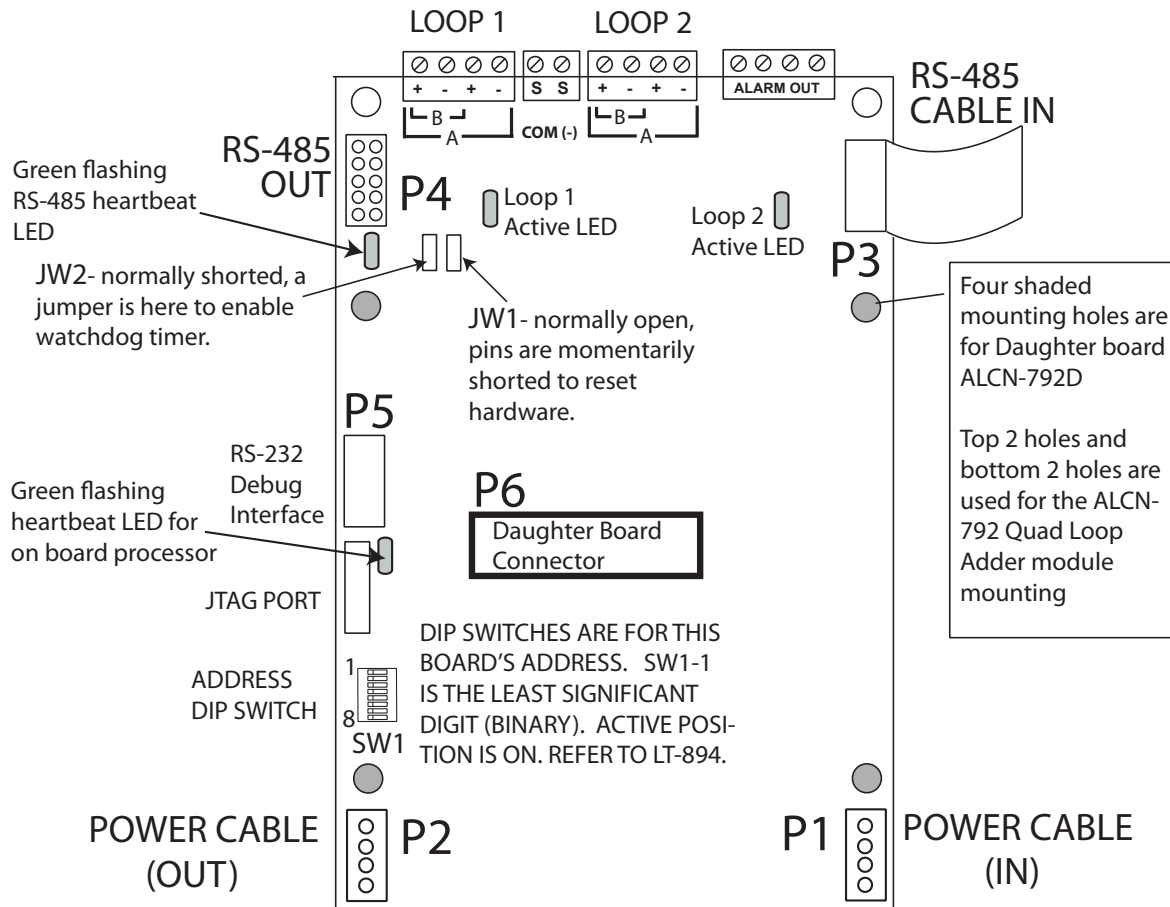
Note: The RS-232 and JTAG Ports are for factory use only

Appendix B: Using the Configurator

Overview

In order to operate as a fire alarm, a fire alarm panel must be loaded with firmware and configuration data. A set of configuration data, to uniquely describe and control a given set of hardware, is called a Job. The Configurator allows the user to create and manage jobs. It also allows the user to send firmware to a panel and all its related nodes and CPUs

On the first use of the configurator the user is prompted for the paths and file names where jobs, backups, the database, etc. are to be stored. Registry entries remember many of the user's preferences.

The configurator is typically run on a portable notebook or lap top computer that is taken to the job site and connected to the panel. The technician prepares a job using the configurator's Graphical User Interface. The job can then be sent to the panel. The same or a different authorised technician can later retrieve the job from the panel, modify it and send it back.

The job repository is a Relational Database (MS-Access). Jobs can be imported or merged from another database, copied, deleted, and archived in various formats. A job can be printed, or two versions of a job can be compared.

GUI - Major Components

The configurator uses a familiar Microsoft Windows Graphical User Interface (GUI) to present a job. The screen is divided into (max.) three panes.

On the left of the screen, the job is represented as a tree, similar to a file explorer. At the highest level in the tree are the Nodes and CPUs. Under each node are its components - Annuniciators, Loop Controllers, etc. Some items are further subdivided, for example, an annunciator into display adders and a loop controller into loops.

Some items in the tree do not directly represent a physical component. For example, tree nodes exist for input and output summaries and for common controls.

The top right pane is used to display the details of the currently selected tree node. This can be a form view or a list view. For example, this pane is used to list the devices on a loop controller (list view) and to display the options and messages of a main display (form view).

The third, bottom right pane is used to show correlations from an item selected in the top right pane, where appropriate. For example, when a loop is selected in the tree, the top right pane would show all of its devices or circuits. When one or more input circuits are selected in the list, then the bottom pane would show the output circuit(s) to which this is correlated.

In addition to standard menus (File, Edit, etc), a specialised menu hierarchy (Job, Panel, Tools) is provided for such functions at Create New Job, Delete Job, Connect to Panel, etc.

A tool bar provides convenient short cuts to the more frequently used functions

Standard keyboard short cuts and mouse operations are supported for such oprations as copy and paste, drag and drop, etc.

Edit Menu

The Edit Menu contains the following commands.

Some commands may be disabled (greyed) depending on what items are selected on the user interface.

Name	Short cut	Description
Delete Item	Del	Deletes the currently selected item.
Modify Item	Ctrl+M	If the currently selected item is a row in an editable list, then the first changeable cell is selected and prepared for editing.
Copy	Ctrl+C	Copies the selected item(s) to the clipboard.
Paste	Ctrl+V	Pastes items from the clipboard to the selected destination.
Paste Special	Ctrl+Shift+V	Similar to Paste: Opens the Paste Special dialog to allow defaults to be changed before pasting.

File Menu

The File Menu contains the following commands:

Name	Short cut	Description
Backup Database		Backup database makes a copy of the Master Database in the File folder specified in the User Preferences. The backup file will have a name of the form YYYY-MM-DD.mdb. The back up can be used by the Restore Database command to recover all of the jobs in the database. The Import command can be used to recover selected jobs from a backup. Backup your Master Database often and store a copy of the resulting file on a CD or other media.
Restore Database		Restores the database from a backup copy. Note: This operation will replace the entire contents of the current, working datbase with the backup.
Compact Database		To ensure optimal performance, you should compact and repair your database on a regular basis. If you have purged job versions or deleted jobs, Compacting the Database will regain the space occupied by those records.
User Preferences		Specifies User Preferences, such as the location of database, backups, job files, etc.
Print	Ctrl+P	Print the active job.
Print Preview		Display a Print Preview of the active job.
Print Setup		Select the printer, paper size and orientation for a print job.
Exit		Closes the configurator.

Insert Menu

The Insert Menu contains the following commands.

Some commands may be disabled (greyed) depending on what items are selected on the user interface.

Some items may be suppressed depending on the product.

Name	Description
Add Network Nodes	Nodes Add a network node to the job.
Add Loop Controllers	Add an Addressable or Conventional Loop Controller to the selected network node.
Add Annunciators	Add an LCD or LED Annunciator to the selected network node.
Add Display Adder	Add a Display Adder to an Annunciator or Base Panel.
Add UDACT	Add UDACT capability to the selected network node.
Context Dependent	
Add Device	If the selected tree item is a device loop, add a device or circuit.
Add Message	Add a Message if the selected tree item is a remote annunciator that can accept Custom Messages.
Add Correlations	Launch a dialog that allows correlations to be added to the selected devices or display items.

Job Menu

The Job Menu contains the following commands:

Name	Short cut	Description
New Job	Ctrl-N	This command will open the Create Job dialog which will allow you to start a new job. The new job can be based on a supplied template or on an existing job.
Open Job	Ctrl+O	This command will open an existing job from your database.
Import Job		Imports a selected job/version from an external database or serialized job archive and converts the job to the current version if necessary.
Export Job	Ctrl+E	Exports the current job in one of two formats: A single job database file, or a compact, serialized archive format.
New Version	Ctrl+W	Make a copy of the current job, assigning it the next highest version number. The user is prompted for mandatory comments and may also override the Author field. The Job Name cannot be changed. The new version is un-locked for editing.

Name	Short cut	Description
Delete Job Version	Ctrl+D	This command permanently deletes the current Job / Job Version from the database
Version History		Display the Version History (Date, Author, Comments) for the current job.
Compare Job Versions		Compare two versions of the same job, or two similar jobs of different lineage.
Convert Job		Convert a job between two models. Produces a new version of the current job.
Validate Job		This action performs all of the steps normally performed when preparing to send a job to the panel.
Edit Job		Toggle the lock on a job that is protected against unintentional edits or has been down loaded to a panel.

Panel Menu

The Panel Menu contains the following commands.

Name	Short cut	Description
Connect	Ctrl+L	This command will establish a connection between the configuration tool and the panel, enabling most of the other commands in this menu. Remember to disconnect when you are finished, as a trouble will be indicated on the fire alarm panel as long as the laptop is connected.
Send Job	Ctrl+S	Build the job and send the configuration to the panel.
Get Job	Ctrl+G	Get the job from the panel and store it on the configuration tool's database. The job becomes the current job, shown in the user interface.
Panel Information...		Displays detailed information about the panel to which the configuration tool is connected.
Security Key Information...		Displays information about the security key for those products that support a key. The user must have entered the correct PIN when prompted - either when configurator was started or when the key was inserted - to enable this command.
Upgrade Firmware...		Loads firmware to the panel from a firmware archive file.
BDM Upload...		Upgrade the firmware using the BDM interface. Only used for upgrading Ver 7.XX to Ver 2.X.X FX2000 firmware.

Tools Menu

The items under the Tools Menu are used mainly for troubleshooting and diagnostic purposes by the factory.

Name	Short cut	Description
Extract All DB		Extracts the latest version of every job to individual database files.
Validate All	Ctrl+S	Validates the latest version of every job on the database.
Build Job	Ctrl+B	Builds the job, assuming the latest product version, creating a ".c" file in the Job Build folder.
Build Job (old version)...		Builds the job ".c" file for a specified, older product version.
Link Statistics		Displays the connection link statistics
Log Send		Toggle the current state of the "dump on send" option. Causes the ".c" file to be produced and dumped on a Get Job.
Log Get		Toggle the current state of the "dump on get" option. Causes the ".c" file to be produced and dumped on a Send Get.
Log Comms		Toggles logging of serial communications.
Trace		Toggles the current state of the trace option. When turned on this causes debug information to be written to a trace file.
Display Structure		This command will display a dialog that will allow you to view and log panel data structures.
External Bus		Toggles the "Use External Bus" setting. When turned on, this signals that the configurator is connected to the External Bus of the panel.

Note: The Tools menu is only available if you checked the Show Tools Menu option. See User Preferences

Add Amplifier

This dialog is displayed in response to an Add Amplifier command.
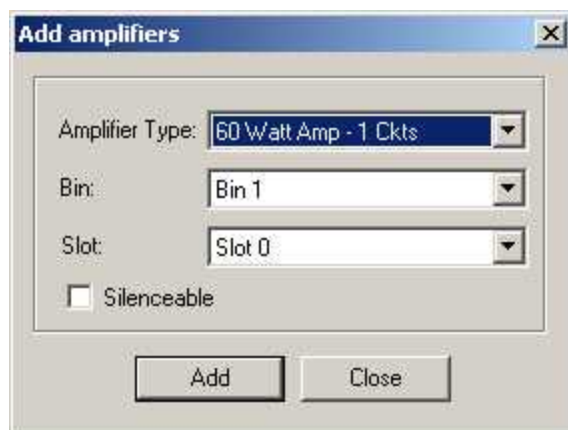
Select the amplifier type. Choose from a single 60 Watt amp., 2*30 Watt or 4*15.

Choose the bin and slot for the location of the amplifiers. The program will suggest the next available, suitably aligned location, but you can choose another that does not immediately follow those amplifiers that are already configured.

Check the silencable box if the new amplifiers can be silenced.

Click the add button to add the amplifiers. The dialog remains open so that you can add more. The Slot and Bin locations are recalculated.

Add Audio

This dialog is displayed in response to an Add Audio command.

Master Hand Set: You must specify whether the Audio Controller will support a master handset (there must be at least one per job). If you choose to support a master handset, it will consume one of the five lines of the controller.

Conventional Phones or Voice Lines: You must specify whether the four (or five) lines are to be configured as conventional phones or as voice lines to serve addressable phone modules.

After the Audio Controller is added you can still edit these attributes, or change just some of the lines between voice and conventional.

Add Circuit Adder

This dialog is displayed in response to an Add Circuit Adder command, or an Add Device when the selected tree item is a conventional (hard wired) loop.

Examples:
Add 8 Input Adder - 8 Ckts: Will add additional DM-1008A Input Module with 8 Class B (4 Class A) Input Circuits

Add Supv Opt.adder 4 Ckts: Will add a SGM-1004A Signal Module with 4 Supervised Output Circuits

Add Relay Opt - 8 ckts: Will add RM-1008A Relay module with 8 Relay circuits.

After the operation is complete the dialog remains open for re-use. The Close button dismisses the dialog.

Note: Some products have a fixed number of conventional circuits and the user cannot delete them or add more.

Add Correlations

This dialog is displayed in response to the Add Correlations command.
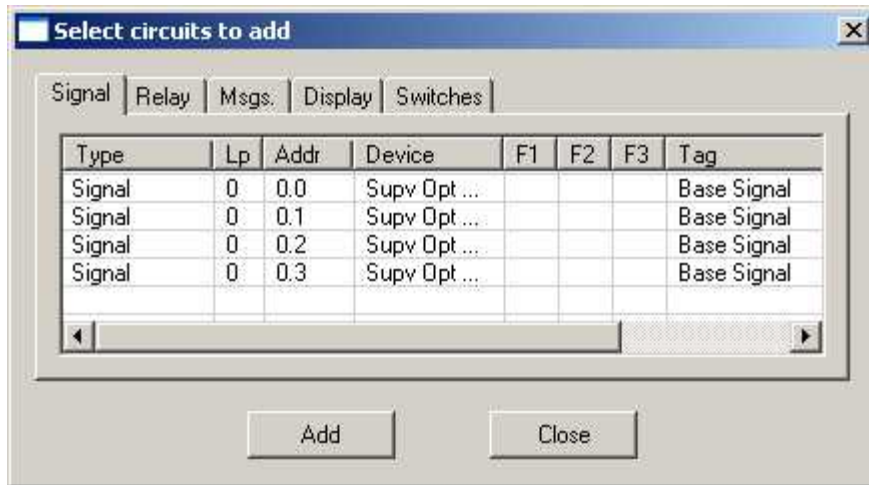
The dialog shows a tab for every category of circuit or display item, etc. that can be correlated to the items selected in the top, right pane view of the user interface. The tab categories mirror those of the Correlations View.

The content of each tab is dynamically updated as correlations are added or deleted so that the dialog always shows the items that are available.

The correlation view and the add correlations dialog are also synchronized: when a tab is selected on one the corresponding tab is activated on the other.

Select the items to be correlated (hold down the Ctrl key and right click the mouse to select multiple rows) and click the Add button.

The dialog remains open and more correlations can be made, selecting items from other tabs if necessary. The dialog remains open when another target is selected in configurator's top, right pane.

Click the Close button to dismiss the dialog.

Add Device

This dialog is displayed in response to an Add Device command. Input zones are also treated as a special kind of device and are added using the same dialog.

Type is the major device type, with choices such as Photo Det, Ion Det, Supv Opt Mod, etc.

The list of available process types in the Process as: combo box is adjusted according to the device type.

In the Address field you can specify the address for the new device. This defaults to the lowest available address for the chosen type. It takes into consideration that some types (Dual Acclimate and Fire Phone) require two addresses, one at the chosen address and one at the address + 100. An address appears in the list only if its paired address is also free.

You can specify how many devices to add by changing the Number to add value. The configurator will attempt to allocate the devices sequentially, starting with the address you selected. If there are insufficient sequential addresses you will be shown a message with three options.

Click Yes to continue - The configurator will add the remaining devices where ever empty addresses exist. The warning message will not appear again for this transaction.

Click No to stop - The block of sequential devices added so far will be committed. No further devices will be added. A second message will tell you how many devices were successfully added.

Cancel to abort - The entire transaction will be rolled back. No devices will have been added.

If at any time during the transaction there are no more available addresses, the entire transaction is rolled back. No devices will have been added.

After the operation is complete the dialog remains open for re-use. The Address value is adjusted to account for the devices just added.

If there are no available addresses for the chosen Type then the Add button is disabled. You can select another type, or close the dialog.

The Close button dismisses the dialog.

Add Display Adder

This dialog is displayed in response to an Add Display Adder command.

Select Adder Type - This control lists valid adder types.

The list only shows adder types that are allowed for the chosen annunciator.

Select Header - This control lists the headers (connectors) of the annunciator.

You may distribute display adders among the headers if an annunciator lists more than one.

Add - Press Add to insert an adder of the selected type. The Job Tree will be updated to show the new adder. If the frame limit for the annunciator/header is exceeded an error message will be displayed. Some Adders consume two or three frames.

The dialog remains open for adding more Display Adders. Press Close to dismiss the dialog.

Add Loop Controller

This dialog appears in response to an Add Loop Controller command.
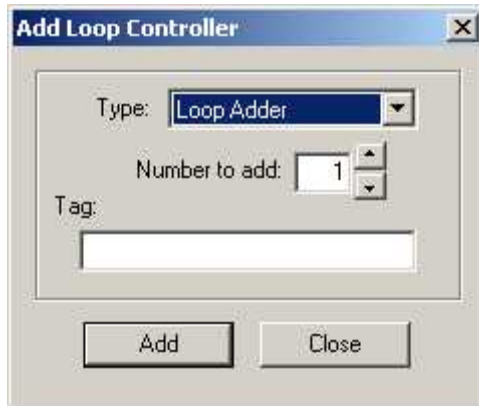
Type - Choose the type of adder you want to add. Different products may list different options. You can typically choose between an Addressable Loop and a Conventional.

Number to add - Enter the number of loop controllers you want to add.

Tag - Enter the optional tag to describe the loop controller.

Click Add. Loop controllers will be added, up to the capacity of the target panel. If the capacity would be exceeded a message is displayed and the operation is stopped. If a tag was specified and more than one loop controller was added, they will all receive the same tag. Tags can be edited in the Loop Controller Information view

Press Close to dismiss the dialog.

Add Message

This dialog is displayed in response to an Add Message command.
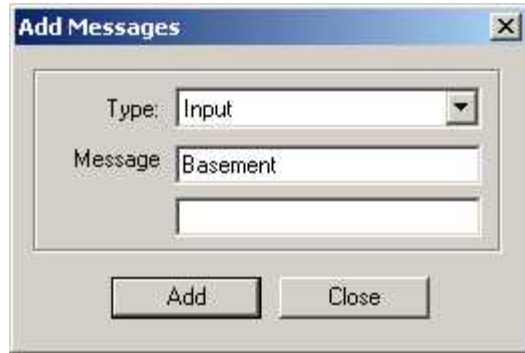
You can select from Input or Output Type. The Add button is disabled until you type at least one character into the first row of the Message fields. You can type a maximum of 40 characters - 20 in each of the two fields.

Add Network Node

This dialog is displayed in response to an Add Network Node command.
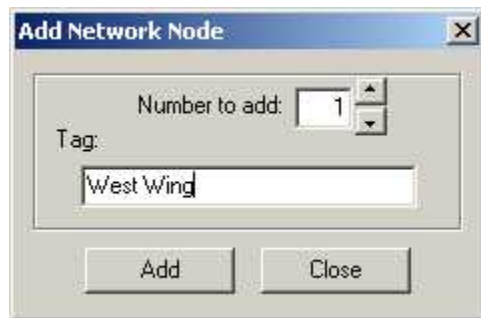
Number to Add - Select the number of network nodes to add. Defaults to one.

Tag - the name or description for the new network node.

The next available Node Address will be allocated. This can be edited later.

Add UDACT

This dialog is displayed in response to an Add UDACT command.

Report Format - Choose from Contact ID, SIA300 and SIA110. This is used only to set limits on the UDACT Ref ranges.

Auto Assign - This option will automatically assign a UDACT group of the correct type for every Input Zone and Output Circuit.

Advanced Panel Information Dialog

This dialog polls all the nodes and CPUs on the panel and checks their status against the configuration.

The following information is displayed:

- Node - address
- Cpu No
- Type - CPU Type
- Version - current firmware version (n/a for RA1000)
- Language - language in firmware (standard messages/menu etc.)
- System Type - one of the following
    - Compact Build
    - Large Build
- HW Type - "base" or "Exp. Master" for the Large board
- HW Vers - currently always VX.X.X
- Status - one of the following
    - Online
    - Not responding
    - Wrong type (configured as "xxxx")
    - Unconfigured CPU
    - Firmware version mismatch.
    - Address mismatch (configured as node xx).
    - Offline trouble: xxx xxx

Audio Compose

Digitized messages are composed using WAV files. A sequence of commands describes how the wave sounds are to be combined. For example, a message could be composed of a sound that is played once, followed by sound that is repeated three times, and finally, a sound to conclude the message.

This dialog is displayed in response to an Audio Edit Message command.

There are two modes, regular (the default) and advanced.

In regular mode each clip or WAV file has an implicit loop that repeats the clip 'n' times. The sequence can be concluded with a Repeat All command.

In advanced mode the user has complete control over four levels of nested loop commands that can go around multiple clips.

Once a sequence uses advanced constructs it cannot revert to regular mode. A message is considered advanced if:

- The sequence contains more than two levels of nested loops.
- An Audio Clip isn't followed immediately by a level 2 loop.
- The level 2 loop does not apply to the single audio clip.
- The outer most, level 1 loop doesn't apply to the whole message.

Audio Clips

This pane is common to Advanced and Regular mode. It lists all of the available clips, or WAV files. Some are built in to the firmware of the Audio Controller, and are listed here to be used in messages. Others were recorded by the user and imported.

Import When this button is pressed a standard file chooser is launched. Browse to the location of a WAV file. This can be a file you have recorded, or any other suitable wave file.

They must be (.wav) files sampled at 11.025 KHz, 16-bit mono, ADPCM 4-bit. It is also possible to use RAW (or PCM) in addition to ADPCM, but since this format is not compressed it takes up more serial flash memory.

The file will copied to the database and given a unique name (a Microsoft GUID). The file will receive another RIFF section, to include some naming and versioning information. Once a WAV file has been imported, it will be listed in the Audio Clips and is available for use in digitized messages.

Remove When this button is pressed the selected clip is removed from the database. The deletion will not succeed if the clip is referenced by any message in any job on the database. Once the clip is deleted it is no longer available for use in any job.

Audio Message

This pane lists the WAV files and commands that comprise a message.

You can give the message a name. Refer to this name when configuring a Digitized Message switch, or for use as Alert or Evac, etc.
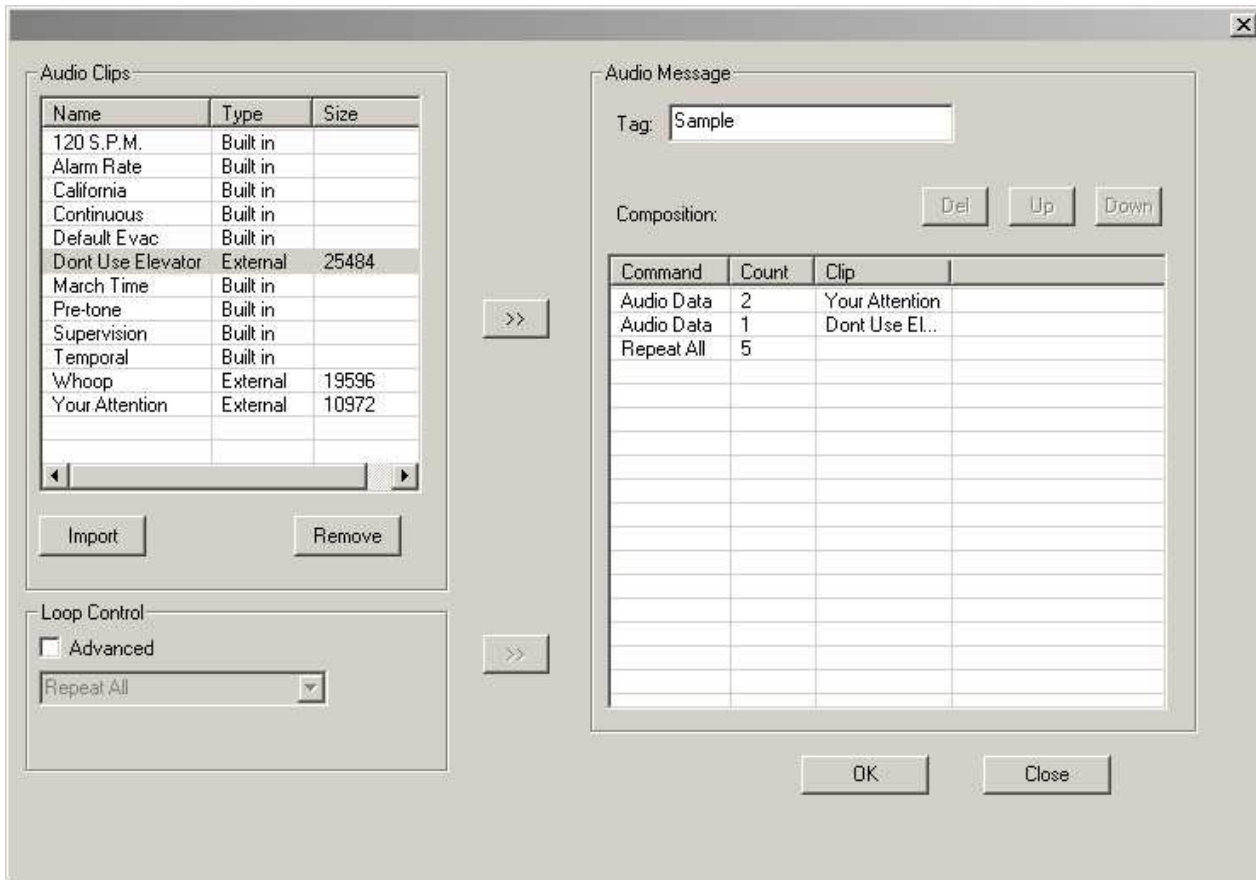
Composition

Commands in the Composition list view can be added, deleted and moved up and down.

Select a WAV file in the Audio Clips pane and press the >> button to move it into the message. It will initially have a count of 1. Edit the count to specify how many times the clip is to be played. A value of 0 means repeat for ever. Repeat for ever should be used with care. If there are following clips, they will never be played.

To repeat the entire sequence, insert a Repeat All command at the end of the list.

Commands in the Composition list view have the following columns.

Name	Description
Command	The command type. Either Audio Data (from the Audio Clips pane) or a Loop Control command.
Count	The number of times the clip is to be repeated. A count of zero means loop for ever.
Wave	The name of the wave file, as moved from the Audio Clips list.

Loop Control

In regular mode you specify the repeat count for a clip in its count field. You can use the >> key to insert a Repeat All command. It must be the last command in the sequence.

Standard Audio Example

This example plays an initial Your attention please two times. This is followed by a message instructing occupants not to use the elevator, played only once. The entire sequence is repeated 5 times.

Command	Count	Clip
Audio Data	2	Your Attention
Audio Data	1	Dont Use Elevator
Repeat All	5	-
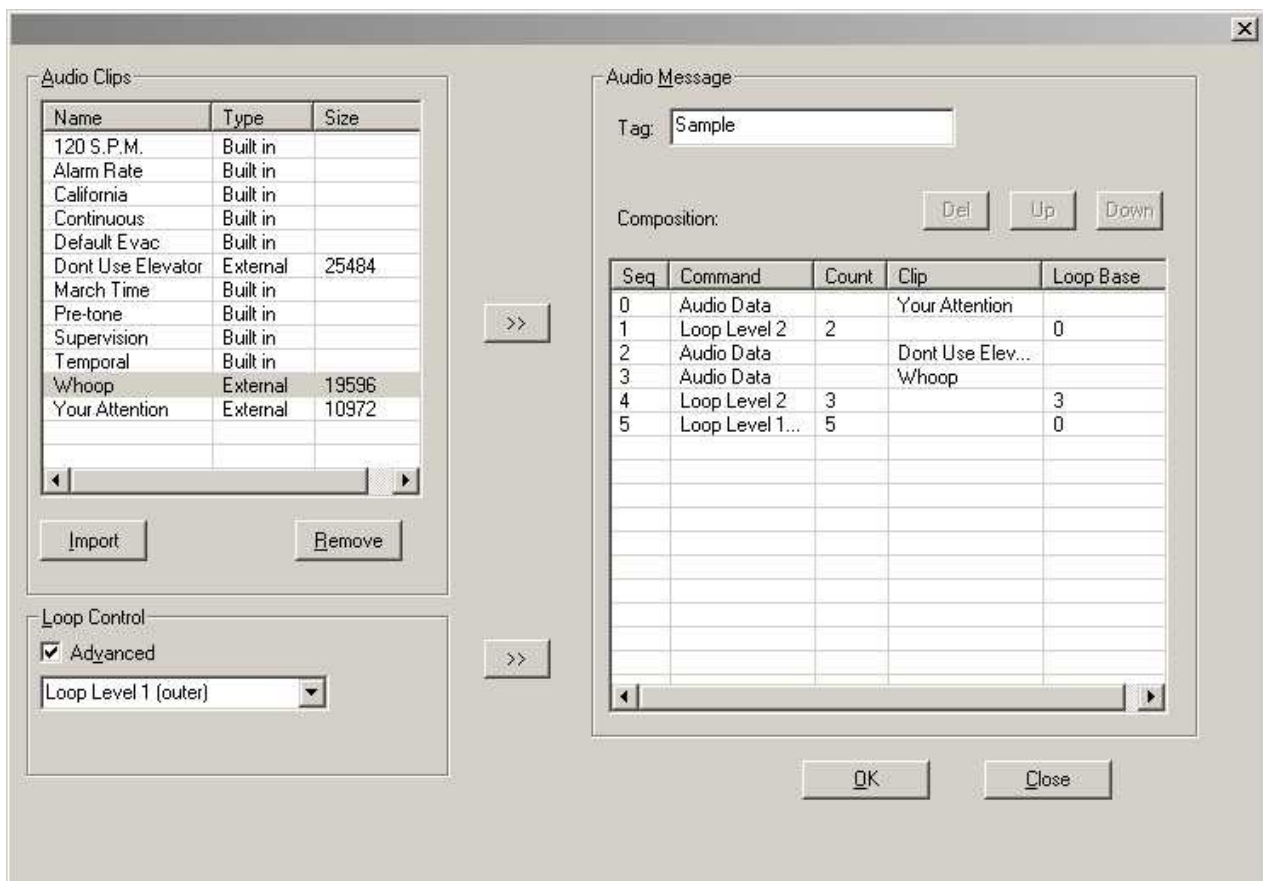
Composition

Commands in the Composition list view can be added, deleted and moved up and down.

Select a WAV file in the Audio Clips pane and press the >> button to move it into the message.

Select a Loop Command and press the >> button to move it into the message. Loops can be nested up to four deep. A Loop 1 command specifies an outer-most loop, etc.

Commands in the Composition list view have the following columns.

Name	Description
Seq	The command sequence number. Beginning with zero. Refer to this number when specifying the base for a looping command
Command	The command type. Either Audio Data (from the Audio Clips pane) or a Loop Control command.
Count	The number of times a loop is to be repeated (applies only to a Loop Control command). A count of zero means loop for ever.
Wave	The name of the wave file, as moved from the Audio Clips list.
Loop Base	This specifies the base command for a loop control. For example, a Loop 1 command in row 5 could specify Seq 1 as its base. This means that the commands in rows 1,2,3 and 4 are repeated Count times. The user is responsible for correct nesting of loops.

Loop Control

Select a Loop Control (level 1, 2, 3 or 4) to move into an Audio Message Composition. Loop 1 is used for the outer most loop. Loop 2 can be nested inside of a Loop 1,etc.

Advanced Audio Example

This example plays an initial Your attention please two times. This is followed by a message instructing occupants not to use the elevator, played only once. Next, a whoop sound is played 3 times. The entire sequence is repeated 5 times.

Seq	Command	Count	Clip	Loop Base
0	Audio Data	-	Your Attention	-
1	Loop 2	2	2	0
2	Audio Data	-	Dont Use Elevator	-
3	Audio Data	-	Whoop	-
4	Loop 2	3	3	3
5	Loop 1	5	5	0

Audio Setup

This dialog is displayed in response to an Audio Setup command.
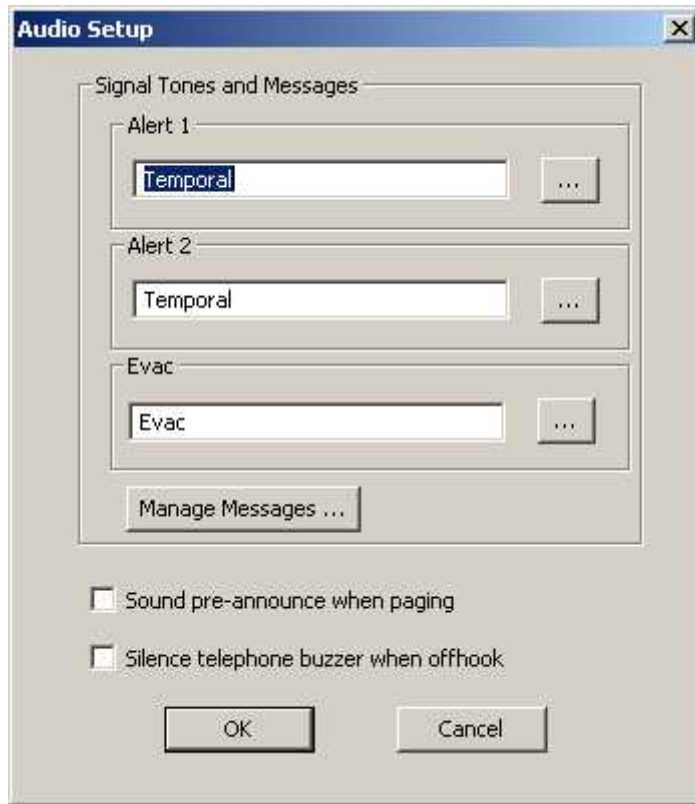
Alert 1, Alert 2, and Evac state options – press the ... (ellipsis) button to launch the Manage Message Dialog to select which audio tone or digitized message to broadcast when the system reaches that state. You can select an existing message or create a new one. On return the selected message is assigned to the chosen Alert or Evac state. The controls associated with Alert 2 will be disabled if the option "Sound pre-announce tone when paging" is enabled.

Manage Messages - also launches the Manage Message Dialog allowing you to add, delete or edit messages. These message then become available for use here (for Alert 1, Alert2, etc.) or to be assigned to a Digitized Message switch.

Sound pre-announce tone when paging – when enabled, a 900Hz pre-announce tone is sounded (using the Alert 2 channel) for 2 seconds before the paging audio source is applied. This special tone will un-silence speakers that are currently silenced.

Silence telephone buzzer when handset off hook – when enabled, the call-in buzzer on the audio controller will be silenced when the local master handset is off hook.

Backup Database

Backup database makes a copy of the Master Database.
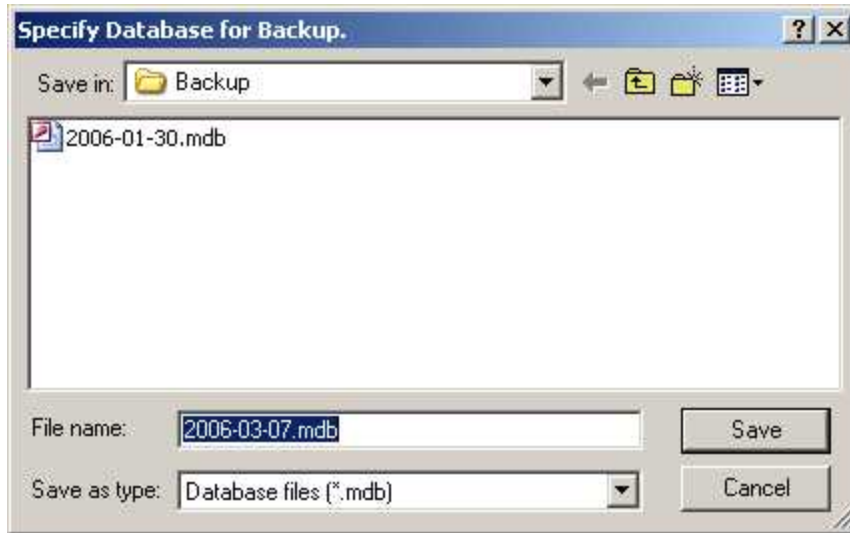
By default the backup is made in the File folder specified in the User Preferences. The backup file will have a name of the form YYYY-MM-DD.mdb.

After the Backup is complete, if the Keep Only Latest Versions After Backup option of User Preferences is enabled, old versions of each job in your main database will be deleted, retaining only the latest version of each job.

The backup can be used by the Restore Database command to recover all of the jobs in the database. You can also use the Import command to recover selected jobs from a backup. Backup your Master Database often and store a copy of the resulting file on a CD or other media.

BDM Load

This dialog appears in response to the BDM Load command, after you have selected a firmware archive.
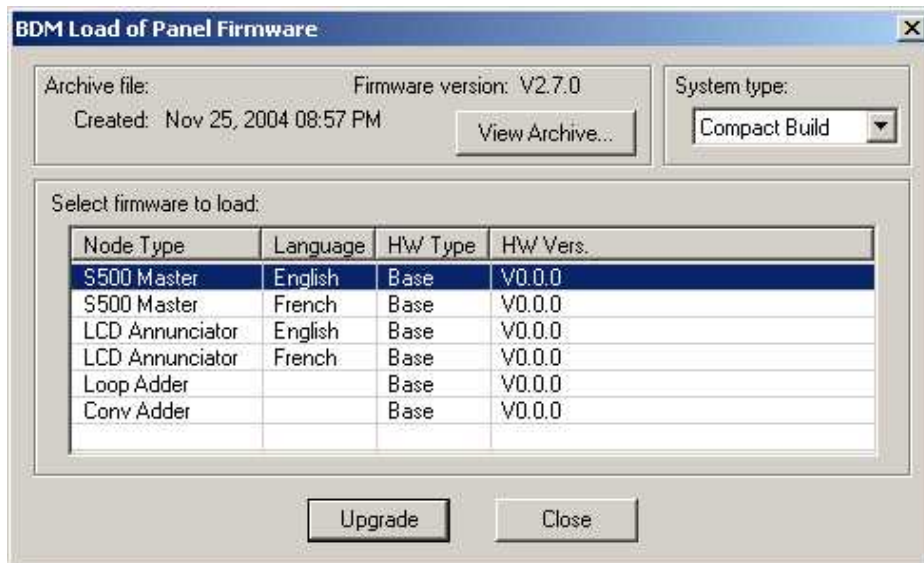
View Archive... - clicking this button opens the Firmware Archive Contents dialog, which lists all of the files in the archive. There should be a file for every combination of System Type (Compact and Large), Node Type and where appropriate, Language.

System Type - Choose the System Type to match the CPU you wish to load. Choose from Compact and Large.

Select firmware to load - The list view shows all of the combinations of CPU Type and language (for main CPUs and Annunciators). Select the row corresponding to the firmware to be loaded.

Upgrade - click this button to start the firmware upgrade and follow the on screen instructions

Audio Choose Message

This dialog is displayed in response to Manage Message button on the Audio Setup dialog.

It lists all of the available messages.

Some standard messages and tones are built into the firmware and can be chosen for use as Alert 1, Alert 2 or Evac. They can also be built into custom messages.

Custom messages are those that the user composed by combining recorded WAV files, built in tones and looping commands.

Add - launches the Audio Compose Dialog where you can create a new message.

Edit - launches the Audio Compose Dialog where you can view or modify the selected custom message.

Remove - deletes the selected message. Built in messages cannot be deleted.

Compact Database

A database that has been the subject of many deletions and additions can become fragmented and occupy more space than required. Compact Database executes a standard MS-Access utility to recover the space and improve performance.

Note: This may take several minutes for a large database

Select Job to Compare
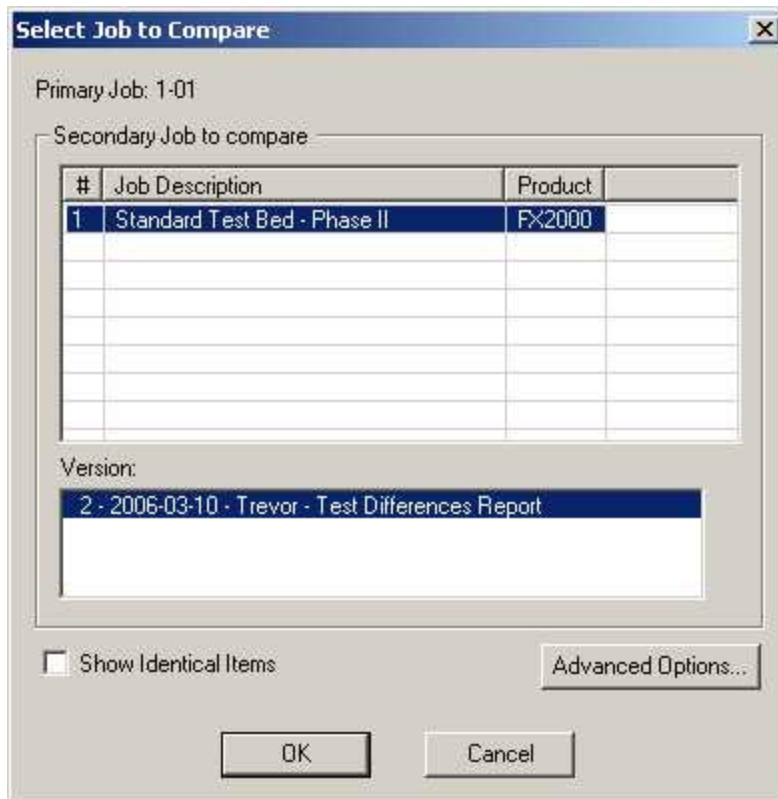
Primary Job - This field reminds you which job you have already established as primary job: the base job against which the secondary job will be compared.

Select Secondary Job: Select Version - Use the combination of Job and Version to select the secondary job. The job defaults to the same one you established as Primary. Normally you will only need to choose a newer version of the same job. You are prevented from choosing the same Job and Version for Primary and Secondary.

Just as when establishing the primary job, you can sort the list of secondary jobs by Job Number, Description or Product.

Show Identical Items - Check this box if you want to see not only changes, but also those items that stayed the same. Normally you will leave this un-checked. Differences are easier to see and Print generates less output if identical items are not included.

Advanced Options - When you press this button the Advanced Options dialog is launched. Here you can change some of the more advanced filtering options. They are normally all checked by default and in most situations do not need to be changed.

Advanced Compare Options

Modified - Check this box to include any item that has been modified. (Modified means that it is the same adder, circuit, switch, etc. but some attribute has been changed.) This box is checked by default. You would only un-check this box if you did not want to see items that have been modified.

Present only in Secondary Job - Check this box to include items that are only present in the secondary job. This means that Loop Adders, Annunciators, Display Adders, circuits, etc. that were not on the base job will be included. This box is checked by default. You would only un-check this box if you did not want to have new additions reported.

Present only in Primary Job - Check this box to include items that were only present in the primary job. This means that that Loop Adders, Annunciators, Display Adders, circuits, etc that were removed from the primary job will be included. This box is checked by default. You would only un-check this box if you did not want to have deletions reported.

Note: Filtering of 'Present only in Secondary' and 'Present only in Primary' do not apply when presenting the tree. The tree is shown in its entirety, regardless of these settings. The filtering is only applied to the Device, Display Item and similar lists. It is intended to make it easy to see what components have been physically added or removed from the job.

Correlations are not considered to be items in this context. If a correlation was added, then that is effectively a modification to the item that received the correlation.

If you chose to check Present only in Secondary Job and/or Present only in Primary Job, but you do not check Modified, then the circuits, etc. that have only had correlation changes will not be included.

Connect

This dialog is displayed in response to a Panel Connect command if the job has a Dialler component.

Select a connection type

- Direct Serial - Select this option if you have connected a serial cable directly from the serial port (or USB / UIMIA) of your computer to the fire alarm panel.

- Modem - Select this option if the fire alarm panel is capable of being programmed remotely. The combo-box will list the modem(s) found on your computer.

    - Telephone Number - Enter the phone number to which the fire alarm panel is connected. The text field will show the last number you entered.

Create Job

- Enter a description for new job This name, which should be unique, will identify the job throughout its lifetime. Note that in a multi-product environment the same job name cannot be used for jobs of different products, even if you don't currently have access to all possible products. An error message is displayed if the name is not unique. The error message will help you identify duplicates that belong to other products or brands.

- Author The technician who is creating the new job. The default is automatically inserted but can be overridden.

- Comments (Must be entered) Enter a comment. It can span multiple lines. This will become part of the job's version history.

- Model Choose the Panel Model for your new job.

- Select Job Template After you have selected a model the list view will show only templates jobs for the that model. The list view has the following columns.

    - Agency There are two copies of most template jobs: one for ULI and one for ULC. The new job will be pre-configured for the chosen agency, but can be subsequently changed.

    - Description A short description of the template job. For a given combination of Product, Agency, System Type and Language there may be more than one template job. Each is pre-configured with different features. The Description field summarizes the features.

- Language If the panel firmware supports it, there may be template jobs for more than one language. e.g. English or French. For panels with multiple CPUs, this is the language of the Main CPU. The firmware must match otherwise the job cannot be sent to the panel.

- Copy current job data As an alternative to choosing a standard template, check this box to make a copy of the current job (which is presently open in the configurator). In this case the Panel Model and Job Template controls are disabled.

Note: This dialog is also shown when Get Job is used to retrieve a job from the panel and no previous version of the job is stored on the database. The same dialog is used if the job name on the panel and the database are the same, but the Product is different. You will be prompted for a new, unique name. In these cases the Panel Model, Job Template and Copy current job data controls are disabled.

Display Structure

This utility allows you to view the contents of a panel data structure. You have the option of continually retrieving and displaying the same structure at a refresh rate you specify. You can also log the results to a file.

To display a structure proceed as follows.

- Connect to the panel and click Display Structure under the Tools menu (you must have selected Show Tools Menu under preferences). The following dialog appears.
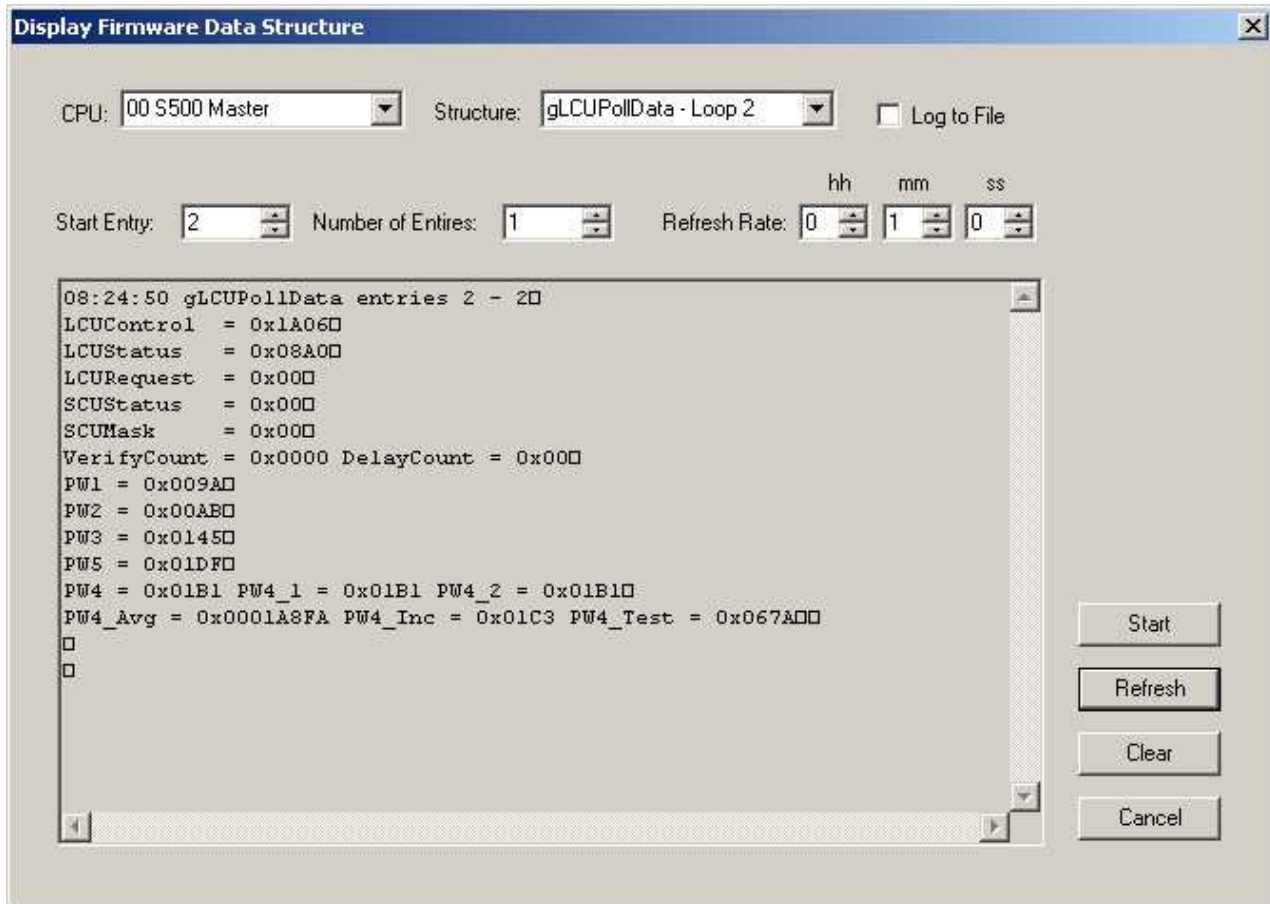
- Choose the Node and CPU.

- Choose the Structure on that CPU. Loop structures are qualified with a loop number. e.g. gLCUPollData - Loop 2.

- Choose the entry (for Poll Data there is one entry per device, other structures may be organised differently).

- Choose how many entries to display. The maximum is adjusted automatically to compensate for the selected start entry. Note: The actual entries on the panel may be less than the maximum. If you choose a start entry higher than the actual number of entries on the panel you will get an error message. If you choose a number of entries greater than those actually on the panel, you will receive only those that are present.

- You can get a "one shot" display by pressing Refresh.

- To run continuously, select a refresh rate and press Start.

- To log to file check the Log To File box and specify a destination file.

You can adjust the refresh rate, the start entry and the number of entries while the display is running. They will take effect after the next interval has expired.

To view a different structure you must first press stop.

Edit Job

This command toggles the edit lock on a job.

A newly created job or a new version of an existing job can be edited immediately.

An existing job, freshly opened can be locked at two levels. A job that has never been loaded to a panel is locked against accidental change. The locking of such a job can be simply toggled by using the Edit Job menu option. If a job is locked and the user enters keystrokes on any of the editable forms or lists, a dialog will be shown, asking the you to confirm your intent to edit the job.

If you answer Yes, the job is unlocked (as if the menu option had been selected). The GUI's list and forms then allow editing, with changes taking immediate effect. If you answer No, all subsequent keystrokes (or mouse clicks) on that form or list are ignored.
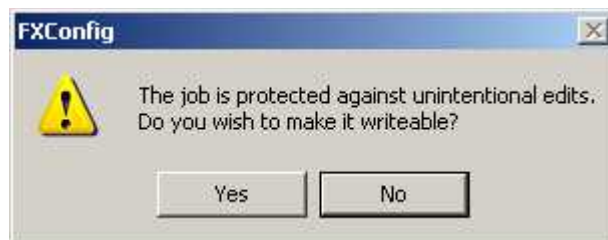
A job that has been loaded to the panel has a harder level of locking. It is intended to prevent the database and panel copies of the job diverging. If the user attempts to toggle the lock from on to off, then the following message appears.

If you choose to proceed, the job is unlocked. If an attempt is made to edit the same job on one of its lists or forms, a similar dialog is shown but without the option to unlock the job.

Once a hard locked job has been unlocked, it can only be toggled between soft locked and unlocked.

Export Job

This command exports the current job in one of two formats.

The user is presented with a File Chooser dialog.
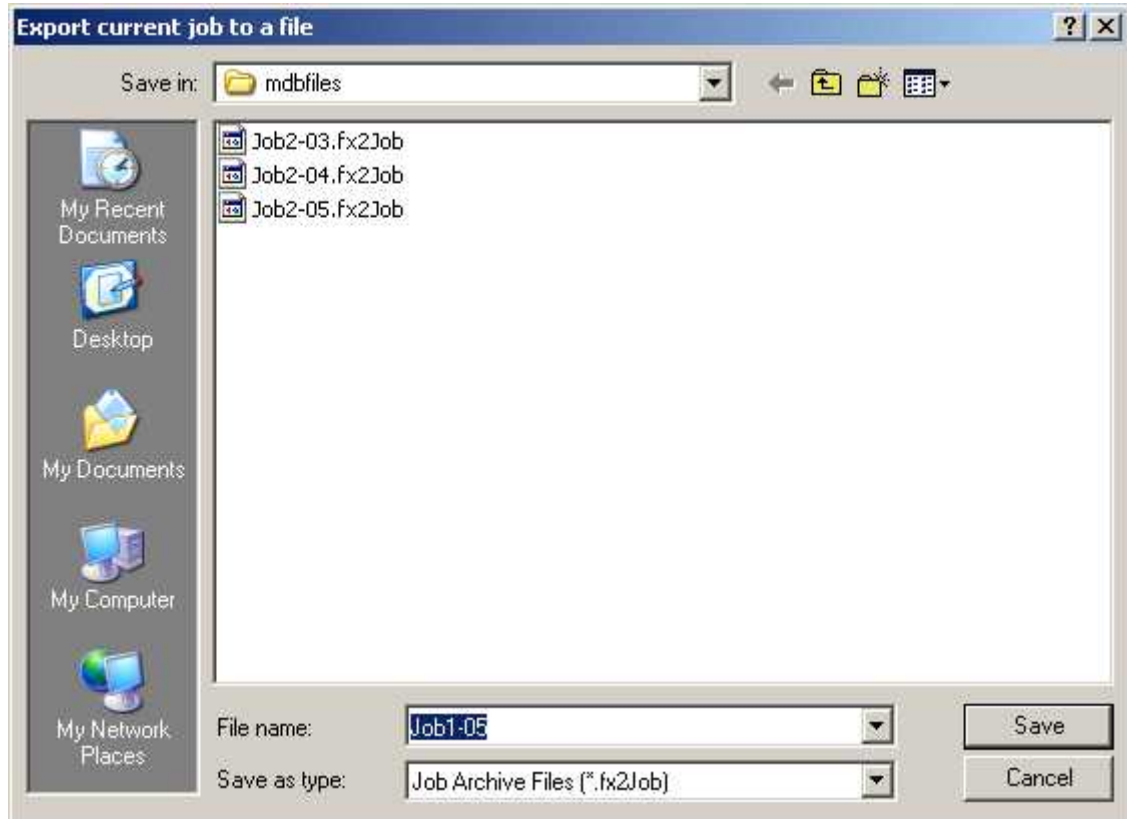
If Type MDB is chosen, a Microsoft Access database containing a single job is produced.

If Type Job Archive File (fx2Job - serialized data structures) is chosen, then a compact archive file is produced.

By default, the file is given a name "Jobnn-vv" where nn is the job number and vv is the version. You can change the name to make it easier to identify the job.

Either of these formats can be the subject of a Job Import.

Export is used to exchange a single job, for example between technicians. The fx2job format results in a very small file, suitable for electronic transmission.

Shortcut Keys: Ctrl-E

Firmware Archive Contents
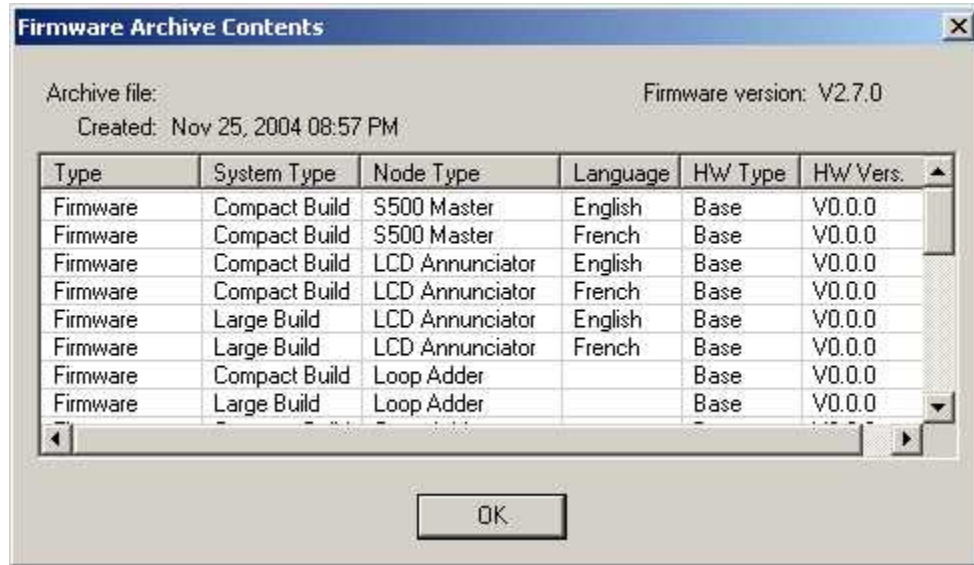
This dialog is launched from the Upgrade Firmware dialog.

It lists all of the files in the archive.

Type- Either Firmware (the firmware image) of Dnld Program (a small boot strap program sent by Upgrade Firmware).

System Type - For products with more than one system type. For example Compact and Large.

NodeType - The Node or CPU Type for which the firmware file is intended.

Language - For Annunciators or Base Panels, the language of the built in system messages.

HW Type -

HW Vers -

About Dialog

Displays the copyright notice and version number of your copy of the Configuration Utility.

Holidays

This dialog allows you to add and remove holiday definitions for use when a panel is configured with the After Hours option.
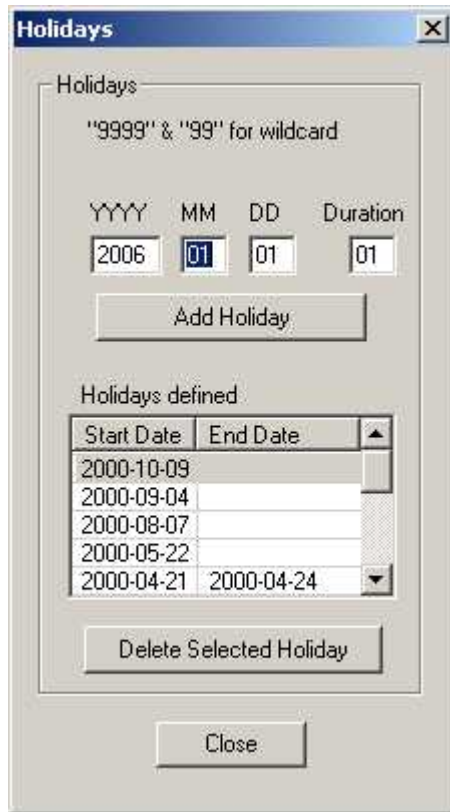
Compose a new holiday definition in the YYYY MM DD edit boxes and press Add Holiday. You can specify recurring holidays by using wild cards.

Enter 9999 for the year to specify that the holiday happens every year.

- e.g. 9999 01 01 for New Years Day.

Enter 99 for a month or day to specify a recurring holiday.

- e.g. 9999 99 01 to specify that the first of every month is a holiday.
- e.g. 9999 07 99 to specify that the site is shut down for the whole of July for summer vacations.

By default the holiday has a Duration of 1 day. Change this to specify a longer holiday.

- e.g 9999-12-25 2 to specify a two day break beginning on December 25th.

Note: The program prevents you from entering duplicate holidays, but does not check for "nested" holidays.

As holidays are added or removed, the list on the "parent" form is maintained to be in agreement. An error message is displayed if the limit for the total number of holidays would be exceeded.

To remove a holiday, select it in the lower Holidays defined list and press Delete Selected Holiday

Press Close to return to the Job Details form.

Import Job

This command imports a selected job/version from an external database or serialized job archive as created by the export or Backup Database commands and converts the job to the current version if necessary. The user chooses the type (MDB or Serialized Archive) and location of the file to read. The location defaults to the Job File folder specified in User Preferences
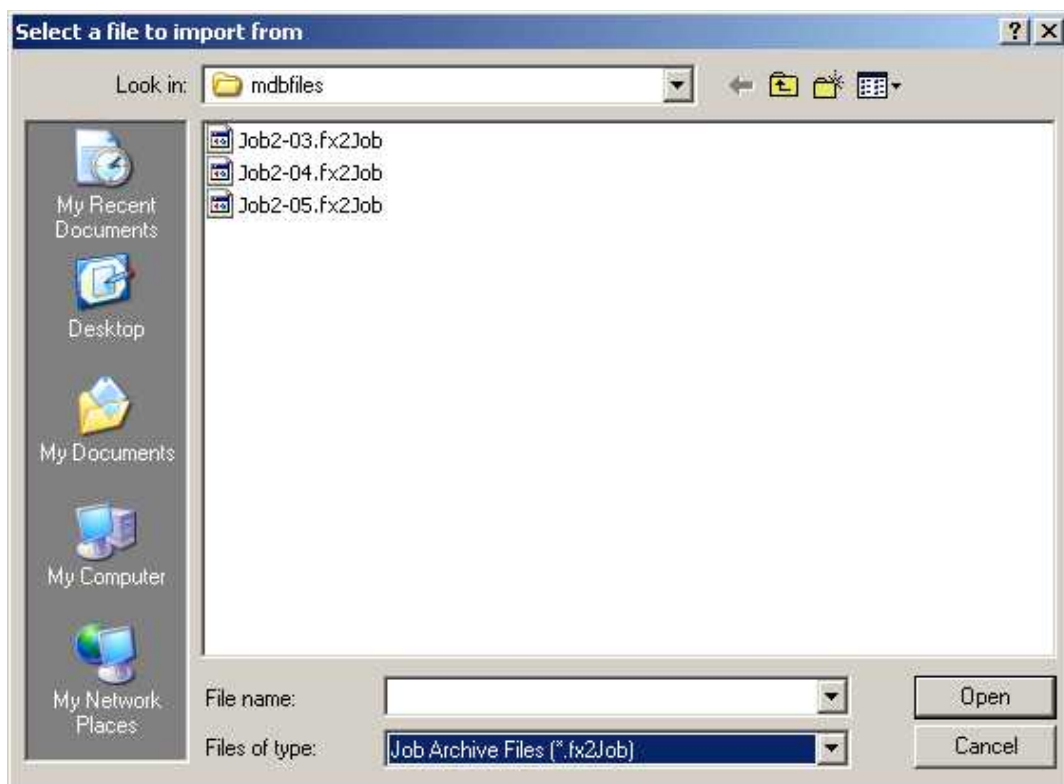
If the selected type is MDB, then the Microsoft Access database (usually a database that resulted from a Backup Database) is opened. A list view, similar to the Open Job dialog, displays jobs contained in the database. The list will be restricted to the Products for which the user is authorized.

The chosen job is read and copied to the current database using logic common to Restore Database. If the version of the source database is not too old (no forward conversion is possible) and is not younger than the current database, then any necessary conversion is performed. If the database version is not compatible, an error is displayed.

If the selected type is fx2job (a serialized archive, usually the result of Export) then the Jobs found in the archive's index are listed. The data structures are de-serialized and treated very much as if they had been downloaded from a panel. The program adjusts older versions of data structures to the current standard, extracts the data and stores the job on the database.

If the same job (identified by its name) is already on the database, then the next highest version is assigned to the job.

If a job with the same name is not on the database, then a new job is created.

Logic Editor Dialog

Displays in response to the Edit button on the Advanced Logic correlation tab.

Using this dialog the user can compose an equation to be applied to a local, dummy input zone. The input zone is then correlated, using regular IO corrs, to the output which is ultimately the object of the equation. This is done by specifying any number of local and remote inputs zones, local input circuits, timers and intervals (operands) and boolean expressions (operators).

When the result of the equation, evaluating the TRUE/FALSE state of all inputs, is TRUE the associated output will be energized. The equation overrides any other Input/Output correlations.

WARNING: Applying an equation directly to an output bypasses all of the regular input to output correlation processing. That is - coded inputs are not processed, etc. Use of a dummy input zone as the intermediary is the preferred method.

The operands recognized by the equation builder are

- AND
- OR
- NOT
- EQU
- ANY x OF(inputs)

Examples:

Turn on a relay if a smoke detector in the lobby is in alarm, but not if the smoke detector in the elevator machine room is detecting smoke.

= 01-00-L2-SM-001 AND NOT 01-00-L2-SM-002

Release halon in a semiconductor clean room only if three of the 10 verified alarms in the area are active.

= ANY 3 OF (01-00-L2-SM-001 , 01-00-L2-SM-002 , 01-00-L2-SM-003 , 01-00-L2-SM-004 , 01-00-L2-SM-005 , 01-00-L2-SM-006 , 01-00-L2-SM-007 , 01-00-L2-SM-008 , 01-00-L2-SM-009 , 01-00-L2-SM-010 , 01-00-L2-SM-011)

Associate an equation with a dummy input and then reference that input in several equations attached to outputs. In this example zone 3 will be TRUE if smoke detectors 5, 6 and 7 are active. Zone 3 is then re-used in the equations for four different relays. Relay 1 will be energized if the equation for zone 3 is TRUE and smoke detector 8 is not active. The simplifies the relays' equations, which would otherwise all have to include zone 3's equation.

// Common to activation of relay #1,2,3,4.
01-00-**-IZ-003 = 01-00-L0-SM-005 AND 01-00-L0-SM-006 AND 01-00-L0-SM-007

// First relay
01-00-L1-RL-001 = 01-00-01-00-**-IZ-003 AND NOT 01-00-L0-SM-008

// 2nd relay
01-00-L1-RL-002 = 01-00-01-00-**-IZ-003 AND NOT 01-00-L0-SM-009

```
// 3rd relay
01-00-L1-RL-003 = 01-00-01-00-**-IZ-003 AND NOT 01-00-L0-SM-010

// 4th relay
01-00-L1-RL-004 = 01-00-01-00-**-IZ-003 AND NOT 01-00-L0-SM-011
```

The left hand pane lists all of the elligible inputs. These are currently limited to

- Local input circuits
- Local input zones
- Remote input zones
- Custom Intervals
- Custom Timers
- Switches

The columns of the list view include an ID. This is a short hand form of the circuit's location. It is contructed from the input's Node, CPU, loop (if any), a two character code indicating the type and the address or number of the input.

The ID is intended to assist the user in recognizing the input when it appears in the final equation.

The remaining columns are the Node, CPU and Tag of the input.

The circuit, timer or switch can be simply tested for TRUE and FALSE, or a particular Device Status can be tested. If a status is selected in the Device Status drop down, it will be appended in the form of :x to the device ID when it is inserted into the equation. Each one applies a different mask to the device's state.

The right hand pane shows the current equation, if any, on entry or the equation under construction.

Although the user can type into the right hand pane, it is recommnended that they insert operands and operators using the controls.

To enter an input, double click it in the left hand list or select it and press the insert button ">". The ID of the input will be inserted in the equation at the current cursor location.

To enter an operator, click one of the operator buttons.

To enter multiple inputs separated by commas, select them in the list by using the mouse in combination with the Ctrl key or Shift key. Press the insert button. If an operation is to be applied on the inputs, such as "Ckt1 OR Ckt2 OR …", select the inputs from the list and then press the operator button. The complete expression, enclosed with parentheses, will be inserted into the equation.

The EQU operand is used in combination with a System Define (a constant). It tests a device's state and produces a TRUE|FALSE result. You may have to apply a device mask to isolate the states you want to test.

e.g. **-**-**-TM-016 EQU TIMER_RUNNING Test for a timer running.
e.g. 01-00-02-IN-003:L ALARM_LEVEL2 Test an input's alarm level

Note: not all Sys Defs can be applied to all circuit types. The user is repsonsible for choosing a valid combination of device mask and Sys Def.

The Sys Def button inserts a named constant into the equation. You can select a named System Def in the drop down list before pressing the button.

The OK button causes the equation to be parsed and verified. If there are syntax errors an error message will indicate the location of the error in the string.

Press the cancel button to dismiss the dialog without making any changes.

New Job Version Information

Displays in response to the New Version command

Also when a job is uploaded from the panel and a job with the same name already exists on the database.

Default user spec'd in user preferences (may be changed).

Note: A Comment MUST be entered for the Version history when you create a new Version of a Job.

Open Job

This dialog, which appears in response to the Open Job command, allows the user to select a job and job-version in the database and open it in the user interface.

The Select Job list view shows all of the jobs on the database. By clicking on the column heading you can sort the jobs by

- Job Number
- Job Description
- Product (where more than one product is supported)

The Select Version list view shows all of the versions of the selected job. This includes the date and a description.

Click OK after you have selected a job and version.
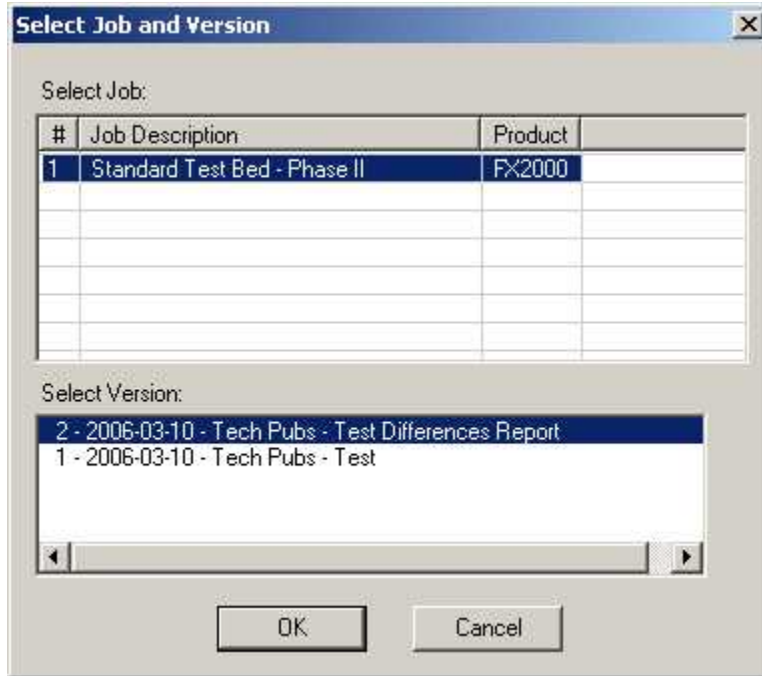
Panel Information Dialog

Displays in response to the Panel Information command.

This dialog displays a summary of panel and the configurator information, with options to view more detail. The information includes:

- The Product Version
- Name and Version of the job currently loaded on the panel.
- Model (deduced from Product, System (build) Type and Hardware Features).
- The Date it was sent
- The ESD and Tech who sent / owns the job. (For products secured with a key)
- Security Key SIN. (For products secured with a key)
- FXConfig Version
- Date and Time Last Changed
- Number of times auto config'd.
- The Panel Time.

An Advanced button launches Advanced Panel Info which retrieves and displays the Type, Product Version, Language, on line status, etc. of all Nodes and their CPUS.

An Update button allows the panel time to be corrected/updated from the configurator for those products that support the feature.
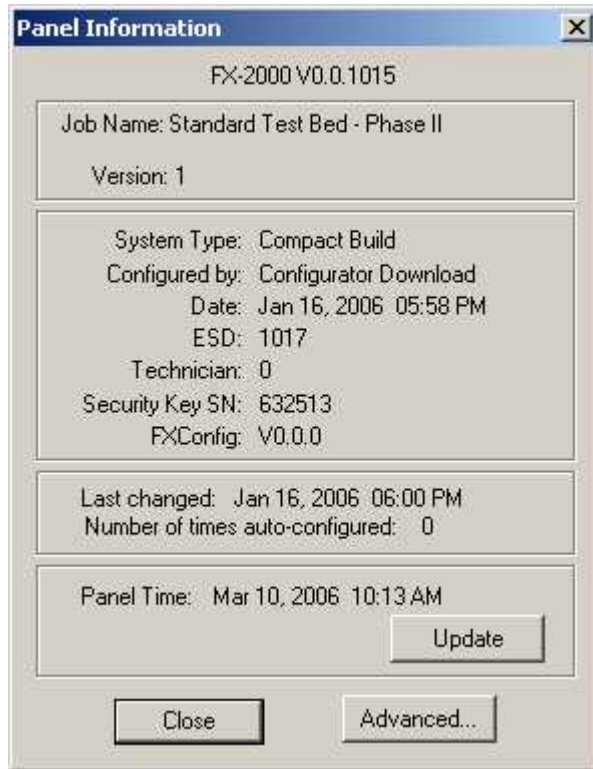
Paste Special

This dialog appears in response to a Paste Special when pasting circuits, conventional adders or entire loops.

The text summarizes what is being pasted and its destination.

e.g Copying Node 1, or Pasting 3 devices to loop 2.

Number of copies - specifies the number of copies to make. The paste operation will attempt to make the specified number of copies. If the capacity of the destination is exceeded a message will be displayed to inform the user how many were successfully made.

Copy I/O correlations - If this box is checked the copied device(s) will have the same I/O correlations as the original.

Copy display correlations - If this box is checked the copied device(s) will have the same display correlations as the original.

Retain Address - Check this box to retain the same addresses on the copied devices. A message will inform the user if this is not possible. Retain Address can fail if the destination loop controller does not have sufficient free addresses. Retain Address will always fail if the source and destination are the same loop.

Paste Special

This dialog appears in response to a Paste Special when pasting display items, display adders or entire annunciators.
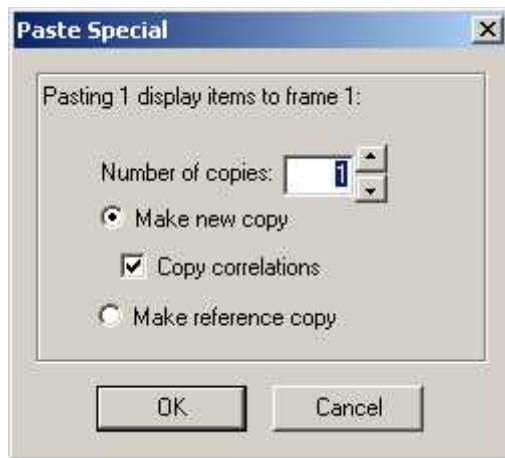
The text summarizes what is being pasted and its destination.

e.g Copying Node 33, or Pasting 3 display items to frame 0.

- Number of copies - specifies the number of copies to make. The paste operation will attempt to make the specified number of copies. If the capacity of the destination is exceeded a message will be displayed to inform the user how many were successfully made.
- Make New Copy - Choose this option to make an unrelated replica of the source.
  - Copy I/O Correlations - If this option is checked, the new display item(s) will be correlated to the same circuits and devices as the source.
- Make Reference Copy - Choose this option to make a reference copy of the source.

A regular copy is defined as follows.

- The LEDs and/or switches are copied and become separate entities from the orignal LEDs or switches.
- Common Control Status LEDS are an exception - all similar types operate in parallel. e.g. A copied and pasted Signal Silence would retain the internal LED Grp of the source.
- All attributes (tags, flags, etc.) are replicated.
- If IO Corrs is checked, then these too are assigned to the new copy. This is a "deep" copy.
- If IO Corrs is not checked they are not copied. This is the "shallow" copy.

A Reference copy is defined as follows.

- New LEDs and switches are defined, but they are linked closely to the original source.

- If any 3 POSITION SLIDE SWITCH is encountered while attempting a "Reference Copy" of individual items, a complete adder or an entire annunciator, an error message is displayed and a roll back of the operation occurs.

- Both the new copy and the source (and any subsequent reference copies) will be marked with an asterisk to warn the user that the items are 'linked" or cross referenced. A change to one (e.g addition of CORRS) affects the others.

Print Dialog

When you initiate either Print or Print preview, the following dialog is displayed.
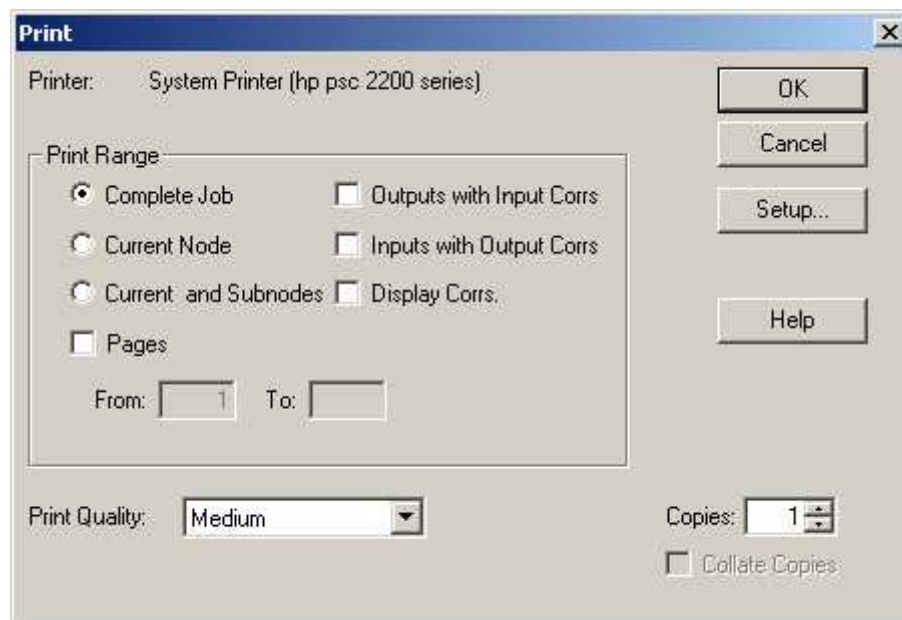
Print Range - You can specify the range or scope of the print job using these controls

Complete Job - Regardless of what item in the Job Tree you currently have selected, the complete job will be printed. The print program will iterate through the network nodes. This process continues in a depth first manner, until the entire job has been traversed and printed. Each major item of the tree is started on a new page.

Current Item - If you choose this option, the print job is restricted to details of the tree item or job component that you currently have selected in the Job Tree. No details of contained loops, etc. are printed.

Current Item and Sub Items - this option prints details of the currently selected tree item and all of its sub-items (and those items' sub-items, if any).

Outputs with Input Corrs - If this box is checked, then the Inputs correlated to Output circuits are printed in addition to the regular print. This is done for any relevant tree items / loops that are included in the scope of the print job.

Inputs with Output Corrs - If this check box is checked, then the Outputs correlated to Input circuits are printed. Status correlations are included with this option. This is done for any tree items / loops that are included in the scope of the print job.

Display Corrs - If this check box is checked, then the Display correlations are printed. This is done for any relevant tree items / loops that are included in the scope of the print job.

General Note - Correlations

If a tree item has no correlations, then it is skipped entirely by the print program. If a tree item has correlations, then a header is printed for every "correlated from" device. Beneath it, and tabbed, are all of the devices correlated to it. If it has none, the major header is still printed.

Setup - This button launches the standard Windows © printer setup dialog. You may choose a printer other than the default, or select a different paper size. The print program is designed to fit all information on Letter sized paper (8 ½ by 11) in portrait orientation. You may also choose Legal sized paper (8 ½ by 14). The print program will take advantage of the longer paper and fit more devices on one page for list views and correlations. If you choose smaller paper the font will be scaled down accordingly (within practical limits).

Pages - this check box is only available when performing a print. It is disabled for print preview.

During preparation of a print preview or a print you will notice that the program makes one first pass through the tree items and loops that are in scope. It does this to calculate the page count. However, the program cannot insert the Max Page Number into the dialog because it is not known at that time.

If you need to repeat part of a print job (e.g. because the printer jammed part way through a job), then you must note the start page and the end page - up to the maximum number of calculated pages - and enter them in the From and To fields.

Generally, you can more easily control which portions of a job you wish to have printed by selecting an item in the tree and printing only that item.

Print Setup

Launch the standard Windows Print Setup dialog to specify the printer, paper size and orientation, etc.
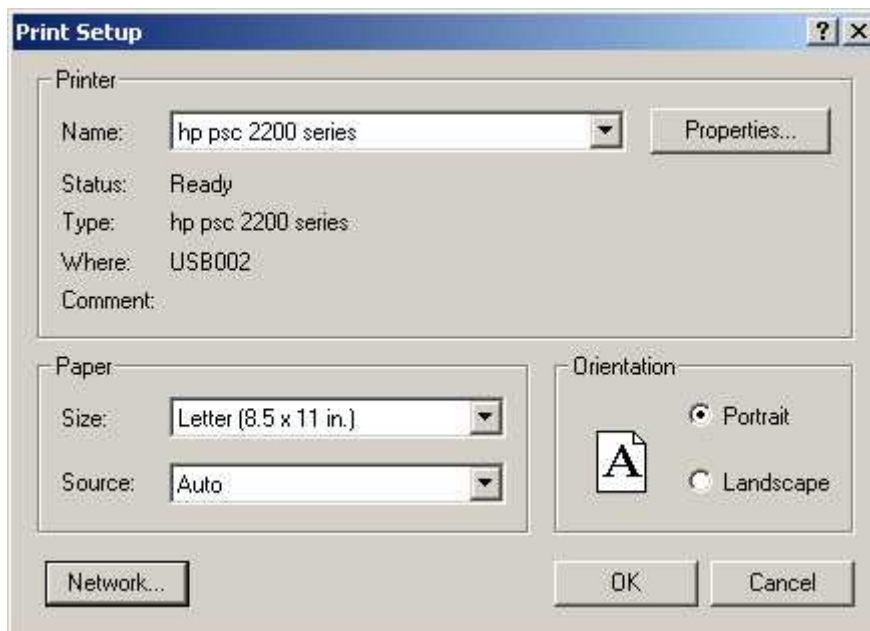
Restore Database

Restore database reads a database file and imports every job found there, after first deleting all of the jobs in the current database.

Warning: When you restore from an older backup you will lose any changes that have been made since the time of the backup.

If you choose to continue the following dialog will open. By default backups are stored in the Backup File folder specified in the User Preferences. The backup file will have a name of the form YYYY-MM-DD.mdb.
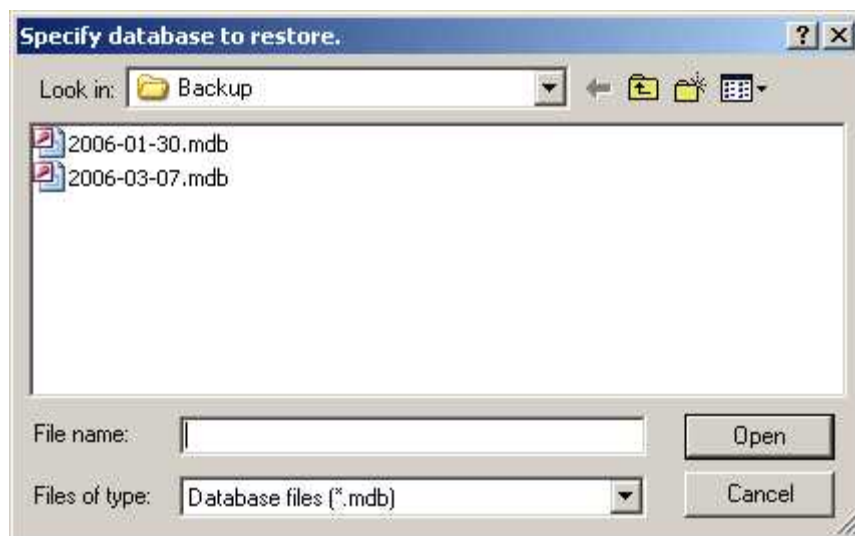
The backup database could have been produced by an older version of the configuration tool, in which case all necessary conversion is performed. Conversion is sometimes necessary when a new version of the configuration tool is released. The install program will make a backup and instruct you to run Restore Database to convert all of your jobs.

Security Key Logon

This dialog appears if the Security Key is present when the configurator is first started. It also appears if the key is inserted at a later time while the configurator is running.

When the dialog appears, enter your PIN and press OK. If the PIN is accepted all future, privileged operations will proceed with no further prompting as long as the key is still inserted.

If the user dismisses the dialog (by pressing escape) or removes the key, then any attemp to perform a secure operation will fail with the message

You need a valid security key to perform this operation.

You must reinsert the key and enter the correct PIN. Also see: Security Key Information

Upgrade Firmware

This dialog appears in response to the Upgrade Firmware command, after you have selected a firmware archive.
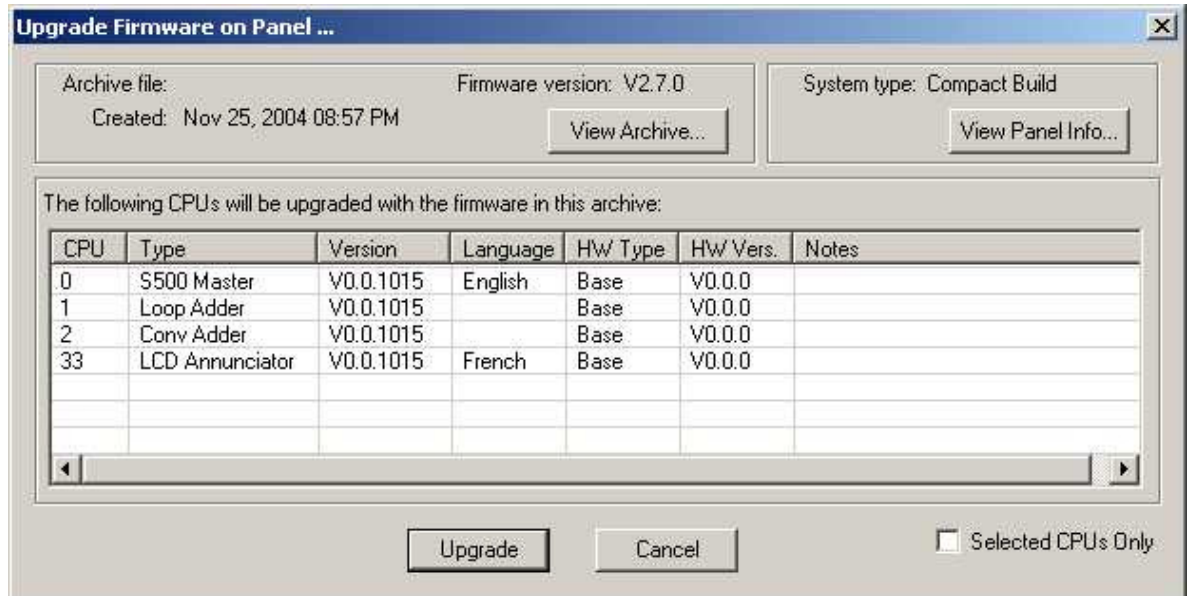
View Archive... - clicking this button opens the Firmware Archive Contents dialog, which lists all of the files in the archive. There should be a file for every combination of System Type (Compact and Large), Node Type and where appropriate, Language.

View Panel Info... - clicking this button opens the Advanced Panel Information dialog, which lists all of the CPUs actually present (Online or Not Responding) on the panel.

The configurator interrogates the panel to which it is connected and lists all of the CPUs actually present and on-line. The list view shows the CPU Number and Type and other information, including the current language for main CPUs and Annunciators.
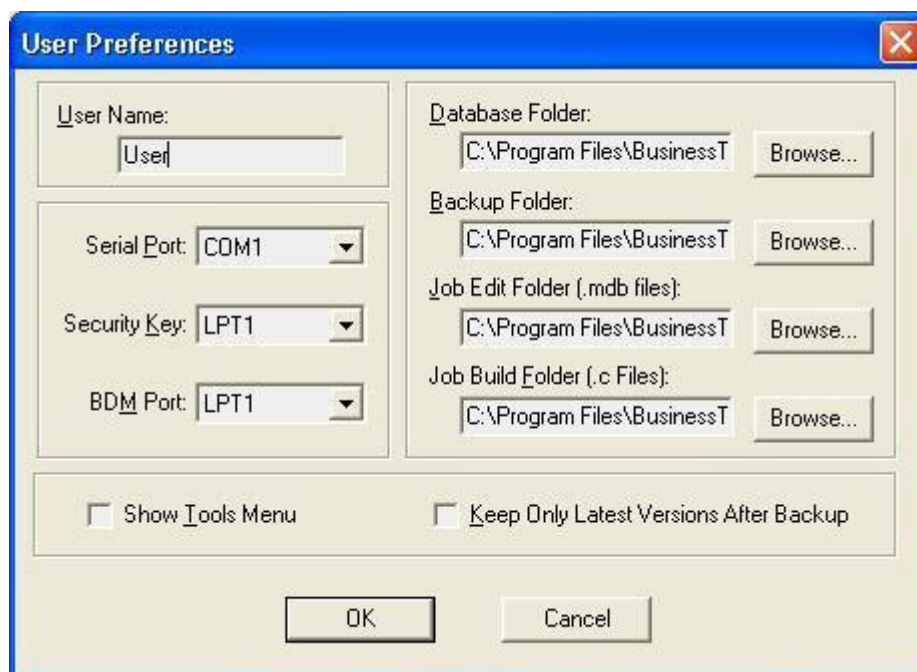
By clicking in the Language field you can select a different language. The CPU will be loaded with firmware for the chosen language, assuming the firmware archive contains the file.

Selected CPUs Only - check this box and select the CPUs you wish to upgrade. You can select multiple rows by holding down the Ctrl key and right clicking anywhere in the row. If this box is not checked all of the CPUs will be upgraded.

Upgrade - click this button to start the firmware upgrade

User Preferences

This dialog is displayed in response to the File menu's User Preferences command.

- • User Name - used for the Author of all new jobs and job versions
- • Serial Port - designates which COM port (or USB pseudo COM port) the configurator will use to connect to the panel.
- • Security Key port - Specifies the port where a WiBu key will be inserted. The drop down list shows the ports that have been registered by the WiBu software. The list will include LPTn if the computer has a printer port. The list may include USB, but only if a USB WiBu key has been inserted and the New Hardware Wizard has been run to install the required drivers. Further, a USB key must have been plugged in since the last restart of the computer, else USB will not appear as an option. If neither LPT nor USB are registered, a warning will be issued. The user cannot perform any privileged operations until a valid choice has been made. If only LPT is registered a warning will be issued since most computers would be expected to use USB for the security key.
- • BDM Port - designates which parallel port the Background Debugging Module will use (for those products that support this interface).
- • Database Folder - specifies where the main configurator.mdb database file resides. Usually the folder where the configurator is installed.

- Backup Folder - specifies where backup database files are written to and restored from.

- Job Edit Folder - specifies where individual job files are extracted to/imported from.

- Job Build Folder - specifies where the 'C' file output files are written by Job Validate and other trace or debug facilities.

- Show Tools Menu - display or hide an additional Tools menu. This menu contains trace and debug facilities and some features that Technical Support may require a user to turn on to gather diagnostic information.

- Keep Only Latest Versions After Backup - if enabled, only the latest versions of all jobs will be kept after a successful Backup Database command, all older versions are removed from the current database.

- Show Advanced Features - if disabled, some of the more advanced features are hidden.

These values are stored in the registry (per configurator version) so that a returning user operates in the same folders, etc.

On the first execution of the configurator this dialog is popped up automatically to establish these values.

Update Panel Time

This dialog can be displayed from the Panel Information Dialog.

It is also displayed when the configuration tool detects that the panel time is significantly different from the PC time.

New Time: defaults to the current PC time. Adjust this time if necesary and presss OK to update the panel time

Version History

This dialog appears in response to the Version History command.

Number	Date		Changed by	Description	Type	Status
2	2006-03-10	09:50 (HH:MM)	Tech Pubs	Test Differences Report	New Job	Editable
1	2006-03-10	09:50 (HH:MM)	Tech Pubs	Test	New Job	Editable
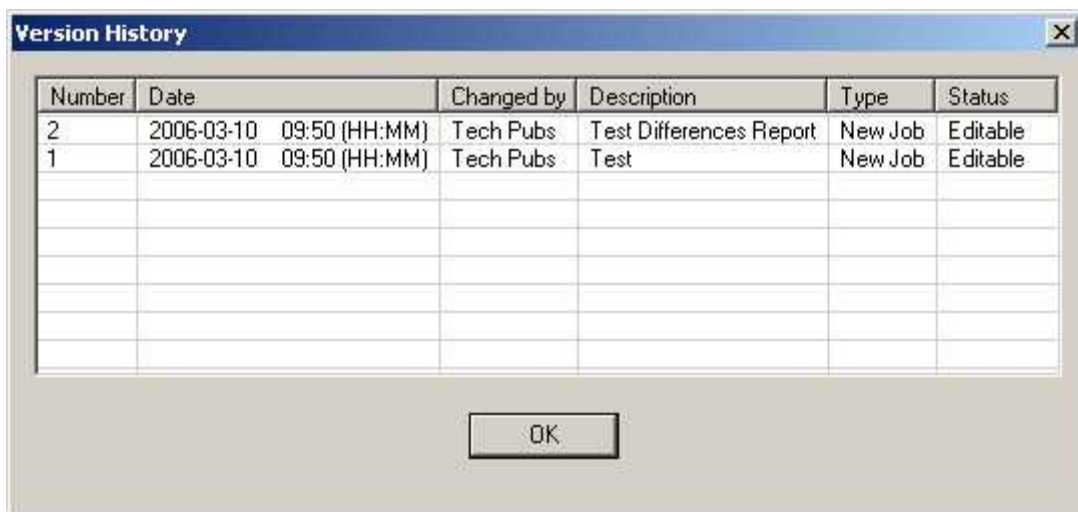
The version history of the current job is displayed in list form, beginning with the most recent version.

Number - The version number. Each time a new version is created, either with the New Version command or by getting a job from the panel or an archive, a new version number is allocated.

Date - The date and time the version was created.

Changed by - The user who created the version.
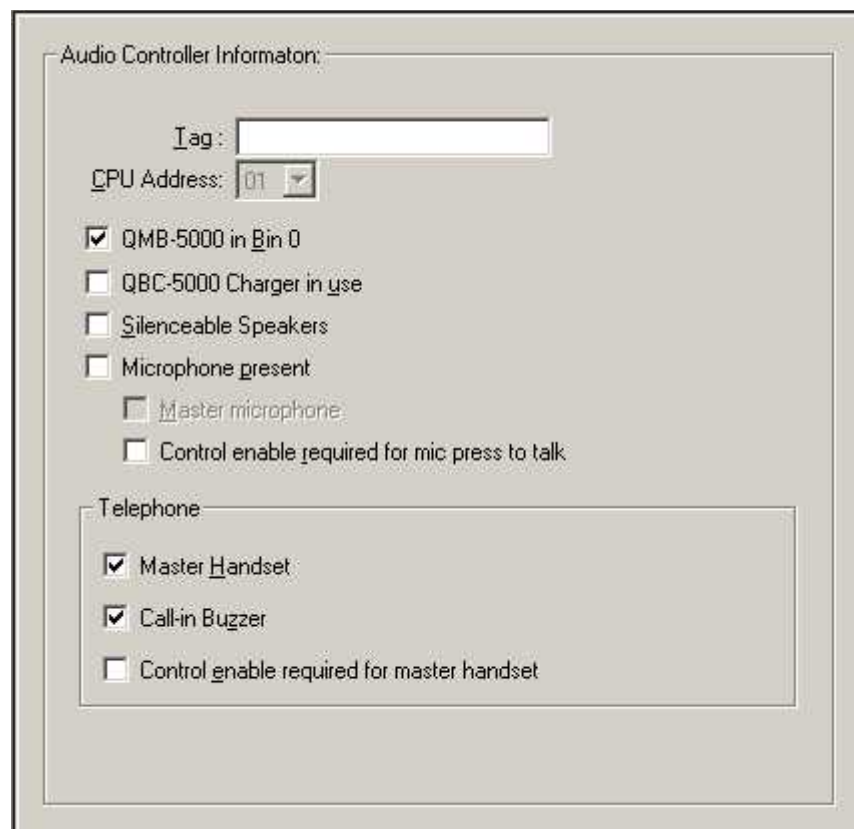
Description - The description, as entered when the new job version was created.

Type - Uploaded- the new job version was a result of a Get Job. New Job - the user created a new version manually.

Status - Either Locked- the job has been sent to the panel and is locked against editing or Editable.

Audio Controller Details

This form view appears in the top, right pane when an Audio Controller item is selected in the Job Tree view.

- Tag: Enter a desciption for the audio controller. This will appear in the Job Tree view.
- CPU Number: Enter the CPU address for the audio controller. A drop down combo box lists the available addresses.
- QMB-5000 in Bin 0: check this box if the amplifier bin arrangement is that of the QMB-5000. The legacy QMB-5000 has seven amplifier slots. If the box is not checked the QMB-5000N is assumed. It has only four amplifier slots. During conversion from QMB-5000N to QMB-5000 any existing amplifiers in expansion bins are re-arranged to first fill

the additional bins of the QMB-5000. During conversion from QMB-5000 to QMB-5000N any existing amplifiers in the base unit's extra slots are moved to the expansion bins.

- QBC-5000 Charger in use: check this box if the amplifier battery charger is a legacy QBC-5000. Leave the box un-checked if a QBC-5000N charger is in use. Selecting the wrong charger can affect battery supervision and charging.

- Silenceable Speakers: check this box if the speakers connected to the controller can be silenced.

- Microphone present: check this box if there is a microphone installed on this audio controller. If there are two or more microphones on the job, then one must be flagged as Master and the control enable required option must be checked on every node with a microphone.

- Master microphone: check this box if there is a microphone installed on this audio controller and it is to be designated as the Master. If there are two or microphones on the job, then one (and only one) must be designated as master.

- Control Enable required for mic press to talk: if this box is checked the operator must enable use of the microphone (through the menu or a key switch). This option must be checked if there is a microphone present on this node, and there is at least one other microphone on another audio controller on the job.

- Master Handset: If you specify a master handset, the first telephone line is used for that purpose. The line will be hidden from view and cannot be used.

- If line 0 is currently in use (either as a voice line serving addressable phone modules, or as a conventional phone) and you check this box you will be asked for confirmation before the line is removed.

- If you remove the master handset, line 0 will become available for use. If there is a correlation from a telephone selector switch to Call Control at this network node, you will be asked for confirmation before the master handset is removed.

- Call in buzzer: Select to enable the call in buzzer

- Control Enable required for master handset: if this box is checked the operator must enable use of the master handset (through the menu or a key switch Control Enable).

System/Node/CPU Status

This list view appears in the top, right pane when either the Common System Status, Node & CPU Status or Annun Status item is selected in the Job Tree.

System Statuses are pseudo inputs that can be correlated to outputs. For example:

- Correlate a signal circuit to operate as a power supply. (using Init Done).

- Customize the Fire Drill operation.

- Correlate a relay to operate on Reset Command (using Sys Reset)

System Statuses are can also be correlated to LEDs.

System statuses can have three different scopes.

- Common System Status - as the name suggests, their scope is system wide. Common Alarm,Fire Drill and Signals active are some examples. They need no further qualification.

- Node Status - Node Active and AC On are examples of Node status. The list view appears once for each network node on the system. When you choose one and

correlate to it, you are specifying, for example, the AC On status of the selected Node. The Scope column specifies the Node of the status.

- CPU Status - These fall into two categories.

    - The list view containing the special Annunciator Statuses, Control Enabled and its complement, appears in the job tree for every CPU that has a LCD (Main Display and LCD Annunciators).
    - The list view containing the other CPU statuses appears in the job tree for each network node and is combined with the Node Statuses. These CPU Statuses are assumed to be associated with the main CPU of the Node.

The Scope column specifies the Node and CPU of the status. You must have defined a suitable LED to accept the correlation from the Node or Node/CPU specific status.

F/W Status	Scope	Status	F1	F2
0	Node 2	Node Active		
0	Node 2 - Network Master	CPU Online		
1	Node 2	AC On		
2	Node 2	Node Sys Reset A...		
3	Node 2	Node Alarm		
4	Node 2	Node Supv		
5	Node 2	Node Monitor		
6	Node 2	Node Trouble		
7	Node 2	Node Alert Active		
8	Node 2	Node Evac Active		
9	Node 2	Node Subsequent ...		
9	Node 2 - Network Master	Alarm Verif		
10	Node 2	Node Alarm Verif		
10	Node 2 - Network Master	Wflw Retard		
11	Node 2	Node Wflw Retard		
11	Node 2 - Network Master	Pre-alarm		
12	Node 2	Node Pre-alarm		
12	Node 2 - Network Master	Maint. Alert		
13	Node 2	Node Maint. Alert		
13	Node 2 - Network Master	Pos Ground Fault		
14	Node 2	Node Signals Active		
14	Node 2 - Network Master	Neg Ground Fault		
15	Node 2	Node Signal Silence		
15	Node 2 - Network Master	Remote Trouble		
16	Node 2	Node Ground Fault		
16	Node 2 - Network Master	Battery Trouble		

Some columns containing advanced or internal information are normally hidden. They are listed as Visible / No in the following table.

Name	Visible	Description
Item	No	The database status number. For debugging purposes.
F/W Status	Yes	The firmware status number.
Node	No	The Node Number (only applicable for Node and CPU statuses).
CPU	No	The CPU Number (only applicable for CPU statuses).
Scope	Yes	Either Common for system wide statuses or the Node name, or Node CPU combination of the status.
Status	Yes	A short description of the status.
F1	Yes	Flag field: NS for Non-Silenceable or blank.

Name	Visible	Description
F2	Yes	Flag field: GA for General Alarm or blank. The GA flag is only applicable in a Two Stage system. The outputs correlated to a Common System Status with the GA flag set will sound at the General Alarm (aka Evac) rate, else they sound at the Alert Rate. In a single stage system, where all outputs correlated to alarm inputs sound at the Evac rate, the column is hidden. The actual tone sequences or digitized messages to be used for Evac and Alert are specified on the Job Details and Audio Setup dialogs.

Some System Statuses can also be correlated to a switch. Examples are Signal Silence, Fire Drill, Aux Disc, Total Evacuation. When one of these items is selected the Switches tab will appear on the associated Correlation View. This will show any display adder switches that have been correlated to the System Status. Note however, that this does not include remote switches (input circuits or devices of type Input Module that are assigned to a Common System Status).

When correlating from a Common System Status to display items and switches, the behaviour is different from correlating to Signals and Relays. The Add Correlations dialog will only show unassigned LEDs and Switches as available to be correlated. Correlating the Common System Status to a display item changes the display item's type and assignment.

Correlations

Most of the primary list views (shown in the top right pane) are used in combination with a correlation view in the bottom right pane. The correlation view is a tabbed pane. Each tab shows a different category of circuit, display LED, etc.

Output Circuit Correlations

If the currently selected circuit(s) is/are outputs then the correlation view typically has tabs for:

- Alarm Zones
- Supv Zones

- Trouble Zones
- Monitor Zones
- Display Points (Output Zones and Bypass LEDs etc.).

Input Circuit Correlations

If the currently selected circuit(s) is/are inputs then the correlation view has a tab for Input Zones only. Input Circuits must be combined into input zones before they can be correlated to outputs or LEDs, etc.

When the user selects Add Correlations a non-modal dialog is used to display the circuits and display items that are eligible to be correlated to the selected items in the top, right pane. It has the same set of tabs as the correlation view. It is kept synchronized with the correlation view: if a certain tab category is selected on one, its counterpart is automatically selected on the other. As correlations are added to the current set, they are removed from the available set.

If multiple items are selected in the top pane, then the correlations view will only show those correlations that are common to all of them. This means the set of displayed correlations can shrink to the empty set. If the user selects a mix of input and outputs no correlations can be shown.

Advanced Logic

Individual outputs ciruits or inputs zones can also be assigned an equation. If only one of these items is selected in the top pane, an Advanced Logic tabbed pane appears. If an advanced logic equation has been composed the text string will appear on the tab. To create a new equation or edit an existing one, use the Edit... button to launch the Advanced Logic Editor.

If an equation is associated with an output there should be no other IO correlations driving the output. If an equation is associated with an input zone there should be no input circuits correlated to the input zone.

Interval List View

This list view appears in the top, right pane when the Custom Interval item is selected in the Job Tree view.

Custom intervals complement the system intervals (HOLIDAYS, WEEKEND, EVENING, etc.). Unlike system intervals, which can have begin and end calendar dates, custom intervals are only comprised of start and end times (HH:MM) and optionally a day of the week. Thus, they can be used to turn on a dedicated air handling system once a week for testing for example, or to reduce sensor sensitivity during certain hours of the day.

Custom intervals can be referenced by equations. If an interval appears on the right hand side of an equation controlling an output or an input zone, it can be tested for TRUE (current system time is within the bounds of the interval) to affect the result of the equation.

A custom interval has only one time range. If you need to test for multiple ranges, you must create multiple intervals and OR them using an equation.

For example:
06:00 to 09:00 "Kitchen in use - breakfast."
11:00 to 13:00 "Kitchen in use - lunch."

The table describes all of the columns in the list view. Some advanced or system columns are hidden by default.

Name	Visible	Description
CktNo	Yes	Internal CKtNo or Index. This number does not start at zero because there is a block of System Intervals that occupy the lower range. The number appears in the DeviceID in the equation symbol table.
Interval No	No	An internal, allocated number: the single interval range associated with this interval.
Start Year	No	Not used for simple intervals.
Start Month	No	Not used for simple intervals.
Start Day	No	Not used for simple intervals.
Start Hour	Yes	The hour (0-23) when the interval period is to start.
Start Min	Yes	The minute (0-59) when the interval period is to start.
Start DoW	No	Not used for simple intervals.
End Year	No	Not used for simple intervals.
End Month	No	Not used for simple intervals.
End Day	No	Not used for simple intervals.
End Hour	Yes	The hour (0-23) when the interval period is to end.
End Min	Yes	The minute (0-59) when the interval period is to end.
DoW	Yes	The day of the week if the interval period is restricted to one day. Leave blank is the period is to occur every day.
Tag	Yes	A 20 character tag to identify the interval. This will appear in the "Symbol Table" when composing equations that reference intervals.

Custom Messages

This feature allows a single message to be used for a group of circuits. This is used for consolidating the annunciating of a group of circuits. In the example shown below the devices in the Exhibits Hall would be annunciated individually on the Main Display, but on the East Wing Exit LCD annunciator, the message Exhibits Hall will be displayed for any device that activates.

In a Network, the local input ciruits must first be combined into input zones. It is then the zones that are combined correlated to custom or group messages.
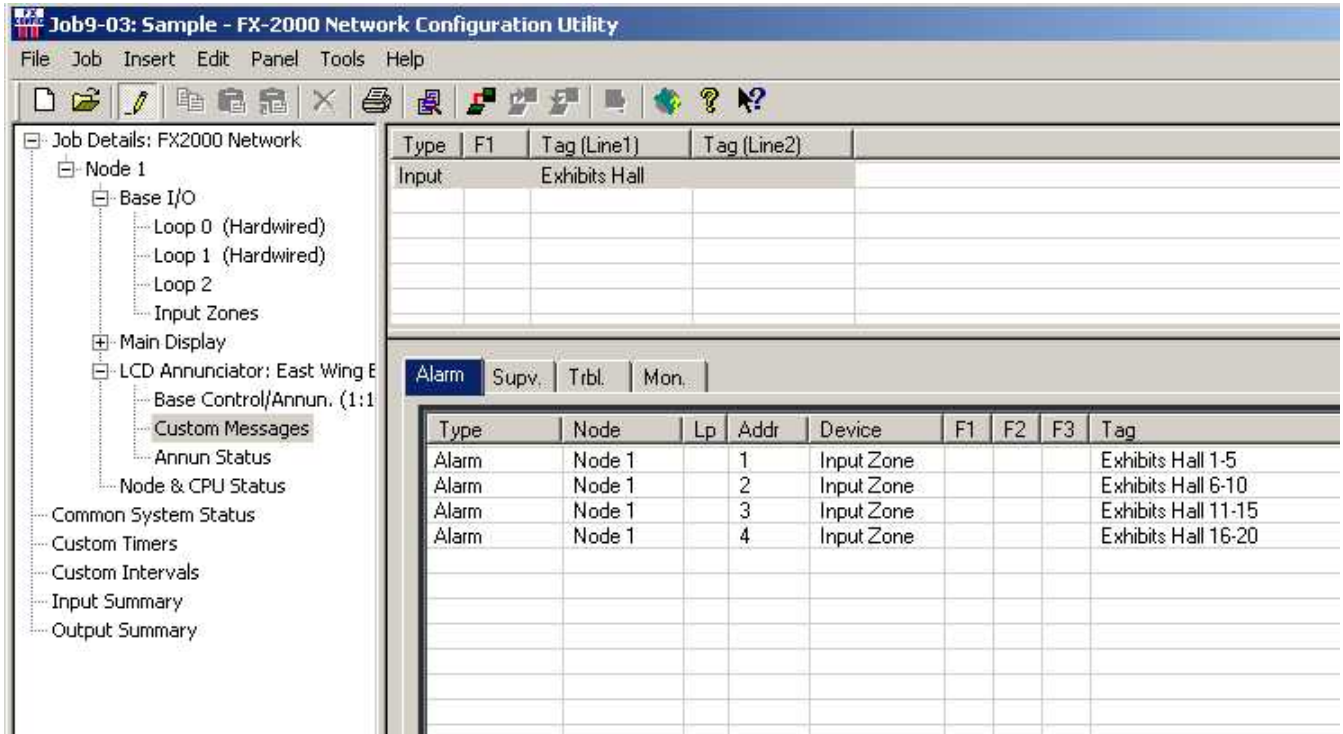
Messages are divided into two types: Input and Output. They can be added from the Insert Menu and modified and deleted from the Edit Menu. Alternately, the right click menu presents the same actions. See Add Message.

When a message is selected on the Custom Messages View the corresponding correlations are displayed on the Correlation View. They are separated into Alarm, Supervisory, Trouble and Monitor categories for inputs and Signal and Relay for outputs. When the Add Correlations dialog is invoked, it shows, on a similar set of tabs, circuits that can be correlated to the selected message.

There are restrictions on the correlations that can be created between a custom message and circuits.

A custom message can be correlated to many circuits, but once a circuit is associated with one message, that circuit cannot be correlated to another message on the same Annunciator CPU.

Input message/circuit correlations are further constrained. A message can only be correlated to input circuits that would be displayed in the same Queue (Alarm, Supv., Trouble and Monitor). For example, once a message is correlated to a circuit of type Alarm it can not be correlated to circuits of a different type.

The Add Correlations Dialog therefore adapts to changing conditions. When you select an input message on an annunciator that has no correlated circuits, the Add Correlations dialog shows a list of all existing input circuits, in all four categories. If you now correlate the selected message to an alarm circuit, that circuit is removed from the list of available choices on the Alarm tab and all available circuits are removed from the other tabs: the message is committed to displaying only a group of alarms.

Similar constraints to correlations apply in the other direction, when you select a circuit or device on the Loop Detail View. The Add Correlations view will only display Messages that are available for correlation. If the circuit is already correlated to a message on an annunciator,

then no other messages from that same CPU will be presented. Add Correlations also prevents you from correlating mixed circuit types (Alarm, Supv., Monitor and Trouble) to the same message. For example, if you have selected an Alarm circuit you will not be presented with messages that are already correlated to another type of circuit. For the same reason, if you select a mixture of circuit types on the Loop Detail View, then the Add Correlations dialog will show no available message on its Msgs tab.

Timer List View

This list view appears in the top, right pane when the Custom Timer item is selected in the Job Tree view.

Custom timers can be referenced by equations. By attaching an equation to a timer, it can be started or stopped. If a timer appears on the right hand side of an equation controlling an output or an input zone, it can be tested for EXPIRED, etc. to affect the result of the equation.

All timers are initally un-assigned. To Enable a timer, edit the Enable column to make it 'Y'.

Name	Visible	Description
CktNo	No	Internal CKtNo or Index. This number does not start at zero because there is a block of System Timers that occupy the lower range.
Address	Yes	The address of the timer. The address uniquely identifies a timer, and is included in the Device-ID in equations. If the timer is not enabled, the address field shows "unassigned".
Enable	Yes	Edit this field, changing it to Y, to assign a timer.
Duration	Yes	The duration, in seconds, of the timer.
Tag	Yes	A 20 character tag to identify the timer. This will appear in the "Symbol Table" when composing equations that reference timers.

Dialer

This form is displayed when the optional Dialer tree item is selected. It allows you to view and to configure the UDACT / Dialer.
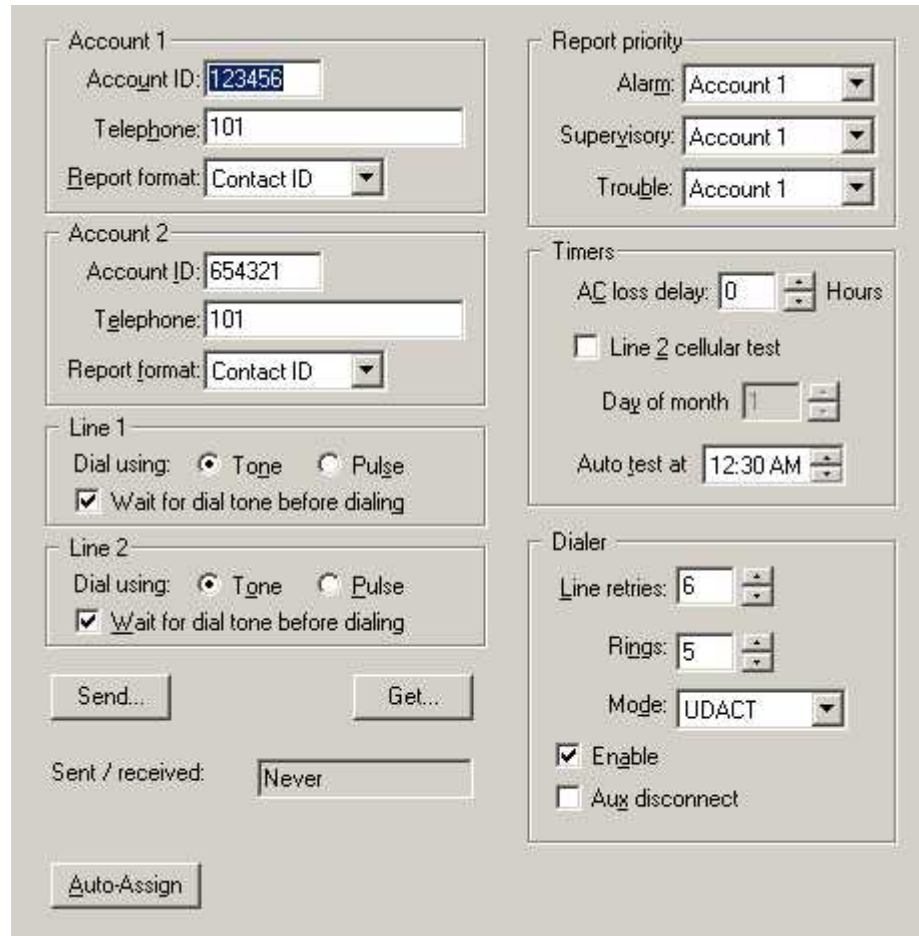
The dialer can dial out on two phone lines. You must configure an account and specify the line attributes for both. Line 2 can dial a cell phone. If this is the case the auto test can be reduced from daily to monthly.

The UDACT can be configured either by using the FX-2000NConfig tool or with the Mircom Dialer Configuration Utility.

To configure using the FX-2000NConfig utility remove the RS485 / UIMA cable from the FX2000N panel and plug it directly to the dialer. You must short JW2 on the dialer to enable configuration. Edit the dialer parameters, described below, and press the Send... button. You will be prompted for a password.

You can use the FX-2000NConfig utility to retrieve the configuration from the dialer by pressing the Get... button. The Sent/received field will tell you if the configuration you are viewing is potentially out of date.

The Auto Assign button will automatically assign a UDACT group of the correct type for every unassigned Input Zone and Output Circuit.

Account 1

- Account ID
  - Six digit decimal for the SIA report formats and four digit hexadecimal for Contact ID.
- Telephone
  - Text Field for telephone number.
- Report Format
  - Choose from SIA110, SIA300, Contact ID

Account 2

- Account ID
  - Six digit decimal for the SIA report formats and four digit hexadecimal for Contact ID.
- Telephone
  - Text Field for telephone number
- Report Format
  - Choose from SIA110, SIA300, Contact ID

Line 1

- Dial Using
    - Tone/Pulse
- Wait
    - Check to wait for dial tone before dialling

Line 2

- Dial Using
    - Tone/Pulse
- Wait
    - Check to wait for dial tone before dialling

Report Priority

- Alarm
    - Choose one of the two accounts to use to report Alarms
- Supv
    - Choose one of the two accounts to use to report Supvisory alerts
- Trouble
    - Choose one of the two accounts to use to report Troubles

Timers

- AC loss delay
    - 0-20 hours
- Line 2 Cellular Test
    - Check this box to indicate that Line 2 dials a cell phone. Use the Spin box to specify the day of the month (1 - 28) for the cell phone test.
- Auto test at
    - Use this spin box to set the time for a daily test of land lines.

Dialer

- Line Retries
    - Use this Spin Box to specify the number of retries to make (5-10)
- Rings
    - Use this Spin box to specify the number of rings when dialing in to configure. Warning: if set to zero the next dial in session will not be able to connect.
- Mode
    - Choose between DACT and UDACT
- Enable
    - Uncheck this box if you wish to set the dialer to the disabled state when you send the job to the panel. If you receive a job from the panel when the dialer was temporarily disabled then this check box will be un-checked. The dialer is enabled by default.

- Aux disconnect
  - If enabled, the dialer will block the alarm and supervisory events from being reported after the auxiliary disconnect button is pressed.

Display Adder

This list view appears in the top, right pane of the user interface when a display adder is selected in the Job Tree. The list displays items (LEDs and Switches) of all the frames on the selected Display Adder.

Name	Visible	Description
Idx	Yes	Index - the zero based position of the item on the adder.
Node	No	The Node Number of the Annunciator to which the adder is attached.
CPU	No	The CPU Number of the Annunciator to which the adder is attached.
Unnamed	Yes	Linked Item - contains an asterisk if the item shares the same LedGrp with other items. This means that correlations to one such item are added to all linked items. Linked Items can be created when Paste Special is used. The linked items can be viewed with the Linked Items dialog.
Frame	No	The Frame Number. An adder may contribute several frames to an annunciator. The frame numbers are zero based.
LED	No	The number (zero based) of the first LED of a logical group. For example, an HOA adder has three LEDs per slide switch. This column would show 0 for Idx 0, 3 for Idx 1, etc. Due to the way some adders are arranged (hardware) the LED numbers are in irregular sequences.
Sw	No	The Switch number (if any) associated with the Idx.

Name	Visible	Description
LedGrp	No	An internal number, allocated when a LED is assigned a role other than un-assigned. In the case of Linked Items, multiple LEDs can share the same LedGrp and hence the same LED Definition, behaviour and correlations.
Type	Yes	Initially unassigned this is the Type of display item. The values in the combo box depend on the Adder/Frame type.
Assignment	Yes	Dependent on the Type.
Node Group	Yes	Applies only to common control switches. The column displays the Node Group to which the common control operation is to be limited. Global means that the operation is system wide and is the default. If the user has created Node Groups, then one of those groups can be chosen. The common control then applies only to the member nodes of that group.
Code	Conditional	If the Type is Zone Sw (correlateable switch) and Coded System is specified, then Code is displayed and editable as for an Input Circuit.
F1	Yes	If the item is some form of switch (Bypass, Slide Switch) etc, then this flag column can be set to ER (enable required) or none.
F2	Yes	For Bypass ands Manual Switches, this flag can be set to AR (Aux Reset Required). For Correlatable Switches it can contain NS (Non silenceable)
F3	Yes	For Correlatable Switches this flag can contain GA (2nd stage, GA device). For Bypass and Manual Push Switches it can contain SR (System Reset Required).
Tag 1	Yes	Except for Common Controls, System Status and Man Ena, a 20 character tag can be entered. It will be used to identify the control in messages, etc. For some Type/Assignment combinations the tag is generated and cannot be editted.
Tag 2	Conditional	Correlatable Switches (being analogous to Input Zones) accept a second line of 20 characters.

Input / Output Circuit Summary

The Job Tree always contains an Input Summary and Output Summary item. Select either of these items to see a list of all of the circuits on the job.

On products that support them, this list may include Correlatable Switches. These will not have a value in the Loop and Address columns.

Ckt...	Loop	Addr	UDACT Ref	Tag
0	0	1.0	001	1st Floor Alarm Non-Verified Ipt
1	0	1.1	002	1st Floor Alarm Verified Ipt
2	0	1.2	003	1st Floor Alarm Waterflow Ipt
3	0	1.3	004	1st Floor Supv Latched Supv Ipt
4	0	1.4	005	1st Floor Supv Non-Latched Supv Ipt
5	0	1.5	006	1st Floor Monitor Monitor Ipt
6	0	1.6	007	1st Floor Trouble Trouble Ipt
7	0	1.7	008	1st Floor Alarm 2nd Stage Ipt
8	0	3.0	009	2nd Floor Alarm Non-Verified Ipt
9	0	3.1	010	2nd Floor Alarm Verified Ipt
10	0	3.2	011	2nd Floor Alarm Waterflow Ipt
11	0	3.3	012	2nd Floor Supv Latched Supv Ipt
12	0	3.4	013	2nd Floor Supv Non-Latched Supv Ipt
13	0	3.5	014	2nd Floor Monitor Monitor Ipt
14	0	3.6	015	2nd Floor Trouble Trouble Ipt
15	0	3.7	016	2nd Floor Alarm 2nd Stage Ipt
16	1	0.0	017	3rd Floor Alarm Non-Verified Ipt
17	1	0.1	018	3rd Floor Alarm Verified Ipt
18	1	0.2	019	3rd Floor Alarm Waterflow Ipt
19	1	0.3	020	3rd Floor Supv Latched Supv Ipt
20	1	0.4	021	3rd Floor Supv Non-Latched Supv Ipt
21	1	0.5	022	3rd Floor Monitor Monitor Ipt
22	1	0.6	023	3rd Floor Trouble Trouble Input
23	1	0.7	024	3rd Floor Alarm 2nd Stage Ipt

Ckt...	Loop	Addr	UDACT Ref	Tag
0	0	0.0	001	Common Alarm Sig Silenceable Signal
1	0	0.1	002	Common Alarm Coded Coded Signal
2	0	0.2	003	Common Alarm Strobe Strobe
3	0	0.3	004	Common Alarm Supervised Relay
4	0	2.0	005	1st Floor Alarm Relay Output
5	0	2.1	006	2nd Floor Alarm Relay Output
6	0	2.2	007	3rd Floor Alarm Relay Output
7	0	2.3	008	4th Floor Alarm Relay Output
8	0	2.4	009	1st Floor Spv Relay Output
9	0	2.5	010	2nd Floor Spv Relay Output
10	0	2.6	011	3rd Floor Spv Relay Output
11	0	2.7	012	4th Floor Spv Relay Output
12	1	1.0	013	1st Floor Signal Non-Silenceable
13	1	1.1	014	2nd Floor Signal Non-Silenceable
14	1	1.2	015	3rd Floor Signal Silenceable
15	1	1.3	016	4th Floor Signal Silenceable
16	1	2.0	017	1st Floor Monitor Relay Output
17	1	2.1	018	2nd Floor Monitor Relay Output
18	1	2.2	019	3rd Floor Monitor Relay Output
19	1	2.3	020	4th Floor Monitor Relay Output
20	1	2.4	021	1st Floor Trouble Relay Output
21	1	2.5	022	2nd Floor Trouble Relay Output
22	1	2.6	023	3rd Floor Trouble Relay Output
23	1	2.7	024	4th Floor Trouble Relay Output

Input Zones

The list view displays the Input Zones. Input Zones are used to combine multiple input circuits into zones which can then be correlated to signals and other outputs and to display LEDs, etc.

Some columns containing advanced or internal information are normally hidden. They are listed as Visible / No in the following table. Other columns are conditionally visible.

Name	Visible	Description
Addr	No	A sequentially assigned zone address. Allocated for consistency with other loop types.
Lp	No	Loop Number. Not meaningful for zones
Lp Addr	No	A sequentially assigned zone number or address.
Ckt No	No	An internal, sequentially assigned number.
Ckt No CPU	No	An internal, sequentially assigned number: the CKT_NO within the CKT_IPT_ZONES.
Device	Yes	Always Input Zone.
Type	Yes	The process Type of the Zone. Can be edited (combo box).
Code	On Coded Systems	Inputs on Coded Systems only. Devices or circuits may optionally be associated with a code to be sounded on the signal circuits to indicate where the alarm has occurred. The code consists of 1 to 4 digits, each digit consisting of 1-15 pulses on the signals. Each coded circuit can be configured to sound the complete code 1 - 15 times after which the signals will either go silent or revert to the programmed GA rate. Embedded zeros and zero repetition counts are illegal. (1-0-2(3) is illegal, as is 4(0)).
Sens No	No	No applicable to input zones.
Sens B No	No	No applicable to input zones.
Tag1 and 2	Yes	The text of the tag, in two 20 character fields, representing the two lines displayed on the front panel when an alarm occurs, etc.

Flag Columns

There are up to three Flag columns (F1, F2 and F3) for flags of various types.

NS - Non Silenceable - used on inputs and supervised Outputs

GA - 2nd Stage Alarm - in two stage system

ND - No Display - indicates that activation of this zone is not to be displayed in the queue. A similar flag applies to indvidual devices. By default, devices do not have the flag set and zones do.

LED Annunciator Summary

An FX-2000 job's Network Node can have multiple LED Annunciators, but they all share the same programming. There is therefore a maximum of one such item per Network Node in the tree view.

This list view is displayed in the top, right pane of the user interface when a LED Annunciator item is selected in the job tree. It shows the addresses and tags of each instance.

The data in the list view can be editted by pressing Enter or by chosing Edit / Modify Item from the menu. The first editable cell in the row opens for editting. Or you can double click in the field you want to edit.
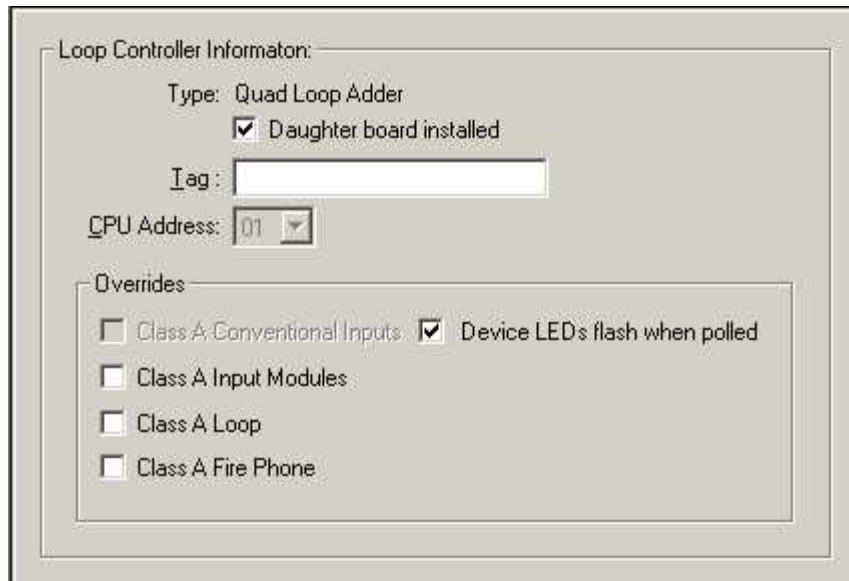
The CPU Address can be changed. A drop down list appears, listing all of the available addresses.

The tag can also be editted.

LED Annunciators can be added or deleted from this view. If the last instance of the Annunciator is deleted a confirmation message appears. When the last Annunciator is deleted, the item is removed from the job tree.

Loop Controller

This form is displayed when a Loop Controller is selected in the Job Tree view.

- Type - Conv Adder or Loop Adder
- Daughter board installed - Set to true/checked if the Quad Loop Controller's daughter board is installed. If checked, the firmware monitors the presence of the additional two loops. Set to false/un-checked if the board is not present.
- Tag - Enter a desciption for the loop controller. This will appear in the Job Tree view
- CPU Number - Enter the CPU address for the loop controller. The list shows all available addresses in the internal bus range.
- Overrides
   - These items override similar attributes on the Job Details page. They initially show the state of the choices made on the Job Details page.

Loop Detail

The list view displays the hard wired (Conventional) circuits or addressable devices of a Loop, when that loop is selected in the tree. The same view is also used for an audio controller's loops: phone and voice lines (inputs) and amplifiers (outputs). The base set of columns is the same for all, but there are some Product and Loop Type dependencies.

Some columns containing advanced or internal information are normally hidden. They are listed as Visible / No in the following table. Other columns are conditionally visible.

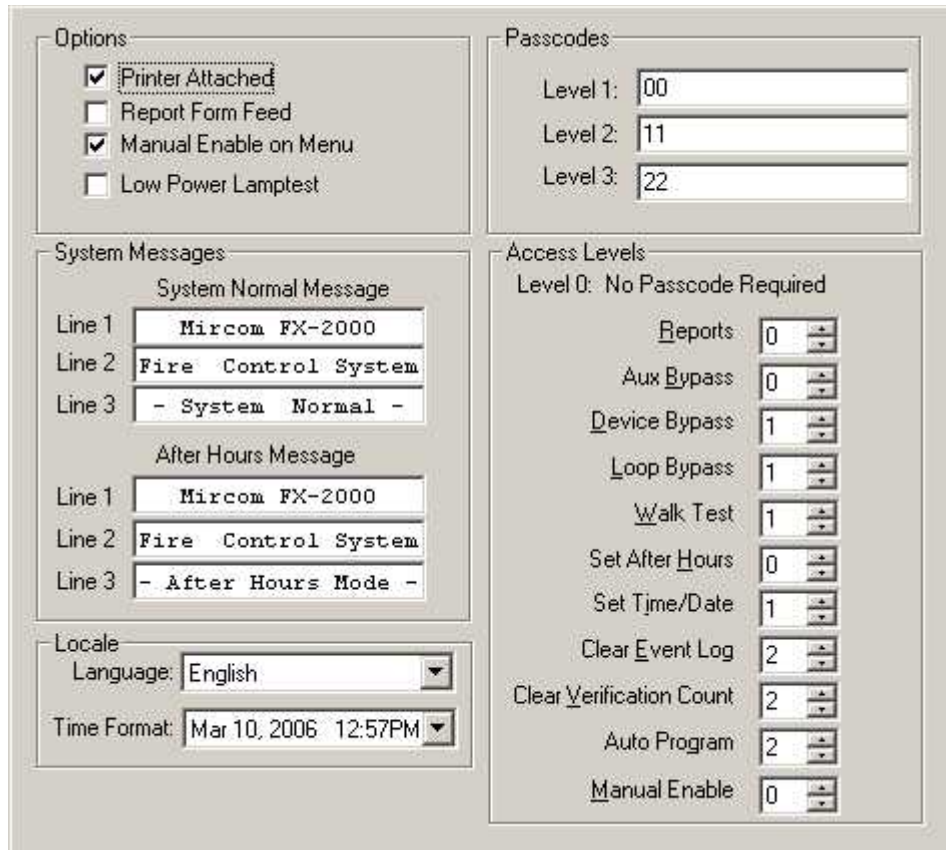| Name	Visible	Description
Addr	Yes	For regular addressable devices, the displayed address is the same as device address. For conventional circuits display adder & circuit on adder.
Lp	No	Loop Number
Lp Addr	No	For conventional, its relative position on the loop. For addressable, the actual address setting.
Ckt No	No	An internal, sequentially assigned number. One set for inputs, another for outputs.
Device	Yes	Conventional - fixed, depending on the circuit adder. See Add Circuit Adders. Addressable - chosen when Adding Device(s). Can be edited conditionally. For example, a Photo Detector can be changed to other types of detector, a Relay Opt module can be changed to a Supv. Opt module. Other changes can only be achieved by deleting the device and adding another.
Type	Yes	The process Type of the Device. Can be edited (combo box). The list of Types shown in the combo box will depend on the Device. E.g. Device Relay Opt Module can be assigned Relay, Signal or Strobe.
Code	No	Applies only to input zones.
Sens Lvl Pre	On Addressable Loops.	The Pre-alarm (or for some device types the trouble) sensitivity level. Optional.
Sens	On Addressable Loops.	The alarm level 1 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Required for sensors.
Sens Lvl 2	On Addressable Loops.	The alarm level 2 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Optional.
Sens Lvl 3	On Addressable Loops.	The alarm level 3 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Optional if Lvl2 specified.
Sens B Lvl Pre	On Addressable Loops, if after hours specified.	The after hours and night time Pre-alarm (or for some device types the trouble) sensitivity level. Optional.

Name	Visible	Description
Sens B	On Addressable Loops, if after hours specified.	The after hours and night time alarm level 1 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Required for sensors.
Sens B Lvl 2	On Addressable Loops, if after hours specified.	The after hours and night time alarm level 2 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Optional.
Sens B Lvl 3	On Addressable Loops, if after hours specified.	The after hours and night time alarm level 3 sensitivity of the sensor. Displays a combo with sensitivity in appropriate units for the device type. Optional if Lvl2 specified.
Tag1 and 2	Yes	The text of the tag, in two 20 character fields, representing the two lines displayed on the front panel when an alarm occurs, etc. The two fields are concatenated, trimmed of trailing spaces and saved on the database.

Flag Columns

There are up to three Flag columns (F1, F2 and F3) for flags of various types.

- AR - Auxiliary Reset required - used on Relay
- BU - Back Up amplifier - used on audio controller. Designates the amplifier as the back up. It must be of sufficient power to substitute any of the other configured amplifiers. The back up amplifier can only accept correlations to status LEDs, trouble LEDs and UDACT groups.
- ER - Enable Required - used on switches for security (code or key)
- GA - 2nd Stage Alarm - in two stage system or to return the supervised signal to EVAC rate after code is completed in coded System
- NB - Non Bypassable used on relays
- NC - Not coded - used on supervised outputs i.e. Strobe to keep the strobe operating until Reset (even after Code has ended)
- ND - No Display - indicates that activation of this input device is not to be displayed in the queue. A similar flag applies to Input Zones. By default, devices do not have the flag set and zones do.
- NS - Non Silenceable - used on inputs and supervised Outputs
- SR - System Reset required - used on Switches used for Fan control

Main Display / LCD Annunciator

Major Sections

- Options
    - Printer Attached - check box to indicate if a printer is attached to this annunciator.
    - Report Form Feed
    - Manual Enable on Menu - check to add a Manual Enable option on the LCD's user menu.
    - Low Power Lamp Test

- System Messages
    - Three 20 character text fields for System Normal Messages. A fixed font is used so that the user can view the actual spacing and alignment of characters as they will appear on the LCD. The standard text, from the template jobs, is in the language specified in the Locale section.

- Locale
    - Language - sets the language for this Annunciator. When the job is sent to the panel, a check is made to ensure that matching Firmware is loaded for this CPU. Any generated messages (Proving / Man Ctrl) will be constructed using the tag of the control plus System defined tokens for the selected language. The Main Display's chosen language becomes the default for other Annunciators that are added to the job, but the language does not have to be the same on all Annunciators of a job.
    - Time Format - choose between a fixed number of time and date formats. The combo box shows a sample of each for the current time of day. The chosen

format will be used for all time reporting (reports, LCD display) for this Annunciator.

- Passcodes - this section only appears on the main display.

- Level 1, 2 and 3 - specify the passcode for three levels of access. Passcodes must be composed from the digits 0-3 only.

- Access Levels - this section only appears on the main display.

- Specify the level of access for various front panel actions. A 0 means that the panel operator need not enter a pass code. A 1 means the operator must enter the code specified for Level 1, in the Pass Codes section of the main display, etc. An operator who has been given the Level 3 passcode automatically has access to the actions assigned lower access levels, etc.

- Node - this section only appears on Remote Annunciators.

- Tag - enter a tag for the annunciator. The tag apears in the tree view.
- Node Number - enter the node number (CPU) for the remonte annunciator. The combo box lists the available addresses in the external CPU range.

Job Details

This form view appears in the top, right pane when the Job Details item is selected in the Job Tree view.

Some items can be overridden at the Loop Controller (CPU) level. Those check boxes are tri-state and are greyed if the choices made at the lower levels have been edited to be different from the system wide values on this page. They can be forced back into agreement by editing them here.

Job Info:

Job 6: "Sample"

Version 1: Test

Created on: 2011-01-11   by: MIrcom

Options:

- ☐ Two stage
- ☑ Fire drill
- ☑ Manual Signal Silence
- ☐ Class A Conv Inputs
- ☐ Class A Input modules
- ☐ Class A Loop
- ☐ Class A Fire Phone
- ☑ Class A Network
- ☐ Digital Audio
- ☐ Digital Phone

- ☐ Monitor alert
- ☐ Second stage alarm relay
- ☐ Relay follows node alarm
- ☐ Relay follows node supv
- ☐ Relay follows node trbl
- ☐ Drift Compensation
- ☑ Device leds flash when polled
- ☐ Alarm Transmit Silence
- ☐ Disable Auto Test
- ☐ Auto All Call

Signal Coding:

- ☐ Coded System
  - ☐ Extended code
  - ☐ Delay Code
  - ☐ Sound Evac after code

Signal Rates:

Evac: Temporal ▼

Alert: Alert Rate ▼

Audio:

Set up...

System Type

Compact Build

Agency

ULI Standard ▼

Timers:

Auto GA: [ ] ▼

Auto Signal Silence: Disabled ▼

Signal Silence Inhibit (Secs): 0 ⇅

Powerfail Send Delay (Hrs.): 0. ⇅

Proving Circuit Delay (Secs): 30 ⇅

New Alarm (Secs): 60 ▼

Page Inhibit (Secs): 60. ⇅

Auto Resound (Mins): 10 ⇅

Date and Time

Daily clock adjustment (Secs): 0 ⇅

☑ Enable Daylight Saving

Start: 02 : 00   on: 2nd ▼ Sunday ▼ in: Mar ▼

End: 02 : 00   on: 1st ▼ Sunday ▼ in: Nov ▼

☐ Enable Auto After Hours

Daytime Start: 08 : 59   Weekend Start: Friday ▼ 18 : 00

End: 18 : 00   End: Monday ▼ 08 : 59

Holidays:

Start Date	End Date
xxxx-01-01	
xxxx-12-25	xxxx-12-26

☐ Reprogram Holiday Trouble

2011-01-11 ⇅

Modify...

- Job Info
    - Shows details of the job's name, number, creation date and author. The multi-line comments field can be edited and become part of the job's version history.
- Options
    - Two Stage - check to enable two stage.
    - Fire Drill - check to enable the panel's Fire Drill switch.
    - Manual Signal Silence- check to enable the panel's Signal Silence switch.
    - Class A Conv Inputs - check this box to indicate that the panel has Class A conventional inputs.
    - Class A Input Modules - check this box to indicate that input modules' field wiring is Class A.
    - Class A Loop - check this box to indicate that the panel has Class A addressable loop(s).
    - Class A Fire Phone - check this box to indicate that the wiring from an addressable fire phone module and the handset is Class A.
    - Class A Network - check this box to indicate that the wiring between Network Nodes is Class A.
    - Digital Audio - check this box to indicate that the audio signals use the Arcnet wiring between Network Nodes. If not checked, then the audio runs over a separate pair of wires.
    - Digital Phone - check this box to indicate that the Fire Phones use the Arcnet wiring between Network Nodes. If not checked, then the phone conversations use a separate pair of wires.
    - Monitor Alert
    - Second stage alarm relay - Sets alarm relay to operate on 2nd stage alarm. Disabled unless Two Stage checked.
    - Relays follow node alarm - Sets Alarm relay to activate on node level alarm - else system level alarm. Mutually exclusive with Second stage alarm relay.
    - Relays follow node supv - Sets Supervisory relay to activate on node level supervisory - else system level supervisory.
    - Relays follow node trbl - Sets Trouble relay to activate on node level trouble - else system level trouble.
    - Drift Compensation
    - Device LEDS flash when polled
    - Alarm transmit silence
    - Disable Auto Test - check this box to disable the automatic testing of System Sensor addressable devices.
    - Automatic All Call - check this box to enable automatic "ALL-CALL" when PTT or Digital message SW is pressed.
    - System Type - indicates the System Type (compact or large) of the current Job/Version. This field cannot be editted, but for some products the job can be converted between System Types. See Convert Job
    - Agency - choose between ULI Standard and ULC Standard.
- Signal Coding
    - Coded System - check to enable coded system features.
    - Extended Code - Code pulse duration. 1/4 (disabled) 1/2(enabled).
    - Delay Code - Time between codes. 3 (disabled) 10 (enabled).
- Signal Rates
    - Evac - choose the evacuation signal rate.
    - Alert - choose the alert signal rate.

- Audio

    - Audio Setup... - launches the Audio Setup dialog.

- Timers

    - Auto GA Timer - Choose from 0-30 minutesor Disabled. The control is disabled unless Two Stage Operation is selected
    - Auto signal silence timer - Choose from 0-30 minutes or Disabled. The auto signal silence timer cannot be set shorter that auto GA or signal silence inhibit timers.
    - Signal silence inhibit timer - 0-3 minutes
    - Proving delay time - 5-90 seconds
    - Power-fail delay for trouble transmit. If the only trouble on the system is an AC power failure, transmision of the status through the UDACT can be delayed up to 18 hours
    - New Alarm - 10-120 seconds. The timer is started by a new alarm. When it expires, the new alarm system status is cleared. It is stopped by system reset.
    - Auto Resound – 5-12 minutes. The timer is started by the New Alarm Active Timer timeout event. When it expires, the system status STAT_AUTO_SUITE_RESOUND is set. The timer is stopped by (1) new alarm (2) Alarm Acknowledge or (3) system reset.
    - Page Inhibit – 10-120 seconds. Started by the first active alarm. Paging is inhibited while the timer is running. The internal system status Page Inhibit is TRUE while the timer is running.

- Date and Time

    - Daily clock adjustment:
    - Specifies the number of seconds (positive or negative) by which the panel's clock is to be adjusted every 24 hours. The adjustment, if any, is made at 01:55 every day.
    - Daylight Saving:
    - Enable Daylight Saving - Enables automatic change to and from daylight saving. The rules specifying when daylight saving time begins and ends are specified below.
    - After Hours:
    - Enable Auto After Hours
    - Daytime Start and End - specify when daytime begins and ends.
    - Weekend Start and End - specify when the weekend begins and ends.
    - Holidays - list the defined holidays.
    - Modify... - open the Edit Holidays dialog
    - Reprogram Holiday Trouble - check this box to put the panel into trouble when there are no future holidays programmed. Specify the date after which there are no programmed holidays. The panel will be in trouble until the job is re-configured to have more holidays or the check box is un-checked.

Job Tree

The Job Tree view represents the job in the form of a tree.
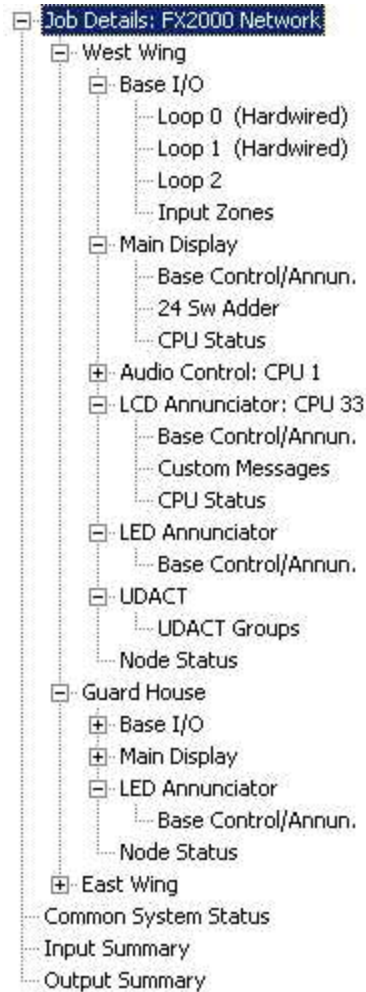
At the highest level are items representing the Network Nodes (for networkable product) CPUs (main display, loop controllers, annunciators, etc.) of the job. These can be expanded to reveal their sub-components: individual loops, display adders, etc.

When an item in the tree is selected, its details appear in the top, right pane of the user interface.

Components can be added to or deleted from the tree. You can also copy and paste or drag and drop most of the tree elements.

Network Node Details

This form view appears in the top, right pane when a Network Node item is selected in the Job Tree view.

- Tag - Enter a desciption for the Network Node. This will appear in the Job Tree view

- Node Address - Enter the Node address. The control lists all of the available addresses.

- IP Address - Enter the Internet Protocol (IP) address of this node's Ethernet connection.

- Subnet mask - This number is combined with the IP Address to identify which network segment the FX2000N Node is on.

- Default gateway - This is the address of the local IP router that is used to forward traffic to destinations beyond the local network.

- User Name and Password - The user name and password required to access the Node's web server. If the User Name and Password are edited, the changes will be applied to all nodes on the job. Also, if new nodes are inserted or copied and pasted, new nodes will have the same User Name and Password as existing nodes. The defaults are "admin" and "mircom".

- Run TCP Services - If checked, the Node will run TCP services. This will allow a graphics application to connect and receive events, etc.

- Run WEB Services - If checked, the Node will run a Web Server. This will allow a user to connect with a browser and view the status and initiate commands that the server supports.

- Run BACNet Services - If checked, the Node will run a BACNet (Building Automation and Control Networks) Server.

    - Model Name: read only, BACNet Model Name
    - Description: read only, BACNet Description
    - Location: BACNet Location. Defaults to the first 25 characters of the Job Name, but can be overridden.
    - Device Name: read ony, BACNet Device Name.
    - Device ID: the BACNet ID for the entire fire alarm system (In BACNet terminolgy, the Device).
    - Vendor Name: read only.
    - Vendor ID: read only.
    - App Version: read only, configurator version.
    - Base ID: The starting ID for all BACNet objects. These are the circuits, switches and system statuses of the configured job.
    - Day Light Savings: read only. From Job Details page.

- Supervise Ethernet Connection - If checked, the Ethernet connection on the Node will be supervised. A trouble will be reported if no Ethernet cable is plugged into the node.

Note: If TCP Services is not selected to run, then the Ethernet connection cannot not be supervised. If TCP Services is not checked, then neither Web Services not BACNet Services can run.

Node Grouping

These controls allow the user to create groups and make the currently displayed node a member of one or more groups. Nodes that belong to one Group will be isolated from nodes that belong to another group. This means that alarms and troubles that occur within one group are not annunciated on the nodes of another group. For example, in the case of a two tower complex, the DGP nodes of the North Tower would be placed in the North group and the DGP nodes of the South Tower would be placed in South group. If there is a CACF Node in a common area (e.g.a lobby) it could be placed in both groups. Alarms, Fire Dill activation, etc. initiated in the North Tower would not be transmitted to the South Tower and vice versa. The CACF, because it is a member of both groups, will receive and annunciate events from both towers.

- Available Groups - This lists all existing groups.

- Groups Membership - This lists the groups of which the current node is a member.

- Add - opens a dialog where a new group can be created and given a name.

- Edit - opens a dialog where the selected group can renamed.

- Del - deletes the currently selected group. Delete will not succeed if the groups has member nodes or if there are Common Controls that refer to it.
- Right Arrow - the Node whose details are currently being displayed becomes a member of the selected, available group.
- Left Arrow - the Node whose details are currently being displayed is removed from the selected group.

<u>Differences Mode / Differences Report</u>

Introduction

The configurator has the capability of comparing two jobs. Once differences mode is entered the job tree shows which elements have been added, removed or changed. The list views show in more detail which items have been modified or whether correlations have been added or removed.

In differences mode a report can be printed. The scope and depth of the print report can be chosen, similar to when printing a single job.

The differences report is intended primarily to provide the authorities with a detailed list of what has (and what has not) been changed. Such a report can used to justify only minor re-testing of an installation.

Primary vs. Secondary Job

In this document we will refer to Primary and Secondary jobs. The primary is normally the older job, currently in service. It is the base against which the secondary job - the newer, modified job - is to be compared.

You will normally first establish the primary job by opening it using the Job Menu and choosing the desired Job and Version. Then you will invoke differences mode, where the secondary job is chosen.

This document occasionally refers to items that have been added or deleted. These terms are used with respect to the primary - assuming that the primary is the older job. There is nothing to prevent you from reversing this convention and establishing a newer job as the primary.

Initiating Differences Mode

Differences mode can be initiated either by selecting Compare Job Version from the Job Menu, or by clicking the Differences icon in the tool bar.

When you initiate Job Compare, the Job Compare Dialog is displayed.

Press OK to enter differences mode. This can take several minutes, as the program examines every component of each job and decides if it is added, removed or changed. Correlations are also compared during this phase. A changed correlation is reflected not only in the correlations list, but is propagated (as a modification) up to the device or circuit list and from there to the Device Loop in the job tree. A dialog is displayed to inform the user of the progress of difference reporting and to allow the action to be canceled. If you cancel, the display reverts to the primary job, in normal mode.

Interpreting the results

When the comparisons have all been made, the jobs are presented as one job tree. See below.
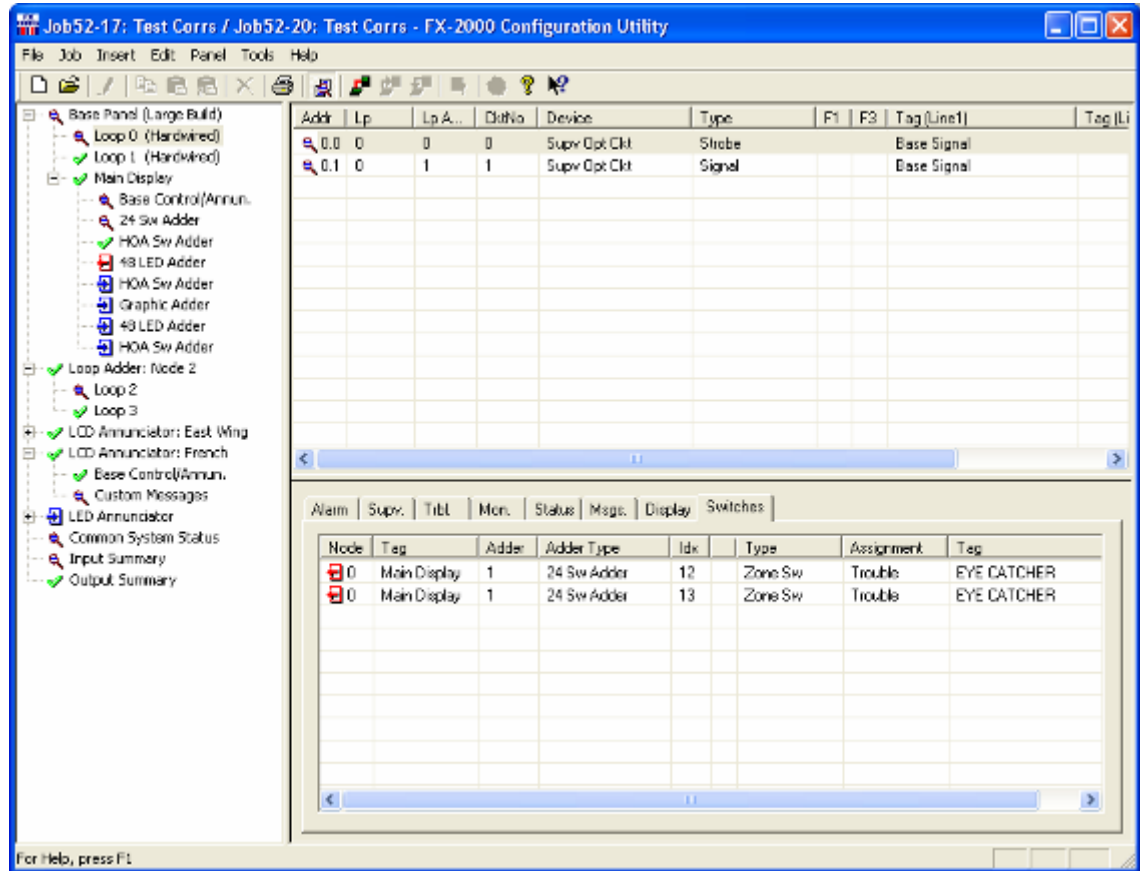
The magnifying glass icon represents an item that has been modified, symbolizing that it warrants a closer look: some lower level attributes have changed.

Items that have not changed are given the green check mark icon. More precisely, this means that there were no reportable changes on this item or any of its lower levels. If you chose a non-standard set of options and excluded, for example '..items that are modified', then a green check mark will appear if there are modifications, but no deletions and additions. This is because you chose to ignore or exclude them. This icon is only used in the job tree. Items in list views are suppressed completely if you choose not to include items that are identical. If you include items that are identical, then they have no icon at all. This is to avoid clutter and aid readability of the lists.

Notice that here (below) the Main Display itself did not change. None of its attributes, such as Pass Codes, System Messages, etc. were changed. The fact that some changes were made to its Base Control/annun. does not cause the Main Display itself to be marked as changed.

An item that has been removed (is present on the primary job, but not present on the secondary) is depicted with this symbol.
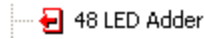
And, conversely, items that have been added are identified with this symbol.

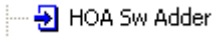The above symbols or icons are also used in the list views. Where a minor modification to a form, a device, LED or switch has been made, two adjacent rows are presented. The attributes that remained the same are represented by ditto marks in the second row.

Where the only difference between two list items is in its correlations, the magnifying glass symbol is used. Again, this means that the user can click on it to view the actual changes: in this case, the correlations in the bottom, right pane.

Printing

The print and print preview operations function just as in regular mode. (See Print) You can choose to print the differences of the entire job, a single node, or a node and its sub-nodes. In addition to choosing how much of the job to print, you can also decide whether to print Outputs with Input Correlations, Inputs with Output Correlations or Display Correlations.

If you chose to suppress identical items when you entered differences mode, then any node in the tree that is marked with a green check mark will not be printed. Items whose only difference is in the lower level correlations are also not printed: only the actual correlations. On the printout the symbols - - > and < - - are used in place of the added and removed icons. The same symbols are used on pairs of lines to indicate which one is from the primary (< --) and secondary (- - >).

If the print range of the job was Complete Job, then you may decide to choose only one of Input or Output Correlations, since every input has a corresponding output somewhere on the job. Be aware that if the print range does not encompass the complete job, then selecting only Input or Output may not include all correlations.

The Input and Output summaries will list any changes to the UDACT numbers to be reported to the authorities.

TIP: Print Preview works best if you maximize the Preview window (other windows can't cover part of it, requiring a redraw when moved) and zoom in/out so that a complete out put page fits in the window (you don't have to scroll to view other parts of a page, which would cause frequent redrawing).

How Does the Program Decide what's Added/Removed/Changed

Each item on the job has some attributes that are considered to be the key. For a Base Annunciator or Loop Controller it is the Node number. You may have changed the tag, or added Display Adders, but the item is still considered to be same one.

If you had removed and added Annunciators such that the node numbers changed, then these are no longer considered to be the same and will be reported as major additions / deletions.

For a circuit or device, the combination of Loop No and Device Address is considered to be the key. The internal Circuit Number (or UDACT) is not considered the key. Through deletions and additions a circuit at the same loop/device address may receive a different UDACT number. This will be reported as a modification.

Display Items (Leds/Switches) are treated a little differently. They cannot be removed, but they can be assigned different roles, or completely un-assigned. The key for these items is a combination of the Node number and their relative position on the adder combined with their Type and Assignment. This means that a seemingly minor change to an LED's assignment (e.g. from Alarm Status to Mixed Ipt) will be treated as though the LED had been deleted and re-added. This makes the handling of correlations more meaningful. Very often there is only a small sub-set of correlation types that are common to two different LED or Switch assignments. By treating the Type and Assignment as key, we can show the complete before and after correlations.

Fire Phone Configuration

Introduction

The configurator allows the user to set up an Audio Controller, conventional phones, voice lines, remote field phones, master telephone handsets and telephone selectors, and connect them together.

There must be at least an Audio Controller, a Telephone Master Controller (QMT-5302N) and Telephone/Page Selector (QZP-5101). The Audio Controller supports conventional fire phone circuits or voice lines. There may also be addressable fire phone modules. If you configure addressable fire phone modules you must also ensure that there is a voice line to support them.

Adding Audio Controller

Invoke Add Audio Controller function. This can be done

- By pressing the right mouse button, with focus on the tree item representing a network node.
- By using the Insert menu and choosing Add Audio Controller

The following dialog appears.

You must specify whether the Audio Controller will support a master handset (there must be at least one per job). If you choose to support a master handset, it will consume one of the five lines of the controller.

The new Audio Controller appears in the job tree. Its CPU Number is initially set to the next available address. Below it, looking very much like loops of a loop controller, are two more items: Phone Lines and Amplifiers.

You must also specify whether the four or five lines are to be configured as conventional phones or as voice lines to serve addressable phone modules. After the Audio Controller is added you can still edit these attributes, or change just some of the lines between voice and conventional.

Adding Fire Phone Module

Invoke Add Device function. This can be done...

- By pressing the right mouse button, with focus on an addressable device list.
- By pressing the right mouse button, with focus on the tree item representing an addressable loop.
- By using the Insert menu and choosing Add Device

The following dialog appears.

Select the Firephone Ipt in the Type Comb Box. Adjust the Number to add if you want more than one Firephone. Press the Add button.

Only the Tag1 and Tag2 fields can be edited.

Adding Master Telephones

A maximum of one Master Telephone can be added to each RAX LCD Annunciator or to the Base Panel's Main Display.

Invoke the Add Display Adder function. This can be done...

- By pressing the right mouse button, with focus on the tree item representing either an annunciator or another display adder belonging to an annunciator.
- By using the Insert menu and choosing Add Display Adder.

The following dialog appears.

Master Telephone only appears in the Adder Type Combo Box if the annunciator does not already have one. It consumes one frame. It is initially set up to have all of the required standard LEDs and switches and the display items should not be edited.

Adding Telephone/Page Selectors for Telephones

Any number of Telephone/Page Selector adders can be added to each RAX LCD Annunciator or to the Base Panel's Main Display, up to the maximum frame count for an Annunciator. An Annunciator can accommodate 14 frames: A Telephone/Page Selector occupies 2 frames.

Invoke the Add Display Adder function. This can be done...

- By pressing the right mouse button, with focus on the tree item representing either an annunciator or another display adder belonging to an annunciator.
- By using the Insert menu and choosing Add Display Adder.

The following dialog appears.

A Telephone/Page Selector is added to the current Annunciator. It has 24 switch positions, all of which are initially un-assigned. They can be configured as Phone Select, Dig Msg or Page Select.

Assigning Selector Switches

Any of the 24 switch positions can be edited to be assigned as Phone Sel. You can also assign each switch a different Tag 1.

When a Phone Sel switch is highlighted, the lower pane shows its correlations.

Correlating Selector Switches to Telephones

The following constraints are applied to Telephone / Switch correlations.

- Each dual LED/Switch combination on a Selector can control and annunciate only one telephone (conventional circuit or addressable module).

- If a switch on one CPU (Annunciator) is already controlling a telephone, then no other switch on that same CPU can be associated with the same telephone. However, any given telephone module can be controlled from a similar LED/Switch combination on another CPU.

Typically, a bank of selectors on one Annunciator will mirror those on another. This is not a requirement though, and the Selector Switches at the Main Panel, for example, could control all the phone modules on a job, while each remote Annunciator controls only a sub-set.

Correlations can be added from either end of the relationship.

Adding Switch Corrs to a Phone.

1. Navigate to the addressable loop or Audio Controller phone list view containing the telephone and highlight it (one phone at a time) in the device list view.

2. Invoke Add Correlations.

3. The Add Correlations dialog appears and presents a list of all of the available Selector Switches, from all CPUs.

4. Select maximum one switch from each CPU that you want to be associated with this telephone.

5. Press Add

If you selected more than one switch from the same CPU, then only the first one will be correlated and an error message will halt the adding of correlations.

If you had previously correlated one or more switches to this telephone module, then you will not see any available switches from the same CPU as those existing correlations.

Correlating Phone Module to a Switch Corrs

1. Navigate to the Display Item list containing the Selector Switch and highlight it (only one switch at a time) in the list view.

2. Invoke Add Correlations.

3. The Add Correlation dialog appears and presents a list of Addressable Phone Modules and Conventional Phone Circuits. If the Selected switch already has a correlation, then no available phones are shown.

4. Select only one Phone Module (a switch cannot control more than one telephone).

5. Press add

If the Phone you selected to add was already correlated to another switch on the same CPU, you will receive a message "A select switch already exists for control circuit number nnn. A circuit can only be assigned to one Telephone Switch per CPU".

If you selected more than one Phone to add, or if you press add again, then you will receive the error message "Cannot correlate a Phone Select switch to more than one phone module".

NOTE: The general purpose nature of the Add Correlations dialog means that it cannot prevent multiple selection. The error is detected after you press Add.

Linked Items

Selector Switches whose operation is linked with a switch on another CPU will be marked with an asterisk. By right clicking and selecting View Linked Items, you can see the CPU, Frame and Index of the other switch(es).

Call Control

The call control feature allows an operator at one node to execute a call-in to another node using the master handset.

Call Control can be configured if two or more nodes are equipped with an audio controller and master telephone.

Assign a Telephone Selector Switch on the node where the user is to receive the Call Control. If this node has a master telephone, and if there are remote nodes with masters, an additional tab - Call Control - appears on the Add Correlations dialog. It lists all of the remote nodes that can potentially participate in Call Control. Select the node that is to initiate Call Control.

When the remote user picks up the master telephone and presses Call Control, this sets the remote node's Call Control status and initiates a call-in. The LED associated with the correlated telephone selector begins to flash and the operator can press the switch to accept the call as if it were from a remote handset. The two master telephones are then connected.

Call Control is a toggle operation. Pressing the switch again cancels the call-in.

Drag & Drop / Copy & Paste

A Fire Phone device cannot be copied if it is already correlated to a selector switch. Doing so would break the rule of one switch, one phone. If you attempt to copy such a device (or a loop that contains one) an error message is displayed. If you need to copy phones, do so with Paste Special and un-check the Copy display correlations option.

Get Job

You can get all job data from the panel by selecting Get Job from the Panel menu. This command retrieves a job from the panel, transposes the data and stores it on the database. If the panel is loaded with an older version of the firmware, the appropriate size and layout of data structures is built to receive the data.

If the job is determined to be a newer version of one already stored on the database (it compares the Job's Globally Unique ID or GUID) then the next highest version is created.

If no prior version of the job is already stored on the database, then a new job is created. The New Job dialog is used to collect information such as the Job Name, Author and Comments.

If a job with the same GUID is already on file - meaning that the jobs are of the same "lineage"- then the New Version dialog is used to collect comments for the version history.

Send Job

You can send the current open job to the panel by selecting Send Job from the Panel menu. This command builds the current job (this means taking data from the database and transforming it into the data structures that are understood by the firmware). The structures are then sent through the RS232 interface (or MODEM) to the panel, where they are assembled and routed to their ultimate destination. Validation is automatically done as part of the build process.

Before the job is sent, the configurator interrogates the panel to discover what version of the product it is running. The configurator is able to build the correct data structures for the majority of older product versions. If the user is running a version of the configurator that is out of date with respect to the firmware version, then it cannot build the job, and will display an error message. The configurator builds the data structures to match the Product Type, Version and Job Type. At this time, it also checks that each Node and CPU on the panel is online and agrees (CPU Type and Firmware Language) with the information in the job's database. An error message is issued if there is a mismatch.

The configurator verifies that the features reported by the firmware match those of the configured job. An error is displayed and Send Job is aborted if the firmware cannot support or does not match the configuration.

Warning - Send Job over writes the job on the panel. If you do not have a copy of the panel's current job on your database, you will be warned that it is about to be overwrriten.

Suite Silence Configuration

Introduction

The configurator allows the user to configure a combination of System Statuses, timers, input zones and signal zones to satisfy the requirements of the Ontario Building Code with respect to "Suite Silence".

The code allows the signals (speakers) in suites other than the suite where the alarm occurred to be automatically silenced. But it specifies that the automatic signal silence cannot occur until a minimum time has elapsed. It also specifies that the signals must resound immediately if there is a subsequent alarm anywhere in the building, or if ten minutes elapse and the alarm has not been acknowledged.

An excerpt of the code is reproduced below.

(13) Audible signal devices, within dwelling units that are wired on separate signal circuits, need not include a means for silencing as required by Sentence(9) provided the fire alarm system includes a provision for automatic signal silence within dwelling units, where,

- (a) the automatic signal silence cannot occur within the first 60sec. of operation or within the zone of initiation,
- (b) a subsequent alarm elsewhere in the building will reactuate the silenced audible signal devices within dwelling units,
- (c) after a period of not more than 10 min., the silenced audible signal devices will be restored to continuous audible signal if the alarm is not acknowledged...

Timers

Two timers were added to support Suite Silence. And the existing Signal Silence Inhibit timer also plays a role. The duration of all three timers can be set on the Job Details form. The conditions which start and stop these timers are also described there.

- Auto Resound (mins) - This timer specifies the time, in minutes, after which the signals will resound if an alarm remains un-acknowledged. The configurable range is from 5 to 12 minutes with a default of 10 minutes.
- New Alarm (secs) - This timer is started by a new alarm. The configurable range is from 10 to 120 seconds, in 10 second steps with a default of 60 seconds.

- Signal Silence Inhibit (secs) - This timer already existed prior to the introduction of Suite Silence and specifies how long the signals must sound before they can be silenced by any means.

Common System Statuses

Two Common System Statuses were added to support Suite Silence.

- New Alarm Active - This status is set to true when a new alarm occurs and remains true while the New Alarm timer is running.
- Auto Suite Resound - This status becomes true when the Auto Resound timer expires.

The "Subsequent Alarm" common system status, which was used before Suite Silence was officially supported, should not be correlated to suite signals.

Configuration

- Set the job to be Two Stage.
- Set the alert rate to "Alert" and the Evacuation rate to "Temporal". Do this on the Job Details form in the signal rates section and if the job has audio, within the Audio Setup dialog.
- Set the New Alarm timer to 60 seconds. Do this on the Job Details form.
- Set the Auto Resound timer to 9 minutes. Do this on the Job Details form.
- Set the Signal Silence Inhibit timer to 60 seconds. Do this on the Job Details form. You may have to adjust the Auto Signal Silence timer since the two are related.
- Add the detectors that are located in each suite. Create an alarm zone for each suite and place the corresponding detectors in each zone.
- Add signal circuits for each suite.
- Correlate each suite alarm zone to the corresponding suite's signal circuits.
- Add signal circuits for areas not within the suites. E.g. Hallways.
- Correlate Common Alarm to the Hallways' signal circuits.
- Correlate the "New Alarm Active" common system status to all suite signal circuits.
- Correlate the "Auto Suite Resound" common system status to all suite signal circuits.