User
Edition

For Ver 5.0

X11CB and X16CB Configuration Application Installation and Operations Manual

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1. INTRODUCTION

This guide contains operating instructions for the X11CB Configuration Application that is used to configure the operating parameters for all X11CB Annunciator Systems.

There are two architectures to consider when configuring the Annunciator at the system level.

The first, most common and simple, is termed a Primary or Primary-Only system. This means that each alarm light display is controlled by a single Interface Module and a single Alarm Module.

The second, and less common, is termed a Redundant system. The Redundant system has two Interface Modules each using a separate CAN bus communicating to the Alarm Modules. Within each of the Redundant Alarm Light displays are two Alarm Modules controlling the LEDs. Each Alarm Module controls one-half of the LEDs for a particular alarm. This limits the style of alarm to the 1000 or 2000 series modules. Redundant Alarm modules cannot accommodate triple and quad lamp displays. Each Interface Module will catalog its own events in the database using its unique UnitID. Therefore, each Field Contact Alarm will have two events that should mirror across the two UnitIDs.

The configuration application is only required for configuration and is not required during the normal operations of the Annunciator. It can, however, provide diagnostic information about the Annunciator during active operations.

This application runs on a separate PC that is connected to the Annunciator system via an Ethernet connection. The application can be installed on any PC, whether or not it is connected to the actual Annunciator device. If this PC is not connected to the device, the PC can configure but cannot download the configuration to the Annunciator. See the Installation Section for further details.

This application is pre-installed on purchased PC systems ordered with the Annunciator system.

1.1. Primary Configurations

The smaller Ronan X11CB Annunciator Systems consists of a single chassis containing a single Integrated Interface Module and a number of Alarm Modules for which the system was configured. A larger more complex system will contain multiple Interface Modules either in the same chassis or separate units. The rational for having more than one Interface Module in a single chassis varies, but the most common would be due to fan-out of the CAN bus. Currently the Interface Module CAN bus accommodates 100 Alarm Modules. If the chassis configuration exceeds the 100 node limit, then it is split between two or more Interface Modules operating independently. The timing, in these cases, should be handled by a common time source or IRIG controller, so that the alarms will flash in unison, and the event time stamps will be accurate.

The Interface Module gathers all the event information from the Alarm Modules and provides a communication path to the outside world, typically to a Distributed Control System.

Internally the Interface Module connects to the local Alarm Modules via an internal CAN bus. The CAN bus is capable of supporting up to 100 individual Alarm Modules each containing up to 4 input channels.   This gives a combined total of up to 400 alarm points. The Alarm modules can be split across multiple enclosures using the CAN bus interface that connects them to a single Interface Module.

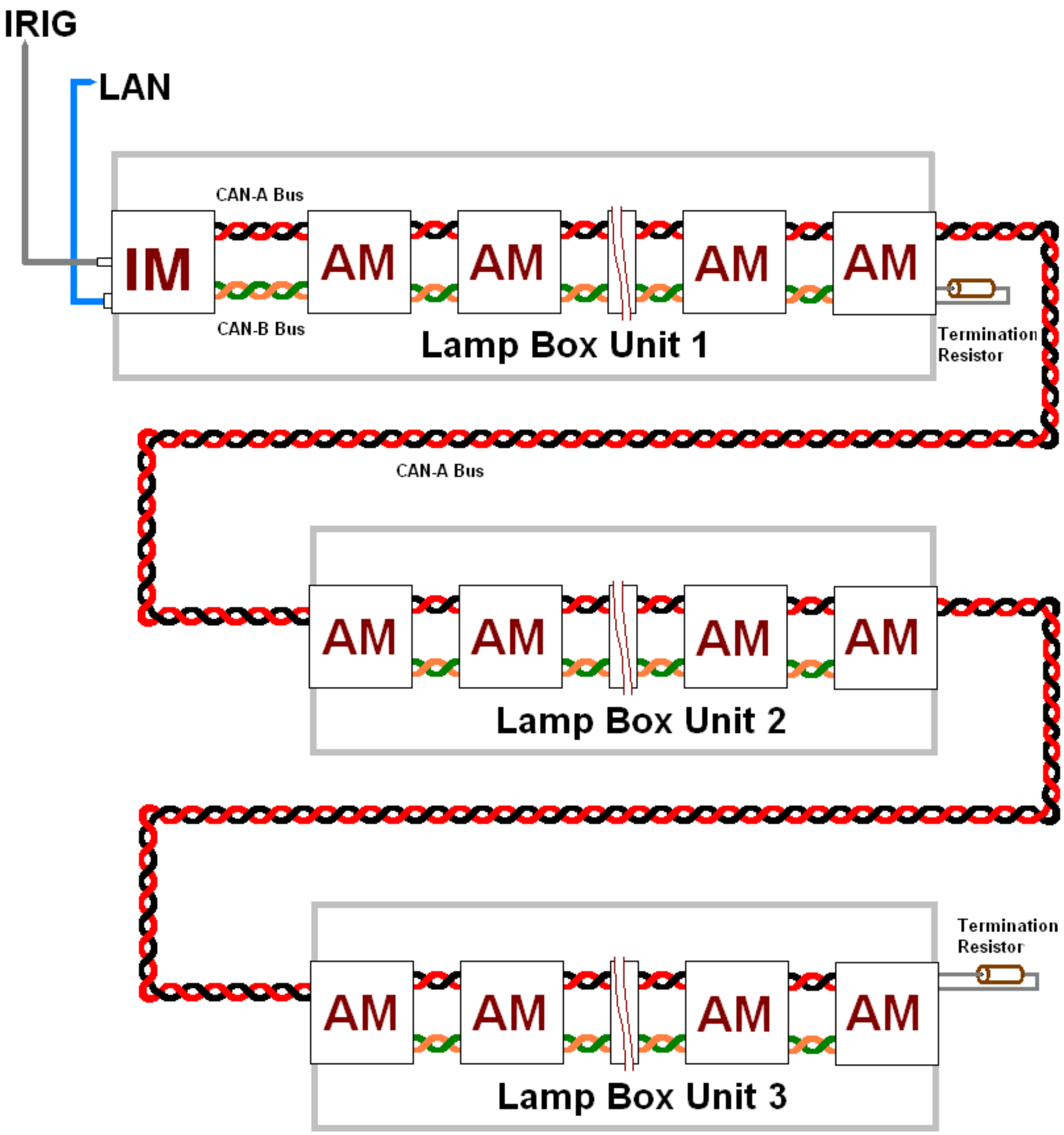


Figure 1-1 Single Interface Module with Multiple Lamp Cabinets

A single RJ45 connector provides an Ethernet connection allowing the X11CB to be connected to a Local Area Network (LAN). This allows the X11CB Configuration Application to be installed on a PC within that LAN that allows the user to connect to and configure the X11CB Annunciator System.

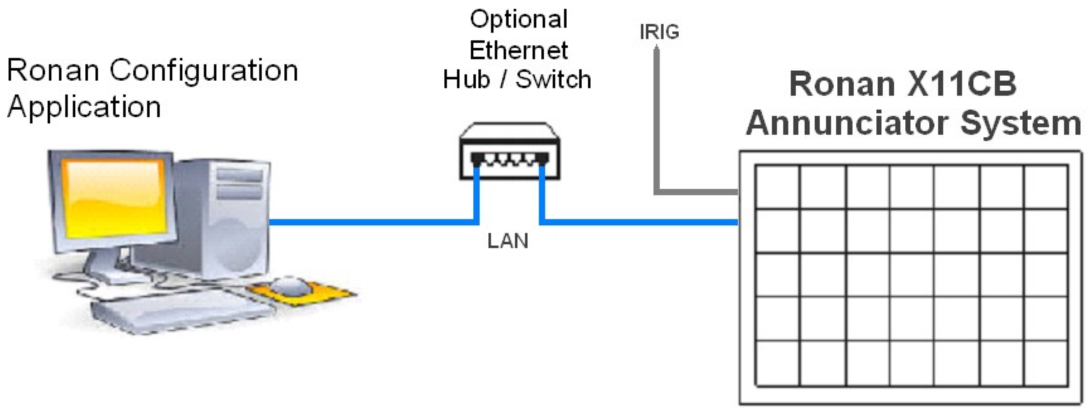
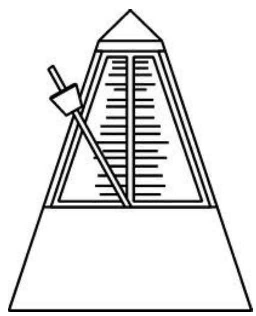


Figure 1-2 Block Diagram of a Simple X11CB Annunciator System

1.2. IRIG – Time Synchronization



An IRIG-B input is provided to allow connection of an IRIG-B time producing device to the X11CB Annunciator System. The IRIG-B generator will provide accurate time to the X11CB system enabling it to time stamp any event generated to within 1 millisecond of GMT. The Interface Module sends a time synchronization message each second to all Alarm Modules for synchronization of their flashing lamps and event time stamping. Each Alarm Module uses this time synchronization message to synchronize their internal timer for millisecond timing.

1.3. Redundant Configurations

An option to the X11CB is the addition of a second Interface Module on the same Lamp Cabinet known as a redundant Interface Module. The two interface modules operate independently over the same or different LANs. Each Interface Module talks to each of the Alarm Modules across a separate CAN bus. The redundant Interface Module communicates to a separate Alarm Module as a daughter card in the Host Alarm Module Unit.

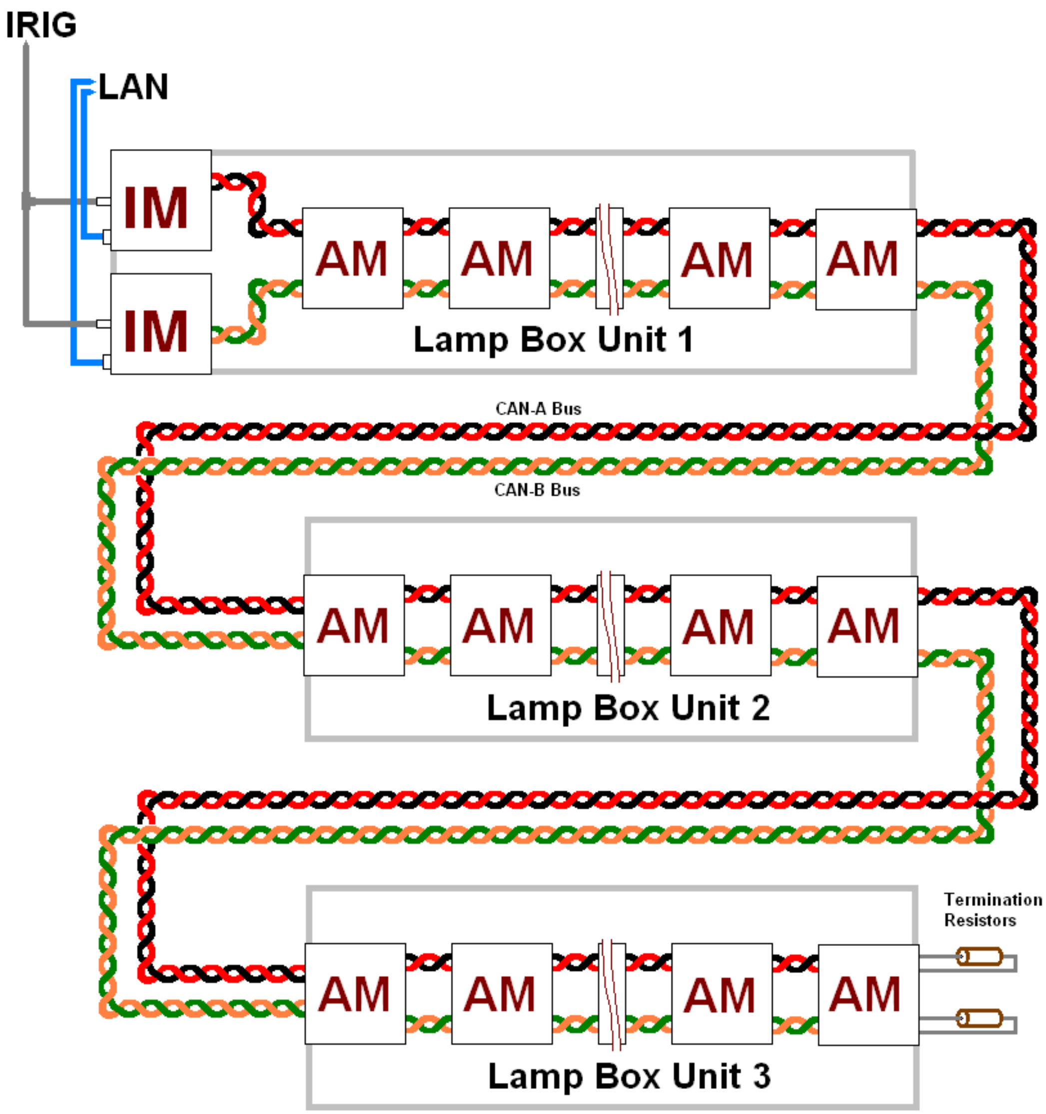


Figure 1-3 Redundant Interface Module with Multiple Lamp Cabinets

Since Multiple Ethernet Connections are required to configure a Redundant system, a Hub or Switch may be necessary. The configuration could be accomplished off the network with a PC desktop or laptop connected directly to each of the Interface Modules individually, one at a time, with a cross-over cable.

A Hub or Switch would be required for the actual production operation.

Both of the IRIG-B inputs would need to be connected to an IRIG-B time producing device. This is especially important to synchronize all of the alarm modules to flash in unison, and keep the events synchronized.

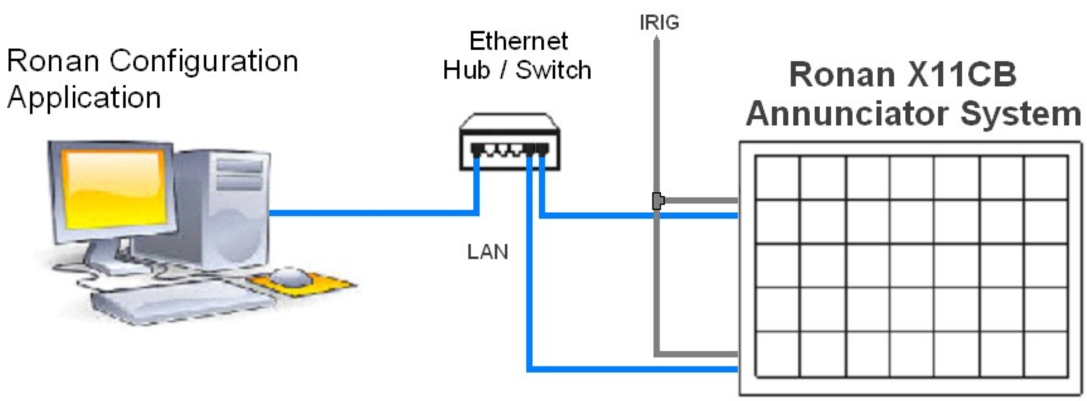


Figure 1-4 Block Diagram of a Redundant X11CB Annunciator System

1.4. Alarm Module and Channel Configuration

Each Alarm Module can control up to four channels. The only commonality across the channels is the Inhibit functions that are configured at the Module level.

Other than that, each channel can have it own individual sequence, inputs and outputs.
The configurable channel items are:

- Alarm Sequence Type
- Common Trouble Alarm participate
- Auxiliary Relay output and options
- Transistor output and options
- Field Contact debounce options
- Horn options for both Horns with Auto Silence
- Group
- Remote Point options
- Remote Point source
- Remote Target Point

Note. Not all of these options are available for both local and remote points.

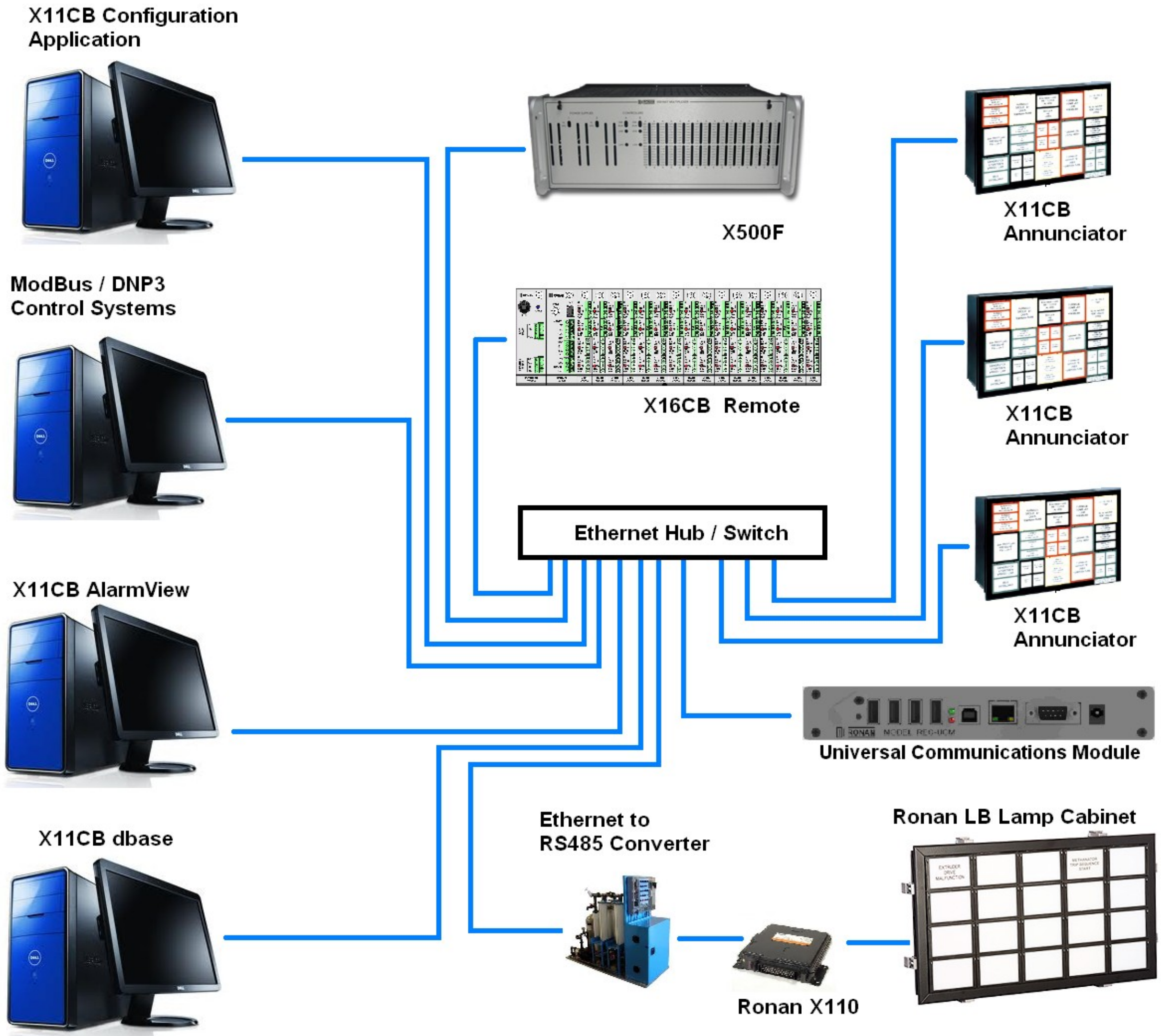


Figure 1-5 Block Diagram of a more Complex X11CB Annunciator System

Other devices such as Programmable Logic Controllers (PLC) and Distributed Control Systems (DCS) connected as nodes the same LAN may allow communication to the X11CB Annunciator.

When specific Industry standard protocols are required of the Annunciator system, the Ronan REC-UCM product is used to interpret those protocols and then transfer the information to and from the X11CB's Interface Module.

If event recording is required and an accurate time source is not available, the Interface Module will use an internal time stamp, but will not be as accurate as an IRIG-B synchronized system time.

The X11CB Configuration Application makes extensive use of “tool tips” to provide descriptions for various buttons and fields. To display a tool tip, position the cursor over a button or field and wait a few seconds. A tool tip will appear with a brief description of that button or field.

1.5. Manual Organization

This manual is organized with a quick start section ahead of the detailed operations of the functions available to users of any security level. The detailed sections are in order as the X11CB Configuration displays its main page from top to bottom, left to right.

1.6. Standard Definitions:

AM – Alarm Module

DHCP - The Dynamic Host Configuration Protocol (DHCP) is a network protocol used to configure devices that are connected to a network (known as hosts) so they can communicate on that network using the Internet Protocol (IP). In simple terms, the DHCP server supplies the application computer with an IP address, typically 192.168.x.x.

IM – Interface Module

IP - Internet Protocol, a set of rules for sending data across a network

IP address - a computer's address under the Internet Protocol. The X11CB Interface Module uses the IPV4 addressing scheme which is a set of octet numbers (example – 192.168.1.1). This manual assumes that the Class ‘C’ IP Address are used.

IRIG - The Inter-Range Instrumentation Group, a standards publishing body

MAC - MAC address, Media Access Control address or Ethernet Hardware Address (EHA)

sequence: the chronological series of actions and states of an annunciator after an abnormal process condition or manual test initiation occurs.

sequence state: the condition of the visual display and audible device provided by an annunciator to indicate the process condition or pushbutton actions or both. Sequence states include normal, alarm (alert), silenced, acknowledged, and ringback.

SQL - (Structured Query Language) is a special-purpose programming language designed for managing data held in relational database management systems (RDBMS). It is pronounced either S-Q-L or “sequel”. This difference in pronunciation also affects the writing of documentation; this manual may lean toward the latter.

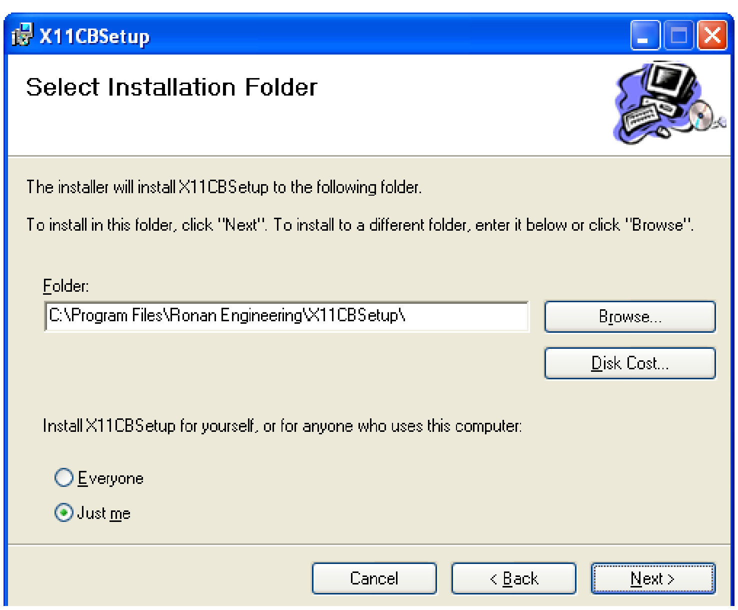
XML - Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. It is used in the X11CB applications primarily for configuration storage files.

2. Installation

The X11CB Installation is contained on a single CD or .zip file downloaded from the Ronan FTP location. Different versions may be available from the FTP site and may be an issue depending on the hardware revisions and other peripheral devices that become an integral part of the configuration.

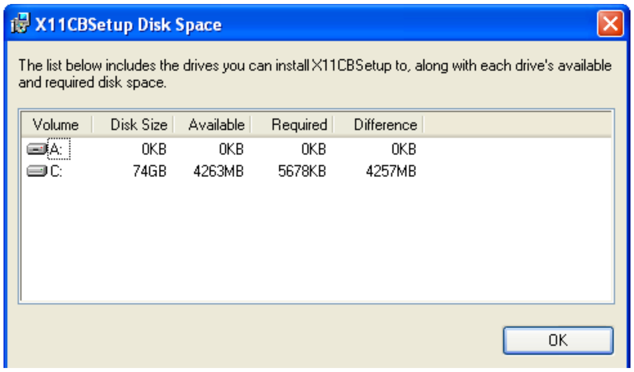
The Installation itself is straight forward. Just follow the instructions in the setup wizard, very carefully understanding all of the options presented, and the installation will complete as directed.

Click Next.



This step in the installation directs the setup as to where to install the applications.

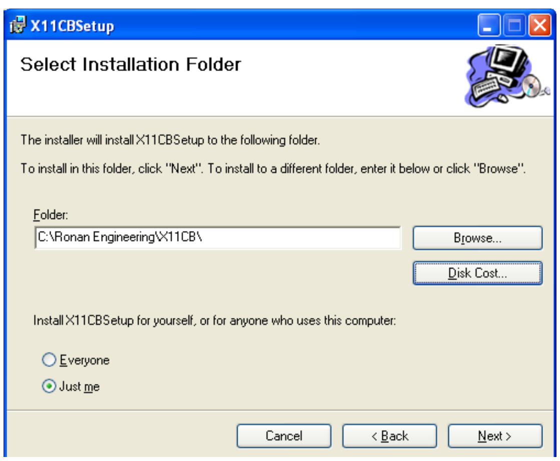
Also notice the Everyone / Just me radio buttons. These instruct setup as to which logon will see the installed application.

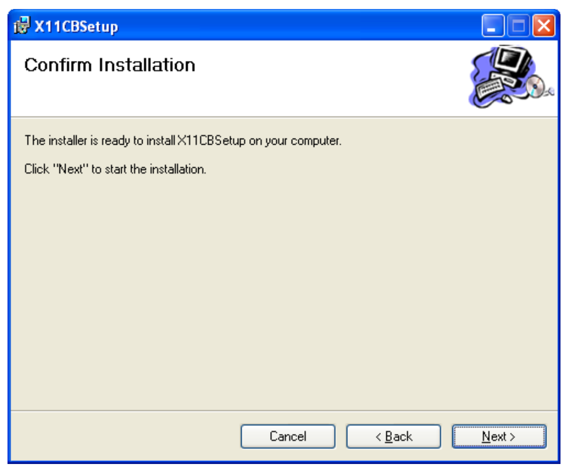


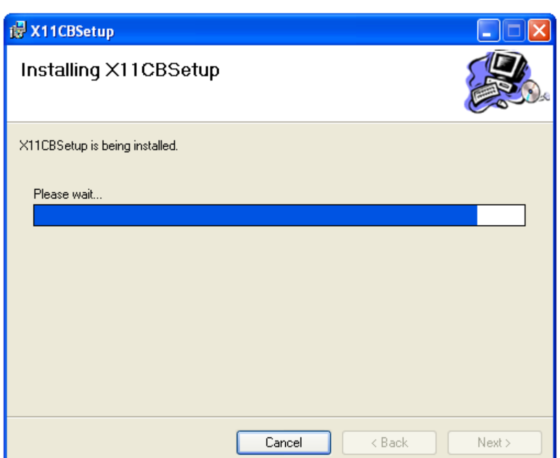
Clicking the 'Disk Cost' button will bring up the Disk Space dialog.

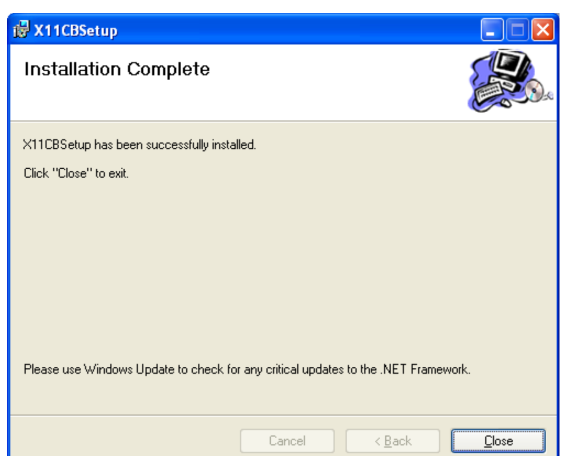
This is a good way of ensuring that there is plenty of space for the installation.

For the next step, it may be a good idea to change the default Folder location. Continue to click 'Next' until the installation is complete. There are several opportunities to 'Cancel' the installation.









3. Quick Start CONFIGURATION

Configuration of the X11CB does not require a connection to the device until it is ready to "upload" to the X11CB-IM unit. The first part of this Quick Start will simply deal with the configuration portion, while the last sections deal with uploading the configuration to the device.

Permissions

The permissions required to add or modify a configuration will require either Administrator or Builder (Local or Remote). The Local and Remote User permissions will not be able to add or modify configurations but will be able to view the configurations.

3.1. Application Start Up

Start the X11CB Configuration application on the PC that it is installed to begin the configuration process.

Look for one of these icons on the Windows Desktop:

Figure 3-6 X11CB Configuration Desktop Icons

The X11CB Configuration Password dialog box will appear. Use Administrator and its appropriate password (Initial Factory default = 123). See Section on password sign-in.

3.2. Create a Simple Configuration File

Enter the job number "12-3456(01)" into the Job Number field.

Enter the customer name "Quick Start Example" into the Customer: field.

After any other field on this screen has been clicked, the offending Red Error highlighting frame around the customer name will go away.

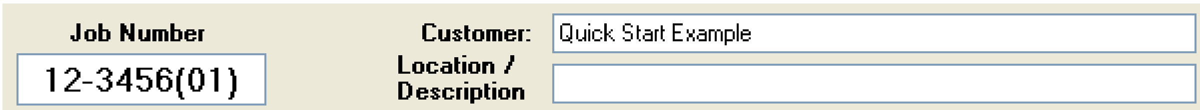


Figure 3-7 Quick Start Job Number, Customer, and Location fields

This is all that is needed to save the configuration, although it is probably not the target system desired. The following sections will address those details.

This Quick Start example will exit the program without the additional step of having the user specifically save the configuration to demonstrate two features:

1. On Exit the Configuration will automatically be saved.
2. Have an existing configuration ready for reloading in the following sections.

3.3. Read the Quick Start Configuration File

Perform the Application Startup as described in the previous section.

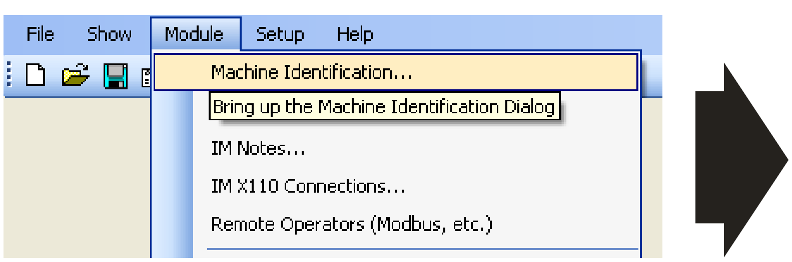
Click in the File menu and then Open. An Open dialog will display. Navigate to where the previously saved configuration, “12-3456(01).xml”, was stored and click “Open”.

This should display exactly where the configuration left off last.

3.4. Specify the Machine Information

Every device on a network has its own unique address. This next step tells the Interface module what address to use, and how this portion of the network is addressed. Once the Interface Module has an IP address, such as the default address from the factory, that address can still be changed with the Machine Setup Dialog using the controls in the Device R/W group. This will be discussed in a later section.

This section will just set the fields for use later if an upload of this information is required.



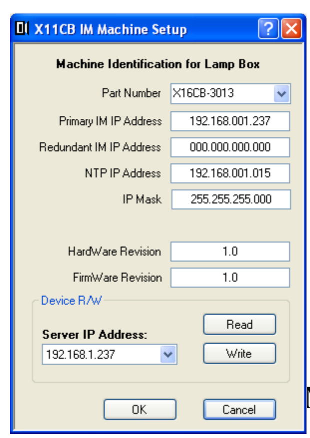


Figure 3-8 Module Machine Identification Menu

Primary IM IP Address:	Defines the IP address for the primary Interface Module of the current X11 CB system.
Redundant IM IP Address:	Defines the IP address for the redundant Interface Module of the current X11 CB system.
NTP IP Address	Identifies the network address at which the SNTP server resides.
IP Mask:	Defines the class range of the possible IP address. See Appendix on IP Address Classifications
Primary IM IP Address:	Defines the IP address for the primary Interface Module of the current X11 CB system.

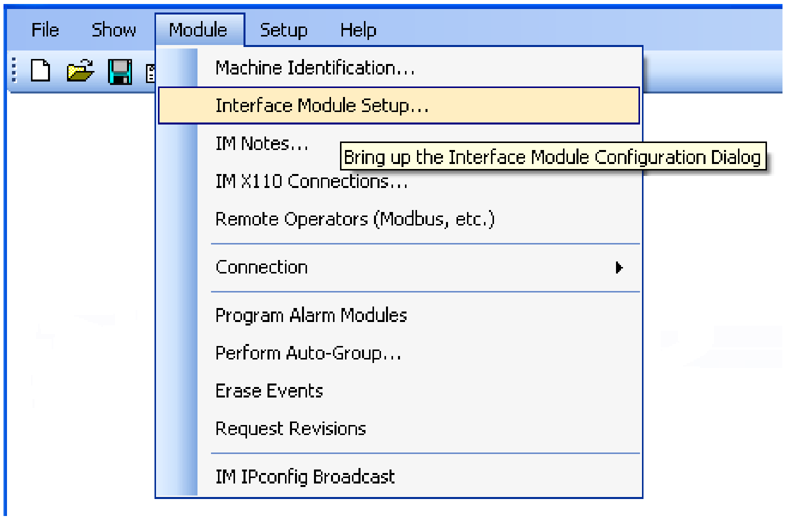
Factory Supplied fields:

The following fields are not critical but "nice to know" when troubleshooting problems with the Interface Module. They are generally entered at the time of manufacture.

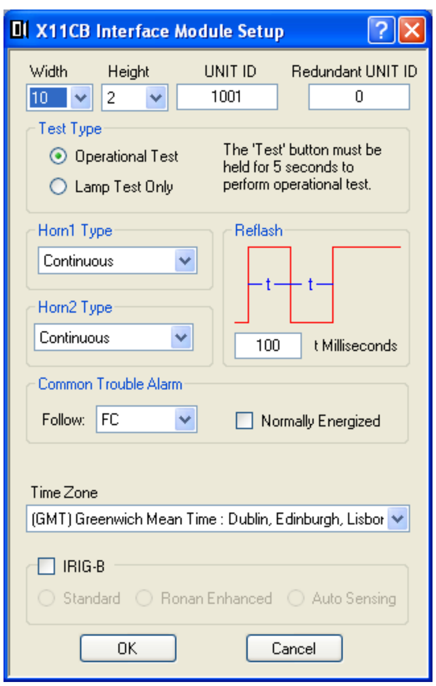
Part Number - Leave as is	The actual configuration file will have the actual part number that was supplied by the factory.
HardWare Revision	Currently there is no way to electrically read this value. It is manually entered.
FirmWare Revision	This entry is manually entered as well. The difference is that it could be read from the Interface Module.

3.5. Modify the Matrix Size

Use the “Module” pull down menu and select Interface Module Setup.



In the X11CB Interface Module Setup dialog:



Enter 10 in the “Width” field.

Enter 2 in the “Height” field.

Enter 1001 as the UNIT ID.

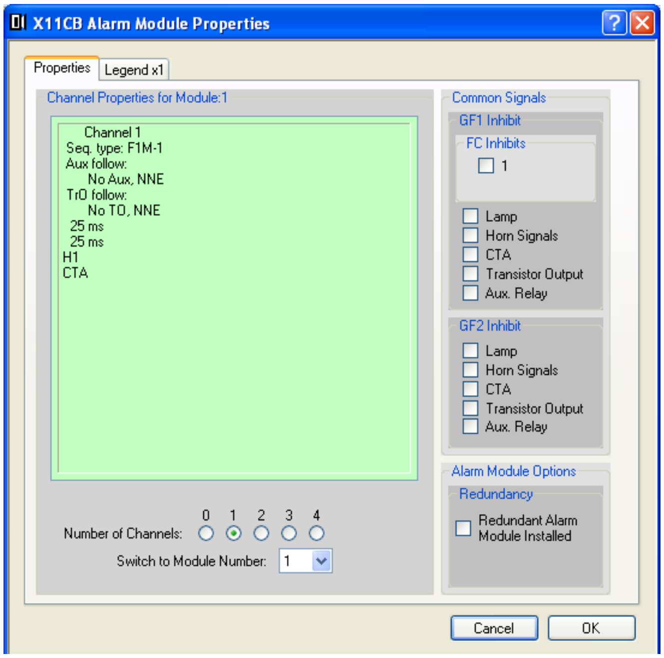
Select “Operational Test” radio button for Test type.

Select “Continuous” from the Horn1 and Horn2 drop down combo box.

Select “FC” from the Common Trouble Alarm drop down combo box.

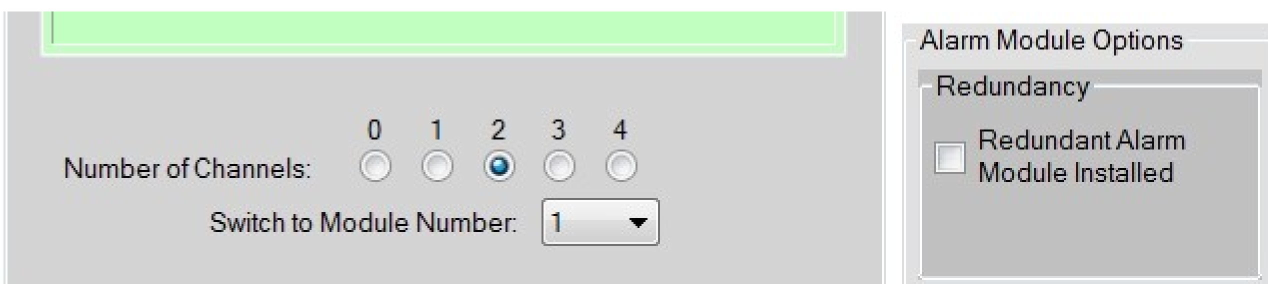
Click on “OK” to accept the settings.

3.6. Modify an Alarm Module

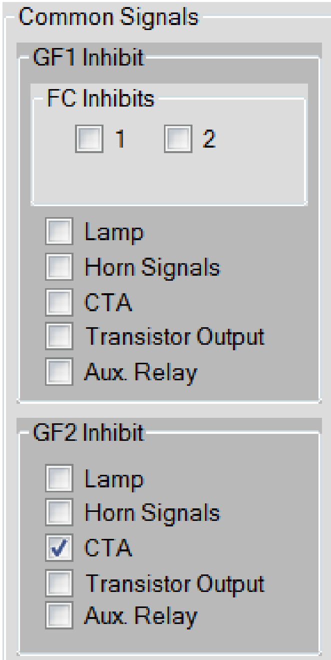


Within the Light Panel tab double click on the top left box 1,1 and the Alarm Module Properties dialog box will appear. Make sure the Properties tab is selected.

Set the "Numbers of channels:" field to 2 by clicking on the button labeled "2".

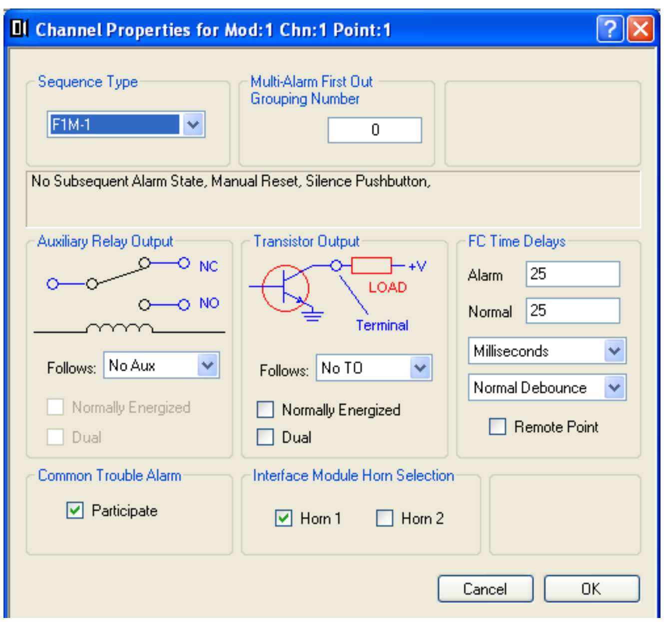


Make sure the option "Redundant Alarm Modules Installed is NOT checked as shown above since this will not be a redundant system.

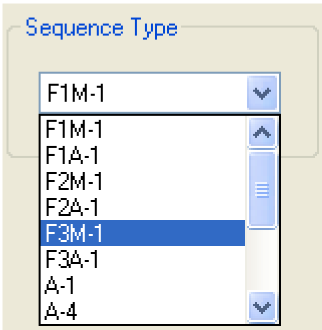


Make sure there are no boxes checked in the GF1 Inhibit section and that the check box for CTA is only checked in the section GF2 Inhibit. This selection will inhibit the Common Trouble Alarm output when the GF2 push button is pressed.

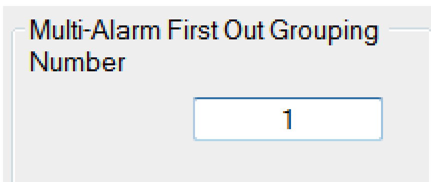
3.6.1. Channel Configuration



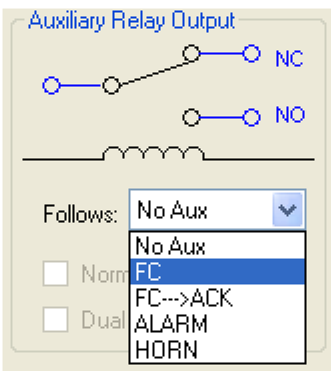
Within the Channel Properties for Module 1 double click in the Channel 1 box. The Channel Properties for Mod:1 Chn:1 Point:1 dialog box will display.



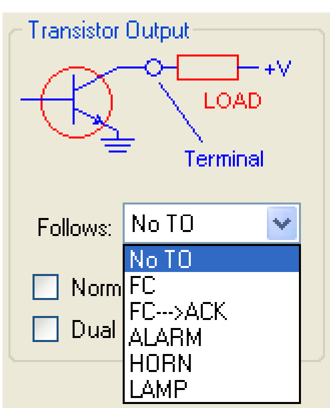
Using the “Sequence Type” drop down combo box, select the alarm sequence “F3M-1”.



Enter “1” in the Multi-Alarm First Out Grouping Number field to assign this point to group 1.

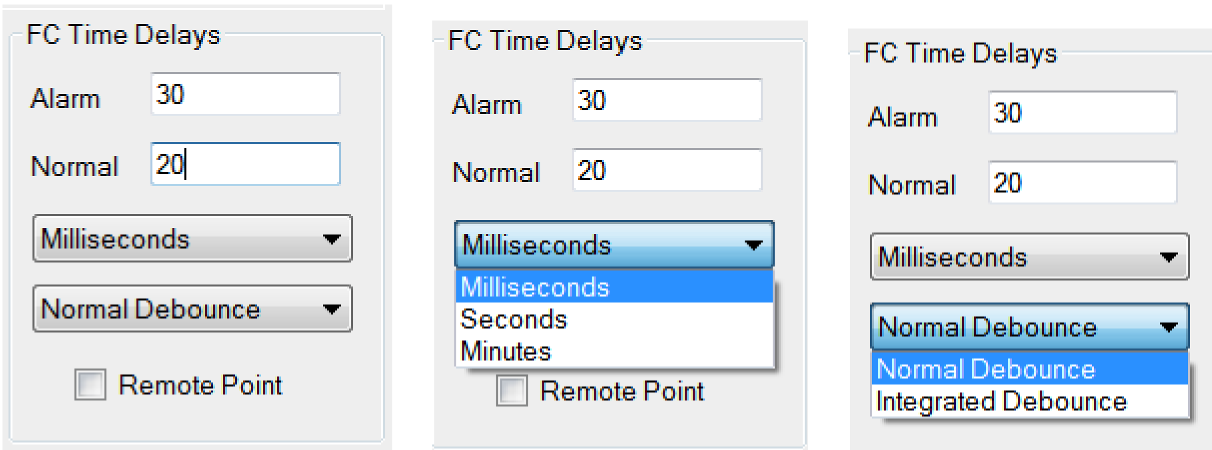


Within the “Auxiliary Relay Output” section use the “Follows:” drop down combo box to select the option “FC”. This will configure the Auxiliary relay for this channel to follow the state of its field contact input.



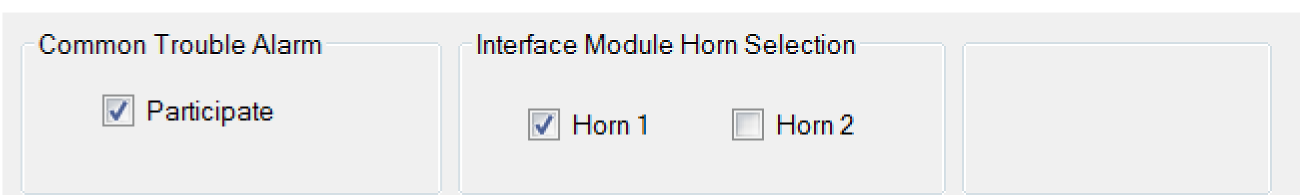
Within the “Transistor Output” section use the “Follows:” drop down combo box to select the option “No TO”. This will disable the Transistor Output.

Set the “Alarm” FC Time Delay field to 30 and “Normal” FC Time Delay field to 20 within the FC Time Delay section. Use the drop down combo box just below the time delay fields and select “Milliseconds”. Use the drop down combo box just below the time units and select “Normal Debounce”.



Make sure the Remote Point check box is not checked since there are no remote points feeding this system.

Check the Common trouble Alarm Participate checkbox so that this channel will drive the Common trouble Alarm system signal when it is in alarm and check the Horn 1 checkbox in the Interface Module Horn Selection checkbox so the Horn will become active when this channels state produces an audible output.



Click OK to accept all the changes made within the Channel Properties dialog box. Now this single channel within this module has been configured to the desired operating parameters defined by the quick start system requirements.

3.7. Copy to multiple Alarm Modules

This just configured “model” channel can now be copied into the other channels of this module. Right click within the Channel 1 Properties for Module 1 and click on “Copy channel 1 to all other channels in this Module? This will transfer the configuration for Channel 1 to Channel 2.

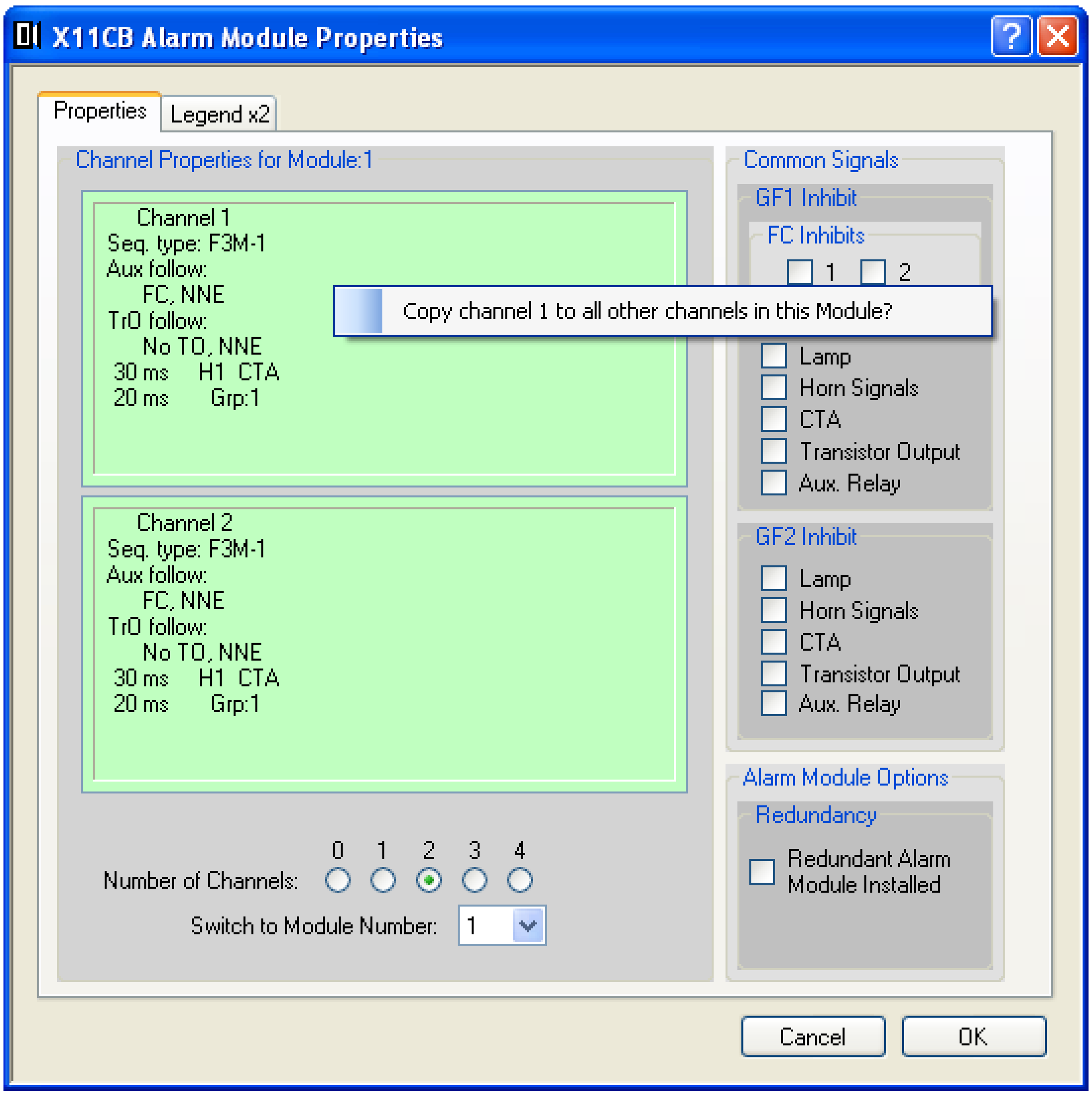
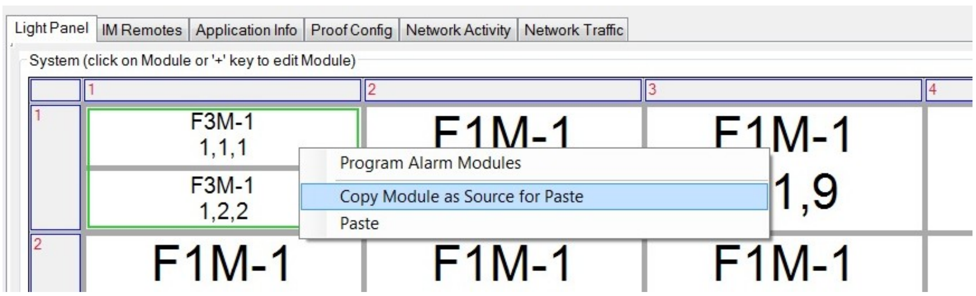


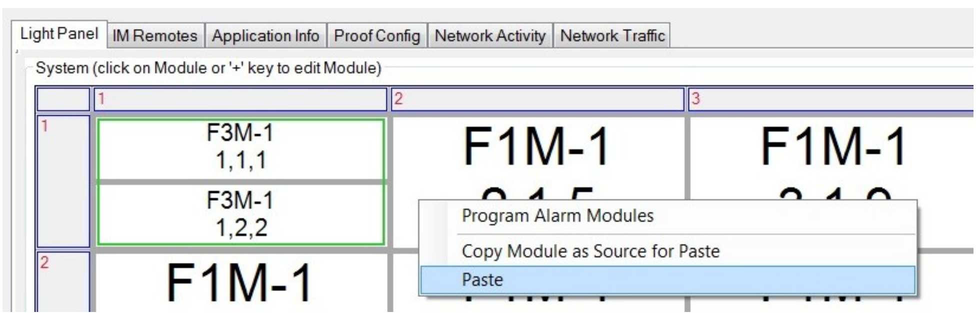
Figure 3-9 Quick Start Alarm Module Properties Dialog

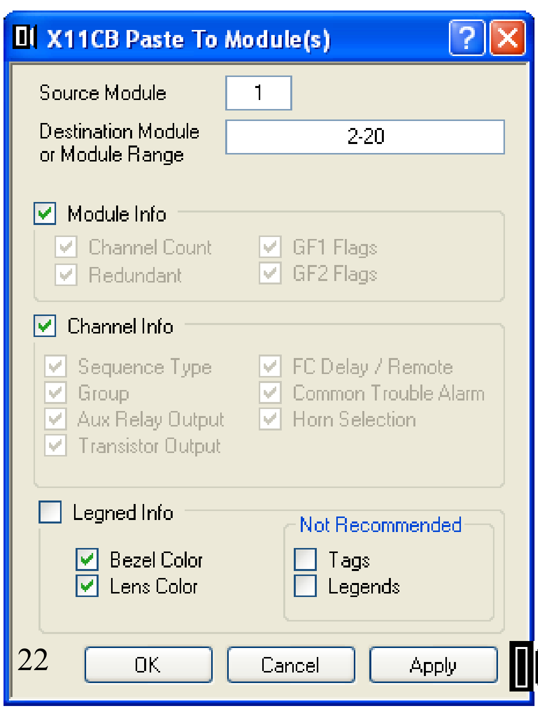
3.8. Copy Module Configuration

Click OK to accept all the changes made within the Channel Properties for Module 1. This module can now be copied as a source for pasting into other modules. Right click within the Module 1 area and click on "Copy Module as Source for Paste".



Right click within any Module area and click on "Paste".





Enter a "1" in the "Source module" field in the Paste to Module(s) dialog box and enter "2-20" in the "Destination Module or Module Range" field.

Check the "Module Info" checkbox, "Channel Info" checkbox, "Bezel Color" checkbox and the "Lens Color" checkbox in the Paste to Module(s) dialog box.

Click OK to accept all the changes made within the Paste to Module(s) dialog box.

3.9. Saving the X11CB System Configuration

The X11CB configuration application now contains the configuration information that meets the requirements of the Quick Start Configuration specified in this chapter. This configuration can be saved to disk for future reference by using the pull down menu “File->Save” or “File->SaveAs” using any conventional file name. See the Save operations described later in this manual.

3.10. Connect to the Interface Module

The next few Quick Start steps involve communications with the X11CB Interface Module.

Permissions

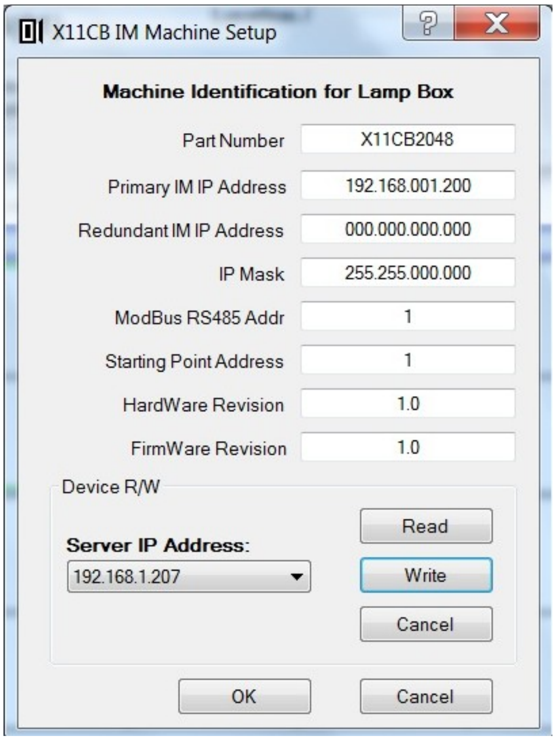
Only Administrator and Remote Builder will be able to send a configuration to the device.

Make certain that there is an Ethernet connection between the configuration application and the IM as described in this manual.

Connect to the IM using the menu, the toolbar icon, or the button on the main page.. See Connect described in this manual. (Module → Connection)

3.11. Upload the Machine Information

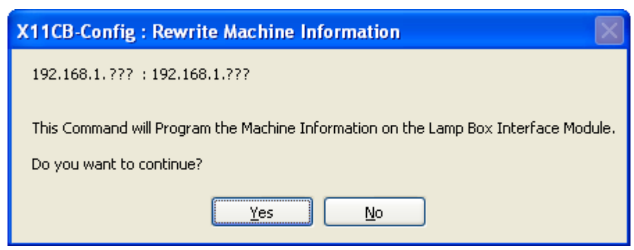
Uploading the Machine Information is different than uploading the Alarm Module configuration in that it deals with connection addresses and types. This operation only needs to be performed once, as the information specified is not likely to change.

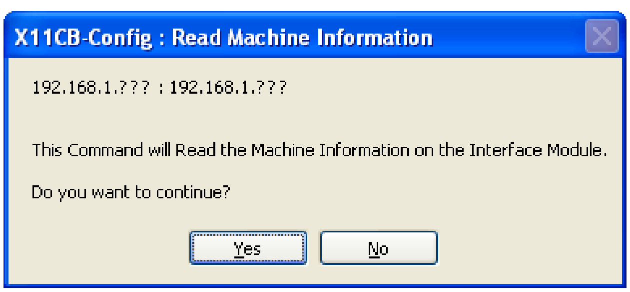


One important detail is the possibility that the target Primary IP address may not yet be used by the Interface Module. The example on the left shows this possibility. The Primary IP address ends with 200 and the Server IP Address, ends with 207.

The Server IP Address in the Device R/W box is the Interface Module transmitting the Broadcast packet for the X11CB series.

Clicking on "Write" will perform an automatic connect, with an acknowledgement message box:





The question marks are used here for demonstration purposes, they will identical to the Server IP Address.

Clicking on "Read" will read the Machine Information from the Interface Module and repopulate the dialog.

The information written, is written to the flash memory not working memory, and does not update the addresses, masks, and other information until the Interface Module unit is restarted (power down / up cycle). This allows the user to continue with the current IP address connection. This will also explain why a subsequent read does not read from the flash memory to update the dialog, it reads from working memory, which may appear to indicate that the transmission did not work. This feature can be used to undo the changes by performing the "Write" operation again.

3.12. Program the Alarm Modules

The configuration that was just entered in the previous steps of this quick start guide is ready to be programmed into the X11CB. Connect to the Interface Module as described earlier.

Click the "Program Alarm Modules" option in the Module pull down menu to initiate the transfer of the configuration data to the X11CB system. A confirmation dialog box will appear asking if the programming of the Alarm Modules should continue. Click on the "Yes" button to program the X11CB system. Press "No" if programming the X11CB system is not wanted, or the destination IP address is incorrect.

For more information, see the Module → Program Alarm Module section of this manual.

3.13. Summary of the Quick Start Configuration

The systems parameters for the quick start example are as follows:

Table 1 Quick Start Configuration Description

Chassis type(s):	Single X11CB chassis with an arraignment of 5 x 2 Alarm Modules
Job Number:	12-3456(01)
Customer:	Quick Start Example
Alarm Module Properties	
GF1 Inhibit:	No GF1 push button Inhibit
GF2 Inhibit:	GF2 to inhibit Common Trouble Alarm
Redundancy:	None
Channels per Module:	2
Channel (Point) Properties	
Sequence:	All points to use F3M-1 Alarm Sequence.
Grouping:	Two Groups, Top row Group 1 and bottom row Group 2
Field Contact Input Filter:	30mS de-bounce on all alarm transitions and 20mS de-bounce on return to normal transitions.
Common Trouble Alarm:	All points to contribute to Common Trouble Alarm. Common Trouble Alarm to follow Field Contact input.
Horn 1 & Horn 2 Selection:	All points to drive Horn 1, No points to drive Horn 2. Continuous Horn output.
Auxiliary Relay Option:	Auxiliary Relay to follow Field Contact.
Transistor Output:	No Transistor Output.
Test Button:	Test button to perform operational test.
Bezel Color:	All Yellow
Lens/LED Color:	Top Section
Legends:	Point 1 = Pump # 1 Failure Point 2 = Blower # 1 Failure Point 5 = Pump # 2 Failure Point 6 = Blower # 2 Failure Point 9 = Pump # 3 Failure Point 10 = Blower # 3 Failure Point 13 = Pump # 4 Failure Point 14 = Blower # 4 Failure Point 17 = Pump # 5 Failure Point 18 = Blower # 5 Failure Point 21 = Pump # 6 Failure Point 22 = Blower # 6 Failure Point 25 = Pump # 7 Failure Point 26 = Blower # 7 Failure Point 29 = Pump # 8 Failure Point 30 = Blower # 8 Failure Point 33 = Pump # 9 Failure Point 34 = Blower # 9 Failure Point 37 = Pump # 10 Failure Point 38 = Blower # 10 Failure Point 41 = Pump # 11 Failure Point 42 = Blower # 11 Failure Point 45 = Pump # 12 Failure Point 46 = Blower # 12 Failure Point 49 = Pump # 13 Failure Point 50 = Blower # 13 Failure Point 53 = Pump # 14 Failure Point 54 = Blower # 14 Failure Point 57 = Pump # 15 Failure Point 58 = Blower # 15 Failure Point 61 = Pump # 16 Failure Point 62 = Blower # 16 Failure

	Point 65 = Pump # 17 Failure Point 66 = Blower # 17 Failure Point 69 = Pump # 18 Failure Point 70 = Blower # 18 Failure Point 73 = Pump # 19 Failure Point 74 = Blower # 19 Failure Point 77 = Pump # 20 Failure Point 78 = Blower # 20 Failure
Point Tags:	Point 1 = Quick Start Pt. 1, Point 2 = Quick Start Pt. 2, Point 5 = Quick Start Pt. 5, Point 6 = Quick Start Pt. 6, Point 9 = Quick Start Pt. 9, Point 10 = Quick Start Pt. 10, Point 13 = Quick Start Pt. 13, Point 14 = Quick Start Pt. 14, Point 17 = Quick Start Pt. 17, Point 18 = Quick Start Pt. 18, Point 21= Quick Start Pt. 21, Point 22 = Quick Start Pt. 22, Point 25= Quick Start Pt. 25, Point 26 = Quick Start Pt. 26, Point 29= Quick Start Pt. 29, Point 30 = Quick Start Pt. 30, Point 33= Quick Start Pt. 33, Point 34 = Quick Start Pt. 34, Point 37= Quick Start Pt. 37, Point 38 = Quick Start Pt. 38, Point 41= Quick Start Pt. 41, Point 42 = Quick Start Pt. 42, Point 45= Quick Start Pt. 45, Point 46 = Quick Start Pt. 46, Point 49= Quick Start Pt. 49, Point 50 = Quick Start Pt. 50, Point 53= Quick Start Pt. 53, Point 54 = Quick Start Pt. 54, Point 57= Quick Start Pt. 57, Point 58 = Quick Start Pt. 58, Point 61= Quick Start Pt. 61, Point 62 = Quick Start Pt. 62, Point 65= Quick Start Pt. 65, Point 66 = Quick Start Pt. 66, Point 69= Quick Start Pt. 69, Point 70 = Quick Start Pt. 70, Point 73= Quick Start Pt. 73, Point 74 = Quick Start Pt. 74, Point 77= Quick Start Pt. 77, Point 78 = Quick Start Pt. 78,

4. System STARTUP and Access

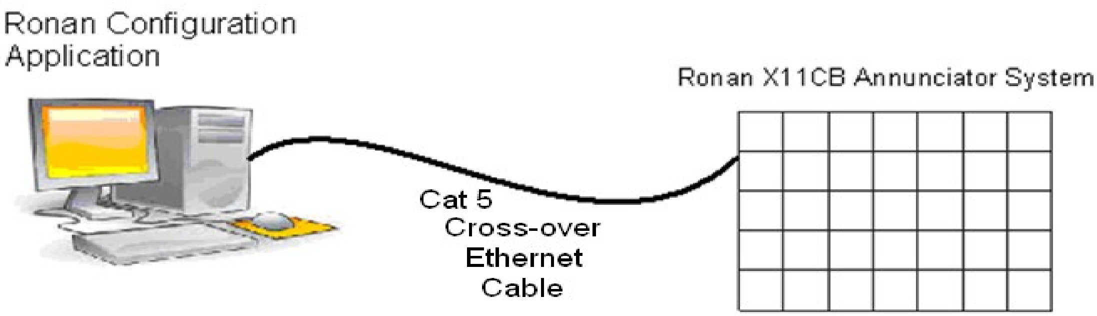


Figure 4-10 Absolute minimal Block Diagram Annunciator System Ethernet Connection

4.1. X11CB Configuration Application Start-Up

Configuration of the alarm modules does not require a connection to the X11CB unit. Although, the connection is required to upload the new or changed configuration.

It is always a good idea to save your work to disk whether or not they are able to be uploaded at this time, or later during a scheduled maintenance period.

Refer to the File / Open and Close functions described in this manual.

4.2. Locate the Configuration Icon on the Desktop

Figure 4-11 X11CB Configuration Desktop Icons

The X11CB Configuration Icon should look similar to those presented above. The above examples have been modified from the original definition which was “Shortcut to X11CB_Config.exe”. Also notice that this is the same icon a three different backgrounds, the Windows desktop will not allow two items to have identical names.

The “Properties” of this icon can be changed to include more options. An example would be those systems that have Remote Points as contacts for some of the alarms in this configuration.

Since most configurations do not need this option, it is left out to simplify the configuration screen.

To include Remote points, modify the Properties to add “IncludeRemotes”, one word no quotes, as a separate word in the Target command line past the executable filename.

There is a separate manual specifically for “Remote Connections” in the X11CB configuration series.

Double click on this icon to start the application.

4.3. Application Start

Once the Application starts, the first order of business is to sing-in with the appropriate security level and password. Depending on the sign-in used, different levels of permissions are granted. Whether the user is allowed to change the configuration or just view it depends on the sign-in. Additionally, the sign-in also grants permissions to view or change the configuration on the actual device. After the appropriate security level and password are successfully entered, the application is cleared for use.

The following screen shot shows a demonstration configuration with the “Light Panel” Tab selected:

Figure 4-12 Full Screen View of Demo Unit

4.4. Opening Existing and Saving System Configurations

When the X11CB system was shipped form the factory, a Compact Disk (CD) was supplied with the system. This CD contains the XML configuration file that was loaded into the system when it was shipped. To open this XML configuration file select the File pull-down menu and select "Open". Navigate to the XML file located on this disk. If desired, a new configuration can be created and saved by using the File pull-down menu and selecting "Save" or "Save As" using a unique file name.

There are two fields that are required to be completed in order to save a configuration file, the Customer field and the Job Number field. The job number should remain the same as the original number. This job number is the reference number for this particular system and allows Ronan support to quickly review this systems configuration as it was shipped. The Customer field can be filled with any alpha numeric characters and is typically the name of the business that owns the system.

4.5. Signing out of the System

The sign-out procedure is actually optional when the user wants to exit the application. The Configuration Application will attempt to save the currently open configuration automatically, but it is always a good idea to save any changes after they were made.

When the operator wants to step away from the console and leave the X11CB Configuration Application up and running, it would be a good idea to sign-out to protect the configuration(s).

Signing out of the application is accomplished by using the Setup pull-down menu and selecting Sign Out. This does not exit the application it only sets the security level to No User where minimal functionality is available through the application.

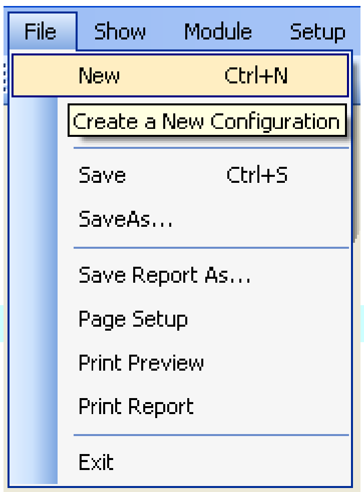
The operator can exit the configuration application by selecting the File pull-down menu and clicking on Exit.

5. File operations

Files in this application refers to saved configurations.

5.1. New

New File Operations



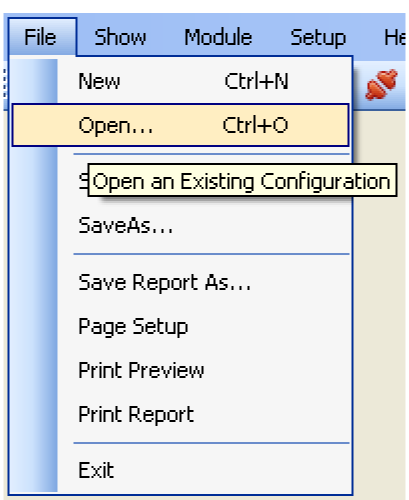
This will start a configuration fresh, without a Job Number or Customer Name. These fields must be filled later. The default lamp box size is 5 wide by 3 high. All are 1 channel alarm modules with F1M-1 sequence types.

Permissions: Administrator or Builder

Figure 5-13 File New Menu

5.2. Open

Open File Operations



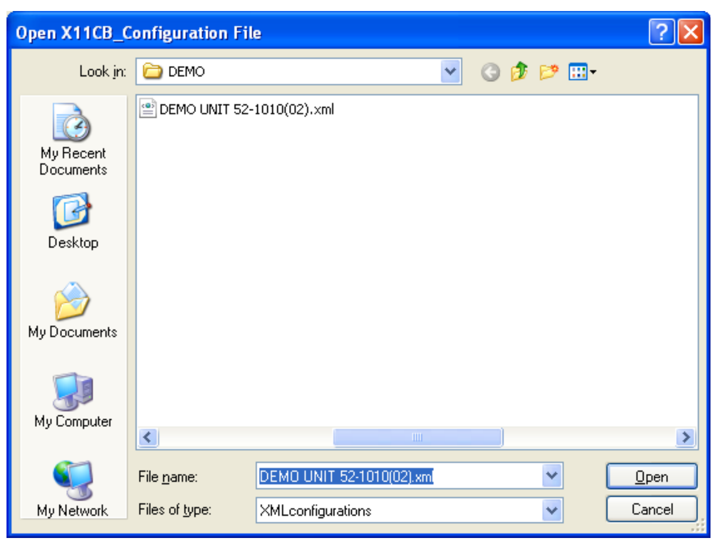
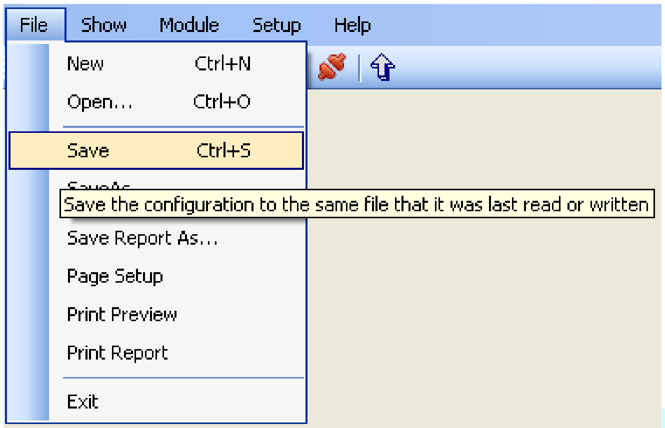


Figure 5-14 File Open Menu

There should be at least one configuration file for the X11CB, and that would be the one with which the system shipped. In many of the examples used in this manual, the file used is a Demo Unit Configuration.

5.3. Save

Save File Operations



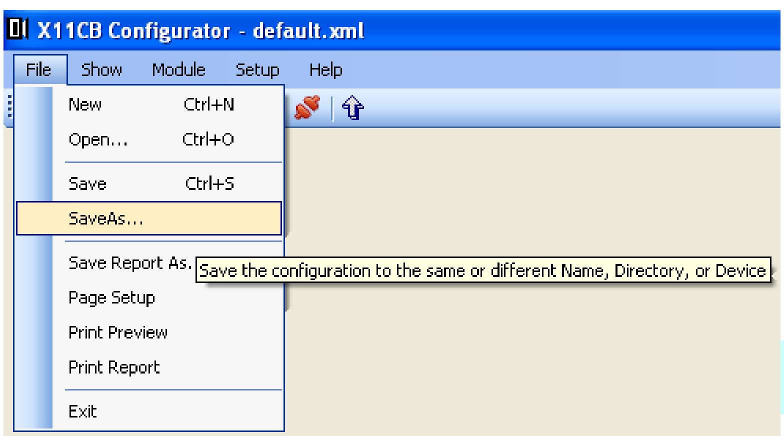
The "Save" operation is different than the "Save As" in that it will not ask for a filename. This operation will save the currently opened configuration to its original filename. If this is a "new" configuration, then the file saved is the name in the "Job Number" field, followed by ".xml". (Additionally a .sql file is also written.)

Permissions: Administrator or Builder

Figure 5-15 File Save Menu

5.4. Save As

Save As File Operations



This operation is identical to the "Save" operation with the distinction of being able to rename the file to another unique filename. Or if not unique, rewrite overtop an existing file.

Permissions: Administrator or Builder

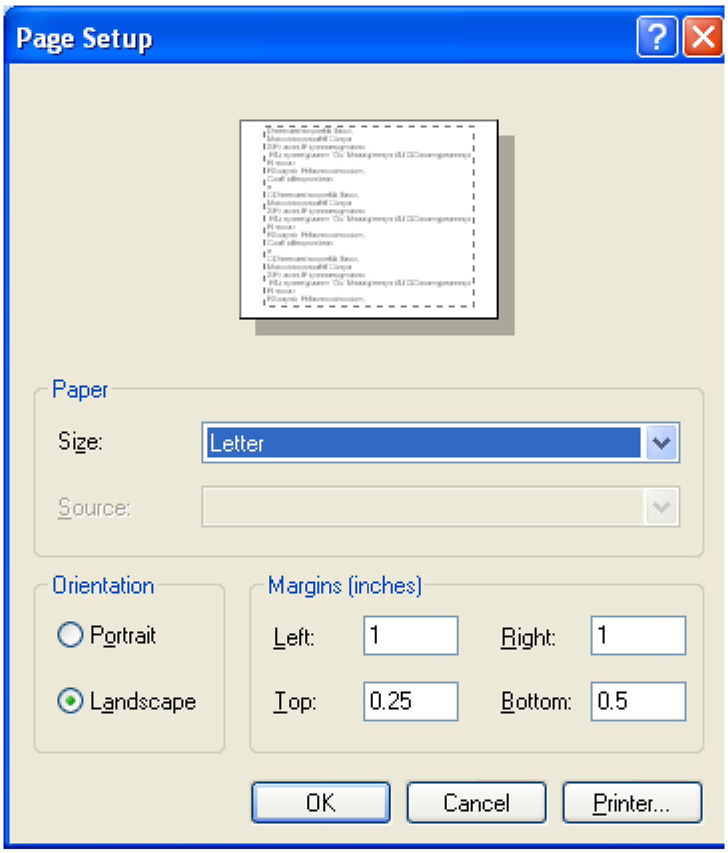
Figure 5-16 File Save As Menu

5.5. Save Report As

“Save Report As” will create a text file very similar to what is in the preview panes for the print operations. The one important difference is that the visual illustration on the last page cannot be saved into a text document. Therefore, this last page is dropped.

5.6. Page Setup

Page Setup is a general Microsoft Operating System dialog.



Paper sizes on this system used for documentation contain 54 different paper sizes, which display:

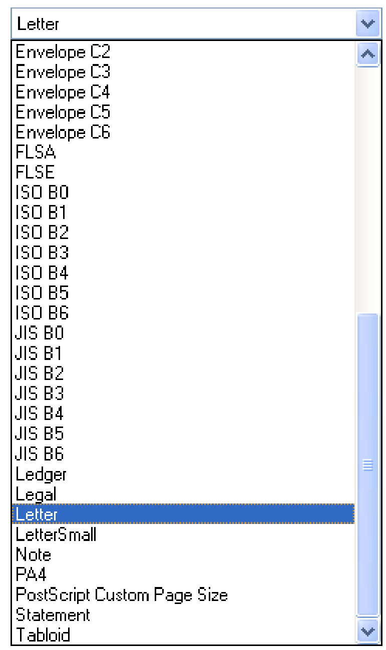


Figure 5-17 Page Setup Dialog

Suffice to say, Letter or Legal are the two most used options. Recommended to keep the format in Landscape as that is how most of the generated pages were designed to fit.

5.7. Print Preview

Print Preview is another general Microsoft Operating System dialog.

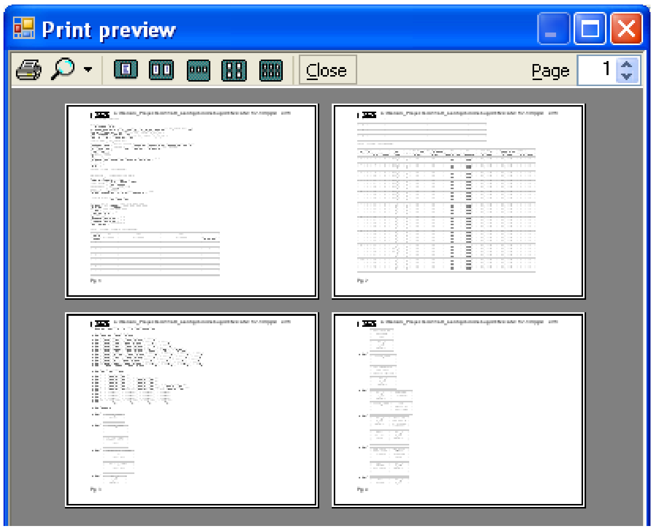


Figure 5-18 Print Preview Dialog

5.8. Print Report

Print is another general Microsoft Operating System dialog.

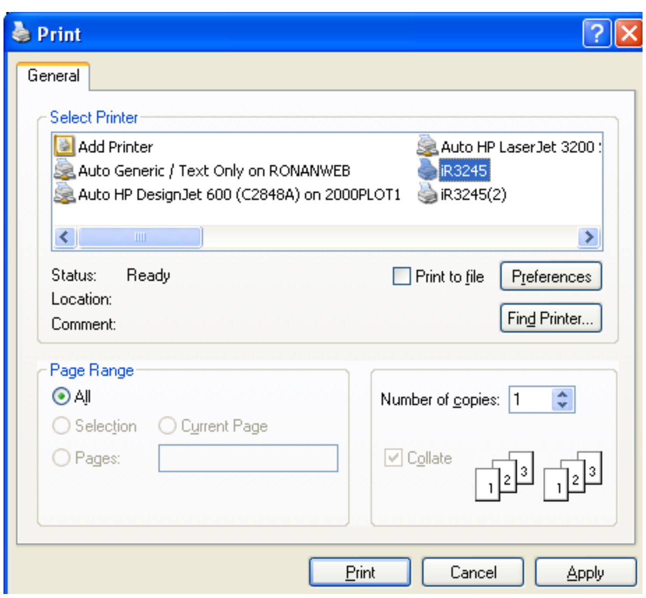


Figure 5-19 Print Dialog

5.9. Exit

Exit is a simple function that will close the Configuration Application. Before closing, every attempt is made to rewrite the open files so that modified or changed items are not lost upon closing.

6. Show / Format Display

The format of what is displayed within each of the Alarm Modules window is determined by what is selected in the Show pull down menu. The following image shows the Light Panel folder for a 6 by 6 X11CB system with the show selection of Module Configuration:

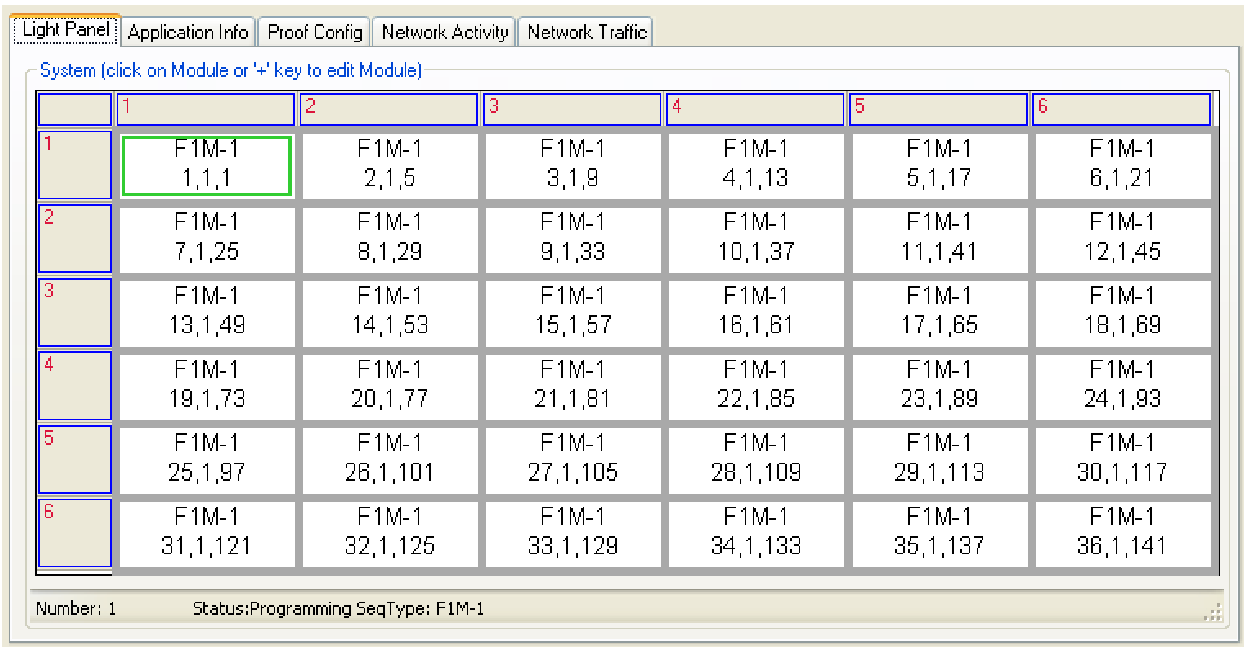
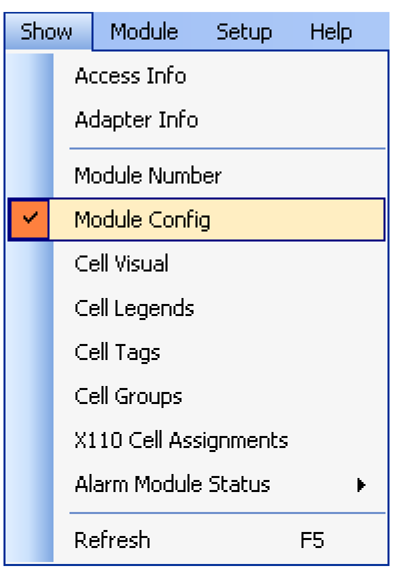


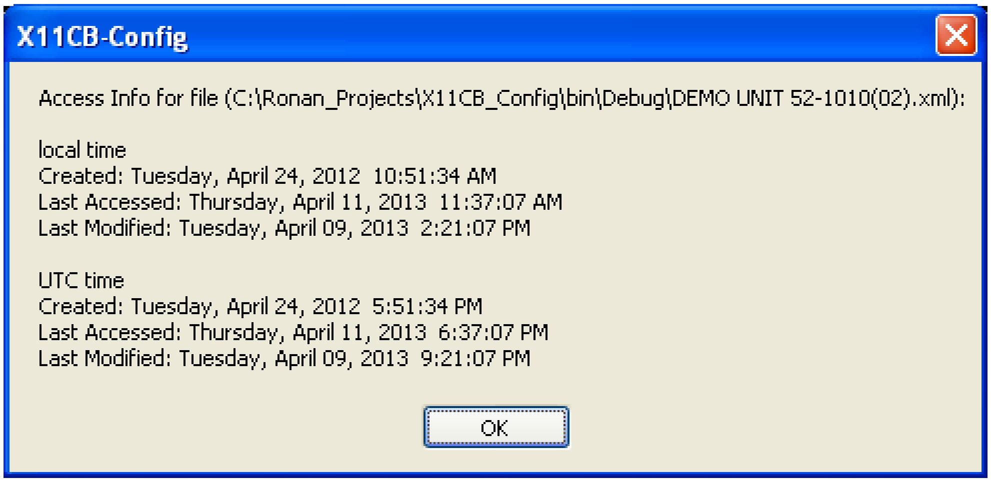
Figure 6-20 6 x 6 Light Panel Display

Show / Format Display



6.1. Access Info

This will display a dialog box describing the Access Information to the current configuration file.



6.2. Adapter Info

When clicked, this command will interrogate the Network adapters available on the currently running system. “The Application Info” tab will come “Front and Center” and display what is available for each network adapter.

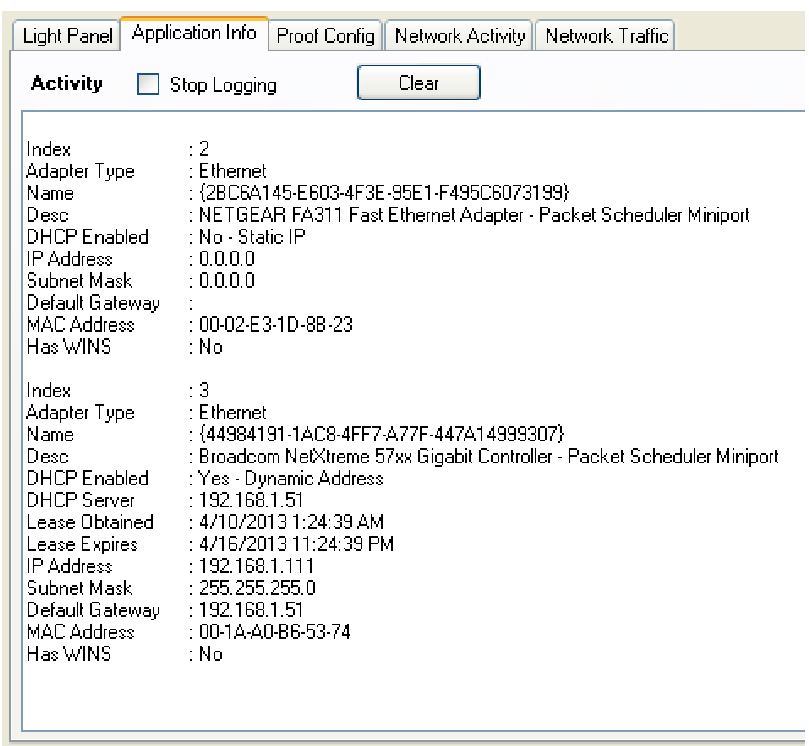


Figure 6-21 Adapter Info Display

6.3. Module Number

This is the simplest of the visual patterns. It displays the Alarm Module CAN address for each of the lamp positions.

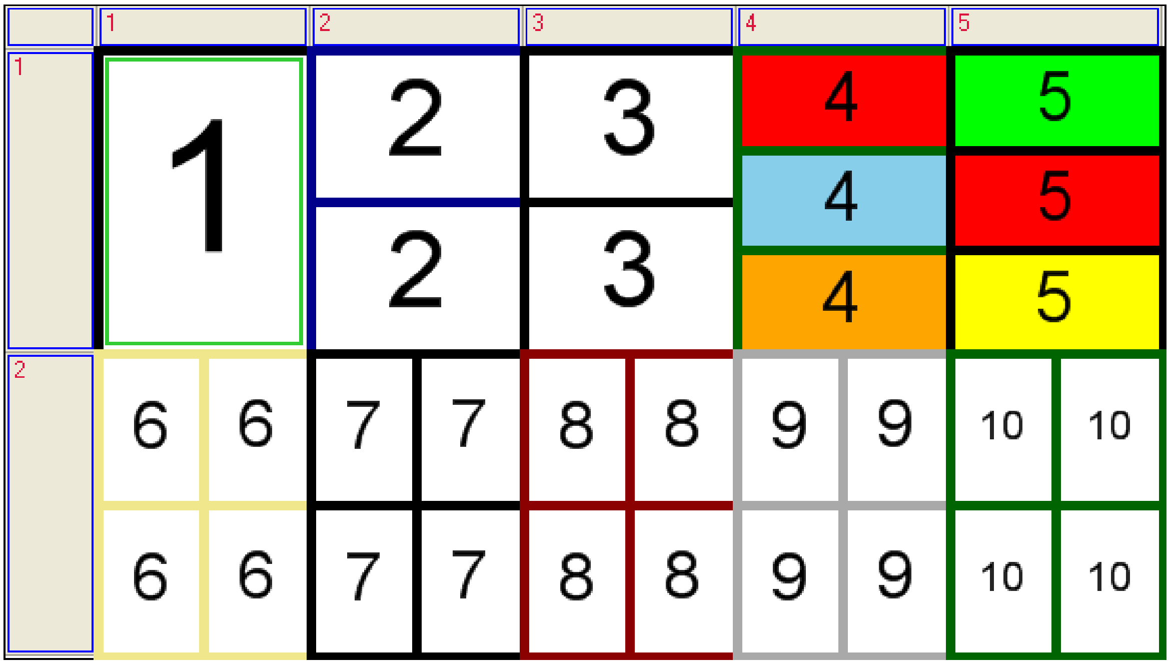


Figure 6-22 Module Number Light Panel Display

6.4. Module Config

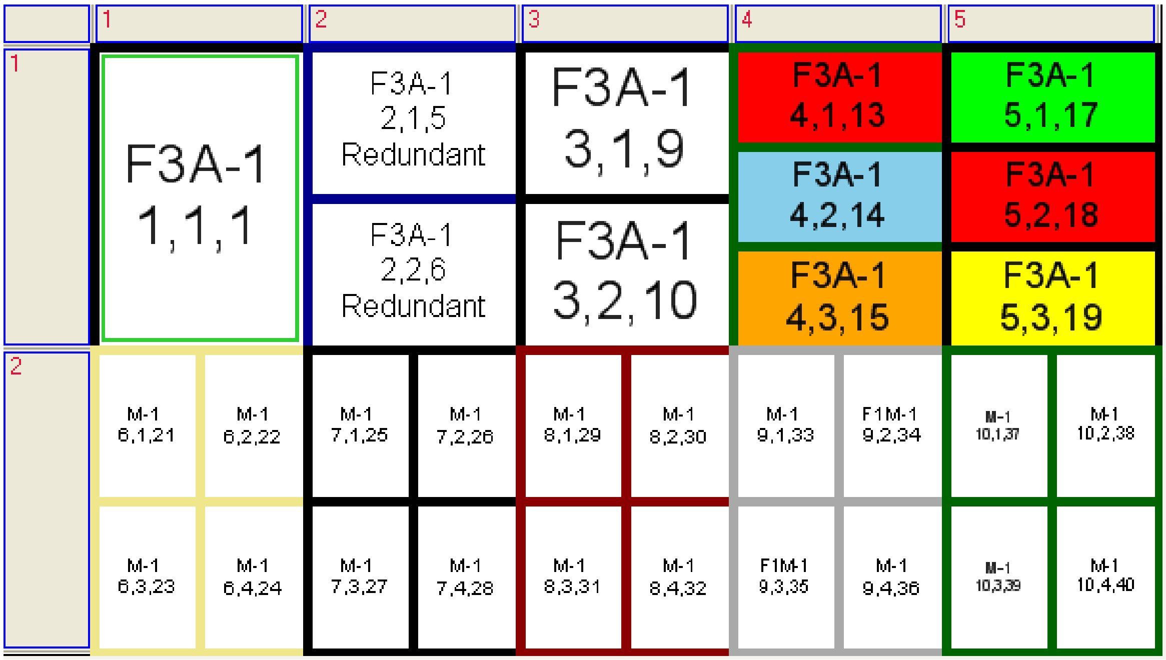


Figure 6-23 Module Config Light Panel Display

This Format displays the configuration of the Alarm Channel displayed. The first line is taken from the Alarm Module configuration and displays the Sequence title. The second line displays the Alarm Module Position or CAN address. The remaining lines include:

“Remoted” – only remote devices can set this point
“Remote” – available to set from an application (ModBus etc.)
“Inhibit” – if GF1 on, then the Field Contacts are inhibited
“GF1(--) – Will contain a string of characters describing what is inhibited with this switch:
- L = Inhibit Lamp
- H = Inhibit Horn
- C = Inhibit Common Trouble Alarm (CTA)
- T = Inhibit Transistor Out
- A = Inhibit Aux Out (Relay)

“GF2(--) – Will contain a string of characters like those described in GF1.
“Redundant” – This is a redundant Alarm Module Channel.

6.5. Cell Visual

This was originally thought up to mark vacant lamp assignments. Now it is sort of reminiscent of those TV test patterns of the past.

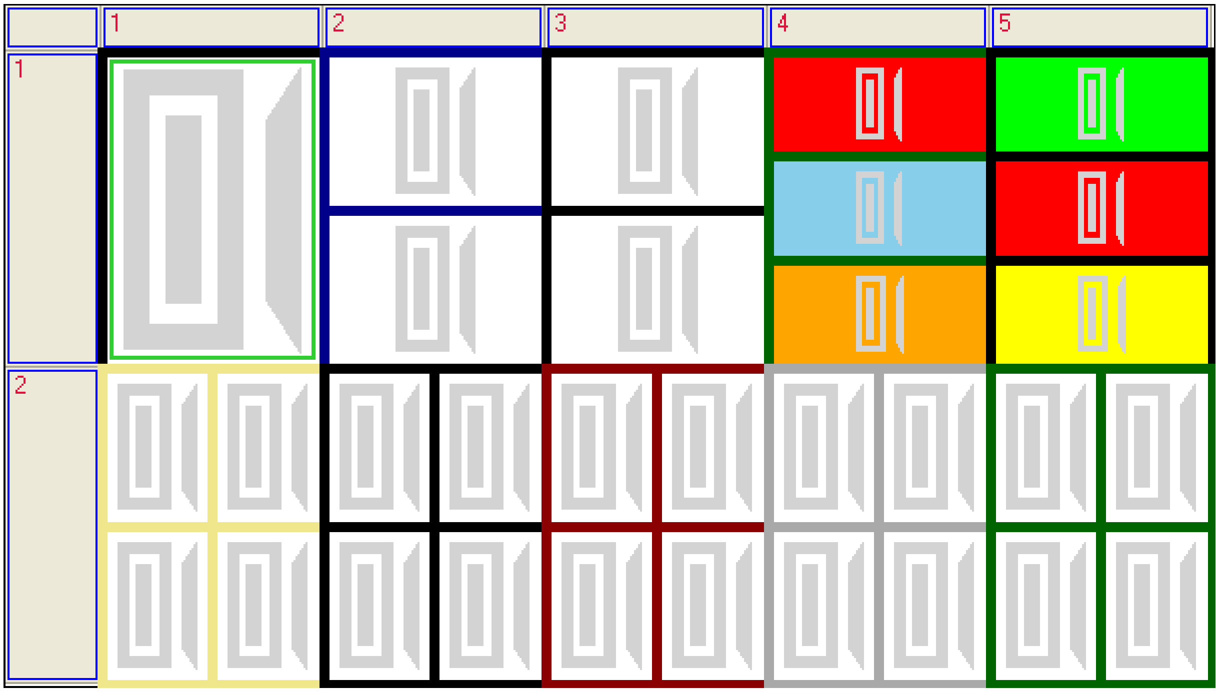


Figure 6-24 Cell Visual Light Panel Display

6.6. Cell Legends

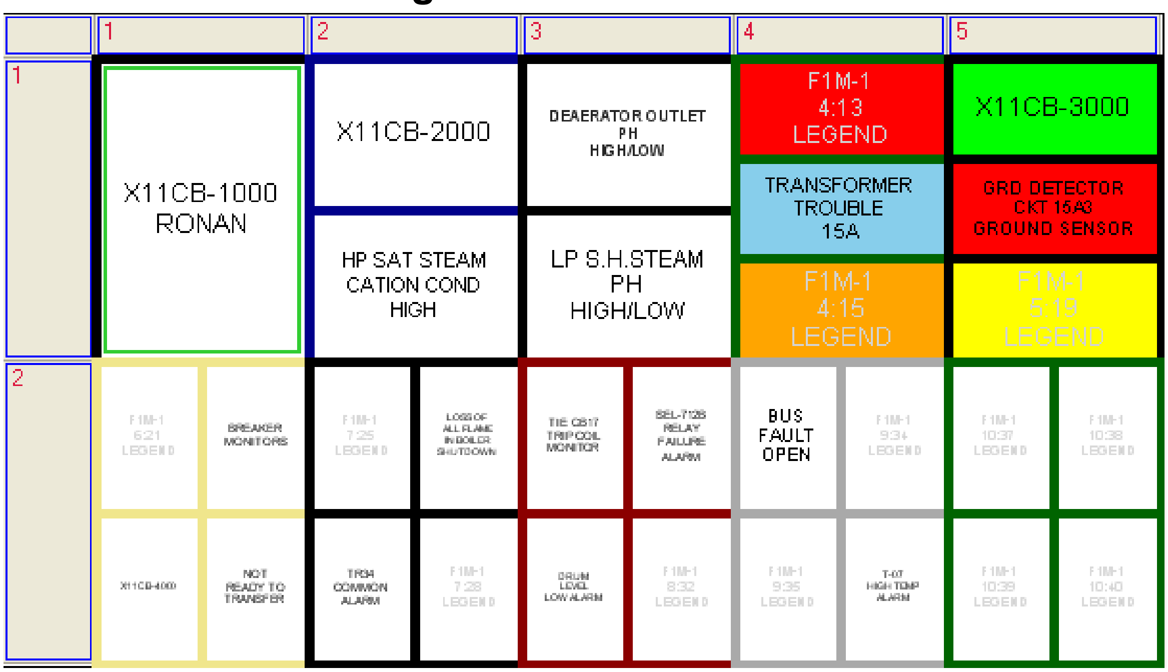


Figure 6-25 Cell Legends Light Panel Display

This function will display the supplied legends as they would be engraved at the factory. The algorithm used assumes a single Font and Height, and splits the lines as specified in the Alarm Module Configuration.

6.7. Cell Tags

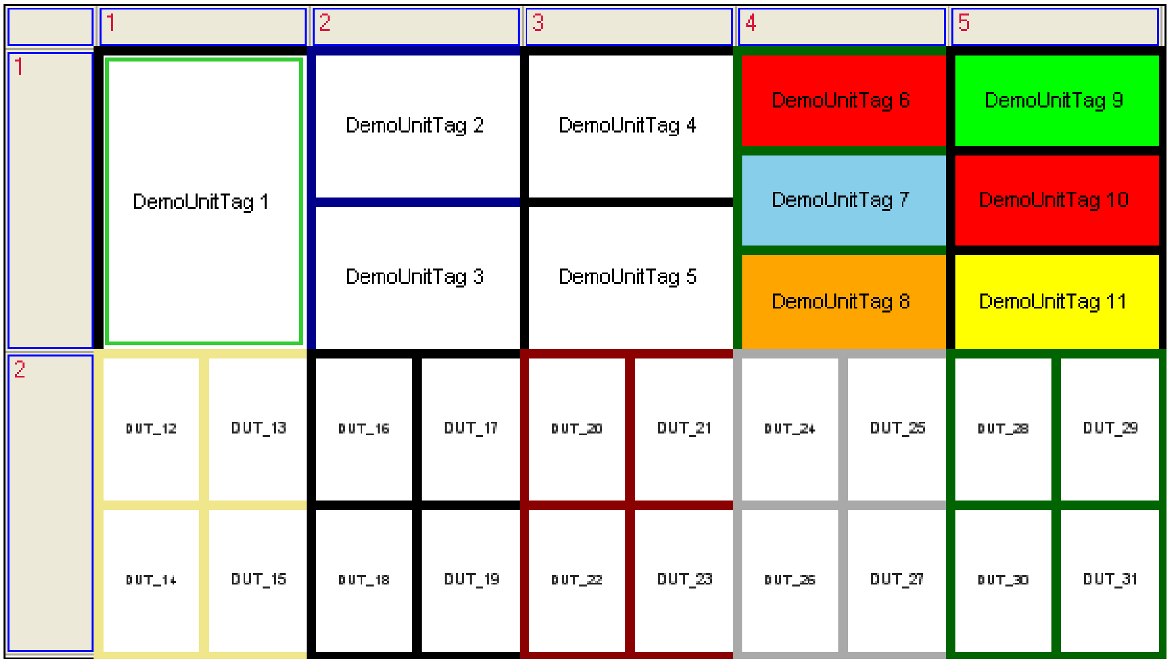


Figure 6-26 Cell Tags Light Panel Display

This function will display the supplied tags as specified in the Alarm Module Configuration.

6.8. Cell Groups

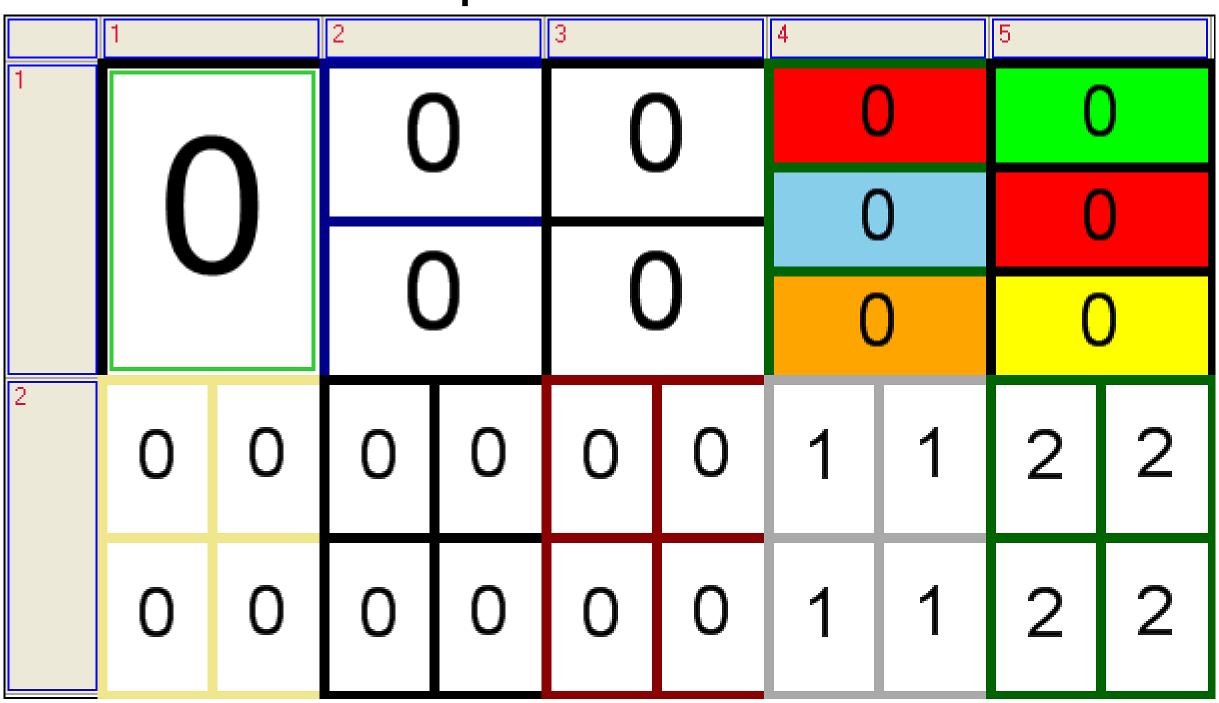


Figure 6-27 Cell Groups Light Panel Display

This will display which of the points are connected via their ME-in terminal. See the Auto-Group function to use the automated version. Manual setting of the groups is discouraged.

6.9. X110 Cell Assignments

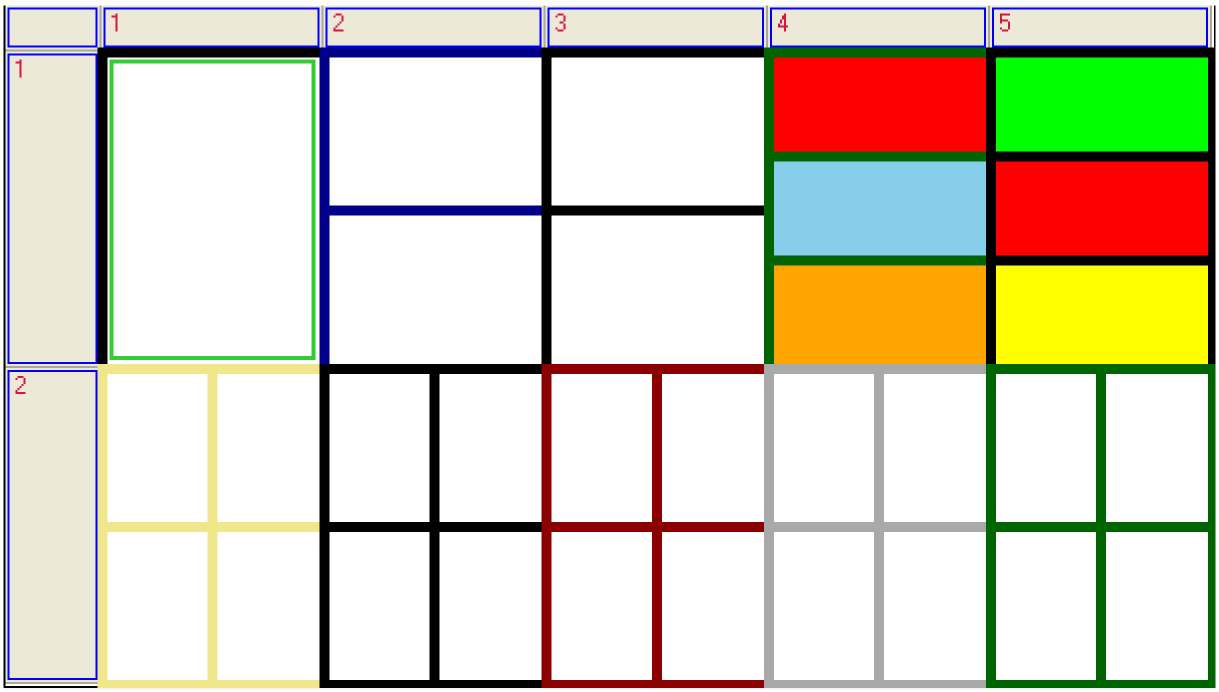


Figure 6-28 Cell Assignments Light Panel Display

This display will show the mux and channel sent out to all of the configured X110's for each of the channels displayed. A blank indicates that nothing is transmitted for that particular cell.

6.10. Alarm Module Status

The following displays may seem a little confusing in that the actual status of the display is not current. It is, however, derived from the last sequence state of the channel. For an understanding of states and sequence tables, see that section in this manual.

Permissions: Administrator or Remote

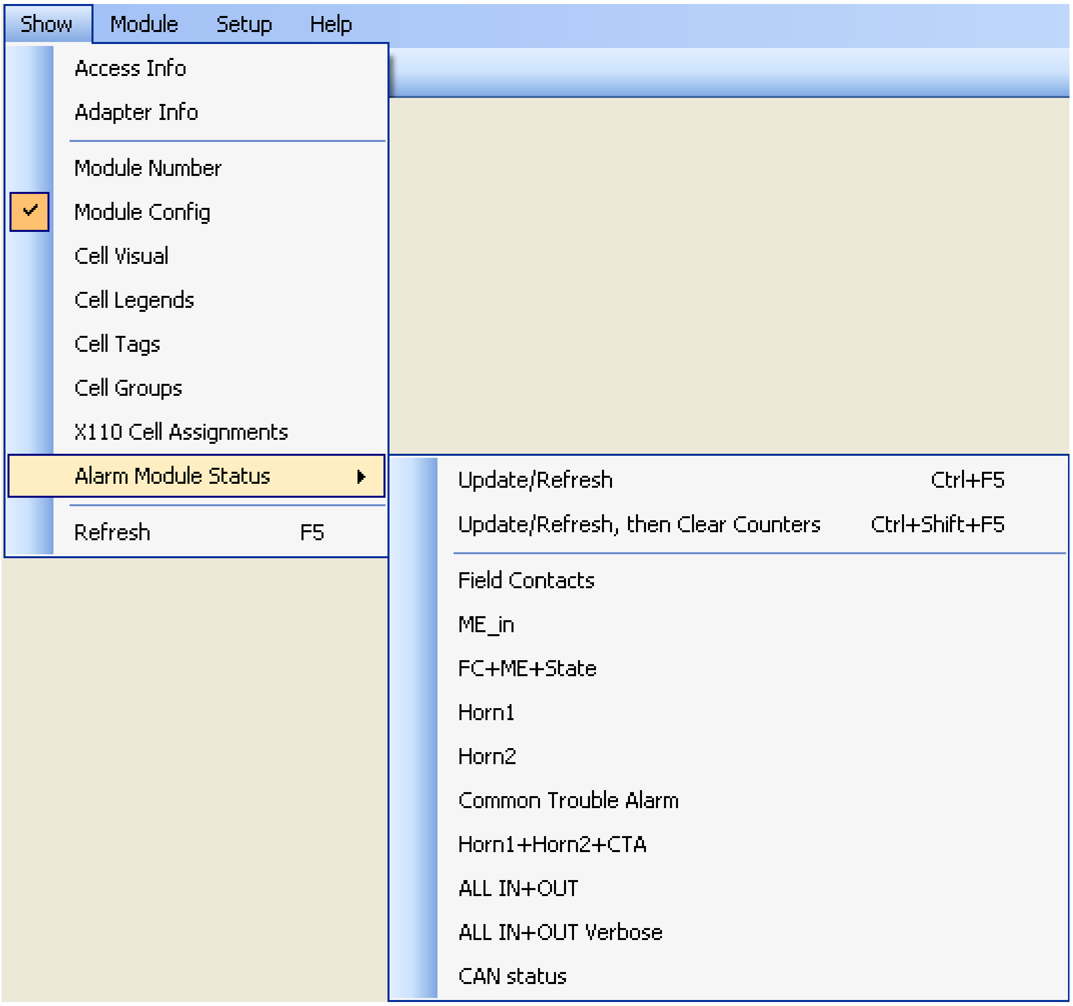


Figure 6-29 Show Alarm Module Status sub-menu Display

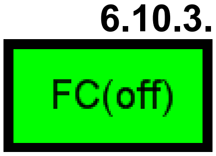
6.10.1. Update/Refresh

Focus is placed back to the Light Panel tab. Then a “refresh” command is issued to the IM.

6.10.2. Update/Refresh, then Clear Counters

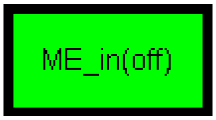
Focus is placed back to the Light Panel tab. Then a “refresh then clear” command is issued to the IM.

6.10.3. Field Contacts



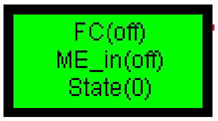
The state prior to the current state indicates that the Field Contact was in the active or inactive state. The exception is if the current state is 0, then Field Contact is assumed to be off.

6.10.4. ME_in



The state prior to the current state indicates that the ME-in was in the active or inactive state.

6.10.5. FC + ME + State



The above definitions for FC and ME-in apply to this display, additionally, the current state number is displayed.

6.10.6. Horn1

The output for the current state indicates that Horn1 is activated. Exclusive of any GF switch inhibits.

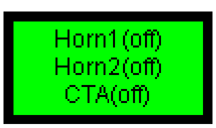
6.10.7. Horn2

The output for the current state indicates that Horn2 is activated. Exclusive of any GF switch inhibits.

6.10.8. Common Trouble Alarm

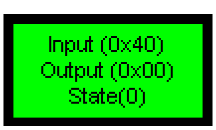
The output for the current state indicates that the CTA is activated. Exclusive of any GF switch inhibits.

6.10.9. Horn1 + Horn2 + CTA



This displays a combination of the above three descriptions, each on its own line.

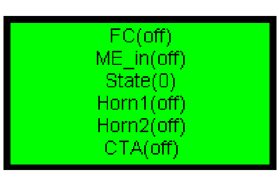
6.10.10. All IN + OUT



X

This displays the hex values for Input and Output. For an understanding of these values, see the Sequence Table section in this manual.

6.10.11. All IN + OUT Verbose



X

This is an accumulation of the above values.

6.10.12. CAN Status

Timeout(0)
Crc Match(7598)
Crc Mismatch(0)

X

The can status is a special view that contains only one cell per Alarm Module. It displays the status of the Configuration CRC polling between the IM and AM.

CAN Status displays a history of the communication status between the Interface Module and all the Alarm Modules. The Timeout field describes the number of times the Interface Module failed to communicate with each of the Alarm Modules. Periodically the Interface Module polls all the Alarm Modules to verify that the configuration of each of the Alarm Modules matches the Interface Modules configuration for each Alarm Module. This is done by comparing the CRC value of the configuration data within the Interface Modules data base to the CRC value of the configuration data within each of the Alarm Modules. The CRC Match field describes the number of times the Interface Module received a valid CRC match from each of the alarm Modules. The CRC Mismatch field describes the number of times the Interface Module did not receive a valid CRC match from one of the alarm Modules.

6.11. Refresh

This will issue a refresh to repaint the Alarm Module display.

7. Module Configuration

Once the Interface Module has been configured for the system type parameters and each of the Alarm Modules has been configured with their particular parameters, the configuration must be downloaded to the X11CB system for permanent storage. Once it is downloaded it can be saved to disk for future reference. Downloading the system configuration to the X11CB system is described in Chapter 3 of this manual. A text file of the system configuration can also be saved to disk. As a text file, the system configuration file can be viewed or printed using any standard text editor such as MS Notepad. The system configuration can also be printed directly from the X11CB configuration application by using the print function in the File pull down menu.

Anytime that a communication link is required between the Configuration application and the Interface Module, this message box may appear if that connection has not yet been made or was somehow disconnected.

Figure 7-30 Connection Required MessageBox

7.1. X11CB Machine Identification

The X11CB machine identification information is entered within the X11CB IM Machine Setup dialog box. This dialog box is accessed by using the Module pull down menu and selecting Machine Identification. The system parameters defined within this dialog box provide the basic information another system will need to communicate with the X11CB system.

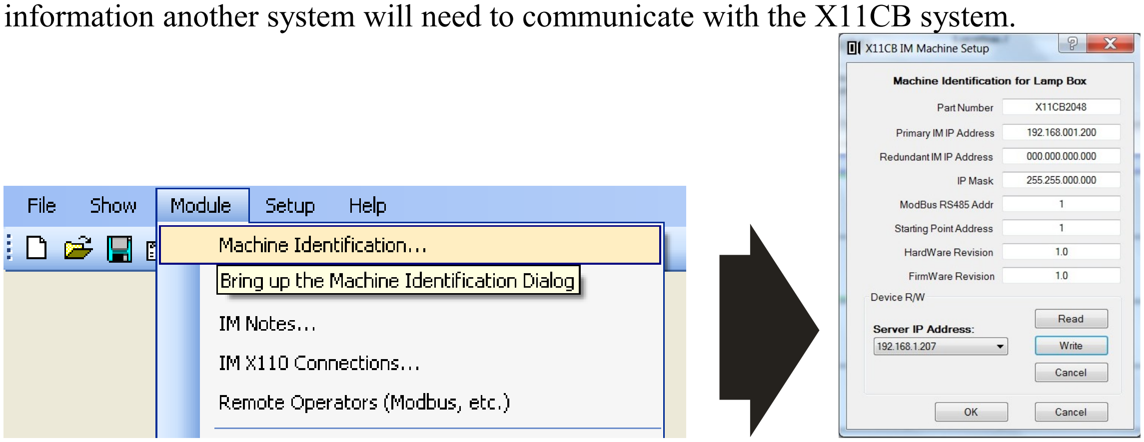


Figure 7-31 Module Machine Identification Menu

The IP address displayed in the “Server IP address” field within the X11CB Machine Setup dialog box is the address of the X11CB system to be viewed or modified. The information can be read from the selected X11CB system or it can be edited and then written to the system. Click the "Read" button to read the machine information of the selected X11CB system. A dialog box will appear asking for confirmation to read the machine information. To read the machine information, Click the "Yes" button, or, click the "No" button to abort the process.

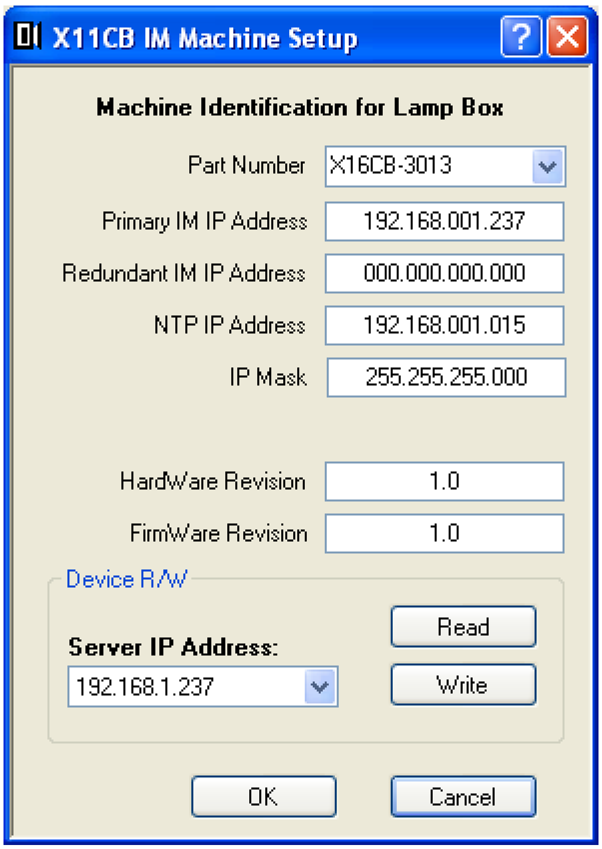


Figure 7-32 X11CB IM Machine Setup Dialog

If the Machine Information needs to be modified then make the necessary changes to the appropriate fields and then write the changes to the system.

The following section provides a description of all the Machine Identification fields:

Part Number:	Contains the part number of the Interface Module located within the 11CB system.
Primary IM IP Address:	Defines the IP address for the primary Interface Module of the current X11 CB system.
Redundant IM IP Address:	Defines the IP address for the redundant Interface Module of the current X11 CB system.
NTP IP Address	Identifies the network address at which the SNTP server resides.
IP Mask:	Defines the class range of the possible IP address. See Appendix on IP Address Classifications
HardWare Revision:	Displays the hardware revision of the of X11CB system.
FirmWare Revision:	Displays the firmware revision of the of X11CB system.

7.2. Interface Module Configuration

Global and Interface Module specific configuration variables are configured under the Interface Module Setup menu. This menu is accessed by using the Module pull down menu and selecting Interface Module Setup. The following image shows the Interface Module Setup dialog box:

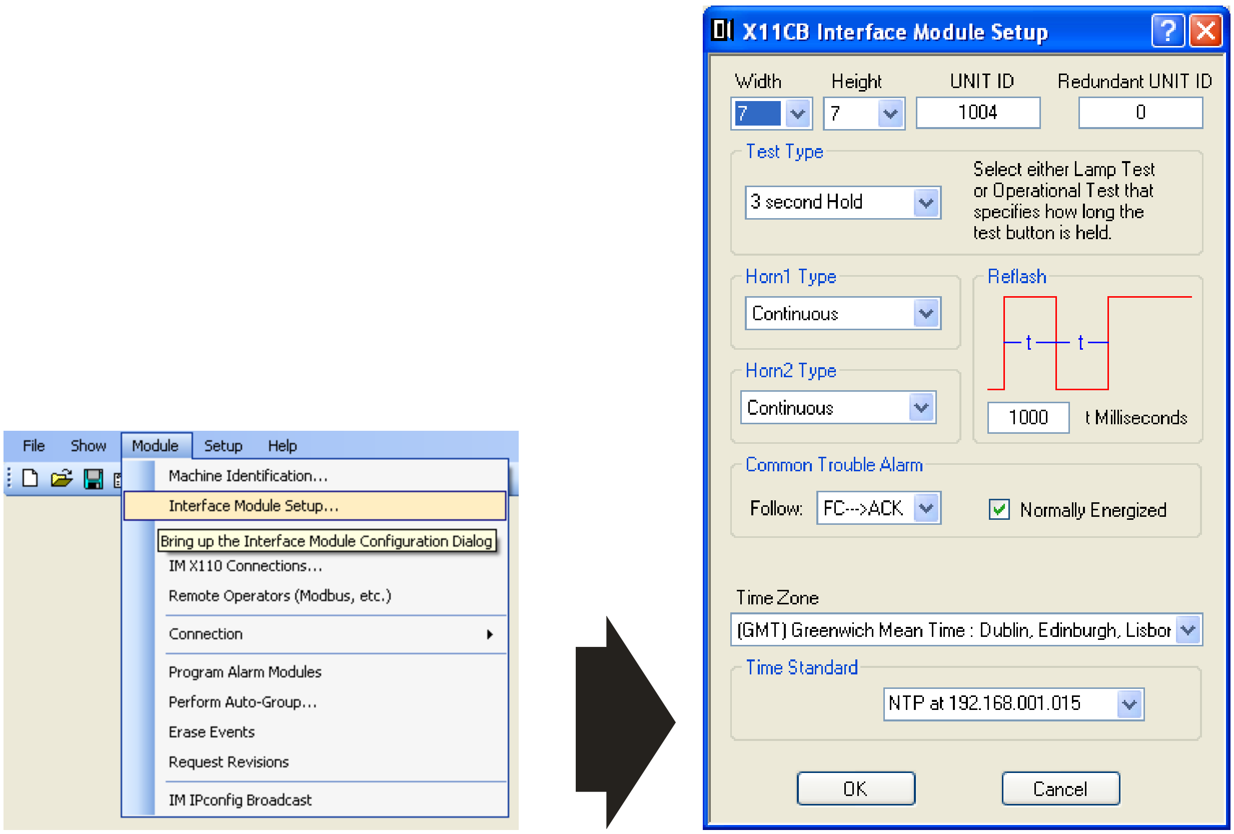


Figure 7-33 Module Interface Module Setup Menu and X11CB Interface Module Setup Dialog

7.2.1. System Width and Height

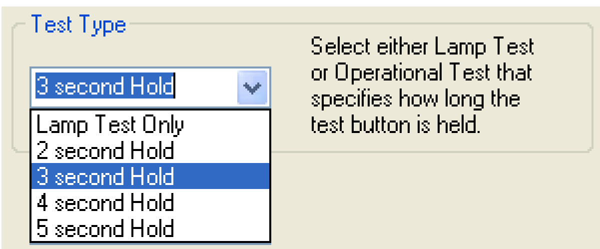
The X11CB System can contain up to 100 Alarm Modules. Each Alarm Module is a 3.5" by 3.5" chassis that becomes an integral part of the X11CB system. The system is assembled into a rectangular array containing all the Alarm Modules. The System Size Fields Width and Height define the total number of Alarm Modules within the system as well as the physical shape of the system. The Width field defines the number of coulombs of Alarm Modules within the system and the Height field defines the number of rows within the system. The total number of Alarm Modules within the system is calculated by multiplying the Width variable by the Height variable with a maximum of 100 Alarm Modules per system. If the number of Alarm Modules exceeds 100 then another Interface Module is added creating a new system that is capable of containing another 100 Alarm Modules.

7.2.2. UNIT ID

The UNIT ID Field allows the User to assign a unique Identification number for each of the X11CB systems within a complete system of multiple X11CB systems. The UNIT ID is a required field even if there is only a single X11CB annunciator within the system. The valid range for the UNIT ID is 1 through 65535.

7.2.3. Test Type

The Test Type field defines how an Alarm Sequence will operate when the Test push button input is depressed. This field applies to Alarm Sequences that support the Test push button function.



When Operational Test is selected as show above and the Alarm Sequence supports the Test push button input, the sequence engine will monitor the state of the Test push button input. When the Test push button is depressed the Sequence Engine will function as though the field contact state changed from normal to abnormal. This should force any Alarm Sequences that support the Test push button input function to advance their states to an alarm state if they were in their normal state. This allows the operator to verify that each monitored point that has the test feature active enters its alarm state properly. The operator can then use the other push buttons to acknowledge and reset the alarm conditions that were invoked by the test button returning each alarm sequence to its normal condition.

When Lamp Test Only is selected from the combobox and the Alarm Sequence supports the Test push button input, the sequence engine will monitor the state of the Test push button input. When the Test push button is depressed and held the Sequence Engine will force the Lamp output ON as long as the test button is depressed. The Lamp output will go off when the Test push button is released.

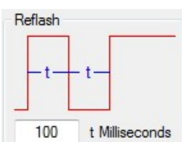
7.2.4. Horn 1 & 2 Type

There are two system Horn outputs in an X11CB system Horn 1 and Horn 2. Each monitored input can be configured to participate or not participate in the driving of one or both of these outputs. The Horn(s) will be driven when the participating input sequence engine goes into an alarm state. The Horn "Type" option determines how the respective horns will react when they are activated. The following describes how the horns will operate based upon the horn type selected.

- Continuous – Horn stays active as long as it is driven.
- Auto Silence 5 sec. – Horn is active for 5 seconds and then becomes inactive until the next activation of the horn.
- Auto Silence 30 sec. – Horn is active for 30 seconds and then becomes inactive until the next activation of the horn.
- Auto Silence 1 min. – Horn is active for 1 minute and then becomes inactive until the next activation of the horn.
- Auto Silence 30 min. – Horn is active for 30 minutes and then becomes inactive until the next activation of the horn.

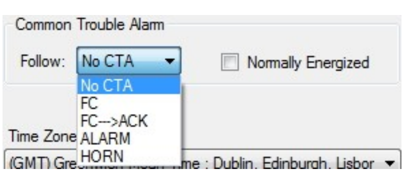
7.2.5. Reflash

There are two system outputs Common Trouble Alarm (CTA) and Re-flash that are used to indicate that at least one of a group of monitored inputs is in an alarm state. Each monitored input can be configured to participate or not to participate in the driving of CTA output. If the point is configured to participate in the driving of the CTA output it will also contribute in driving the Re-flash output. Each time one of the participating inputs goes into an alarm state a pulsed output will be generated at the Re-flash output. The value entered for re-flash represents the time (t) as shown below and is the duration of both the high time and low time of the output pulse. The range for the Re-flash time is TBD.



7.2.6. Common Trouble Alarm (CTA)

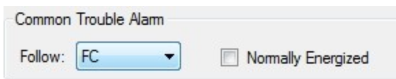
The Common Trouble Alarm (CTA) is used to indicate that at least one of a pre-assigned group of monitored input channels is in a pre-defined state. Each monitored input can be configured to participate or not to participate in the driving of CTA output. If any point that is configured to participate in the driving of the CTA output goes into the pre-defined state the CTA output will become active. The CTA Follow variable defines what state any one of the participating points have to be in to drive the CTA into an active state.



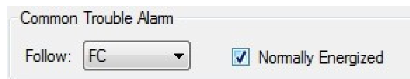
The following is a list of assignments for the CTA Follow variable:

- No CTA - No CTA output. CTA is inactive.
- FC - CTA will become active when any of the participating channels field contact inputs is in an abnormal state.
- FC –>ACK - CTA will become active when any of the participating points field contact inputs goes to an abnormal state. CTA will return to inactive state when the push button Acknowledge is pressed.
- Alarm - CTA will become active when any of the participating points field contact inputs goes to an abnormal state. CTA will return to inactive state when the push button Acknowledge is pressed.
- HORN - CTA will become active when any of the participating points field contact inputs goes to an abnormal state. CTA will return to inactive state when the push button Silence is pressed.

The active state of the CTA output can be changed from normally not energized to a normally energized when the Normally Energized option is checked. If the box is not checked the active state of the CTA output will provide to the relay output a non energized coil. If the box is checked the active state of the CTA output will provide to the relay output an energized coil.



OR



7.2.7. Time Zone

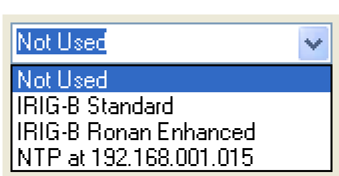
The Time Zone option variable allows the user to select what time the X11CB system is offset from Greenwich Mean Time (GMT). When a distributed database system is spread over multiple time zones, it is common practice to store all alarm and event data with Greenwich Mean Time only. Later, when printing reports, this value comes in handy for the local operations.

7.2.8. Time Standard

The X11CB system provides an input for an IRIG-B time producing device. The IRIG-B input allows the Interface Module to provide accurate time stamping capability down to 1mS resolution of all events within the X11CB system. The IRIG-B selection allows the User to enable this input and use the accurate source of time for the time stamping of events within the system.

There are two different formats of IRIG-B that the X11CB system is capable of receiving. The original IRIG-B format did not contain the year within the full frame of data. Recently the year was added and is available on some IRIG-B time producers.

Also provided is an option for the Simple Network Time Protocol or SNTP. This acronym is further condensed to NTP in this application. The IP address of this device is specified in the X11CB IM Machine Setup dialog.



- Not Used – Simply means that there is no time standard equipment available allowing the Interface Module to keep track of time by itself. This time may drift from other units on the system.
- IRIG-B Standard – The Interface Module does not read the year from the IRIG-B input. The User must set the year using the X11CB Configuration application.
- IRIG-B Ronan Enhanced - The Interface Module reads the year from the IRIG-B input.
- NTP at 000.000.000.000 – There is an NTP device on the LAN at the IP address specified in the Machine Setup dialog. This time standard contains milliseconds and four digit year.

7.3. Interface Module Notes

A note field capable of holding up to 1000 characters is provided to allow notes to be entered with respect to the Interface Module design and its Alarm Modules. Any notes entered within this page will be available for reference simply by opening this dialog box and viewing notes.

The notes can be erased or altered at any given time and are available whenever the configuration application is active.

The frame of this dialog is expandable, grab right or bottom or corner with mouse button held down and size accordingly.

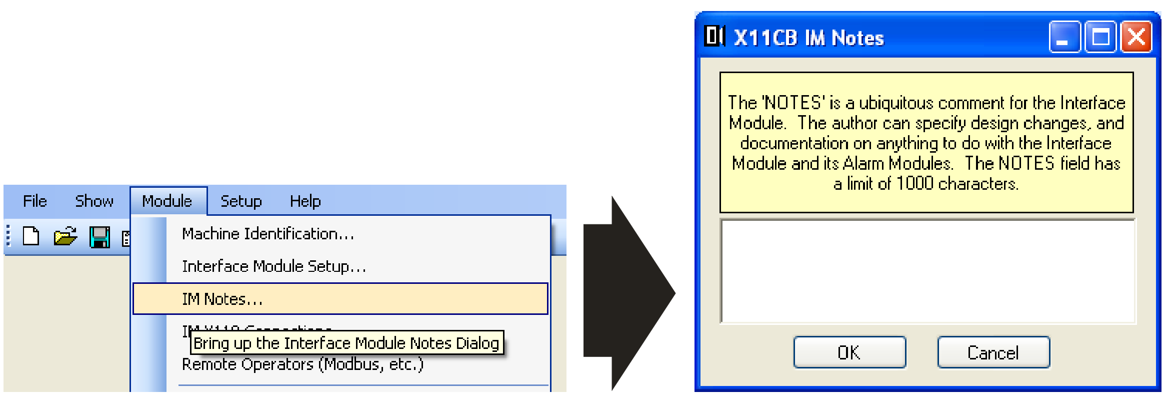


Figure 7-34 X11CB IM Notes Dialog and Menu

7.4. X110 Connections

When an X11CB system is required to connect to one or more Ronan X110 system(s) the connection information must be entered. Two different communications protocols are supported TCP and UDP.

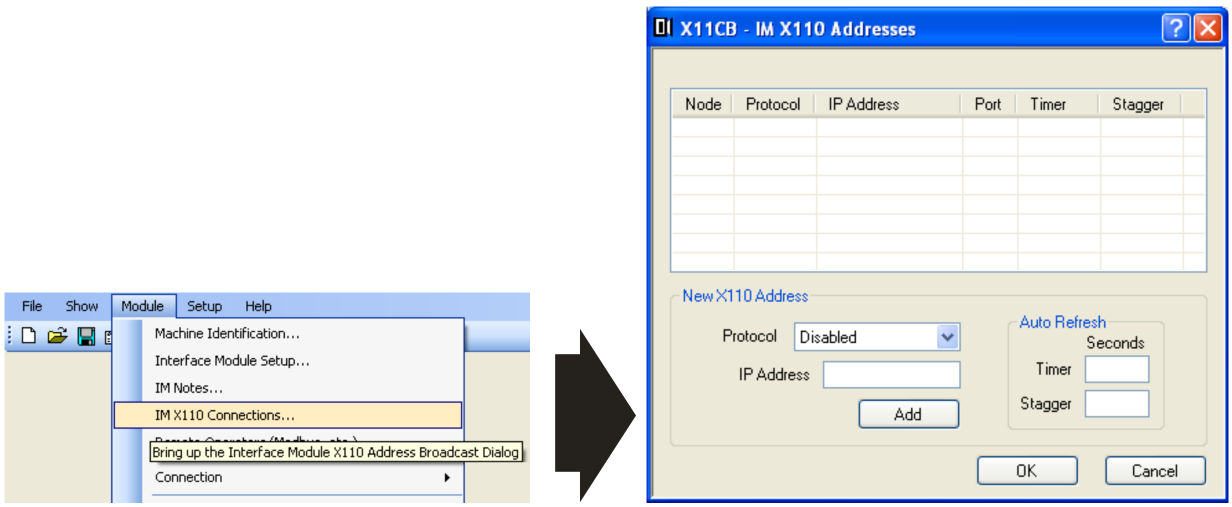


Figure 7-35 X11CB IM X110 Addresses Dialog and Menu

7.4.1. X110 List View

The List View displays all of the current configured entries and parameters.

Node	Sequential numbering for this list.
Protocol	Only 2 active protocols (TCP and UDP)
IP Address	255.255.255.255 for UDP, user supplied for TCP
Port	always 4001
Timer	Refresh every timer seconds.
Stagger	Offset from common time.

Each of the items in the list will command the IM to send point information to the Unit described.

7.4.2. X110 Protocol = TCP

If a TCP connection is used then select TCP from the pull-down menu "Protocol". A valid IP address must be entered in "IP Address" field. Enter the appropriate Auto Refresh values or leave blank. Click on the "Add" button to add this connection to the list of X110 connections.

7.4.3. X110 Protocol = UDP

If UDP is selected, enter the appropriate Auto Refresh values or leave blank. Click on the "Add" button and a UDP connection will be added to the list with the appropriate IP address and Port assignment.

7.4.4. X110 Auto Refresh

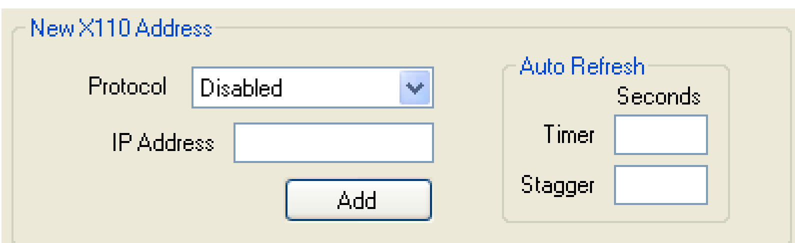


Figure 7-36 X110 New Address Group Box

The X110 Auto Refresh works on a 60 minute cycle.

If the timer is set to 0 or left blank, the Auto Refresh will not occur.

When the Timer is not zero, the X11CB-IM will refresh all of the points this often. The cycle restarts every hour on the hour.

Example 1: timer set to 300 (every 5 minutes), stagger set to 120 (2 minutes), the refresh would occur at xx:02:00, xx:07:00, xx:12:00, xx:17:00, xx:22:00, xx:27:00, xx:32:00, xx:37:00, xx:42:00, xx:47:00, xx:52:00, xx:57:00 every hour.

Example 2: timer set to 120 (every 2 minutes), stagger set to 7 (7 seconds), the refresh would occur at xx:00:07, xx:02:07, xx:04:07, xx:06:07, xx:08:07, xx:10:07, xx:12:07, xx:14:07, xx:16:07, xx:18:07, xx:20:07 xx:22:07 and so on, every hour.

7.5. Remote Operators and Restrictions

When the X11CB Annunciator system is configured to support industry standard protocols, assignments must be made to allow a remote device to drive the Pushbutton inputs (Test, Silence, Acknowledge …) and read system output status such as Horn1, Horn2, CTA and Reflash.

This is accomplished by assigning each function a unique point address in which the remote system can individually address the function. The assignment of these remote operator addresses must not align with either an actual point or another remote point address.

To review or change these address values use the Module pull-down menu and select "Remote Operators (Modbus, etc.)". Predefined values for all remote switches and output status signals are automatically filled within the Setup Remote Switches dialog box. These values can be changed but care must be taken not to duplicate point definition with some valid field contact input or valid remote field contact input.

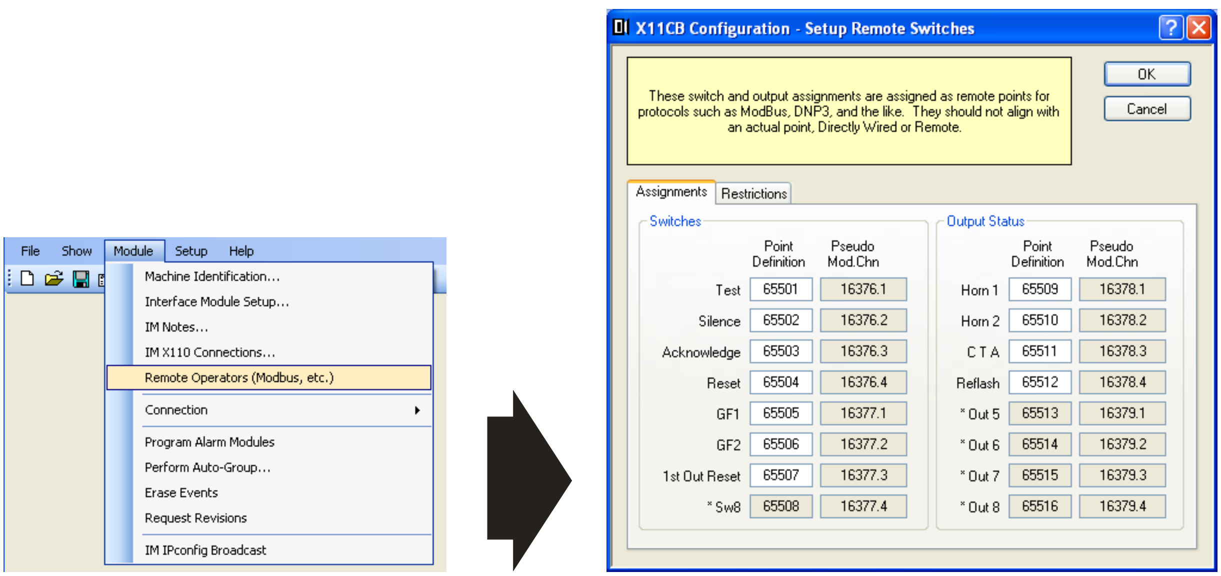


Figure 7-37 Module Remote Operations and Setup Remote Switches Dialog

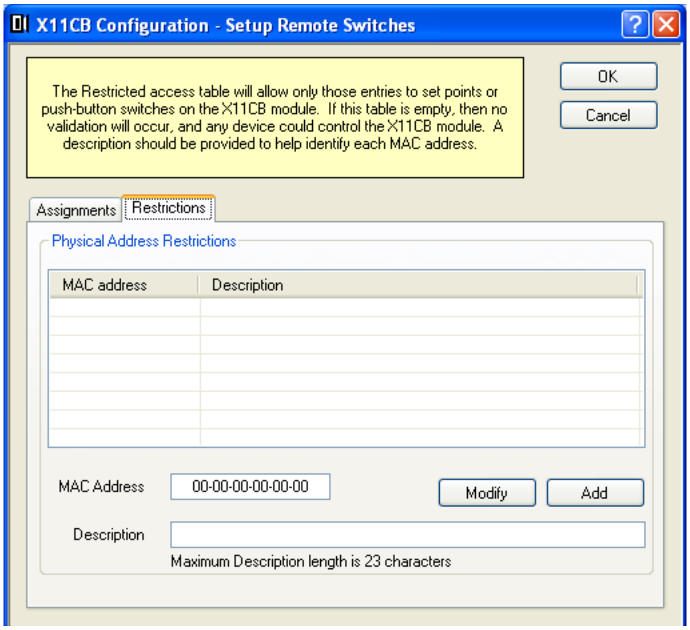


Figure 7-38 X11CB Configuration Setup Remote Switches dialog box

In order to prevent unapproved systems from transmitting pushbutton commands into the X11CB system a list of restricted devices can be implemented. If this list is empty, any device can make a connection to the X11CB system and issue push button commands to change the state of those internal signals. If the list is populated, the X11CB system will only accept commands from these devices listed in this list.

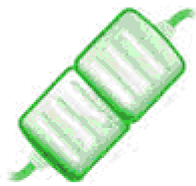
The two parameters needed to add accepted devices to the list are the MAC address of the accepted device and a description of this device. The description field will help identify each of the devices assigned.

The "Add" button is used to add devices to the list and the "Modify" button is used to modify devices already in the list. Click on the "Restrictions" tab of the "Setup Remote Switches" dialog box to display the restrictions dialog box.

7.6. Connection – Connect

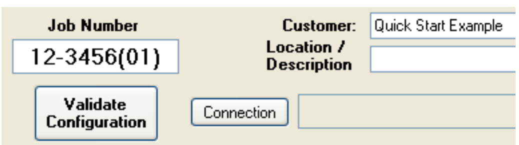
Permissions: Administrator or Remote

There are three ways to connect to an Interface Module.

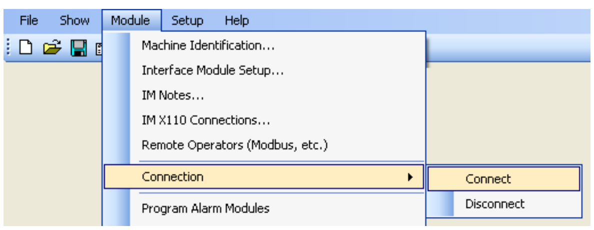


1) From the Tool Bar:

Session Connect to Interface Module (IM)



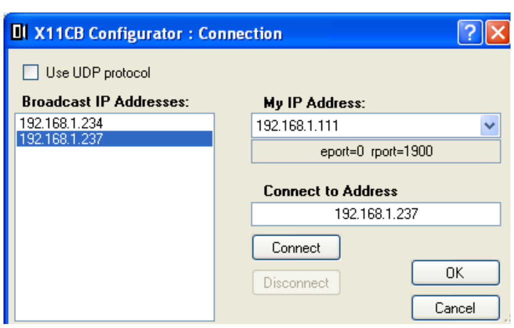
2) From the Main View “Connection” button.



3) Or from this menu item

Figure 7-39 Connection – Connect - Methods

Each of these will bring up the following dialog.



Enter the IP Address of the X11CB System that will be programmed with the configuration just entered into the “Connect to Address” field. To make the connection, click on the “Connect” button and then click on the “OK” button.

Figure 7-40 X11CB Configuration Connection Dialog

The **“My IP Address”** identifies this computer's IP addresses.
On older model computers there is typically only one IP Address per computer,
but a computer can have more than one network card, thus, more than one address.

Newer computers may identify their network card as both an IPV4
(32 bit address specified as: 000.000.000.000),
and, IPV6
(128 bit address specified as: XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX (HEX DIGITS))

This ComboBox will display both of these addresses separately, even though they pertain to a single controller.

NOTE: The X11CBIM series 1, can only communicate with the IPV4 addresses.

In this case, select the network controller that can physically communicate with the Interface Module.

If the IP address of the X11CB system to be programmed is available in the Broadcast IP Address section, click on this address and it will be transferred to the **"Connect to Address"** field automatically. To make the connection, click on the "Connect" button and then click on the "OK" button.

A connection will be displayed in the connection field showing the "My IP Address" shown in the connection page connected through a TCP/IP connection to the "Connect to Address" entered in the connection page.

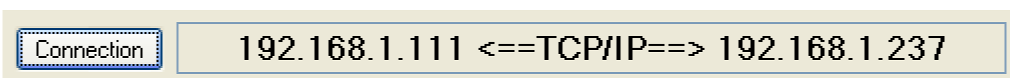


Figure 7-41 Connection Status Display

To the right of the Connection button is the connection status. This status displays in one of three formats:

1. not connected
2. 192.168.1.111 <==TCP/IP==> 192.168.1.237
3. 192.168.1.111 <==UDP==> 192.168.1.237

7.7. Connection – Disconnect

Permissions: Administrator or Remote

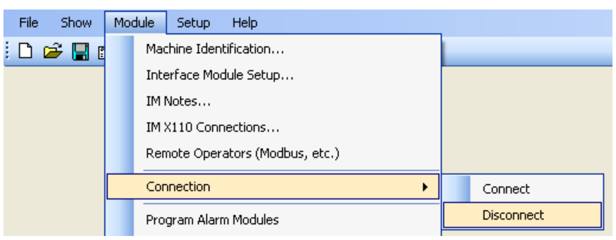
Disconnecting from the IM can be entered in similar ways as connecting.

There are three ways to disconnect to an Interface Module.

1) From the Tool Bar:

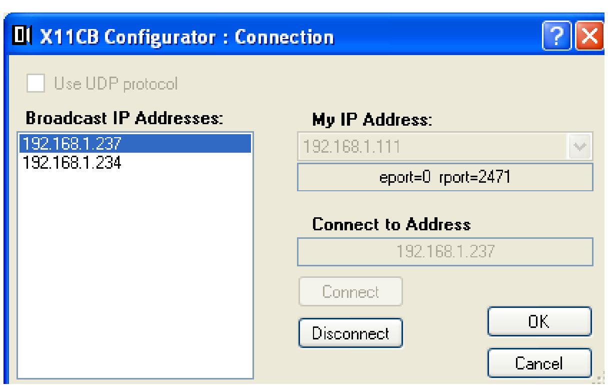
Session Disconnect from Interface Module (IM)

2) From the Main View "Connection" button.



3) Or from this menu item

Figure 7-42 Connection – Disconnect - Methods



Then click the Disconnect button.

7.8. Program Alarm Modules

Permissions: Administrator or Remote Builder

This menu item initiates the transfer of the configuration data to the X11CB system. A confirmation dialog box will appear asking if the programming of the Alarm Modules should continue. Click on the "Yes" button to program the X11CB system. Press "No" if programming the X11CB system is not wanted.

> Why two identical addresses in the confirmation dialog?
>
> The address on the left is actually the "Host name". It most likely will be the same as the IP address when communicating with the Ronan X11CB Interface Module. Hostnames are human-readable nicknames that correspond to the address of a device connected to a network. Since the Interface Module does not employ a Domain Name System (DNS), the two items should be identical.

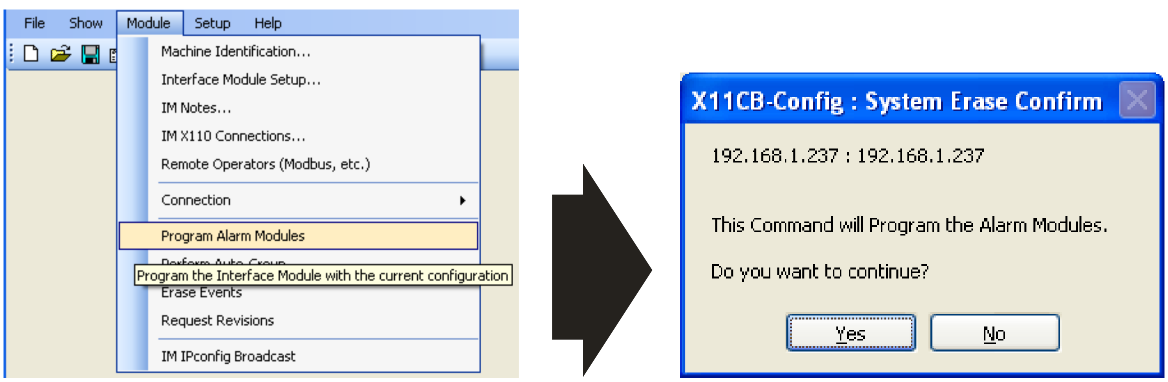


Figure 7-43 Module Program Alarm Modules Menu

An alternative method from the Module Drop-Down menu selection is to right click in the Lamp-Box area. This will display the following context menu:

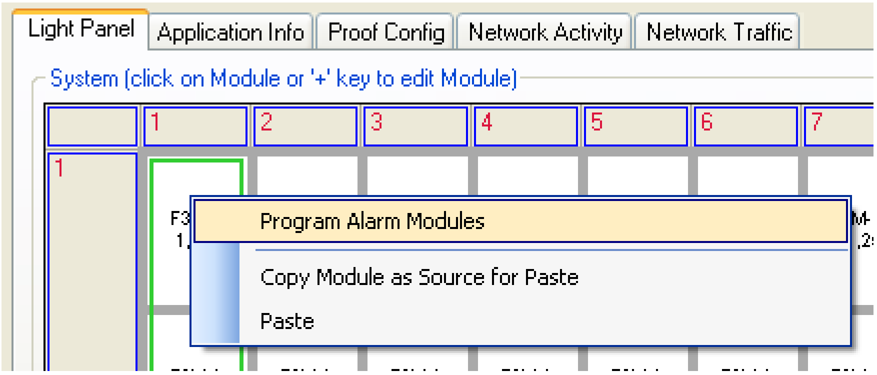


Figure 7-44 Program Alarm Modules from Light Display

From here, select the "Program Alarm Modules" entry.

The time it takes to program the Alarm Modules is dependent on two main conditions, the amount of traffic on the network connection and the size of the system. The more network traffic or the larger the system the more time it will take to transfer all the configuration data to the X11CB system and the less traffic on the network and the smaller the system X11CB system the shorter it will take. As shown below a progress timer will appear to display the progress of the transfer of the configuration data to the X11CB system. Longer times will show progress using a clock symbol with moving hand to indicate the transfer progress. Shorter transfer times may only show a blank box with no timers and may only be displayed for a short period of time.

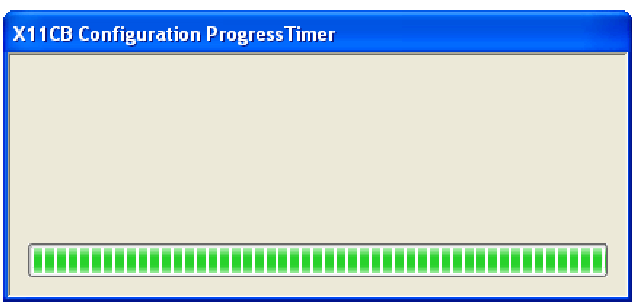


Figure 7-45 X11CB Configuration Progress Timer Dialog - Successful

When the progress timer window disappears the transfer is complete. The system may now be used in a normal operating mode without the need of the configuration application. The X11CB system will permanently hold the operating configuration until it is programmed with a new configuration.

In the event of a communications failure, a series of three clocks may appear and count up to each of their time-out values. Finally when all of the retries are exhausted, the final fatal message is displayed then automatically closes after a short time.

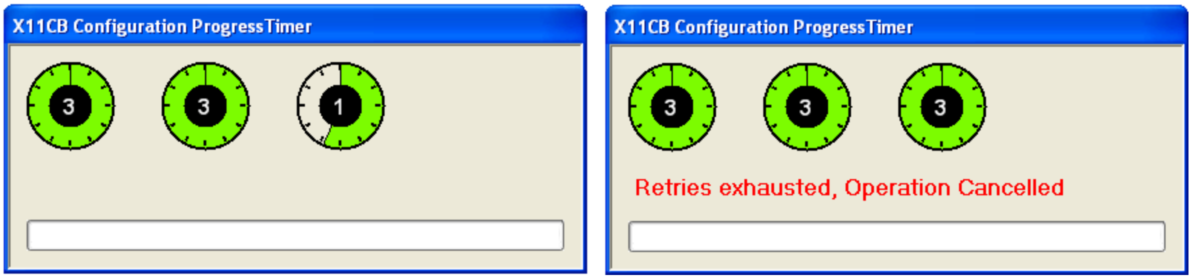
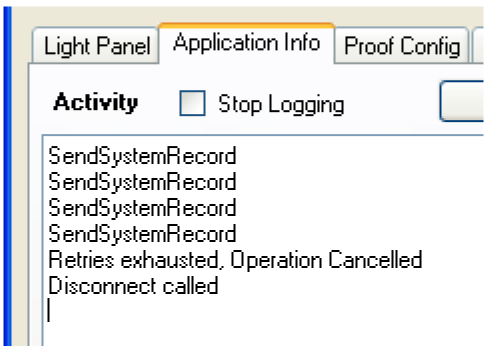


Figure 7-46 X11CB Configuration Progress Timer Dialog - Unsuccessful

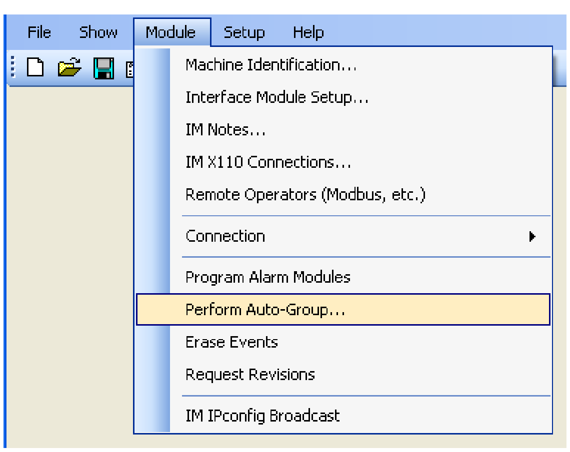
The cause of the error may appear in the "Application Info" tab.



7.9. Perform Auto-Group

Permissions: Administrator or Remote

Auto-Grouping is a method performed by the Configuration Program and the X11CB unit. When initiated, the Unit is temporarily removed from active "Run" service.



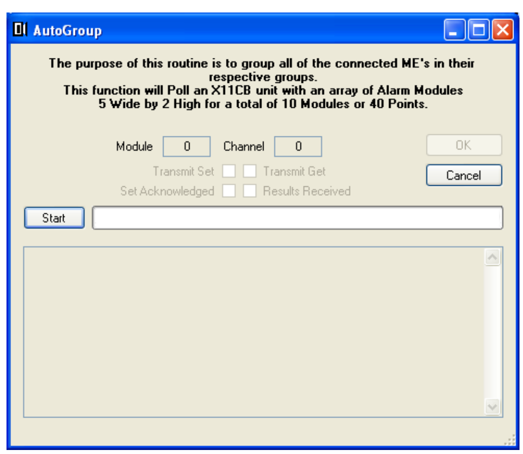
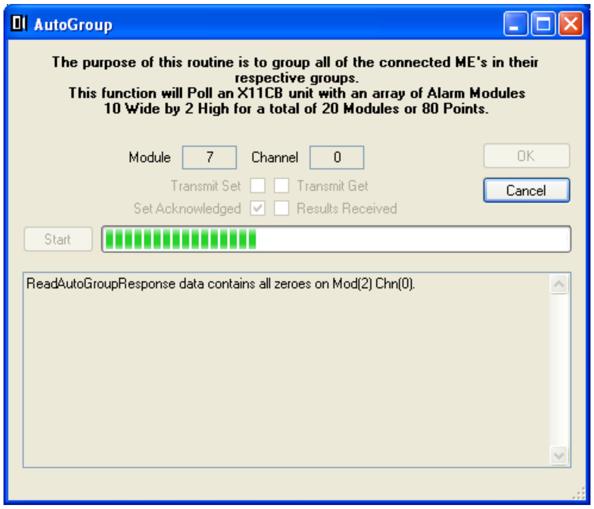


Figure 7-47 Module Perform Auto-Group Menu and Dialog

Once Start has been clicked, this application begins polling the AM modules using the IM module as its proxy. Once the polling has completed, the OK button is enabled. When the OK button is clicked, then the values (Group Number) are written to the Alarm Module entries.



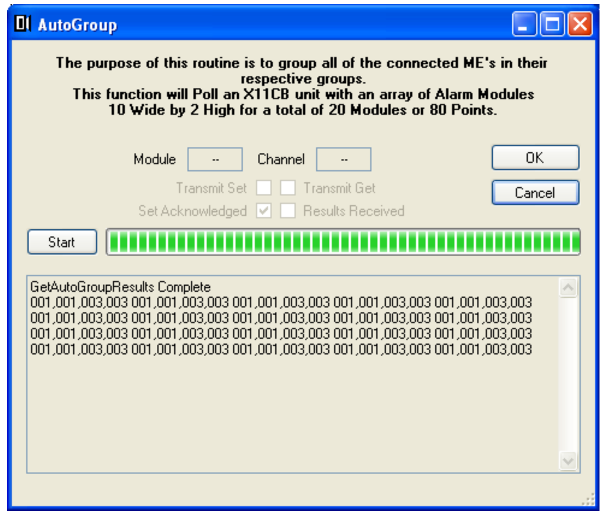


Figure 7-48 Auto-Group Dialog Working Dialogs

Possible error messages:

"AutoGroup Polling Cancelled by Operator"

Cancel button clicked.

"ReadAutoGroupResponse Retry n on Mod(x) Chn(y)."

The required number of responses did not arrive at the IM or the IM did not pass them onto the Configuration application in a timely manner. Could be the configurations don't match, or simply polling an incorrect IP address.

"ReadAutoGroupResponse Retrys Exhausted, Re-request Mod(x) Chn(y)."

When all of the retries have been exhausted, this message displays. Check the connections, configurations, and IP addresses and try again.

"ReadAutoGroupResponse More entries sampled(n) than configured(m) on Mod(x) Chn(y)."
" Processing continues, but results may not be accurate."

More than likely, the current configuration loaded in the X11CB Configurator does not match what is configured in the IM that it is polling. Either incorrect configuration XML file, or polling the wrong IP address.

"ReadAutoGroupResponse data contains all zeroes on Mod(x) Chn(y)."

This sounds like nothing was really set. It could mean that the ME out for that point has malfunctioned.

"ReadAutoGroupResponse The MEin that should be on Mod(x) Chn(y) isn't."

When setting an ME high, one would think that the channel associated with that point would report its ME on. In this case that didn't happen.

"ReadAutoGroupResponse length short (n) should be (m) on Mod(x) Chn(y)."

This would be a programming error. The lengths are double checked to what the message thinks it should have sent. Report this error to Ronan Engineering.

```
"ReadAutoGroupResponse mismatch found [a1]=b1 cannot be replaced with [a2]=b2 on Mod(x) Chn(y)."
"  All connected MEin's must report identical results, no matter which MEout is set in that group."
```

When polling Mod(x) Chn(y) different results were reported when it appeared that the points ME should be wired together.
i.e. Polling point 8 shows that it affected point 11. But when point 11 was polled, point 8 behaved differently.

```
"GetAutoGroupResults Complete"
```

Completed. The remaining lines are in the same order as are the rows of alarm modules in the configuration. Each line will have 4 numbers for each alarm module in that row. These are the raw group numbers, after some massaging, the group numbers are compressed to sequential integers before they are stored in the Alarm module entries.

7.10. Erase Events

Permissions: Administrator

Although it probably doesn't need to be said, **BE CAREFUL**! Executing this incorrectly could make a mess of the database.

Figure 7-49 Erase Events Dialog

Normally, on a new system, the Starting Event Number is usually set to 10,000. This large number helps with printed report column alignment.

In the event there is a need to completely erase the events, and the need to continue where the database left off, enter the next available event number for this particular UnitID here in the text box before pressing OK.

7.11. Request Revisions

Permissions: Administrator or Remote

The execution of this function will produce the following:

```
SendAdministrativeRequest - cmd(76) Request Module Revision Numbers

Response to Request for Revisions
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
SendAdministrativeRequest - cmd(75) Request Module Build Numbers
(WR) Interface Module Administrative Command Completed

Response to Request for Builds
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
0849 0849 0849 0849 0849 0849 0849 0849 0849 0849
0849 0849 0849 0849 0849 0849 0849 0849 0849 0849
SendAdministrativeRequest - cmd(81) Request Module AM CRC's
(WR) Interface Module Administrative Command Completed

Response to Request for AM CRC's
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
7110 1977 CEB5 C9B9 1E7B 761C A1DE 7804 AFC6 C7A1
1063 176F C0AD A8CA 7F08 0B5F DC9D B4FA 6338 6434
(WR) Interface Module Administrative Command Completed
```

The response displays what the Interface Module has configured as far as the Matrix Array, not necessarily what is in the currently opened configuration.

The three parts to this display include Revisions, Build Numbers, and Alarm Module configuration CRC sums.

7.12. IM IP Config Broadcast

Permissions: Administrator

There are instances when the default IP Address and Mask shipped from the factory will not allow the Configuration application to connect to the IM.

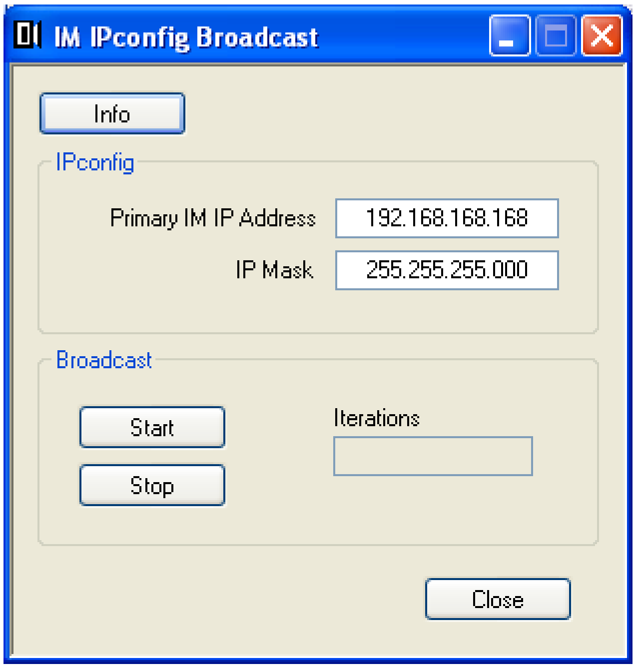


Figure 7-50 IM IPconfig Broadcast Dialog

If the Windows Operating System network is specified differently than the Interface Module, this function can help allow the two to match.

This function will allow a temporary host address and net mask to be used by the IM until a more permanent solution can be set using the Module → Machine Identification → Device R/W operation.

The IPconfig group will tell the Interface Module how to configure its network. This message is broadcast to all listening devices on the current network.

Now the trick is to tell the target Interface Module to listen for this particular broadcast packet. This can be done by pressing a series of push button switches that are hard wired to the Interface Module.

Click on the "Info" button for instructions on how this is accomplished. The message displayed should be something similar to:

> This IM device must be at version 3.0 or above for this implementation.
>
> This function will send out a broadcast message with the IP Address and Mask to all listening devices once every 5 seconds after the Start button has been pressed.
>
> The operator at the listening IM device will then press a series of buttons to set these fields into the unit. The series will be similar to, or, exactly like the following.
>
> Press and hold the Reset Button,
> Press the Acknowledge button 3 times,
> Press the Silence button once,
> Press the Test button once,
> Press the Acknowledge button 3 times,
> Release the Reset Button.

Figure 7-51 Secret Button Sequence for IP Broadcast

Once this is understood, Click the "Start" button in the Broadcast group. Wait a few iterations, then press the series of buttons on the Interface Module. The Interface Module polling address should change immediately.

Click the "Stop" button, then click the "Close" button.

Do not attempt to connect just yet.

Execute the function at "Module → Machine Identification → Device R/W operation" with the correct values in the network identifiers, and use the Write function.

A power Off / On cycle may be necessary to verify that this operation was successful.

> NOTE. This procedure will not work when the X11CB system contains both a Primary and a Redundant Interface Module.
>
> For this procedure to work in this instance, only one module at a time can be present in the system.

8. SETUP

Before getting into the menu items described beneath the SETUP menu, there should be an understanding of security levels and why a user signs in at a particular level.

8.1. Security Access Level

The X11CB Configuration Software provides the ability to create various levels of access to system configuration by utilizing password entry system. Each password that is created can be assigned a level of access to the configuration options that is appropriate for that particular user. The level of access ranges from full access to all configuration parameters down to no access with only monitoring of the system configuration parameters.

When the system starts a valid password must be entered to allow access to the X11CB Configuration Software and its configuration components.

Select Administrator in the Security Level pull-down menu first. Click in the password box and enter the password assigned for the Administrator then click on OK.

The factory default password for all users including the Administrator is 123. All passwords should be changed by the administrator as soon as the administrator has signed in. To reset passwords back to factory default passwords, contact Ronan Engineering Technical Support.

The following table describes the different security levels:

Security Level	Allow User basic Access to Configuration Application	Allow User to read and view current configurations	Allow User to access X11CB Status	Allow User to make and save Configurations to file	SystemsAllow User to download Configuration changes to X11CB	Allow User to change Passwords	Allow User to send Push Button events to X11CB System
None	X						
Local User	X	X					
Remote User	X	X	X		X		
Local Builder	X	X		X			
Remote Builder	X	X	X	X	X		
Administrator	X	X	X	X	X	X	X

Table 2 Authorization Level Table

Once the security level has been selected the assigned password for that Security level must be entered into the Password box. Passwords can be assigned or reassigned only by the Administrator.

Note that:

- LOCAL user access will not have the ability to communicate with the actual device.
- REMOTE user access can communicate with the actual device(s).
- Builders can modify configurations, where Users cannot.
- Administrator has full access to all the system configuration parameters, and has the ability to perform all functions within the system including changing passwords.

The X11CB System is shipped with all passwords set to "123". These passwords should be changed by the administrator once the system is installed.

8.2. Sign In

The Configuration Authorization Password Dialog will present itself in two separate instances, when the application first starts, and when a user is not currently signed-in, and a user selects Setup / Sign In from the main menu.

The Configuration Password dialog has two user modifiable fields. The first is a drop-down combo box that defines the security level. The second is the cloaked password entry field.

These two fields are described in detail in this chapter.

Figure 8-52 X11CB Configuration Password Dialog

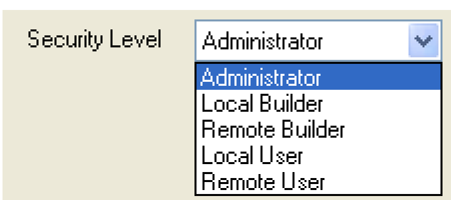


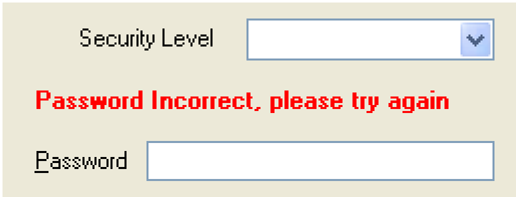
Figure 8-53 The Configuration Authorization Security Level Selections

The cursor is normally placed in the Password field when this dialog starts, to change the security level displayed, click the combo-box arrow and click one of the available entries.

To enter the password, check that the cursor is in the password field and not still in the Security Level field.

For each character entered, an asterisk is displayed in the password text box. When finished click OK and the dialog will check for a valid password for the security level selected.

If the password is incorrect, a message will display in the dialog:



This message will continue to display until a valid password is entered, or Cancel is selected.

8.3. Sign Out

There is nothing special that needs to be done here, signing out is quick and simple. One click and the operation is performed quietly.

8.4. New Password

Passwords for individual security levels can only be changed by the Administrator. When the Administrator is signed into the system, access to the New Password menu is available through the Setup pull down menu.

Old and new passwords need to be entered before the password will be changed.

Use the Security level pull-down menu to select the desired security level to assign to the new password.

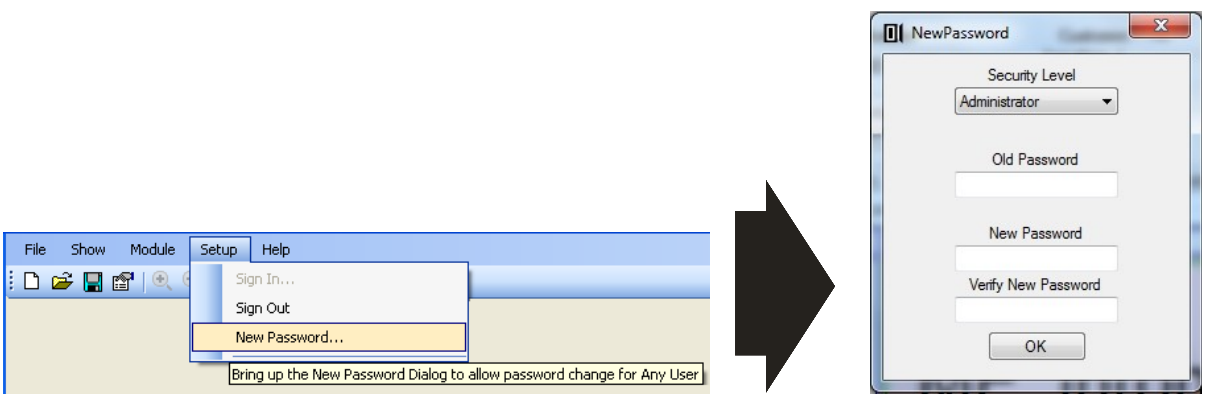


Figure 8-54 Setup New Password and Dialog

Select the Security Level drop-down combo box and click on the appropriate security level type.

To change the password for a particular security level the original password for that Security level must be entered before a new password can be entered.

Enter any displayable characters to create the password. You may not use any function or control keys within the password. Keep the password characters to upper/lower case alpha, numeric and special characters including spaces. There is no minimal length limit for the password and the maximum is length is 255.

In order to ensure the correct new password is entered it must be entered twice, once in the new password entry box and a second time in the Verify New Password entry box.

Click on OK to accept the password entries made.

If the old password is not correct, a message will appear describing the error and prompting the operator to try again.

Figure 8-55 Password Incorrect, please try again

If the New and Verify New passwords don't match, a message will appear describing the error and prompting the operator to try again.

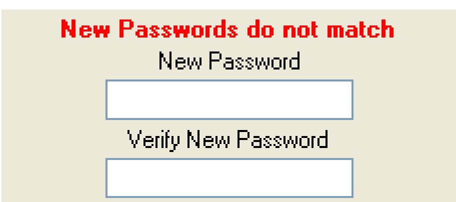
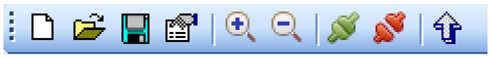


Figure 8-56 New Passwords do not match

If a problem occurs while attempting to write the password file, an error message box will display "Unable to Modify" followed by the actual file name, and the Windows Operating System error message.

9. Tool Strip



9.1. New Configuration

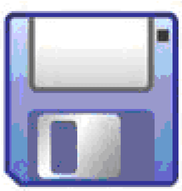
Same as File → New

Permissions: Administrator or Builder

9.2. Open Existing Configuration

Same as File → Open

9.3. Save Configuration



Same as File → Save

Permissions: Administrator or Builder

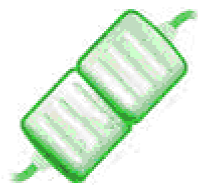
9.4. Alarm Module Properties

Select a module in the Lamp Panel Tab,
Either double click there, or click this icon.

9.5. Zoom In, Zoom Out

Lamp Panel tab page only
Maximum Zoom is 3x

9.6. Connect



Session Connect to Interface Module (IM)
Same as Module → Connection → Connect
Same as pressing the "Connection" button on the Main display.

Permissions: Administrator or Remote

9.7. Disconnect

Session Disconnect from Interface Module (IM)
Same as Module → Connection → Disconnect
Same as pressing the "Connection" button on the Main display.

Permissions: Administrator or Remote

9.8. Upload

Upload Program Alarm Modules
Same as Module → Program Alarm Modules
Same as Light Panel Right Click → Program Alarm Modules

Permissions: Administrator or Remote Builder

10. Main Display Page

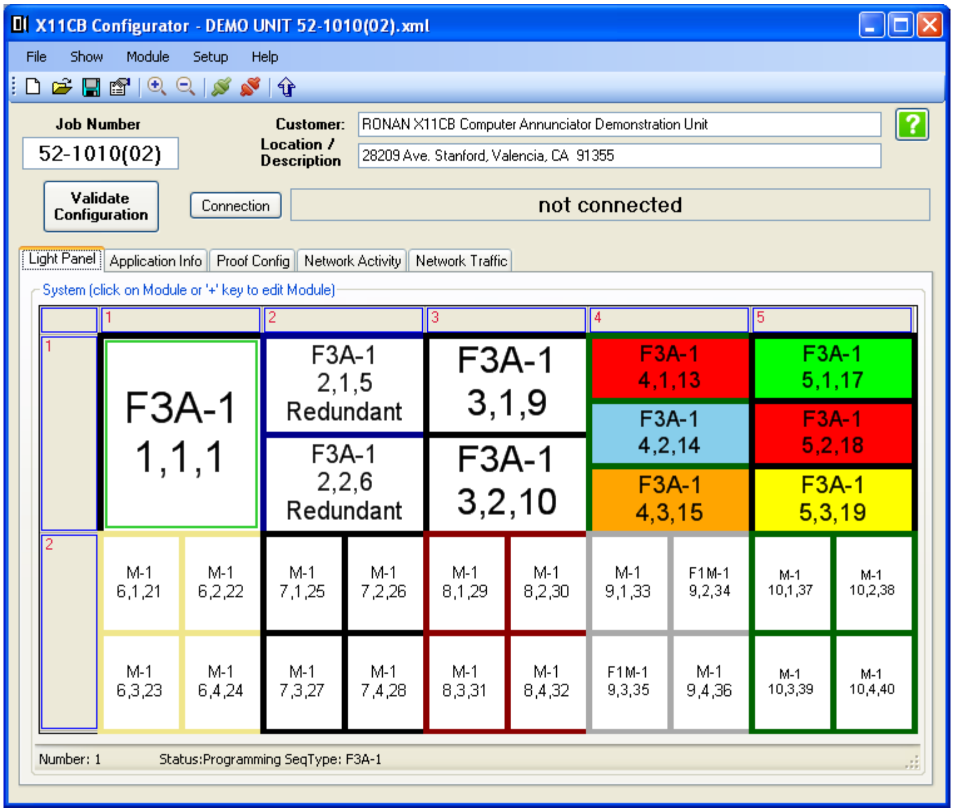


Figure 10-57 Main Display Page – Demo Unit

The first 3 fields (2 are "Must Have")

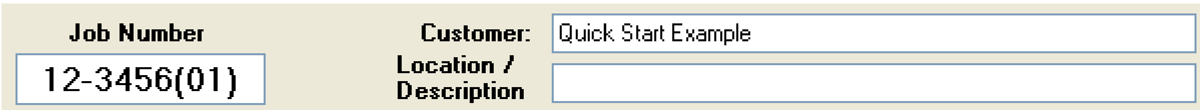


Figure 10-58 Job Number, Customer and Location fields

10.1. Job Number

Must Have.

The Job Number is the identifier for a single or multiple chassis order.
Our current Inventory System uses the format 99-9999 for this identifier.
The Job Number specified here is further identified with a (99) suffix.
This number will normally start with 01 (not 00), and identify each IM in the order.
There is typically a single Interface Module in each chassis, but larger chassis can contain more than one Interface Module.

The job number should remain the same as the original number. This job number is the reference number for this particular system and allows Ronan support to quickly review this systems configuration as it was shipped.

An error in the Job Number format will display a RED frame around the Job Number text box.

10.2. Customer

Must Have.

The Customer field can be filled with any alpha numeric characters and is typically the name of the business that owns the system.

An error in the Customer field will display a RED frame around the text box.

10.3. Location / Description

Optional.

This further identifies the Customer.
It may contain the Corporate Division and/or the location of this alarm panel's final physical destination.

10.4. Validate Configuration

This will ensure that the data specified in this configuration has valid data within its fields.
This includes but is not limited to MachineInfo, UnitID, and Starting Point,

IM Info UnitIDs and Starting Points, Matrix size, and Target Points specified in Remotes.

A typical "Validate Configuration" output to the Log Area would look similar to:

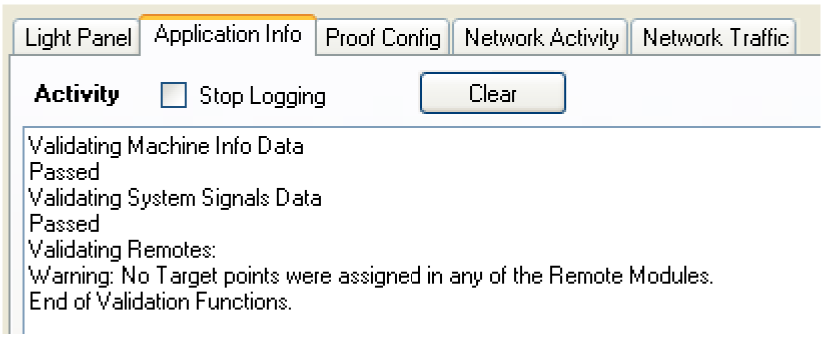


Figure 10-59 Validate Configuration Display

The validation checks for as many possibilities as currently possible. Some of the errors that may be encountered are:

- ModBus RS485 Addr in machine info not valid, must be 1 - 250.
- Starting Point in machine info not valid.
    Must be 1 - 65519, and all configured points must be within this range.
- Warning: UnitID's between 64 through 99 are reserved.
- The Lamp Matrix Height is invalid. (Maximum Height = 16)
- The Lamp Matrix Width is invalid. (Maximum Width = 16)
- Warning: Matrix Width and Height exceeds 100 (x * y = z).
  The fan-out for the CAN bus may not be able to handle this number of transceivers. This configuration is acceptable if not all of the positions are populated with Alarm Modules.
- Redundant Modules were found in the configuration, but no Redundant IP address was specified in the Machine Info dialog.
- Redundant Modules were found in the configuration, and the IP addresses are identical in the Machine Info dialog.
- Redundant Modules were found in the configuration, but no Redundant UnitID was specified in the Interface Module Setup dialog.
- Redundant Modules were found in the configuration, and the UnitIDs are identical in the Interface Module Setup dialog.
- There is a problem with the Switch assignments to points.
- No Remotes Specified in this Configuration.
- Error: Duplicate IP Addresses specified (nnn.nnn.nnn.nnn) for Remote[AAAAA] and Remote[BBBBB].
- Warning: No Target points were assigned in Remote Module AAAAA.
- Warning: No Target points were assigned in any of the Remote Modules.
- Error: Duplicate Target point specified (mod.chn),
      AAAAA Source point specified (mod.chn),
- Error: Target point out of range in this configuration: AAAAA mod.chn.

10.5. Connection

Clicking this button has the same effect as Menu Module → Connection → Connect
It will bring up the connection dialog.

To the right of this button is the connection status. This status displays in one of three ways:

4. not connected
5. 192.168.1.111 <==TCP/IP==> 192.168.1.237
6. 192.168.1.111 <==UDP==> 192.168.1.237

The IP address on the left is the PC machine that the configuration application is running, and the IP address on the right is the IM unit to which it is connected.

10.6. Main Tab Control

In the main tab control are 5 tabs:

1. Light Panel
2. Application Info
3. Proof Config
4. Network Activity
5. Network Traffic

10.6.1. Light Panel

The Light Panel display the Modules and Channels in the format defined in the “Show” menu. It can be zoomed in and out as needed if the display area is too small to for the amount of information presented.

Right click brings up the following context menu:

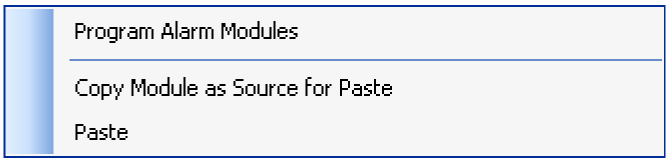


Figure 10-60 Right Click Light Panel Context Menu

Selecting Program Alarm Menus is the same as Module → Program Alarm Modules.

Selecting “Copy Module as Source for Paste” simply copies the selection location as a source for further “Paste” operations.

Selecting “Paste” displays the following dialog:

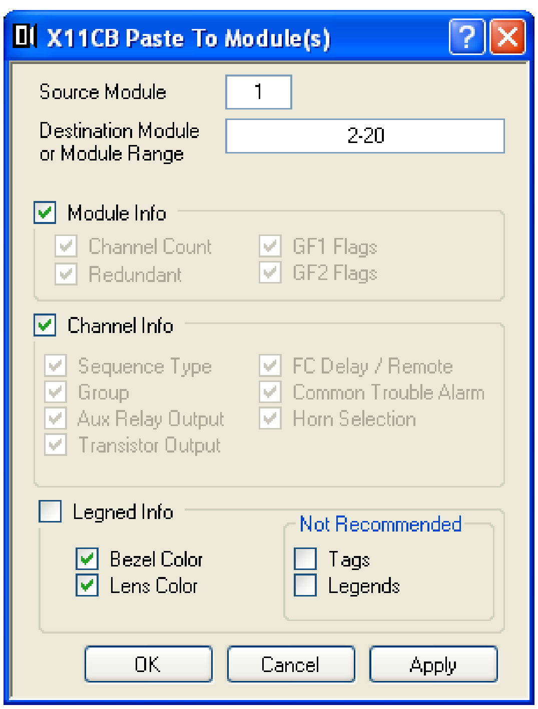


Figure 10-61 X11CB Paste To Module(s) Dialog

The source module is that module clicked as per the previous context menu item.

The Destination will initially have the currently selected Alarm Module. This can be modified to a completely different module or range of modules.

The destination can be specified as a single Module Number (relative to 1),
or, a series of Module Numbers separated by commas,
or, a range of Module Numbers (a starting Module and an ending Module with a dash in between),
or, any combination of the above.

i.e. 2
or 2,3,4
or 2-4
or 1,2-4

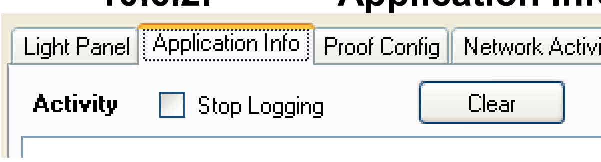
By checking 'Module Info', all of the fields associated with this group will be copied. When unchecked, each of the items within this group will be copied if they are checked, if none of the items are checked, then nothing from this group will be copied

By checking 'Channel Info', all of the fields associated with this group will be copied. When unchecked, each of the items within this group will be copied if they are checked, if none of the items are checked, then nothing from this group will be copied

By checking 'Legend Info', all of the fields associated with this group will be copied. When unchecked, each of the items within this group will be copied if they are checked, if none of the items are checked, then nothing from this group will be copied

It wouldn't make much sense to have duplicate legends, that would make one alarm indistinguishable from the other. Tags are closely related to legends, in that they define the alarm in abbreviated form. The alternative to the classical tag definition would be that tags could refer to a group or class of alarm.

10.6.2. Application Info



The "Application Info" tab is a general logging area for messages and responses requested by the operator, or, Activity of the general workings within the Application.

There is a check box to "Stop Logging" and it does just that tossing any message destined for this area while the box is checked. This will allow the operator to save some of the log for copy or review.

The "Clear" button clears the slate, erases the current contents of the Application Info Log.

10.6.3. Proof Config

Permissions: Administrator or Remote

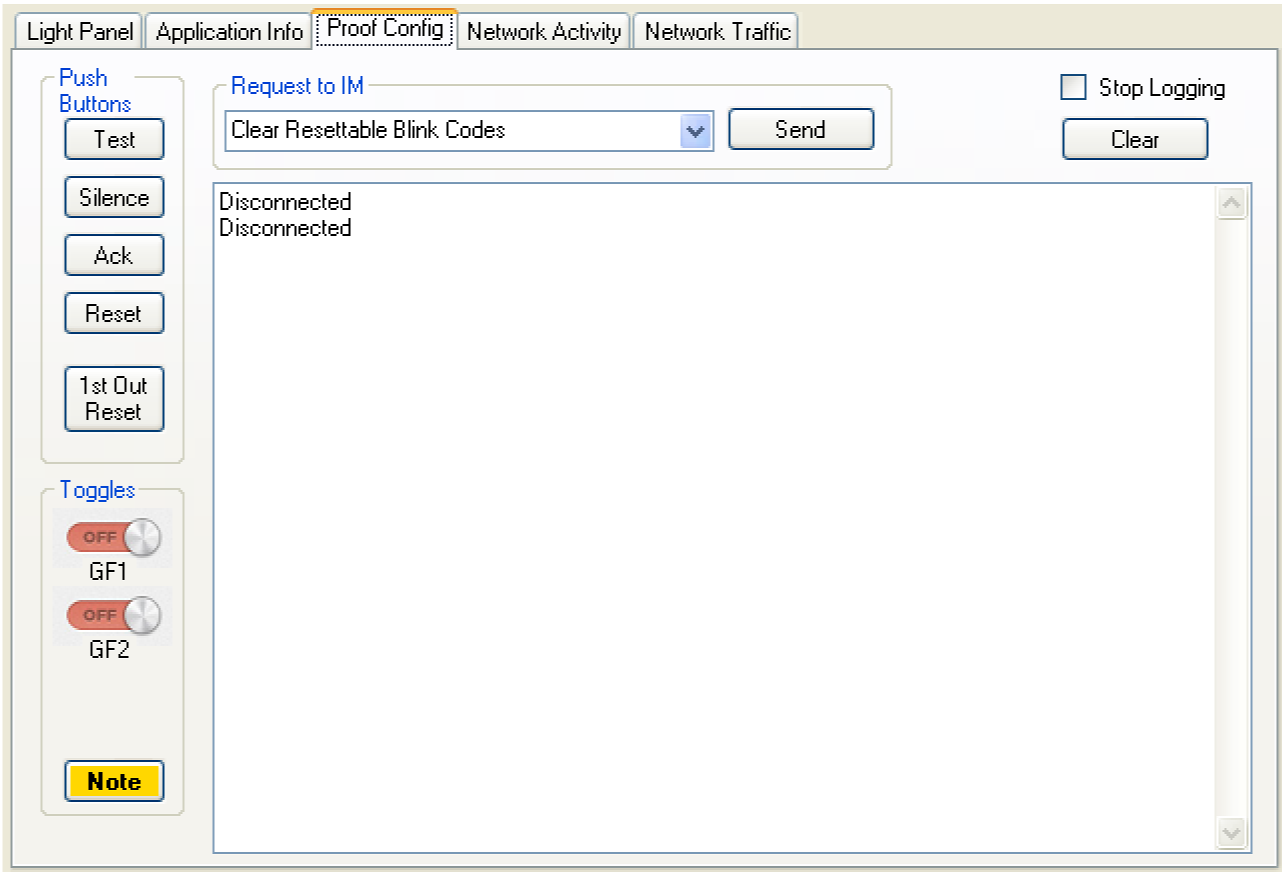


Figure 10-62 Proof Config Tab Page

The "Proof Config" has its own logging area. This area is referred to as the "Button Info" page, due to how many buttons previous versions of this page had.

It also has the "Stop Logging" and "Clear" controls and behave the same on this tab as those on the "Application Info" tab.

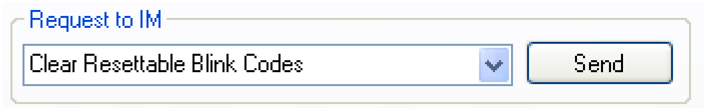


Figure 10-63 Request To IM Group Box

The “Request to IM” group box contains a series of commands that can be sent individually to the Interface Module (IM). The list includes:

1. Clear Resettable Blink Codes
2. Event Status
3. Get Flash CRC's
4. Get Serial Number
5. IRIG Status
6. Request All Log Messages
7. Request Revisions
8. Run -
9. Send Date

Note. Those items in the drop-down list that end with a hyphen or dash, are visible but not active for the currently signed security level, or not available at this point in the configuration.

10.6.3.1. Clear Resettable Blink Codes

The IM will flash blink error codes on it maintenance lamp / relay. The blinking is relentless and will continue until the issue is addressed. The codes include those defined below which may be resettable.

Blink codes pertaining to IM functions:

- Need Configuration
- IP Transmit Queue Overflow
- IRIG Zero Crossing Race Condition

10.6.3.2. Blink codes pertaining to the AM functions:

- One or more modules Not Responding
- Invalid Configuration detected on Alarm Module
- Could not finish configuring all of the Alarm Modules
- Invalid Systems Record (invalid number of rows and columns for instance)
- CAN Time out
- CAN bus failure
- Redundant Alarm Module failure

In addition to resetting the Blink Codes, this function also resets all of the IRIG Status Counters (see IRIG status).

See Appendices for a further description of Blink Codes.

10.6.3.3. Event Status

This request will log the following (or something similar) into the window:

```
Request Event Info
Event Status:
  (10001) Oldest Event Number
  (11498) Next Event Number
  (409) Events Per Sector
  (175870) Event Capacity
```

This shows the properties of the Event circular queue. The "Oldest Event Number" will start with the number specified in the "Erase Events" dialog. The "Next Event Number" is assigned to the next event generated by the Interface Module. Events per sector is more an internal factoid that hast to do with the flash memory erase granularity. Finally the "Event Capacity" is the number of events that the flash memory can store before it starts rewriting events in the circular queue.

The "Oldest Event Number", in the above example, will show 10410 when a single sector is lapped (do the math = 10001 + 409).

10.6.3.4. Get Flash CRC's

This request will provide a list of the Configuration CRCs currently in the Interface Module. This is more a diagnostic function for technicians, but provides a visual verification of the status of the flash configuration:

```
Interface Module Flash CRCs Info Request
Flash Read CRC Table:
Sector(0000) RdCrc(905C) FlCrc(905C) WrCrc(0000) AllFF(0000)
Sector(0001) RdCrc(C806) FlCrc(C806) WrCrc(0000) AllFF(0000)
Sector(0002) RdCrc(A7BA) FlCrc(A7BA) WrCrc(0000) AllFF(0000)
Sector(0003) RdCrc(4E73) FlCrc(4E73) WrCrc(0000) AllFF(0000)
Sector(0004) RdCrc(C019) FlCrc(C019) WrCrc(0000) AllFF(0000)
•            .
•            .
•            .
Sector(003D) RdCrc(0ADD) FlCrc(0ADD) WrCrc(0000) AllFF(0000)
Sector(003E) RdCrc(F7AE) FlCrc(F7AE) WrCrc(0000) AllFF(0000)
Sector(003F) RdCrc(F61C) FlCrc(F61C) WrCrc(0000) AllFF(0000)
Sector(01FE) RdCrc(5ECB) FlCrc(5ECB) WrCrc(0000) AllFF(0000)
Sector(01FF) RdCrc(5ECB) FlCrc(5ECB) WrCrc(0000) AllFF(0000)
End Flash Read CRC Table:
```

The sectors 0000 through 003F are the configuration sectors and their backup copies. The sectors 01FE – 01FF are the Machine Identification information and it backup copy.

Five Columns are displayed for every sector in the Configuration collection:

- Sector – identifies the physical sector on the flash device
- RdCrc - Computed read CRC from in-memory configuration
- FlCrc - CRC written on Flash
- WrCrc – On a sector rewrite the CRC Written to Flash
- AllFF – either 0000 or 0001 binary condition for test: Were all 0xFF's read on sector

10.6.3.5. Get Serial Number

In the following example, a serial number has not yet been written to this device. That means that the device was fresh from manufacturing and had not gone through the unit test procedure that assigns the serial number. Notice, however, the MAC address has been assigned. The User1 register is available for expansion by engineering.

Serial Number specified is not within range of 100001 to 101024.
Serial number has not been permanently written, value = 0xFFFFFFFF 2147483647.
User1 register is available for writing, value = 0xFFFFFFFF 2147483647.
MAC address 00-50-C2-9C-EC-00

10.6.3.6. IRIG Status

The IRIG Status request can tell how well the IRIG time generation is working, if at all. The first example shows a unit without the IRIG input:

```
Interface Module IRIG Info Request
Interface Module IRIG Info

Raw accumulated bit data is an internal table that temporarily holds the IRIG bit data.
Somewhat cryptical, it will contain both data and index bits making each SubWord more than 8 bits in length.
Raw accumulated bit data: 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000

The next two arrays are generally not turned on except for debugging.

Pulse1Width Counts are generally 2, 5, or 8 counts, where 2 = a zero bit, 5 = a 1 bit and 8 = marker.
any continually accumulating counts in anything other than the 0, 2, 5, or 8 counters are not ideal.
Pulse0Width Counts (0-11): 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

Pulse1Width Counts are generally 2, 5, or 8 counts, where 2 = a zero bit, 5 = a 1 bit and 8 = marker.
any continually accumulating counts in anything other than the 0, 2, 5, or 8 counters are not ideal.
Pulse1Width Counts (0-11): 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

  yr(13) mo(4) da(10) hr(18) min(39) sec(44) ms(5) pseudo(1)
  time of day in seconds from IRIG(19569)
      extrapolated time from above hrs(5) min(26) sec(9)
  IRIG Zero Crossing Count(0) 0(0) 1(0) Chatter(0)

250us interrupt counter (past the ZeroCrossing interrupt) that contains either a Mark or Space identifier.
Contiguous reads (either 0 or 1) occur a this time (the apex or the sinusoidal waveform).
  IRIG Receive Count(0) Contig-0(0) Contig-1(0)

Internal gap counter to test whether any seconds were skipped in the interrupt routines.
For example: If the current seconds value is 13 and the last known second processed was 11.
Mark-Mark is incremented each time two Reference Marks in a row are received.
Timer Increment is incremented each time the timer interrupt is required to increment seconds.
State Fail is incremented whenever a Data Failure is detected in the State machine.
  IRIG Gap Count(0)  Mark-Mark(0)  Successful Time Assemblies(0) Timer Increment(19570)  State Fail(0)
  Bit0(0)  Bit1(0)  Mark(0) Junk(0)
```

Figure 10-64 Non-working IRIG Status Display

The first section “Raw accumulated bit data” is an internal table of the converted amplitude modulated bit sequences, accumulated into words. There are 10 buckets that accumulate 10 words of IRIG data.

The next two sections (arrays) compute pulse widths counts for all zeroes or all ones. There are twelve buckets that will accumulate these counts.

After decoding, the bits can finally be deciphered to a readable form as follows:

```
yr(13) mo(4) da(10) hr(18) min(39) sec(44) ms(5) pseudo(1)
time of day in seconds from IRIG(19569)
   extrapolated time from above hrs(5) min(26) sec(9)
```

The Zero Crossing data and 250us counter are for internal use and may be helpful to Ronan Engineering.

```
IRIG Zero Crossing Count(0) 0(0) 1(0) Chatter(0)
```

Finally, there is the gap test, to test if any IRIG messages were lost. And other counters that will inform the User and Engineer how many timestamps were collected from the IRIG vs. how many were internally generated.

Internally generated is not such a bad thing if it is interspersed with some good IRIG samples. The internal clock is accurate to about 1 millisecond per day.

This next example shows an IRIG working correctly.

```
Interface Module IRIG Info Request
Interface Module IRIG Info

Raw accumulated bit data is an internal table that temporarily holds the IRIG bit data.
Somewhat cryptical, it will contain both data and index bits making each SubWord more than 8 bits in length.
Raw accumulated bit data: 0x00000048 0x00000026 0x00000025 0x000000E0 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000

The next two arrays are generally not turned on except for debugging.

Pulse1Width Counts are generally 2, 5, or 8 counts, where 2 = a zero bit, 5 = a 1 bit and 8 = marker.
any continually accumulating counts in anything other than the 0, 2, 5, or 8 counters are not ideal.
Pulse0Width Counts (0-11): 0x00000000 0x00000000 0x000003E5 0x00000001 0x00000000 0x0000040B 0x00000000
0x00000000 0x00001B78 0x00000000 0x00000000 0x00000000

Pulse1Width Counts are generally 2, 5, or 8 counts, where 2 = a zero bit, 5 = a 1 bit and 8 = marker.
any continually accumulating counts in anything other than the 0, 2, 5, or 8 counters are not ideal.
Pulse1Width Counts (0-11): 0x00000001 0x00000000 0x00001B78 0x00000000 0x00000000 0x0000040B 0x00000000
0x00000000 0x000003E5 0x00000000 0x00000000 0x00000000

  yr(13) mo(3) da(11) hr(15) min(16) sec(14) ms(0) pseudo(0)
  time of day in seconds from IRIG(54974)
      extrapolated time from above hrs(15) min(16) sec(14)
  IRIG Zero Crossing Count(90653) 0(1) 1(90652) Chatter(0)

250us interrupt counter (past the ZeroCrossing interrupt) that contains either a Mark or Space identifier.
Contiguous reads (either 0 or 1) occur a this time (the apex or the sinusoidal waveform).
  IRIG Receive Count(90652) Contig-0(8) Contig-1(8)

Internal gap counter to test whether any seconds were skipped in the interrupt routines.
For example: If the current seconds value is 13 and the last known second processed was 11.
Mark-Mark is incremented each time two Reference Marks in a row are received.
Timer Increment is incremented each time the timer interrupt is required to increment seconds.
State Fail is incremented whenever a Data Failure is detected in the State machine.
  IRIG Gap Count(0)  Mark-Mark(91)  Successful Time Assemblies(90) Timer Increment(2)  State Fail(1)
  Bit0(7032)  Bit1(1035)  Mark(997) Junk(1)
```

Figure 10-65 Working IRIG Status Display

The first section “Raw accumulated bit data” is an internal table of the converted amplitude modulated bit sequences. There are 10 buckets that accumulate 10 words of IRIG data.

Notice that only the first four sections appear to be populated.

Seconds: 48 : divide the 10’s position by 2 = 28, divide this by 2 = 14
Minutes: 26 : divide the 10’s position by 2 = 16
Hours: 25 : divide the 10’s position by 2 = 15
Days: E0 : divide the 10’s position by 2 = 70

The Days spill over into the next cell (contains 0x00000000 above), and are days * 100.
The next cell, or 6th position, may contain the year in certain IRIG units.

Some IRIG controllers will send the year as well within this group of 10 accumulators, but most do not. Therefore, the year must be manually sent by the Configuration application and calculated by the Interface Module (when it detects midnight crossing on December 31st).

Other IRIG controllers will include Seconds in Day, which can be used to verify Hours, Minutes, and Seconds. And still other IRIG controllers can send tenths and hundredths of seconds.

As stated: The next two arrays are generally not turned on except for debugging.

These two arrays are consecutive counts of 0 pulses and 1 pulses that will identify the bit as a 0 or 1, and additionally whether this is a mark.

If the 1 pulse count is equal to 2 and the 0 pulse count is equal to 8, then this is a ‘0’ bit.
If the 1 pulse count is equal to 5 and the 0 pulse count is equal to 5, then this is a ‘1’ bit.
If the 1 pulse count is equal to 8 and the 0 pulse count is equal to 2, then this is a mark.
Any other combination is considered junk.

Zero Crossing counts should occur at a rate of 1,000 per second. Do the math: Since it takes 10 pulses to identify 1 bit, and 10 bits to identify 1 word and 10 words to identify a complete time stamp, that uses up all 1,000 Zero Crossing Interrupts.

The logic side of the zero crossing is set to interrupt only on a negative to positive crossing of a sinusoidal waveform. Then, 250ms past that should be the apex of the waveform. Depending on the amplitude at this point determines if this is a 0 or 1 pulse.

The next set of numbers are the statistics for the zero crossing described above.

The final set of statistics describe the success of the IRIG functions within the Interface Module.

- **IRIG Gap Count** – When computing one complete time stamp to the next, we test to see if all of the seconds are contiguous, and that we haven't missed any time stamps. It a missed timestamp was detected, then this gap counter is incremented.
- **Mark-Mark** – Two consecutive marks indicate the end of a timestamp transmission from the IRIG controller.
- **Successful Time Assemblies** – This counter is incremented when the correct number of raw table entries has been completed.
- **Timer Increment** – This counter is incremented by the Interface Module each time it own timer routines detects that the IRIG function did not update the number of seconds in time. The time is updated by the IM.
- **State Fail** – This counter is incremented each time an invalid sequence of 0 and 1 pulses is detected, or an incorrect number of assembled raw data items are encountered.
- **Bit0** - Total hash count of bit-0's detected.
- **Bit1** - Total hash count of bit-1's detected.
- **Mark** - Total hash count Mark's detected.
- **Junk** – This counter is incremented each time an invalid sequence of 0 and 1 pulses is detected.

10.6.3.7. Request All Log Messages

The Interface Module has a buffer in volatile memory for logged messages. Messages are queued in this circular buffer and are sent as they become available. If a user want to see all of the messages from as far back as possible, then this command is what is needed.

10.6.3.8. Request Revisions

This command will request three different collections from the IM and AM units:

1. Request Revisions
2. Request Build Numbers
3. Request AM Configuration CRC's

All three are displayed, one after the other, for Request Revisions:

```
SendAdministrativeRequest - cmd(76) Request Module Revision Numbers

Response to Request for Revisions
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
SendAdministrativeRequest - cmd(75) Request Module Build Numbers
```

```
(WR) Interface Module Administrative Command Completed

Response to Request for Builds
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
0849 0849 0849 0849 0849 0849 0849 0849 0849 0849
0849 0849 0849 0849 0849 0849 0849 0849 0849 0849
SendAdministrativeRequest - cmd(81) Request Module AM CRC's
(WR) Interface Module Administrative Command Completed

Response to Request for AM CRC's
IM Rev 4.0 Build(4441) Date Mon Mar 11 11:28:28 2013
The Matrix Array is (10 x 2).
7110 1977 CEB5 C9B9 1E7B 761C A1DE 7804 AFC6 C7A1
1063 176F C0AD A8CA 7F08 0B5F DC9D B4FA 6338 6434
(WR) Interface Module Administrative Command Completed
```

Figure 10-66 Request Revisions Display

10.6.3.9. Run –

The hyphen or dash terminating this command indicates that this command in not available for requests at this time. Normally this command is used to force the Interface Module into "Run" mode from an uncompleted configuration change (Very Dangerous).

10.6.3.10. Send Date

The Send Date command is for units without the benefit of a GPS or IRIG time unit.

```
SendAdministrativeRequest - cmd(43) Send the date(YEAR) to the IM
(WR) Interface Module Set Date/Time Completed
```

10.6.3.11. The Push buttons and toggle switches:

The first 5 switches behave generally the same as would an actual switch connected to the IM. The difference being the “Test” switch, which doesn’t need to be held down for 5 seconds or so to initiate an operational test. Each of these switches sends a separate pressed and released event.

These switches should not be used for “magical” switch operations defined in the IM engineering operating guide.

The toggle switches are different. These are designed in the IM to be on for long periods of time for testing purposes. If these switches are used in the configuration application concurrently with someone actually toggling the hardware version on the same IM, this could prove problematic with indeterminate and unpredictable results.

The bright construction yellow “Note” button displays the following when pressed:

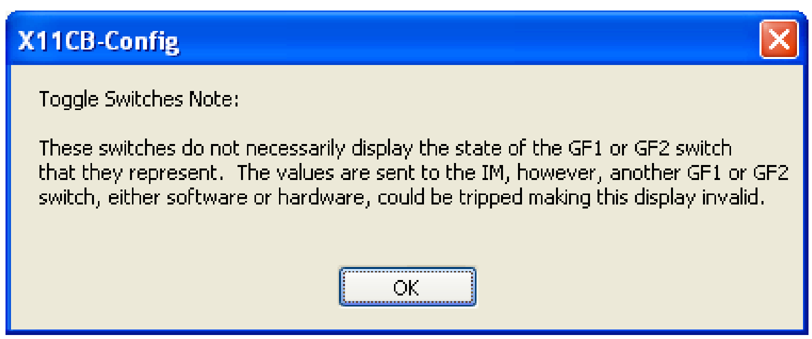
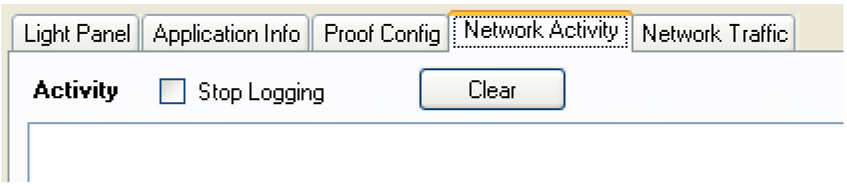


Figure 10-67 Push Buttons and Toggle Switches and Note MessageBox

10.6.4. Network Activity

Permissions: Administrator or Remote



From the description and general looks, this appears as another “Application Info” tab page, and in general it is. The network traffic would clutter and confuse the myriad of messages already displayed in the “Application Info”.

This is an administrative helper page that could provide some clues as to communications problems that may occur between this application and the Interface Module.

10.6.5. Network Traffic

Permissions: Administrator or Remote

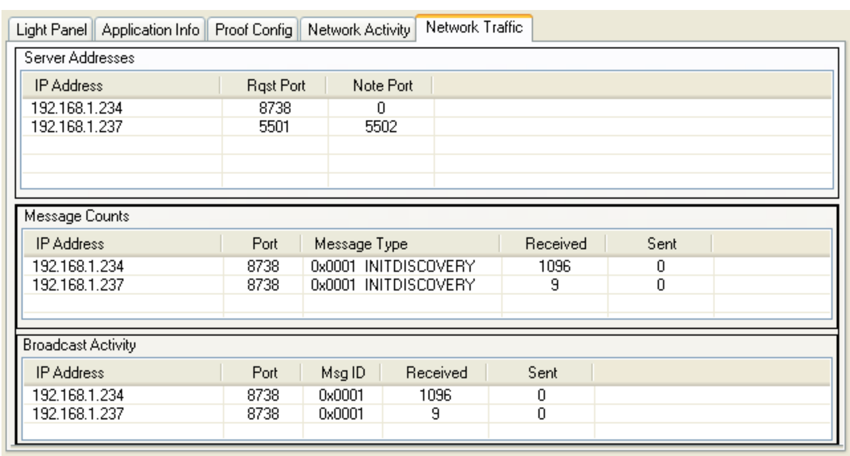
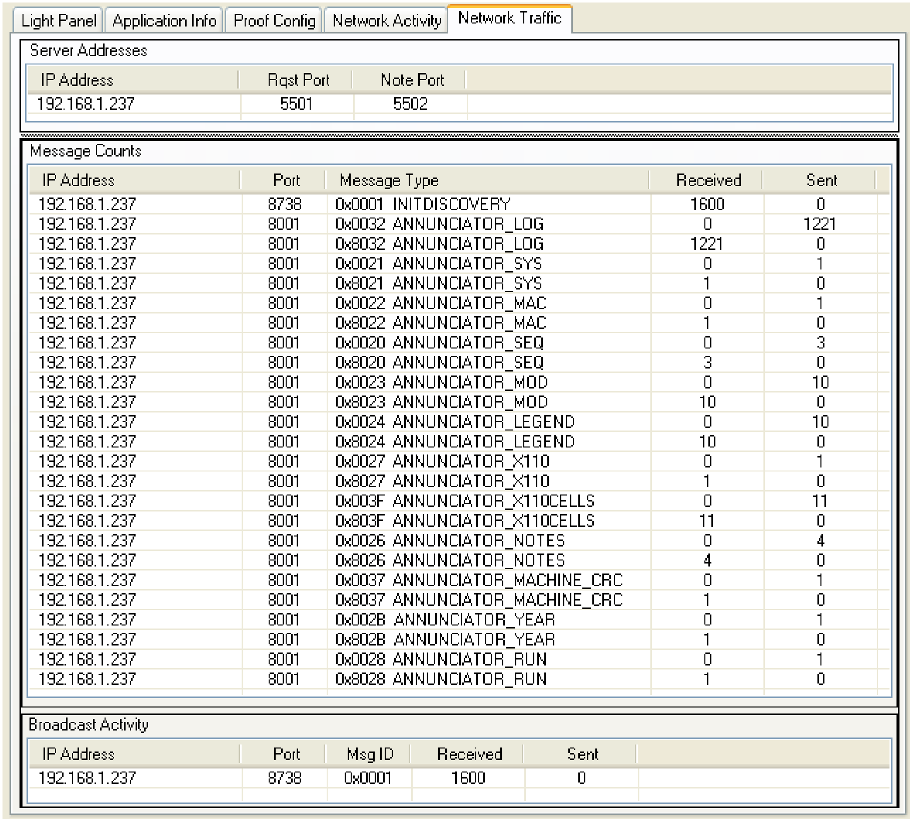


Figure 10-68 Network Traffic – minimally populated

This tab provides a catalog of messages sent and received to this application. As traffic increases between this application and the Interface Module, more and more entries are added to the tables.

After uploading a new configuration, the “Message Counts” table will be updated:



IP Address	Rqst Port	Note Port
192.168.1.237	5501	5502

Message Counts

IP Address	Port	Message Type	Received	Sent
192.168.1.237	8738	0x0001 INITDISCOVERY	1600	0
192.168.1.237	8001	0x0032 ANNUNCIATOR_LOG	0	1221
192.168.1.237	8001	0x8032 ANNUNCIATOR_LOG	1221	0
192.168.1.237	8001	0x0021 ANNUNCIATOR_SYS	0	1
192.168.1.237	8001	0x8021 ANNUNCIATOR_SYS	1	0
192.168.1.237	8001	0x0022 ANNUNCIATOR_MAC	0	1
192.168.1.237	8001	0x8022 ANNUNCIATOR_MAC	1	0
192.168.1.237	8001	0x0020 ANNUNCIATOR_SEQ	0	3
192.168.1.237	8001	0x8020 ANNUNCIATOR_SEQ	3	0
192.168.1.237	8001	0x0023 ANNUNCIATOR_MOD	0	10
192.168.1.237	8001	0x8023 ANNUNCIATOR_MOD	10	0
192.168.1.237	8001	0x0024 ANNUNCIATOR_LEGEND	0	10
192.168.1.237	8001	0x8024 ANNUNCIATOR_LEGEND	10	0
192.168.1.237	8001	0x0027 ANNUNCIATOR_X110	0	1
192.168.1.237	8001	0x8027 ANNUNCIATOR_X110	1	0
192.168.1.237	8001	0x003F ANNUNCIATOR_X110CELLS	0	11
192.168.1.237	8001	0x803F ANNUNCIATOR_X110CELLS	11	0
192.168.1.237	8001	0x0026 ANNUNCIATOR_NOTES	0	4
192.168.1.237	8001	0x8026 ANNUNCIATOR_NOTES	4	0
192.168.1.237	8001	0x0037 ANNUNCIATOR_MACHINE_CRC	0	1
192.168.1.237	8001	0x8037 ANNUNCIATOR_MACHINE_CRC	1	0
192.168.1.237	8001	0x002B ANNUNCIATOR_YEAR	0	1
192.168.1.237	8001	0x802B ANNUNCIATOR_YEAR	1	0
192.168.1.237	8001	0x0028 ANNUNCIATOR_RUN	0	1
192.168.1.237	8001	0x8028 ANNUNCIATOR_RUN	1	0

Broadcast Activity

IP Address	Port	Msg ID	Received	Sent
192.168.1.237	8738	0x0001	1600	0

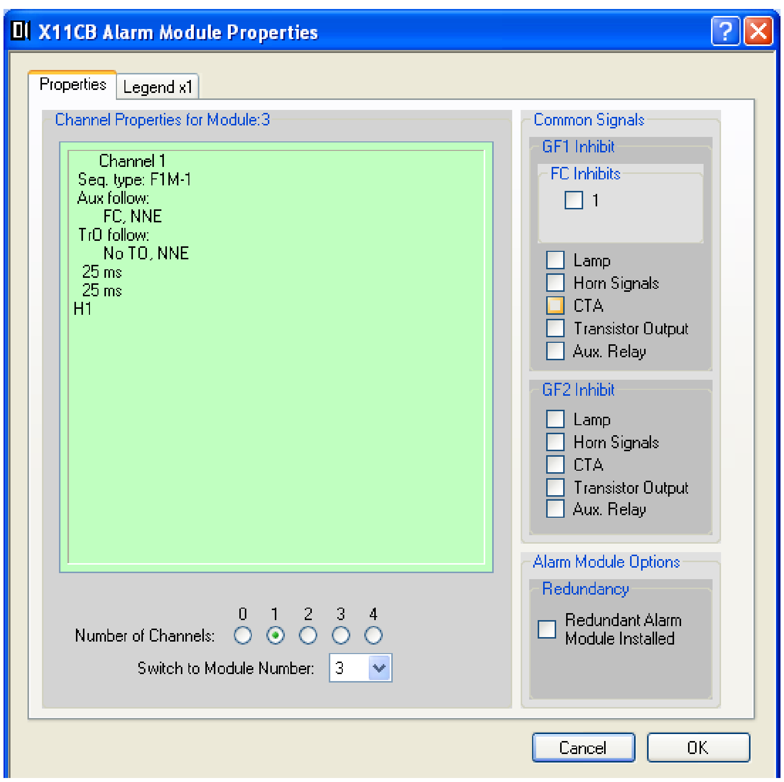
Figure 10-69 Network Traffic – populated after uploading configuration

11. ALARM MODULE Configuration

Alarm Module configuration variables are configured using the Light Panel Tab. When the Light Panel Tab is selected the Light Panel folder will display the entire X11CB system as it was configured in the Interface Module Setup Menu.

11.1. Individual Input Channel Configuration

Each Alarm Module can contain from 1 to 4 input channels for monitoring. Each one of these channels that are active must be configured to the user's requirements in order to operate properly. This section describes the method in which these configuration variables are configured. The user must select the Light Panel to allow access to the Alarm Modules configuration menu. The Light Panel folder will display the entire X11CB system as it was configured in the Interface Module Setup Menu. To access an Alarm Modules properties dialog, the user must double click on the Alarm Module to be modified. The "Alarm Module Properties" dialog box will display.



The Properties Dialog Box displays two tabs, Properties and Legend.

Selection of the Properties tab displays each of the assigned channel and their basic configuration as well as the assignments for the inhibit features for that Alarm Module.

Figure 11-70 X11CB Alarm Module Properties Dialog

11.1.1. Channel Properties Window

Near the bottom of this window there are 5 radio buttons defining the number of channels. The five possible choices are 0 through 4.

Notice as walking through all of these that elements of this dialog are dynamic.

When 0 channels is selected, No Legends tab is made available.

Only Modules with 1 or 2 channels will have an addition "Alarm Module Options" window at the bottom right of the dialog.

As well, the number of FC Inhibits check boxes corresponds with the number of channels selected.

Also notice that there is a "Switch to Module Number" at the bottom of this window. This is a quick "jump to" that Alarm Module without having to go back to the "Light Panel".

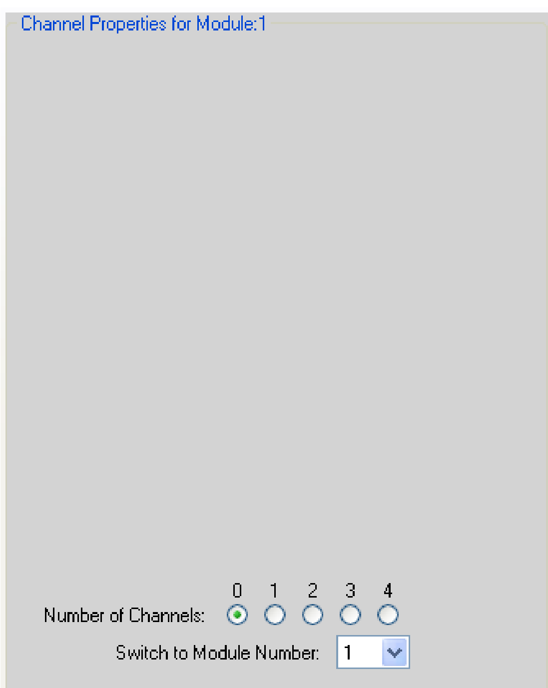


Figure 11-71 Channel Properties with 0 Channels

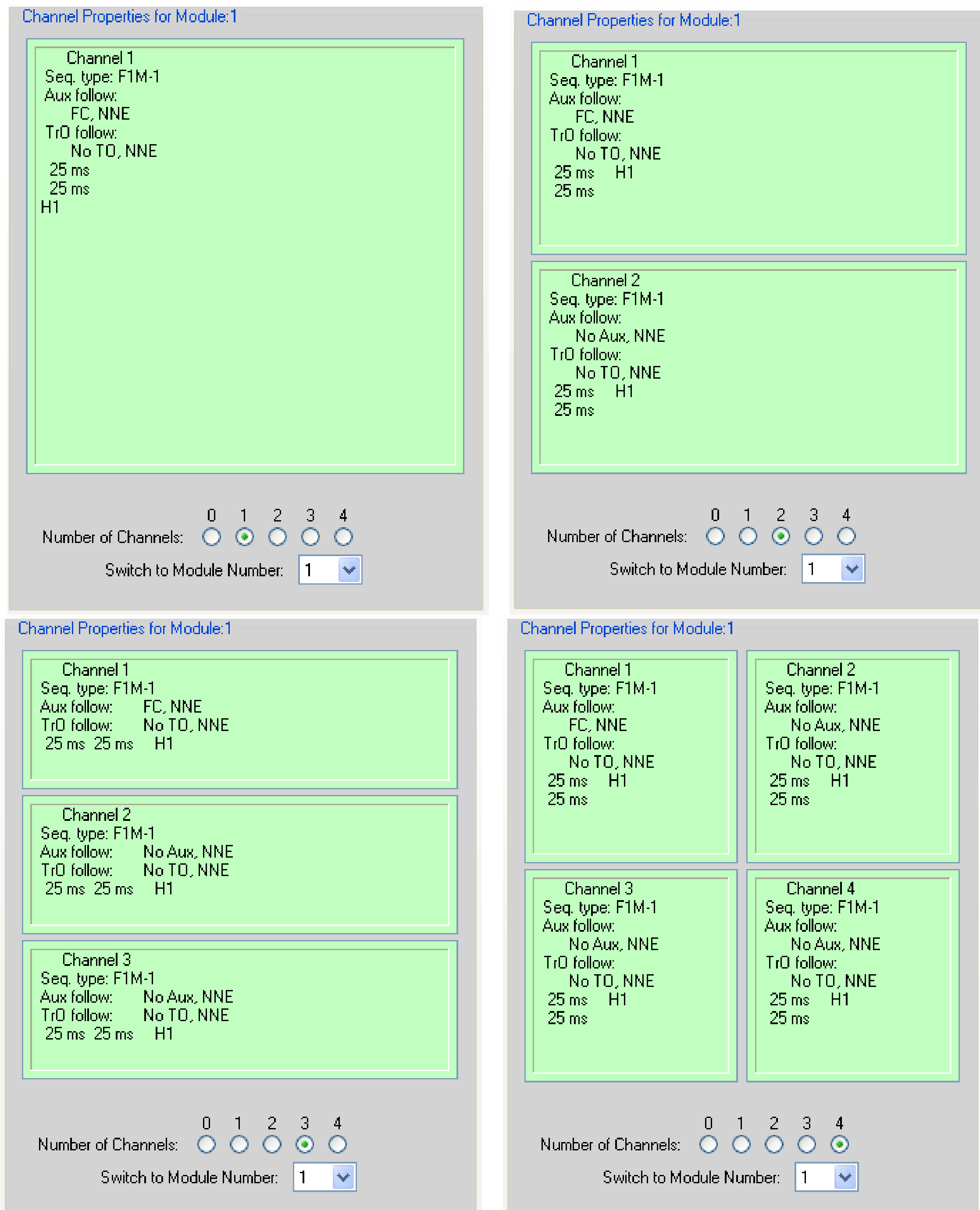


Figure 11-72 Channel Properties with 1, 2, 3, and 4 channels

Each of the 4 selections with channels will have a legends tab alongside the Properties tab.

Each of these are displayed accordingly:

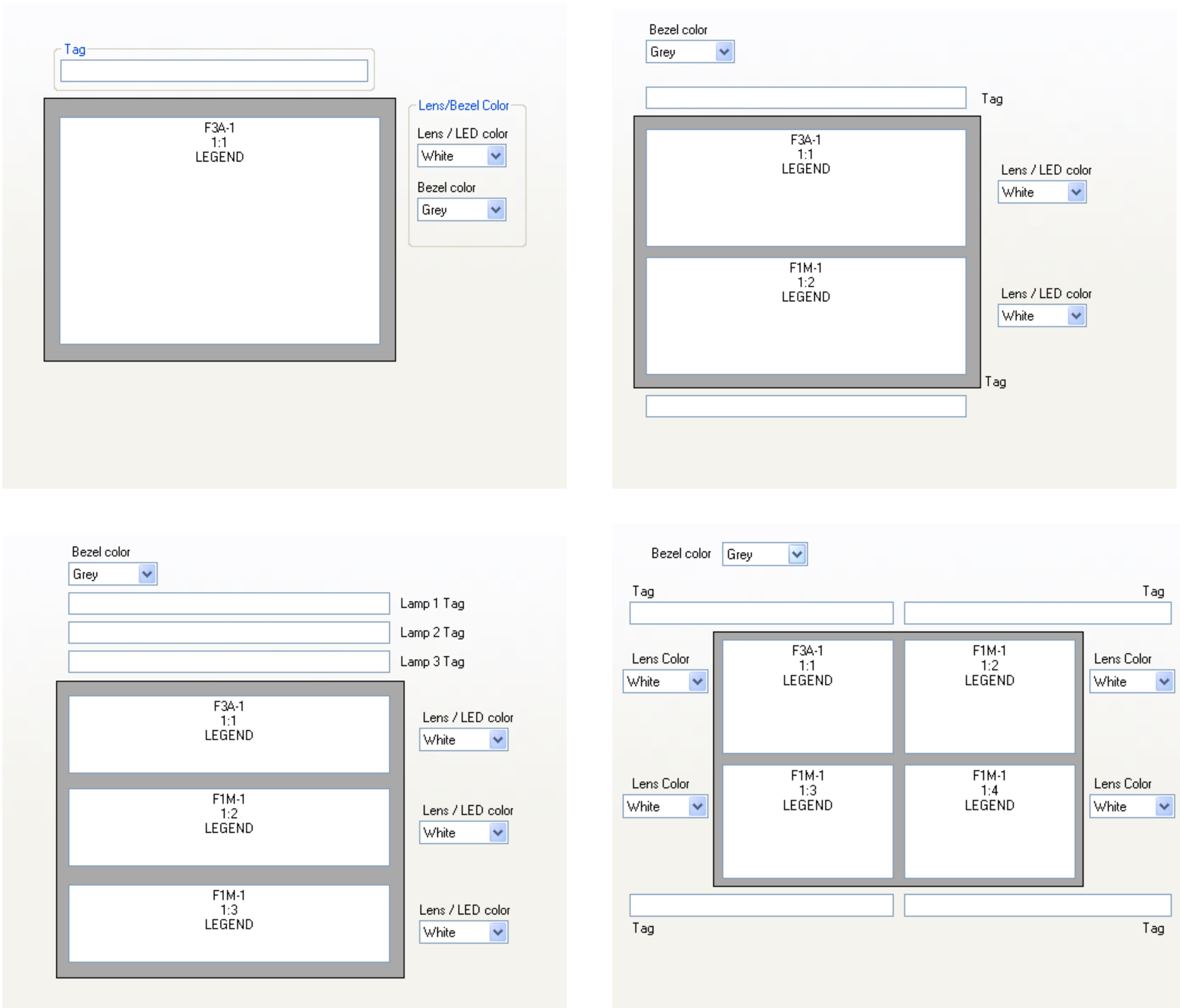


Figure 11-73 Channel Legend Properties with 1, 2, 3, and 4 channels

Each Alarm Module can only have a single Bezel color. Each individual channel can have its own Lens color (or LED color).

Then: Each channel defined has its own

1. Tag Identifier
2. Lens Color
3. Legend (what is printed on the lens)

The physical hardware on the Alarm Module cannot detect the color of the bezel or the different LED colors, but it is important to match the configuration software with the physical device to help communicate with operators as to the alarm in question. This is of particular importance when the software display using the X11CB AlarmView application in an area that is not near the physical display. It also helps standardize the visual displays, physical and virtual.

11.1.2. Bezel Color

Currently there are eight available colors for the Bezel on an Alarm Module.

1. Black
2. Brown
3. Red
4. Yellow
5. Green
6. Blue
7. Grey
8. White

The different colors allow for distinct differentiation between groups of internal system's function, e.g., same sequence, first out groups, common alarm groups etc., or plant and process groups of similar functions.

11.1.3. Tag Identifier

The Tag identifier is a user define field that can be up to 30 characters long. This could be a company standard for points in a system, an alpha-numeric identifier that describes a class or alarms, a group of alarms, or the location of alarm points. This field is useful when extracting data from the database to produce specific reports.

11.1.4. Lens / LED color

The Lens color is a term from legacy displays. Currently, different color LEDs are used in place of a lens filter. The number of colors available in the configuration application is six, but more may be available depending on customer demand. The six standard colors are:

1. Red
2. Yellow
3. Green
4. White
5. Blue
6. Amber

The different color LED lamps behind the white lens is required to indicate alarm functions such as High or Low, or to distinguish between alarm and shutdown functions.

11.1.5. Legend Area / Nameplate Engraving / Printing

The Legend area on the Nameplate is proportional to the number of panes (channels) on the individual Alarm Module. The Window Annunciator can be supplied with engraved letters for all different models of bezels, or customized with laser printed lettering on heat resistant, translucent thin film material.

The physical characteristic of this display may not exactly match that of the software rendering. The software will render the lettering in the box based on the size and shape of the area available for that alarm. A number of lines for each panel are available and do not necessarily have to match the physical printing. Lines are kept intact, but the font size or any individual alarm channel will be constant across all of the lines. An algorithm to compute font size is applied for best fit on each individual panel.

There is a variable number of characters per pane/channel, rather than a fixed number per channel. The total number of characters per Alarm Module is 250.

11.2. Alarm Module Channel Assignment

The "Number of Channels" should match the physical number of windows for that particular Alarm Module within the system.

Each of the selected channels must be individually configured. If a system has duplicate configurations for groups of input channels, a copy and paste channel is available. This feature is described within this section of the manual, see section "Saving and Copying Channel Properties".

11.3. Copy Channel Configuration

With any single channel configured with the necessary operating parameters, it can be copied into the other channels of this module. Right click within the Channel Properties for the configured module and click "Copy channel 1 to all other channels in this Module?". This will transfer the configuration from this channel to the remaining channels.

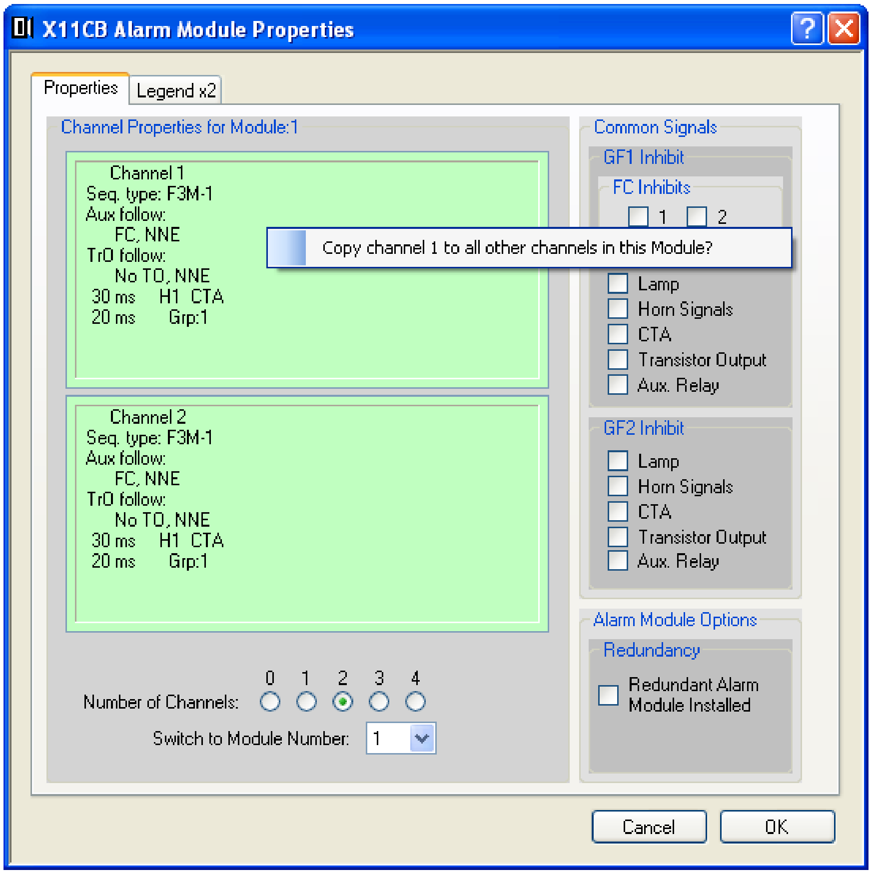


Figure 11-74 X11CB Alarm Module Properties, Channel Properties sub-menu

11.4. General Function Inhibit Switches

The General Function Inhibit Switches are typically toggle style switches, although they could be momentary push button switches. The two groups are identical with the exception that GF1 includes Field Contacts.

11.4.1. Field Contact Inhibit

When the Field Contact is inhibited, then this input is ignored. No alarm will be set and no event will be recorded for that contact during this inhibit.

11.4.2. Lamp Inhibit

When the Lamp is inhibited, then none of the lamps on that particular module will illuminate during a fault or test.

11.4.3. Horn Inhibit

This signal will be transmitted via event to the IM. The IM determines if the Inhibit is in force for that Module and decide whether to issue a 'logical OR' to either horn on the Interface Module.

11.4.4. CTA (Common Trouble Alarm) Inhibit

This signal will be transmitted via event to the IM. The IM determines if the CTA Inhibit is in force for that Module and decide whether to issue a 'logical OR' to the CTA output on the Interface Module.

11.4.5. Transistor Output Inhibit

This inhibit is for the local channel on the Alarm Module and will determine if that output should activate. The event will still be transmitted to the IM.

11.4.6. Auxiliary Relay Output Inhibit

This inhibit is for the local channel on the Alarm Module and will determine if that output should activate. The event will still be transmitted to the IM.

11.5. Redundancy (Redundant Alarm Module)

The Alarm module for series 1000 and 2000, those with one or two channels, can have the option of having a second controller on the Alarm Module. The second controller also requires a separate Interface Module. While communications from the Interface Module to the Alarm Modules usually take place over the CAN-A bus, the Redundant controllers use the CAN-B bus. As well, the Redundant Interface Module will also have its own IP Address.

The Redundant Alarm Modules share some of the lamps for their respective side of the common alarm. Each will control half of the lamps. As well, Transistor output and Auxiliary Relay output are also split between the two controllers.

11.6. Alarm Module Channel Properties

Double click the appropriate window (channel) from the "Channel Properties" dialog box. The Channel Properties for the selected Alarm Module and Channel should now be displayed and should look similar to the following:

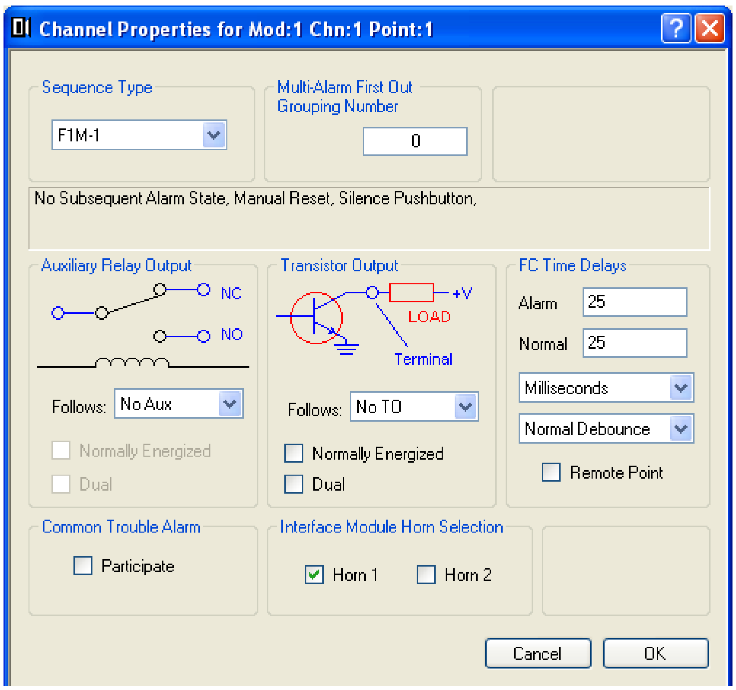
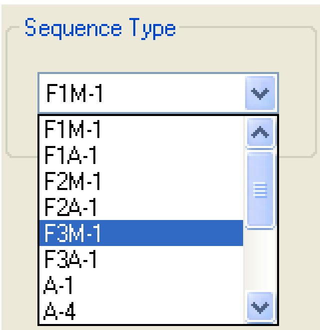


Figure 11-75 Individual Channel Properties Dialog

This dialog has 8 significant sections:

1. Sequence Type
2. Group
3. Sequence Type Description
4. Auxiliary Relay Output
5. Transistor Output
6. FC Time Delays
7. Common Trouble Alarm
8. Horn Selection

11.6.1. Sequence Type



Each input channel must have a specific sequence type assignment. The Sequence type drop down box allows the user to define what alarm sequence will be used for the selected input channel.

There are 14 different standard ISA sequence types available for selection. They are F1M-1, F1A-1, F2M-1, F2A-1, F3M-1, F3A-1, A-1, A-4, A-4, 5, 6, M-1, R-1, R-12, and RFAH.

Figure 11-76 Sequence Types

An information box will display a basic description of the currently selected sequence just below the Sequence Type. Please refer the Alarm Sequence Tables at the rear of this manual for a thorough description of each of the available sequences.

11.6.2. Grouping Number

There are certain sequences that utilize the ME_I/O signal to help provide a First Out signal. This allows multiple input channels to be grouped together to determine what input channel was the first to go into an alarm condition. The assignment of a group number is entered here and can be in the range from group number 0 to 65535. The assignment of the group number is for display purposes only.

The actual grouping of the Input channels is accomplished by physically connecting the ME_IO terminal of each of the grouped input channels together.

Additionally, the grouping can be verified by an Auto Group function available to this application. This will eliminate the need to manually enter this number.

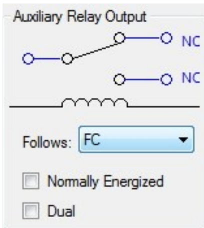
A sub-menu under the Module menu will begin this procedure:

11.6.3. Sequence Type Description

This area will contain a computer generated verbose description using the abbreviated code from the sequence type.

11.6.4. Auxiliary Relay Output

An auxiliary relay output is available for every input channel within the X11CB system. An optional auxiliary relay board is available that provides relay contact outputs at the output terminals for each input channels within an individual alarm module. How this relay output functions is determined by the setting of the Auxiliary Relay Output variable Follows.



There are 5 options for this field, No Aux, FC, FC->ACK, ALARM and HORN. The auxiliary relay output will mimic what ever item is selected in the list. For example, if FC is selected, the auxiliary relay will be active when the field contact input is in an abnormal state and when it is normal state the relay will be non active.

As shown above in the Auxiliary Relay Output section, there are two radio buttons labeled Normally Energized and Dual. When checked the Normally Energized button will command the auxiliary relay output to be in an energized state when the output is not active and not energized when it is in an active state. If it is not checked the output will be in a non energized state when it is active and in an energized state when it is inactive.

Help for AUX Normally Energized checkbox

Normally Energized option for the relay output

When FC, ACK, ALARM or HORN is chosen for the relay-triggering signal,
the Normally Energized check box becomes activated.
By default, the relay output is set to Normally Not-Energized.
When this box is checked, the state of an event gets reversed,
so that it stays active in its normal state, but inactive in
its alarm state.

The second radio button labeled Dual only becomes enabled when the number of input channels is equal to 1 or 2. This feature allows 2 relays to be assigned as outputs for a single input channel. Since the total number of relays on an auxiliary relay board is 4, it can only support 2 channels of dual relay outputs.

Help for 'AuxDual' checkbox

The 'AuxDual' checkbox is available for the 1000 and 2000
series Alarm Modules, and not available for 3000 and 4000 types.
This will allow Aux Relays 1 and 2 to energize in unisyn for
the 1000 series Alarm Modules.
For the 2000 series, this will allow Aux Relays 1 and 3 to energize
in unisyn for channel 0, and relays 2 and 4 to energize in
unisyn for channel 1.

Help for Auxiliary Relay Output

Choose the signal that will trigger the Auxiliary Relay Output signal from the
IM. The result depends on the sequence type of each channel.

No AUX (No Auxiliary Relay Output)

Auxiliary Relay output is not available.

FC (Field Contact)
If the Field Contact input is not normally energized:
º When the Field Contact goes into an alarm condition, auxiliary output becomes energized.
º When the Field Contact returns to normal condition, auxiliary output becomes de-energized.

If the Field Contact input is normally energized
º When the Field Contact is in an alarm condition, auxiliary output becomes de-energized.
º When the Field Contact returns to normal condition, auxiliary output becomes energized.

FC->ACK (Acknowledge)
If the Field Contact input is not normally energized:
º When the Field Contact goes into an alarm condition, the auxiliary output becomes energized.
º When the acknowledge button connected to the IM is pressed, auxiliary output becomes de-energized.

If the Field Contact input is normally energized
º When the Field Contact goes into alarm condition, auxiliary output becomes de-energized.
º When the alarm is acknowledged on the IM, the auxiliary output becomes energized.

ALARM (Alarm Simulator)
If the Field Contact input is not normally energized:
º When the Field Contact goes into alarm condition, auxiliary output becomes energized.
º When the alarm is acknowledged, auxiliary output stays energized.
º When the alarm returns to normal, auxiliary output becomes de-energized.

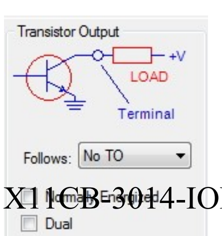
If the Field Contact input is normally energized:
º When the Field Contact goes into alarm condition, auxiliary output becomes de-energized.
º When the alarm is acknowledged, auxiliary output stays de-energized.
º When the alarm returns to normal, auxiliary output becomes energized.

HORN 1& 2
If the Field Contact input is not normally energized:
º When the Field Contact goes into alarm condition, the audio device becomes active.
º When the horn is silenced, the audio display goes OFF

If the Field Contact input is normally energized:
º When the Field Contact goes into alarm condition, the audio device becomes inactive.
º When the horn is silenced, the audio display turns ON.

11.6.5. Transistor Output

A transistor output is available for every input channel within the X11CB system and is available at the output terminals for each input channel within an alarm module. How this transistor output functions is determined by the setting of the Transistor Output variable Follows.



There are 6 options for this field, No TO, FC, FC->ACK, ALARM, HORN and LAMP. The transistor output will mimic what ever item is selected in the list. For example if FC is selected, the transistor output will be active when the field contact input is in an abnormal state and when it is normal state the transistor output will be non active.

As shown above in the Transistor Output section, there are two radio buttons labeled Normally Energized and Dual. When checked the Normally Energized button will command the transistor output to be in a low output state when the output is not active and high output state when it is in an active state. If it is not checked the output will be in a high output state when it is active and in a low output state when it is inactive.

The second radio button labeled Dual only becomes available when the number of input channels is equal to 1 or 2. This feature allows 2 transistor outputs to be assigned as outputs for a single input channel. Since the total number of transistor outputs on an alarm module board is 4, it can only support 2 channels of dual transistor outputs.

Help for 'TODual' (Transistor Out dual) checkbox

The 'TODual' checkbox is available for the 1000 and 2000
series Alarm Modules, and not available for 3000 and 4000 types.
This will allow Transistor Outs 1 and 2 to energize in unisyn for
the 1000 series Alarm Modules.
For the 2000 series, this will allow Transistor outs 1 and 3 to energize
in unisyn for channel 0, and Transistor outs 2 and 4 to energize in
unisyn for channel 1.

Help for Transistor Output

Choose the signal that will trigger the Transistor Output signal from the IM.
The outcome depends on the sequence type of each channel.

No TO (No Transistor Output)
The signals are ignored.

FC (Field Contact)
If the Field Contact input is not normally energized:
º When the Field Contact goes into an alarm condition, transistor output turns ON
º When the Field Contact returns to normal condition, transistor output turns OFF.

If the input is normally energized
º When the Field Contact is in an alarm condition, transistor output turns OFF.
º When the Field Contact returns to normal condition, transistor output turns ON.

FC->ACK (Acknowledge)
If the input is normally not energized:
º When the Field Contact goes into an alarm condition, transistor output turns ON.
º When the alarm is acknowledged, transistor output turns OFF.

If the input is normally energized

º When the Field Contact goes into alarm condition, transistor output turns OFF
º When the alarm is acknowledged, transistor output turns ON.

ALARM (Alarm Simulator)

If the input is normally not energized:

º When the Field Contact goes into alarm condition, transistor output turns ON.
º When the alarm is acknowledged, transistor output stays ON.
º When the alarm returns to normal, transistor output goes OFF.

If the input is normally energized:

º When the Field Contact goes into alarm condition, transistor output turns OFF.
º When the alarm is acknowledged, transistor output stays OFF.
º When the alarm returns to normal, transistor output turns ON.

HORN 1& 2

If the input is normally not energized:

º When the Field Contact goes into alarm condition, the audio device becomes active.
º When the silence button connected to the IM is pressed, the audio display turns OFF.

If the input is normally energized:

º When the Field Contact goes into alarm condition, the audio device becomes inactive.
º When the horn is silenced, the audio display turns ON.

LAMP ALARM

If the input is normally not energized:

º When the Field Contact goes into alarm condition, the lamp starts fast flashing.
º When the alarm is acknowledged, the lamp becomes steady ON.
º When the alarm returns to normal, the lamp goes OFF.

If the input is normally energized:

º When the Field Contact goes into alarm condition, the lamp starts fast flashing.
º When the alarm is acknowledged, the lamp goes OFF.
º When the alarm returns to normal, the lamp goes ON.

11.6.6. Field Contact Input Delay Times

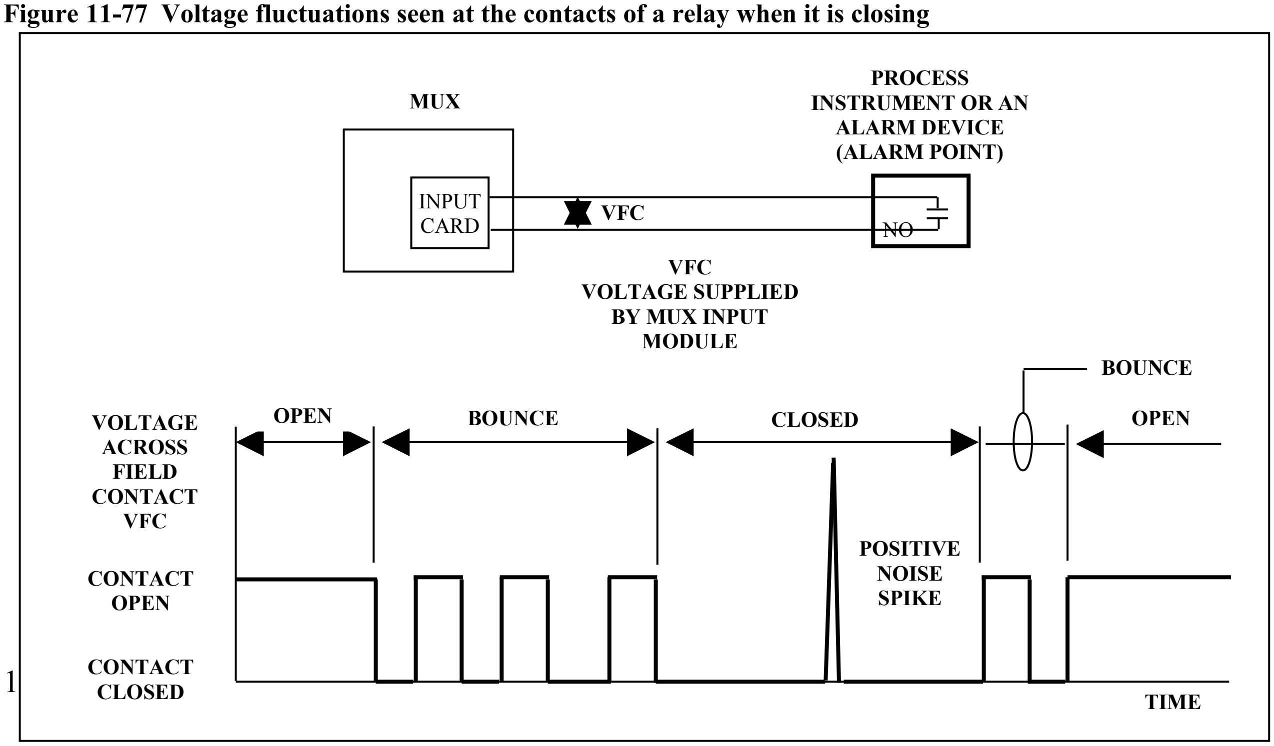
The following sections provide a detailed discussion of filtering techniques.

Reasons for Filtering:

The figure below shows the voltage fluctuations seen at the contacts of a relay when it is closing. When the contacts begin to make a closure, they touch and bounce apart due to the mechanical spring action in the arm of the contact. The bounce continues until the spring action is overcome. A steady contact closure results when the oscillation finally settles. The same type of contact bounce occurs during separation of the contacts. The contacts oscillate as the spring is depleted of its energy. Each time the contacts touch and bounce apart, the voltage at the contact changes. The actual time required, for contacts to reach a final point, varies with the type of device used (i.e., snap-action switch, mechanical or solid-state relays). The manufacturer generally supplies a specification sheet, which states the electromechanical operating time.

If the monitoring system was allowed to remain active during a transient period, each change in the voltage seen at the contacts would trigger a new event (alarm or return-to-normal). Since the voltage shown in the following figure changes 15 times, the two actual events (one closure and one opening) erroneously generate 15 events. The X11CB incorporates two software-controlled filtering techniques, which greatly reduce the probability of triggering false events. The techniques are referred to as the “consecutive” filter and “integrating” filter methods. The following sections provide discussions and diagrams of each.

Figure 11-77 Voltage fluctuations seen at the contacts of a relay when it is closing

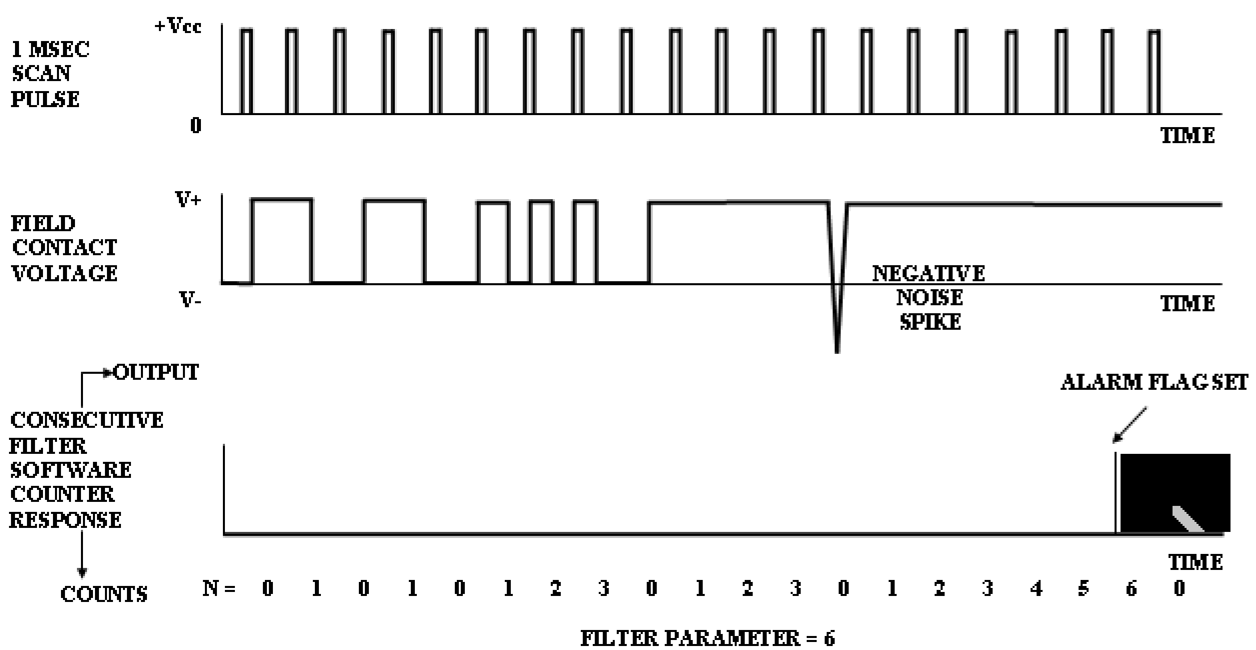


1

11.6.6.1. Consecutive Filtering Method:

The consecutive-type filter employs a counter for each input, which is activated when the monitoring system samples the input contacts. The contacts are scanned every millisecond (1/1000 of a second). The counter begins to tally when a change in the input status of a contact is first detected. If a specified number of consecutive scans reflect this change, an event is recorded. Should the input sample return to the original state before the specified number of consecutive scans elapses, the count returns to zero. In this manner, an event is only recorded if the duration of a change in the status of a contact exceeds a pre-programmed time limit. Each count is equal to one millisecond. A disadvantage of this filtering method is that a single noise glitch can reset the consecutive count. The figure below illustrates a consecutive type filter whose specified count is set for six. The top line represents the scan cycles or times at which the input contacts are sampled. The second line shows the voltage fluctuations seen at the contacts. The third line illustrates how the counter is either tallied or returned to zero. The shaded area represents the event being recorded once the count reaches six. A noise induced glitch, rather than contact bounce is able to reset the count to zero.

Figure 11-78 Consecutive type filter whose specified count is set for six

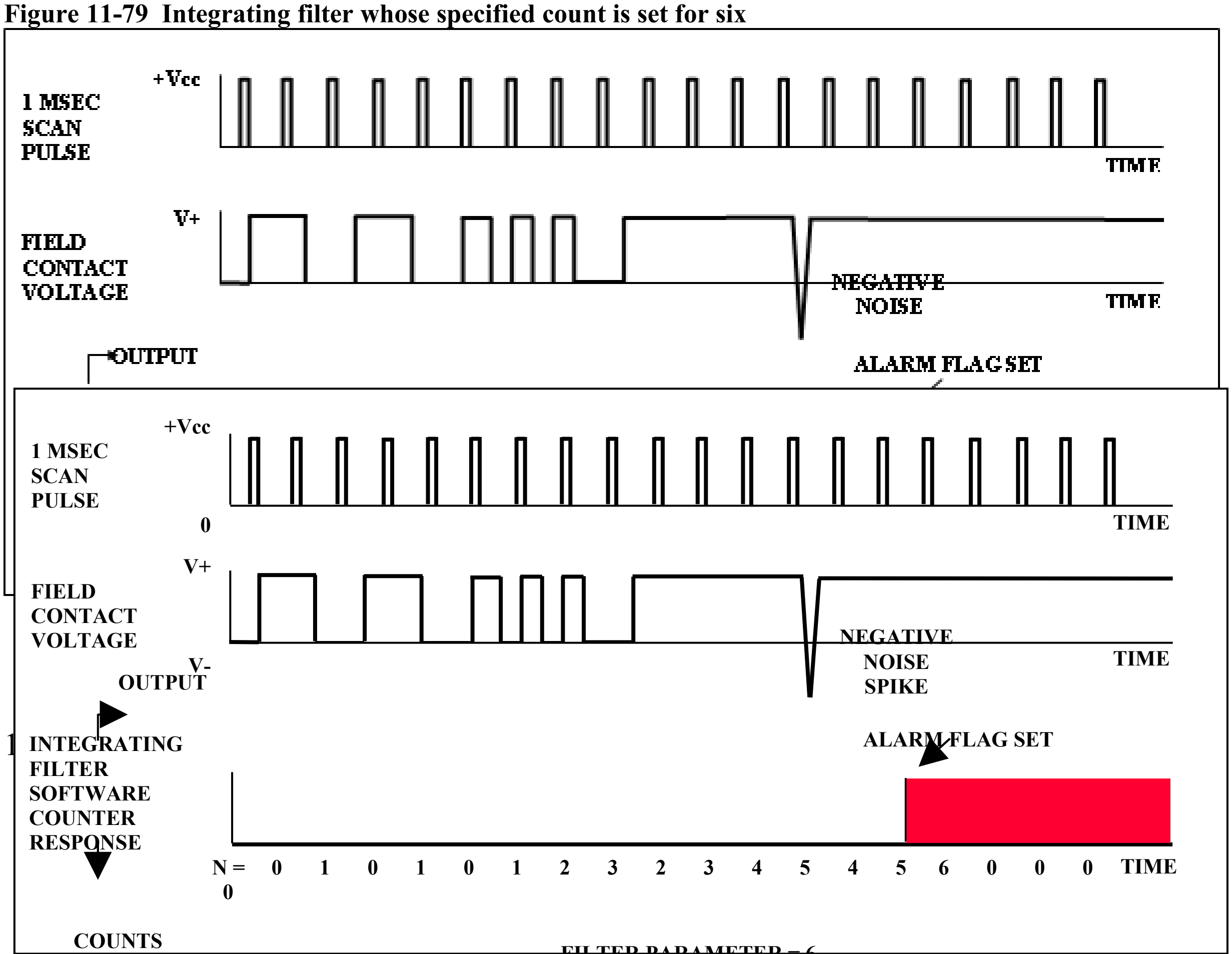


11.6.6.2. Integrating Filter Method:

The integrating filter method is similar to the consecutive filtering method approach, except an up/down counter is used to track the status of the contact. The process begins in the same manner as the consecutive state filter. The counter begins to tally when a change in the input status of a contact is first detected. During each scan in which the new contact status is maintained, the count is incremented by one. The event is recorded when the specified count is reached. (Each count equals one millisecond.) The difference is that an input sample that shows a return to the original state merely causes one unit to be subtracted from the count, rather than resetting the counter to zero. If the next scan reflects the change, the counter is again increased. Should the count be reduced to zero after the initial state has been maintained for a specified number of counts, the counter will remain at zero until a new change is detected. This method minimizes the influence of noise glitches that may not be achieved to the same extent when the consecutive filter method is utilized.

The figure below illustrates an integrating filter whose specified count is set for six. The top line represents the scan cycles, or times, at which the input contacts are sampled. The second line shows the voltage fluctuations seen at the contact. The third line shows the active count. The shaded area represents the event being generated once the count reaches six. Notice that the noise glitch only causes the loss of one scan time.

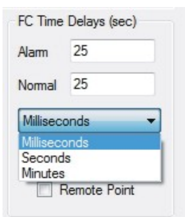
Figure 11-79 Integrating filter whose specified count is set for six



11.6.6.3. Alarm and Normal Field Contact Filter Time Constant

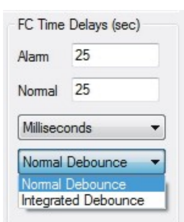
The field contact input filter time constant can be entered using the “FC Time Delays (sec)” portion of the channel properties menu. The value that is entered in the “Alarm” field defines the filter time constant for when the field contact transitions from a normal condition to an alarm condition. The value that is entered in the “Normal” field defines the filter time constant for when the field contact transitions from an Alarm condition to Normal condition.

11.6.6.4. Field Contact Filter Time Constant Units



The units for the Alarm and Normal Field Contact delays are determined by the pull down selection just below the FC Time Delay values. Three types of units are available, Milliseconds, Seconds and Minutes. The units selected will apply to both the Alarm and Normal Field Contact Delay values entered.

11.6.6.5. Field Contact Filter Type



As described earlier in this section of the manual either a consecutive filtering method or integrating filtering method can be applied to the Alarm and Normal Field Contact Filters. This single selection applies to both the Alarm and Normal filters. The drop down combo box for selecting the filter type can be found just below the Field Contact filter units selection.

Help for 'Debounce Type' Combobox

The 'Normal' debounce is the more common debounce type.
It waits until the Field contact is at a particular state,
On or Off, for the time period for the state to be recognized.
(Field Contact On and Off conditions)

The 'Integrated' debounce is the more esoteric debounce type.
It will sum or subtract 1 each time the Field Contact is tested.
It will not reduce the count below zero. The purpose of this
type of debounce is for those situations where a wave action
occurs at the Field Contact. Integrated will wait until the
state is stabilized.

Possible error messages:

```
"Delay values cannot be greater than 16,383"

"It is not recommended that debounce values be less than 20ms"
"Are these Delay values OK?"
```

If "NO" is selected for the above message, 20 is substituted for those values below 20.

11.6.6.6. Field Contact Source (Remote Point)

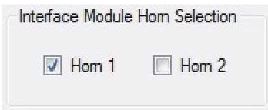
The source of a field contact input is typically a local input and is applied to the field contact inputs at the rear terminal for the respective Alarm Module. The source of the field contact can also be from a remote device. The Remote Point check box determines the source of the selected field contact input. If the check box is not checked the field contact input will be locally at the Alarm Module's field contact input terminals. If the check box is checked the field contact input will be from a remote point producing device.

11.6.7. Common Trouble Alarm Participation

The Common Trouble Alarm output is used to indicate to the operator that the field contact is in an alarm state. When the alarm sequence for any point in the system defines that the CTA will be driven when the point goes into an alarm that point will drive the system CTA line to an active state when it's field contact is in an alarm state. This action must be enabled at the point level by checking the Common Trouble Alarm "Participate" check box for that point. If the Participate check box has no check mark the CTA line will not be driven by the selected field contact input at all. The following image shows the Participate check box selected and will participate in drive the CTA line when appropriate.

11.6.8. H1 and H2 Selection

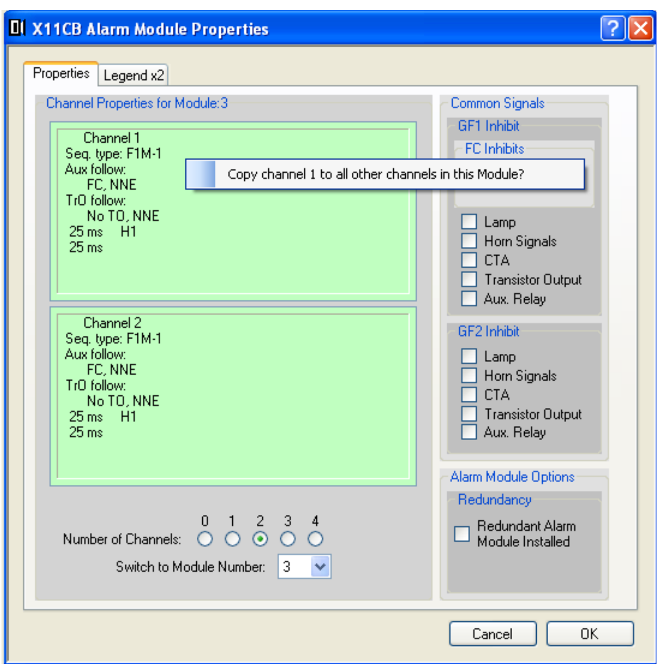
There are two other alarm type outputs H1 and H2. These can be used to indicate to the operator specific states that the field contact is currently in. This is determined by the alarm sequence selected for that particular point. When the alarm sequence defines that the H1 output be to driven to an active state it will only be driven if the Interface Module Horn Selection check box for H1 is checked. If it is not checked then the H1 line will not be driven by the selected field contact input at all. When the alarm sequence defines that the H2 output be to driven to an active state it will only be driven if the Interface Module Horn Selection check box for H2 is checked. If it is not checked then the H2 line will not be driven by the selected field contact input at all. The following figure shows the H1 being selected to participate in driving the H1 signal and H2 not being selected to participate in driving the H2 signal for selected field contact input.



11.6.9. Finishing Up

Once all the selected channel parameters have been configured to the desired functionality, click the "OK" button to save the configuration in memory, the "Cancel" button and exit icon will ignore the changes. This action will bring the operator back to the Module Properties dialog box.

If desired, this single channel of configuration can be copied into the other channels within the selected Alarm Module.



Right click on the channel that is the source of the copy, the message "Copy channel X to all other channel in this module?" should appear.

Click on this message and the configuration will be copied to the other channels that are present within the Alarm Module.

Click the "OK" button here to save the configuration to memory and return to the Configuration Main Screen view.

12. Upload the Configuration to the Interface Module

Connect the system in a manner described in this manual to allow the Configuration application to communicate with the X11CB Interface Module across the Ethernet.

Apply power to the X11CB Annunciator System. During initialization the X11CB system Alarm Modules will brighten and dim repeatedly for approximately 10 seconds while the Interface Module performs a variety of internal tests. These tests verify that the system's hardware is functioning properly. Once the Interface Module completes its internal power-on, all points will go to their normal conditions (typically lamps off) and begin processing their inputs.

Once the Interface Module completes its internal power-on tests, it reads the system configuration information that is stored in its non volatile internal memory. The Interface Module then polls each Alarm Module one at a time to verify that each Alarm Module is configured as per the Interface Module's non volatile configuration information.

Once the Alarm Modules have been verified to have the correct Alarm sequence and configuration they all begin the monitoring of their respective field contact input(s).

If the Alarm Modules have not yet been configured, they will continue to cycle bright and dim until they have been configured. In order to configure an Alarm Module that is not configured the X11CB Configuration Application must be utilized. This application provides the ability to save and recall system configuration data in an XML formatted file. System configuration data must be recalled (opened) before changes can be made to it.

Check that the correct configuration is opened and loaded in the Configuration application.

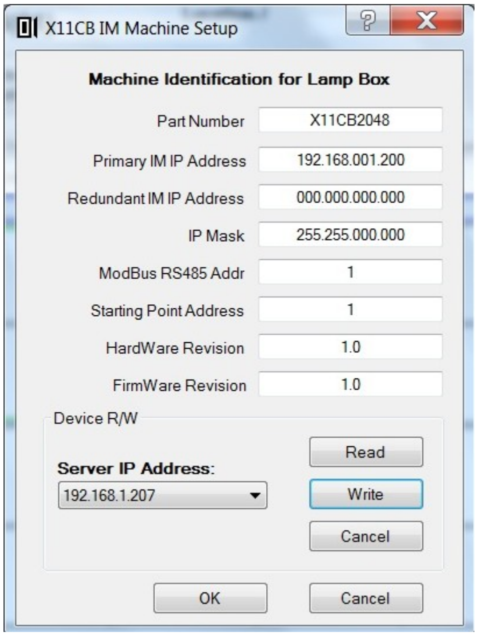
12.1. Connect to the Interface Module

Make certain that there is an Ethernet connection between the configuration application and the IM as described in this manual.

Connect to the IM using the menu, the toolbar icon, or the button on the main page.. See Connect described in this manual. (Module → Connection)

12.2. Upload the Machine Information

This operation only needs to be performed once, as the information specified is not likely to change.



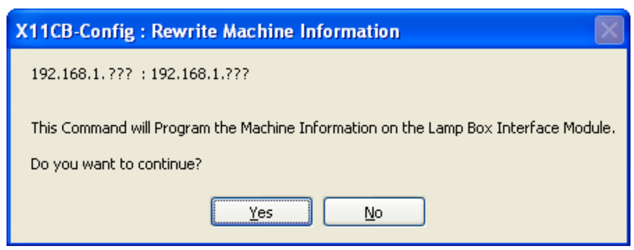
One important detail is the possibility that the target Primary IP address may not yet be used by the Interface Module. The example on the left shows this possibility. The Primary IP address ends with 200 and the Server IP Address, ends with 207. The current configuration wants the primary IP address to be 200, not 207.

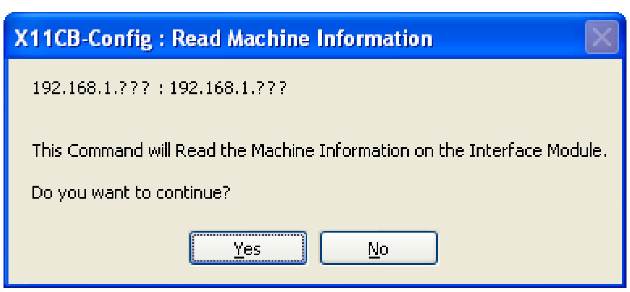
The Server IP Address in the Device R/W box is the Interface Module transmitting the Broadcast packet for the X11CB series. There may be more than one active Interface Module on the network.

It is not necessary to be connected beforehand when clicking the Read or Write buttons in the Device R/W box. Both of these buttons will perform an automatic connect if not already connected.

Clicking on "Write" will perform an automatic connect, with an acknowledgement message box:

The question marks are used here for demonstration purposes, they will identical to the Server IP Address.





Clicking on "Read" will read the Machine Information from the Interface Module and repopulate the dialog.

The information written, is written to the flash memory not working memory, and does not update the addresses, masks, and other information until the Interface Module unit is restarted (power down / up cycle). This allows the user to continue with the current IP address connection. This will also explain why a subsequent read does not read from the flash memory to update the dialog, it reads from working memory, which may appear to indicate that the transmission did not work. This feature can be used to undo the changes by performing the "Write" operation again.

12.3. Program the Alarm Modules

The configuration that was just entered or loaded is ready to be programmed into the X11CB. Connect to the Interface Module as described earlier.

Click the “Program Alarm Modules” option in the Module pull down menu to initiate the transfer of the configuration data to the X11CB system. A confirmation dialog box will appear asking if the programming of the Alarm Modules should continue. Click on the “Yes” button to program the X11CB system. Press “No” if programming the X11CB system is not wanted, or the destination IP address is incorrect.

For more information, see the Module → Program Alarm Module section of this manual.

13. COMPLEX System Configurations

Figure 13-80 Complex Network System Configurations

A more complex X11CB Annunciator system might contain one or more remote point input devices such as a Ronan X500 Multiplexer or a Ronan X16CB Remote Annunciator. These devices monitor their field contact inputs for changes of state and transmit those events when they occur to the X11CB Annunciator system. In order for the X11CB system to understand what remote devices are connected to it a remote device properties description needs to be entered. Another more complex X11CB System might support a common or custom communications protocol. In this case Ronan's REC-UCM is used to implement the protocol and manage the communications to the X11CB Annunciators within the system.

Appendix A – Sample Save Report As:

```
X11CB SYSTEM REPORT.

File Access Info:
c:\ronan_projects\x11cb_config\bin\debug\demo unit 52-1010(02).xml
Created: Tuesday, April 24, 2012  10:51:34 AM
Last Accessed: Monday, April 15, 2013  9:52:54 AM
Last Modified: Thursday, April 11, 2013  3:43:28 PM

JOB NUMBER : 52-1010(02)
Customer Name : RONAN X11CB Computer Annunciator Demonstration Unit
Unit Location : 28209 Ave. Stanford, Valencia, CA  91355
Time Offset : 0
UnitID : 1999
UnitID2 : 1998
Software Configuration Records Revision : 1.2
Width  : 5
Height : 2

GLOBAL SYSTEM PROPERTIES

TEST TYPE :  OPERATIONAL TEST, Test button held for 3 seconds
Extended Events :  Send
HORN1 TYPE : AutoSilence 5 sec
HORN2 TYPE : Continuous
CTA FOLLOW : FC--->ACK,NNE
IRIG : 0  (No IRIG)
Reflash granularity in milliseconds : 100

MACHINE INFO for Lamp Box

Primary IP Address: 192.168.001.209
Redundant IP Address: 000.000.000.000
IP Mask: 255.255.000.000
Starting Point : 1
Unit ID : 1
Hardware Revision : 1.0
Firmware Revision : 1.0
Part Number : X11CB2048

MACHINE NOTES for Lamp Box

-----------------------------------------------------------------------------------------------
The 'NOTES' is a ubiquitous comment for the Interface Module.
The author can specify design changes, and documentation on anything to do with the Interface
Module and its Alarm Modules.  The NOTES field has a limit of 1000 characters.

-----------------------------------------------------------------------------------------------

X110 BROADCAST LIST
----------------------------------------------------------
|         |           IP             | Refresh | Refresh |
|   Type  |         Address          |  Timer  | Stagger |
----------------------------------------------------------
|   UDP   | 255.255.255.255 (4001)   |   60    |    7    |
----------------------------------------------------------
|   TCP   |  192.168.4.199 (4001)    |   60    |   12    |
----------------------------------------------------------

REMOTE OPERATOR SWITCH ASSIGNMENTS
  (FOR MODBUS ADDRESSING)
--------------------------------
|                   |          |
|       Name        |  Value   |
--------------------------------
```

Test switch	65501
Silence switch	65502
Acknowledge switch	65503
Reset switch	65504
GF1 switch	65505
GF2 switch	65506
FirstOut switch	65507
Spare switch8	65508
Horn1 output	65509
Horn2 output	65510
CTA output	65511
Horn1 output	65512
Spare output5	65513
Spare output6	65514
Spare output7	65515
Spare output8	65516

REMOTE OPERATOR RESTRICTIONS

MAC Address	Description

There were no Remote Operator Address Restriction entries entered in this configuration.

ALARM MODULES PARENT PROPERTIES

Module Number	FC INHIBIT	GF1 INHIBIT	GF2 INHIBIT	Redundant
1				
2				Y
3				
4				
5				
6				
7				
8				
9				
10				

ALARM MODULES PROPERTIES

Mod #	Chn #	Point	Group	Seq. Type	R	FC Time Delay	FC Release Delay	FC Resolution	FC Debounce	AUX Rly Follows	Transistor Follows	CTA Join	Horn
1	1	1	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
2	1	5	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	6	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
3	1	9	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	10	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
4	1	13	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	14	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	15	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
5	1	17	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	18	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	19	0	F3A-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
6	1	21	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	22	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	23	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	4	24	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
7	1	25	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	26	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	27	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	4	28	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
8	1	29	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	30	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	31	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	4	32	0	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
9	1	33	1	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	34	1	F1M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	35	1	F1M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	4	36	1	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
10	1	37	2	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	2	38	2	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	3	39	2	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1
	4	40	2	M-1	-	25	25	ms	Normal	FC, NNE	FC, NNE	Y	H1

32 Remotes Specified in this Configuration.

Module Lens and Bezel Colors

Module 1 Bezel(Black), Lens Colors 1(White)
Module 2 Bezel(Blue), Lens Colors 1(White), 2(White)
Module 3 Bezel(Black), Lens Colors 1(White), 2(White)
Module 4 Bezel(Green), Lens Colors 1(Red), 2(Blue), 3(Amber)
Module 5 Bezel(Black), Lens Colors 1(Green), 2(Red), 3(Yellow)
Module 6 Bezel(Yellow), Lens Colors 1(White), 2(White), 3(White), 4(White)
Module 7 Bezel(Black), Lens Colors 1(White), 2(White), 3(White), 4(White)
Module 8 Bezel(Red), Lens Colors 1(White), 2(White), 3(White), 4(White)
Module 9 Bezel(Grey), Lens Colors 1(White), 2(White), 3(White), 4(White)
Module 10 Bezel(Green), Lens Colors 1(White), 2(White), 3(White), 4(White)

Module Tag Identifiers

Module 1 1(DemoUnitTag 1)
Module 2 1(DemoUnitTag 2), 2(DemoUnitTag 3)
Module 3 1(DemoUnitTag 4), 2(DemoUnitTag 5)
Module 4 1(DemoUnitTag 6), 2(DemoUnitTag 7), 3(DemoUnitTag 8)
Module 5 1(DemoUnitTag 9), 2(DemoUnitTag 10), 3(DemoUnitTag 11)
Module 6 1(DUT_12), 2(DUT_13), 3(DUT_14), 4(DUT_15)
Module 7 1(DUT_16), 2(DUT_17), 3(DUT_18), 4(DUT_19)
Module 8 1(DUT_20), 2(DUT_21), 3(DUT_22), 4(DUT_23)
Module 9 1(DUT_24), 2(DUT_25), 3(DUT_26), 4(DUT_27)
Module 10 1(DUT_28), 2(DUT_29), 3(DUT_30), 4(DUT_31)

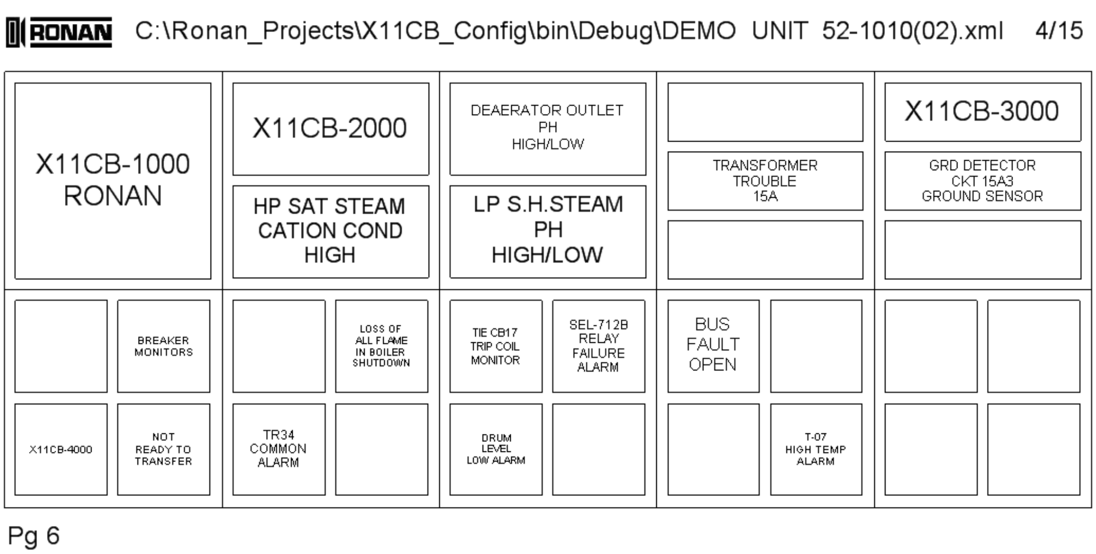
Module Legends

```
Module-1 --------------
.        | X11CB-1000 |
.        |   RONAN    |
.        --------------
Module-2 ----------------
.        |  X11CB-2000  |
.        |              |
.        |              |
.        ----------------
.        | HP SAT STEAM |
.        | CATION COND  |
.        |     HIGH     |
.        ----------------
Module-3 --------------------
.        | DEAERATOR OUTLET |
.        |        PH        |
.        |     HIGH/LOW     |
.        --------------------
.        |   LP S.H.STEAM   |
.        |        PH        |
.        |     HIGH/LOW     |
.        --------------------
Module-4 ---------------
.        |    F1M-1    |
.        |    4:13     |
.        |   LEGEND    |
.        ---------------
.        | TRANSFORMER |
.        |   TROUBLE   |
.        |     15A     |
.        ---------------
.        |    F1M-1    |
.        |    4:15     |
.        |   LEGEND    |
.        ---------------
Module-5 -----------------
.        |  X11CB-3000   |
.        |               |
.        |               |
.        -----------------
.        | GRD DETECTOR  |
.        |   CKT 15A3    |
.        | GROUND SENSOR |
.        -----------------
.        |     F1M-1     |
.        |     5:19      |
.        |    LEGEND     |
.        -----------------
Module-6 ---------------------------
.        |   F1M-1    |  BREAKER   |
.        |    6:21    |  MONITORS  |
.        |   LEGEND   |            |
.        ---------------------------
.        | X11CB-4000 |    NOT     |
.        |            |  READY TO  |
.        |            |  TRANSFER  |
.        ---------------------------
Module-7 -------------------------
.        |   F1M-1   |  LOSS OF  |
.        |   7:25    | ALL FLAME |
.        |  LEGEND   | IN BOILER |
.        |           | SHUTDOWN  |
.        -------------------------
.        |   TR34    |   F1M-1   |
.        |  COMMON   |   7:28    |
.        |   ALARM   |  LEGEND   |
```

```
.         |            |            |
.         -------------------------
Module-8  -------------------------
.         | TIE CB17  | SEL-712B  |
.         | TRIP COIL |   RELAY   |
.         |  MONITOR  |  FAILURE  |
.         |           |   ALARM   |
.         -------------------------
.         |   DRUM    |   F1M-1   |
.         |   LEVEL   |   8:32    |
.         | LOW ALARM |  LEGEND   |
.         |           |           |
.         -------------------------
Module-9  -------------------------
.         |    BUS    |   F1M-1   |
.         |   FAULT   |   9:34    |
.         |   OPEN    |  LEGEND   |
.         -------------------------
.         |   F1M-1   |   T-07    |
.         |   9:35    | HIGH TEMP |
.         |  LEGEND   |   ALARM   |
.         -------------------------
Module-10 -------------------
.          | F1M-1  | F1M-1  |
.          | 10:37  | 10:38  |
.          | LEGEND | LEGEND |
.          -------------------
.          | F1M-1  | F1M-1  |
.          | 10:39  | 10:40  |
.          | LEGEND | LEGEND |
.          -------------------
```

This is the last of the Saved Document. Another page is available when printing.

Finally, the following page is only available for printing, and will not be part of the “Save As” file:



Appendix B – IP address classifications:

Class	Bits in Network ID	Number of Networks	Bits in Host ID	Number of Hosts per Network	Address Range n.0.0.0 – n.255.255.255	Subnet Mask
A	8	126	24	4M	1-126	255.0.0.0
B	16	16,384	16	65,536	128-191	255.255.0.0
C	24	2M	8	65,536	192-223	255.255.255.0
D	0	0	28	268M	224-239	

Class D addresses are usually used for testing only.
Class E addresses are reserved for future use.

Assigning Host IDs:

Address from	Address through	
a.b.c.1	a.b.c.10	usually routers and servers
a.b.c.11	a.b.c.204	usually workstations
a.b.c.241	a.b.c.254	usually UNIX (or Linux) hosts

Intranet Network IDs:

Address from	Address through	
10.0.0.0	10.255.255.255	usually Internal networks
172.16.0.0	172.31.255.255	usually Intranets not connected to the Internet
192.168.0.0	192.168.255.255	usually networks connected to the Internet (and usually behind a firewall)

Class A Subnet Masks

Subnet Mask	Number of Bits in Mask	Number of Usable Subnets	Number of Hosts per Subnet
255.0.0.0	8	1	16.777.214
255.192.0.0	10	2	4.194.302
255.240.0.0	12	14	1.048.574
255.255.0.0	16	254	65.634
255.255.128.0	17	510	32.766
255.255.240.0	20	4.094	4.094
255.255.255.128	25	131.070	126
255.255.255.240	28	1.048.574	14
255.255.255.252	30	4.192.302	2

Class B Subnet Masks

Subnet Mask	Number of Bits in Mask	Number of Usable Subnets	Number of Hosts per Subnet
255.255.0.0	16	1	65.634
255.255.192.0	18	2	16.382
255.255.240.0	20	14	4.094
255.255.255.0	24	254	254
255.255.255.240	28	4.094	14
255.255.255.252	30	16.382	2

Class C Subnet Masks

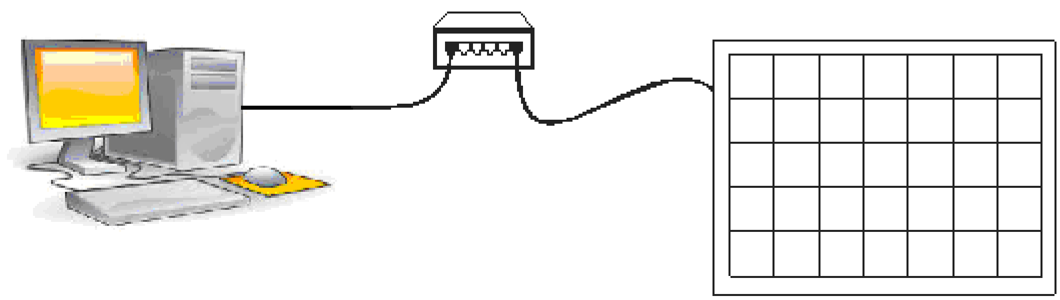
Subnet Mask	Number of Bits in Mask	Number of Usable Subnets	Number of Hosts per Subnet
255.255.255.0	24	1	254
255.255.255.192 0xC0	26	2	62
255.255.255.224 0xE0	27	6	30
255.255.255.240 0xF0	28	14	14
255.255.255.248 0xF8	29	30	6
255.255.255.252 0xFC	30	62	2

The X11CB Interface Module uses IPv4 Addressing. Internet Protocol version 4 (IPv4) is the fourth version in the development of the Internet Protocol (IP) and the first version of the protocol to be widely deployed. IPv4 addresses may be written in any notation expressing a 32-bit integer value, but for human convenience, they are most often written in the dot-decimal notation, which consists of four octets of the address expressed individually in decimal and separated by periods. The typical network is a class C type network.

Appendix C – Ethernet connections:

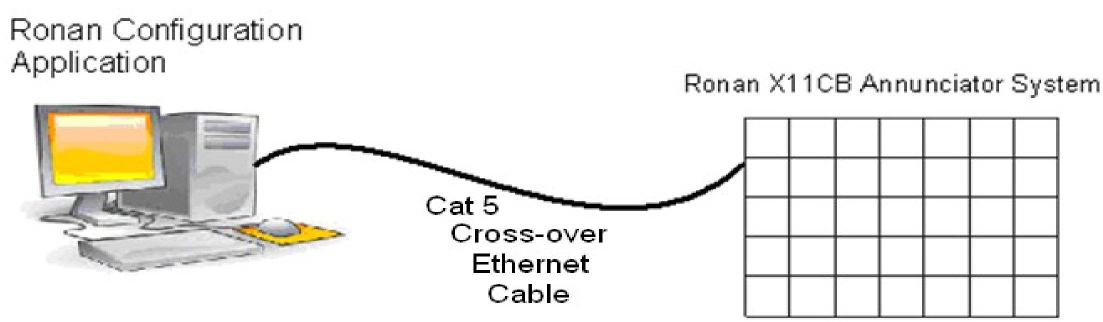
To be able to upload a configuration to the X11CB Interface Module, an Ethernet connection is required. This can be set up several different ways.

The figure below shows the three basic components: An application computer, a multi-port Ethernet device, and the X11CB unit. Standard straight-through CAT5 Ethernet cables are used to connect the devices.



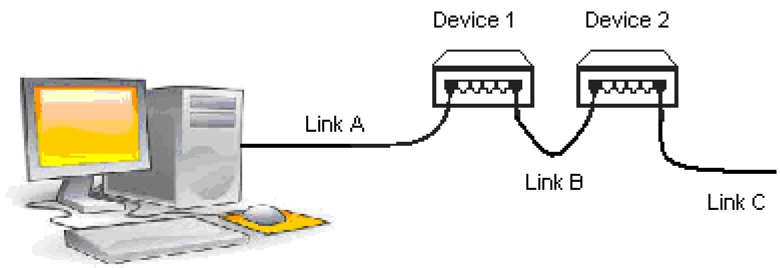
The multi-port Ethernet device can be a hub, switch, or a router with an integral hub or switch. It is anything that will allow connection of the two devices together through the Ethernet. If there isn't a network DHCP server, then the IP addresses are probably going to be static.

The figure below is a simplified version of the above, in that there is no hub or other network device between the application computer and the X11CB Interface Module. The difference is the cable used cannot be the standard straight through Ethernet cable; it must be a cross over cable. This connection will use a static IP address on the application computer.



If everything described above is in place and powered on, starting the Windows operating system should see all of the device and the communications links should be available.

When the multi-port Ethernet device is not powered on, different result could occur. Consider the following:



The Links in the diagram above are the CAT5 Ethernet cables. The Devices are multi-port Ethernet devices.

When Device 1 is a switch and Device 2 is a router or company-wide switch, the following can be observed.

All three are powered on and the Windows Operating System is started, the IP address would more than likely be something similar to 192.168.1.33. The last two numbers of the 4 octets will be different depending on the system.

When Device 1 is a switch and is powered, and Link B is disconnected or Device 2 is not powered, starting windows may product an IP address similar to 169.254.216.100. Again the last octet may be different depending on the switch.

When LinkA is disconnected or Device 1 is not powered, starting windows will show an IP address of 0.0.0.0 if at all, and declare that the network cable is not connected.

Appendix D – X11CB Sequences

There are currently 14 sequences available for Alarm Module Configuration:

F1M-1	No Subsequent Alarm State- Manual Reset- Silence Pushbutton
FIA-1	No Subsequent Alarm State- Automatic Reset- Silence Pushbutton
F2M-1	No Subsequent Alarm Flashing- Manual Reset- Silence Pushbutton
F2A-1	No Subsequent Alarm Flashing- Automatic Reset- Silence Pushbutton
F3M-1	First Out Flashing and Reset Button- Manual Reset- Silence Pushbutton
F3A-1	First Out Flashing and Reset Button- Automatic Reset- Silence Pushbutton
A-1	Automatic Reset- Silence Pushbutton
A-4	Automatic Reset- No Lock-in
A-4.5.6	Automatic Reset- No Lock-in- No Flashing- No Audible
M1	Manual Reset- Silence Pushbutton
R1	Ringback- Silence Pushbutton
R12	Ringback- Automatic Momentary Ringback
RFAH	Ringback
F3M-1B	First Out Flashing- first out reset button- Manual Reset

Basic Sequence Types

The descriptions of the basic sequence types are listed below. Variations in the basic sequences are defined by adding the options numbers to the basic sequences.

A	Automatic Reset: The sequence returns to the normal state automatically, after the event returns to normal when acknowledged
M	Manual reset: The sequence returns to the normal state, after the event returns to normal, acknowledged and reset.

First-out Sequence

First out sequences indicate which one of a group of alarm points operated first. To accomplish this, the visual display of the first alarm event must be different from the visual display of the subsequent alarm events in that group. Only one first out alarm event can exist in the group. The first out sequences are designated by a combination of the first out designation, the basic sequence letter, and the option numbers.

F1	No subsequent Alarm State: The F1 family of sequences differentiates the first alarm event of the group from the subsequent events by flashing its lamp and activating its horn. Clearing of the first alarm event allows the system to accept the next alarm in the group as the First out.
F2	No subsequent Alarm Flashing: The F2 family resets the first out alarms with the operation of the Acknowledge push button. The first out alarm and subsequent alarms operate as the F1 family. Clearing of the first alarm event allows the system to accept the next alarm in the group as the First out.
F3	First Out Flashing and Reset Push button: Additional types of flashing are added to identify new and acknowledged first alarms. A first out reset push button is added to reset the first alarms, whether the event has returned to normal or not.

F1A-1

First Out with Automatic Reset

The First Alarm operates as a basic sequence A. Subsequent alarms operate as a status lamp. The visual display of the subsequent alarms is steady on until the events return to normal, at which time the lamp lights go off.

Key applications:

- If First out is the only alarm of importance.
- Current status of the sub-sequences is of interest.
- Minimum operator action is preferred for the subsequent alarms.
- Subsequent alarms must lock-in and be annunciated by audible and visual flashing, see sequence F3A.

F1M-1

First out with Manual Reset

The first alarm operates as a basic sequence M. Subsequent alarms operate as a status lamp that locks in until the events return to normal and Reset is initiated.

F2A-1

First out Automatic Reset

The first alarm operates as a basic Sequence A. subsequent alarms operate as a status lamp and also activates the audible devices. Option 1 must be used to enable the apparent operation of the audible for subsequent alarms. Subsequent alarms are locked-in and cannot return to the normal state until the Acknowledge push button is activated, resetting the first out-alarm. After the inputs return to normal and acknowledgment, all input points return to the normal sequence state automatically.

Key applications:
1. First-out Alarm is of prime importance.
2. Subsequent alarms must lock-in and resound the audible if it has been silenced.
3. If Option 1 is used, the number of concurrent alarms expected is small enough that flashing is not required to locate each new subsequent alarm when the audible sounds.

F2M-1

First out Manual Reset

The First out alarm operates as a basic sequence M. Subsequent alarms operate as a status lamp and also operate the audible. Before acknowledging the First out alarm, sequence F2M operates the same as sequence F2A. After acknowledgment, sequence F2M differs by requiring a Reset to return to normal even though the events have returned to normal.

F3A-1

First out Automatic Reset

Displaying the visual device in intermittent flashing pattern and activating the audible devices until the first function is reset distinguish the first alarm. The acknowledged first alarm is distinguished by changing the visual display as slow flashing. Subsequent alarms follow the basic sequence A. Because the Reset push button is used to reset the first out function, Acknowledge can be used to sequence the subsequent alarms through a standard sequence. This makes it possible to distinguish the new subsequent alarms from the previously acknowledged subsequent alarms. Also the subsequent alarms lock in until they are acknowledged. Once acknowledged, they can automatically return to normal state when the input points return to normal.

F3M-1

First out Manual Reset

The first out alarm in a group is distinguished by unique display until the first out function is reset. Because Acknowledge is not used to reset the first out function, the new first alarm and subsequent alarms can be acknowledged so that the new alarms can be distinguished from the previously acknowledged alarms. The subsequent alarms return to normal state only if they are in the normal state when the Reset is operated and the first out group has been reset.

A-1

Automatic Reset

The audible device is silenced and flashing stops when acknowledged. Acknowledgment of the alarm resets automatically when the event returns to normal.

M-1

Manual Reset

Sequence M is a basic alarm sequence (Horn on with Flashing Visual) with Manual Reset that retains acknowledged alarms until the process input conditions return to normal and the manual Reset push button is activated. In some applications, Sequence M may have a disadvantage since new alarms that occur while the Acknowledge Push button is being operated appear in the steady on condition. Any alarm occurring during the Acknowledge push button operation may be confused with existing acknowledged alarms. In order to reset alarms, sequence M requires that the Reset push button be operated repeatedly to determine if the process input conditions have returned to normal. Use of Options 1 and 2 improves the sequence of for reviewing new incoming alarms.

The Sequence Tables

Each time the X11CB_Configuration application is started, it reads in a sequence file named "X11CBSEQ.txt", checks and verifies the contents, then outputs an interpreted verbose version of this same file named "X11DumpSeqTab.txt".

Each of the following sequences contain the part of this interpreted file pertaining to the diagram alongside.

Each sequence in these files contain 3 parts:

1. The Alphanumeric identifier
2. The state test table, terminated with 255,255,255
3. The state output table, terminated with 255,255,255

To the right of each table entry, starting with "//" (slash-slash) is what is automatically generated by the configuration application. This generation is the third position of each entry displayed in hexadecimal, binary, then verbose interpretation.

```
//  0x30 00110000 FCon Ack
```

The above example is a test statement and indicates that **BOTH** Field Contact ON and Acknowledged button is depressed must be true for this state test to be true.

The first table, the state test table, has a variable number of 3 item entries, with multiple entries per state, with the following definition for each entry:

Item1: The current state
Item2: The state to switch to when all tests in Item 3 are true
Item3: The tests:
x0000000 – First Out Reset Switch depressed
0x000000 – Field Contact in OFF state
00x00000 – Field Contact in ON state
000x0000 – Acknowledge Switch depressed
0000x000 – Reset Switch depressed
00000x00 – ME in ON state
000000x0 – Operational Test Switch depressed
0000000x – Silence Switch depressed

The second table, the state output table, has a set number of 3 item entries, with a single entry per state, with the following definition for each entry:

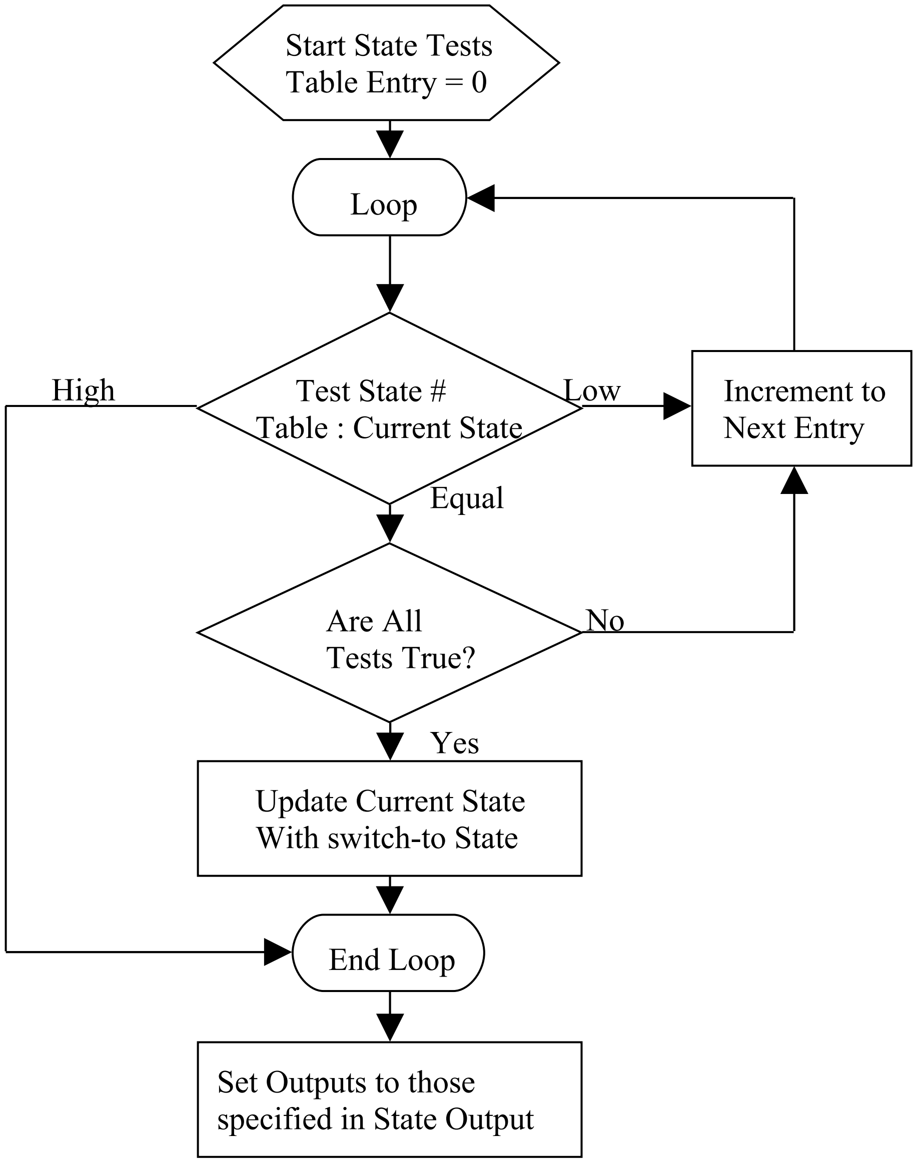
Item1: The current state
Item2: The type of Flash Output

0 – Solid OFF
1 – Solid ON
2 – Fast Flash
3 – Slow Flash
4 – Medium Flash
5 – Intermittent Flash

Item3: The peripheral outputs:

xxx00000 – n /a
000x0000 – Ring back or Horn 2
0000x000 – 1st Out or ME out
00000x00 – Flash / Lamp ON
000000x0 – Fault
0000000x – Horn 1

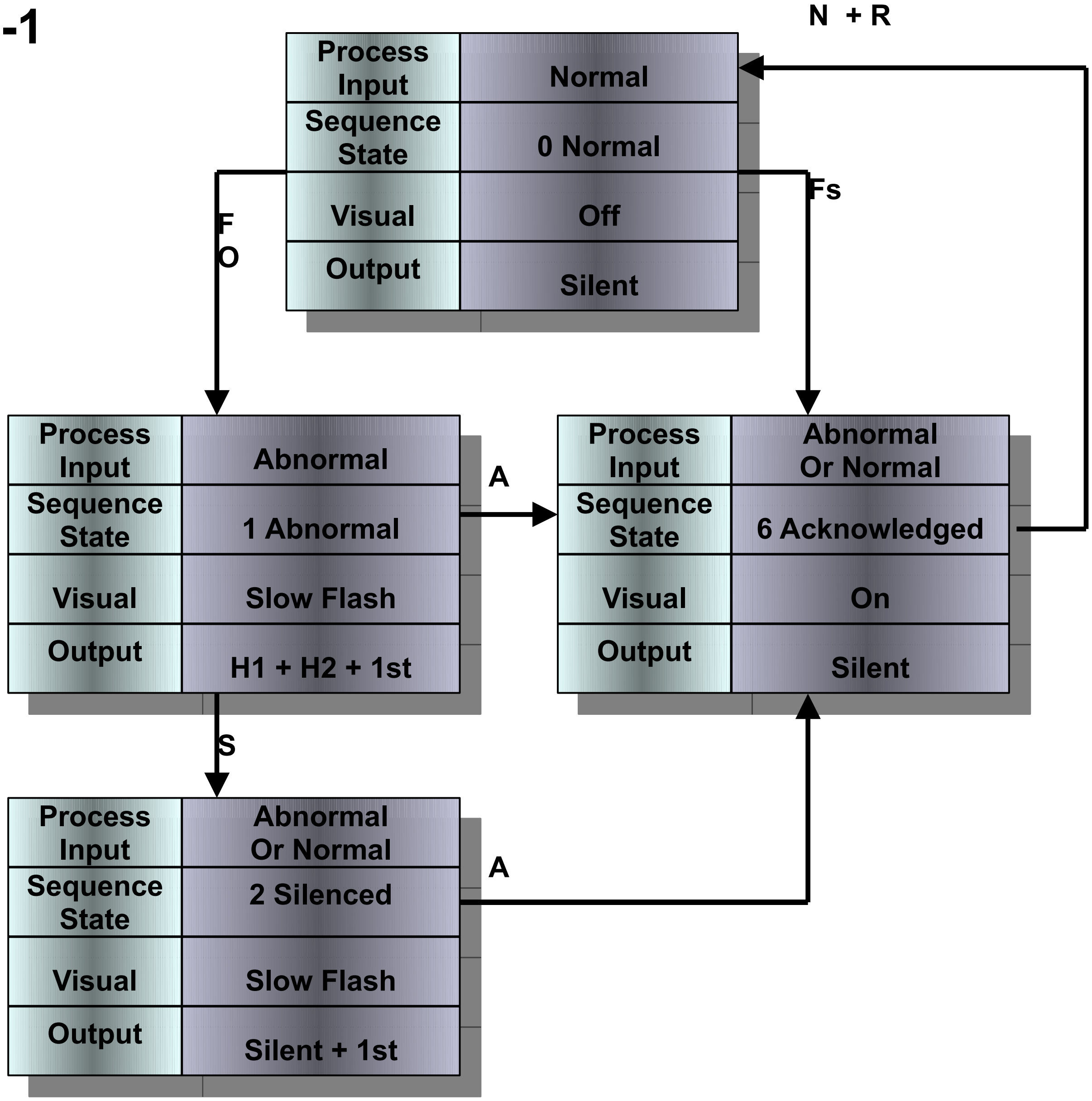
The state table function loop operates similar to the diagram below. It performs each state test for the current state until a "true" condition is found for the test, or the entries for that state are exhausted.




```
"F1M-1"
0,6,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,6,16          //  0x10 00010000 Ack
```

```
1,2,1           //  0x01 00000001 Silence
2,6,16          //  0x10 00010000 Ack
6,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,3,31          //  0x1F 00011111 (Slow Flash) RgBk/H2 1stOut Flash Fault Horn1
2,3,14          //  0x0E 00001110 (Slow Flash) 1stOut Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,0,0           //  0x00 00000000 (Solid Off)
5,0,0           //  0x00 00000000 (Solid Off)
6,1,2           //  0x02 00000010 (Solid On) Fault
255,255,255     //                Delimiter
```

F1M-1



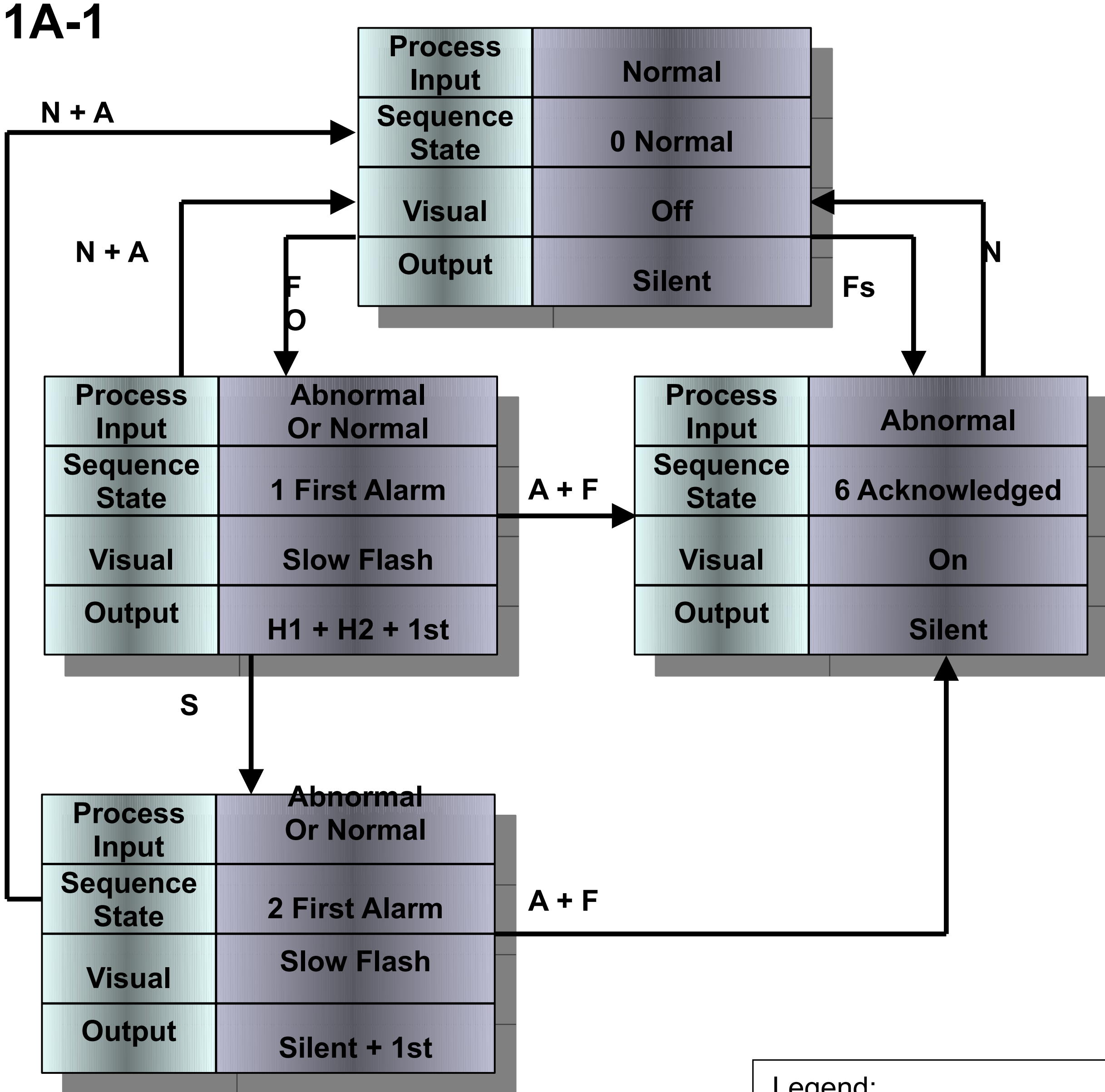
Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"F1A-1"
0,6,36         //  0x24 00100100 FCon ME
0,1,32         //  0x20 00100000 FCon
0,1,2          //  0x02 00000010 OpTest
1,1,2          //  0x02 00000010 OpTest
1,6,48         //  0x30 00110000 FCon Ack
1,0,80         //  0x50 01010000 FCoff Ack
1,2,1          //  0x01 00000001 Silence
2,6,48         //  0x30 00110000 FCon Ack
2,0,80         //  0x50 01010000 FCoff Ack
6,0,64         //  0x40 01000000 FCoff
255,255,255    //                Delimiter
0,0,0          //  0x00 00000000 (Solid Off)
1,3,31         //  0x1F 00011111 (Slow Flash) RgBk/H2 1stOut Flash Fault Horn1
2,3,14         //  0x0E 00001110 (Slow Flash) 1stOut Flash Fault
3,0,0          //  0x00 00000000 (Solid Off)
4,0,0          //  0x00 00000000 (Solid Off)
5,0,0          //  0x00 00000000 (Solid Off)
6,1,2          //  0x02 00000010 (Solid On) Fault
```

255,255,255 // Delimiter

F1A-1

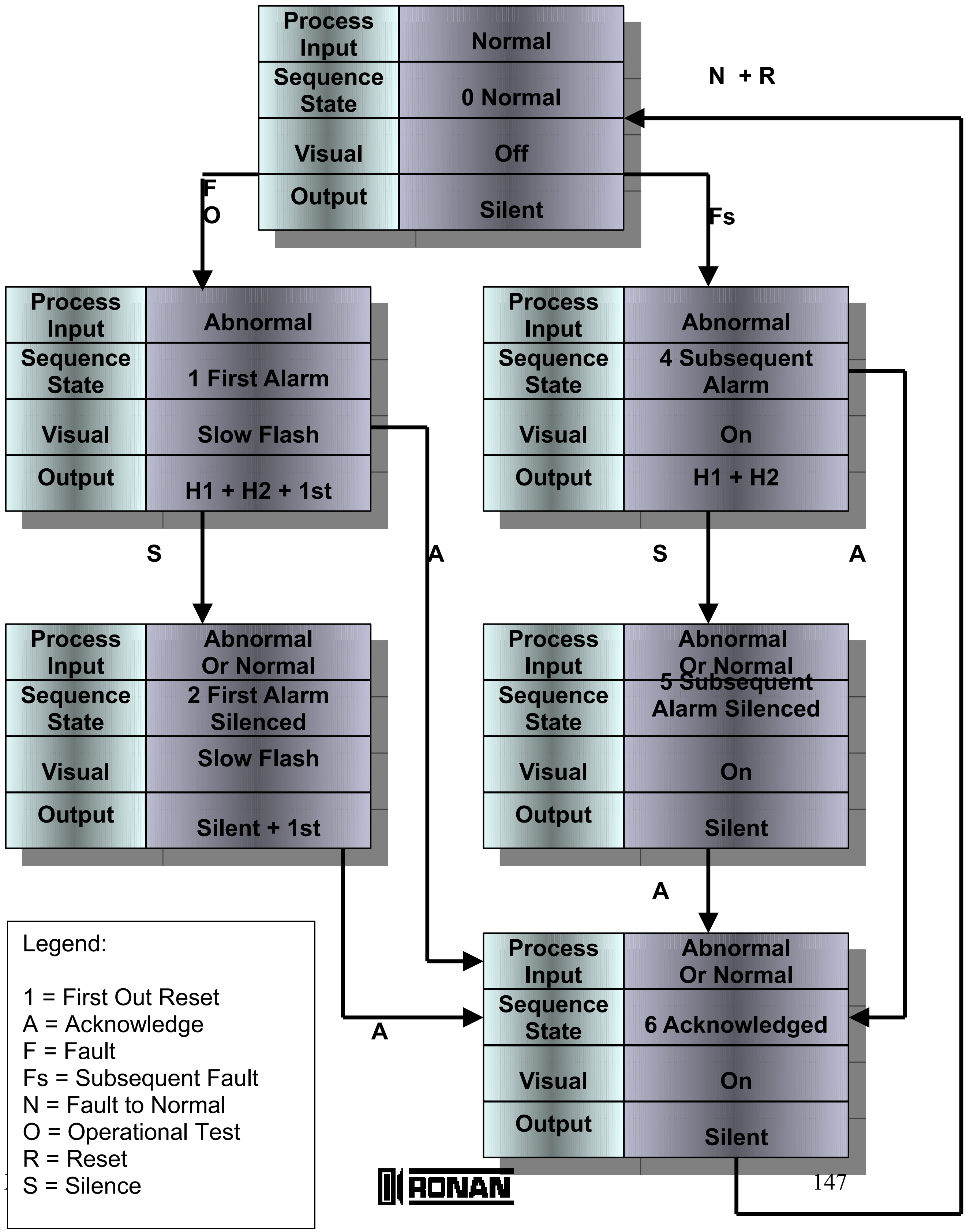


Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"F2M-1"
0,4,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,6,16          //  0x10 00010000 Ack
1,2,1           //  0x01 00000001 Silence
2,6,16          //  0x10 00010000 Ack
4,6,16          //  0x10 00010000 Ack
4,5,1           //  0x01 00000001 Silence
5,6,16          //  0x10 00010000 Ack
6,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,3,31          //  0x1F 00011111 (Slow Flash) RgBk/H2 1stOut Flash Fault Horn1
2,3,14          //  0x0E 00001110 (Slow Flash) 1stOut Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,1,23          //  0x17 00010111 (Solid On) RgBk/H2 Flash Fault Horn1
5,1,6           //  0x06 00000110 (Solid On) Flash Fault
6,1,2           //  0x02 00000010 (Solid On) Fault
255,255,255     //                Delimiter
```

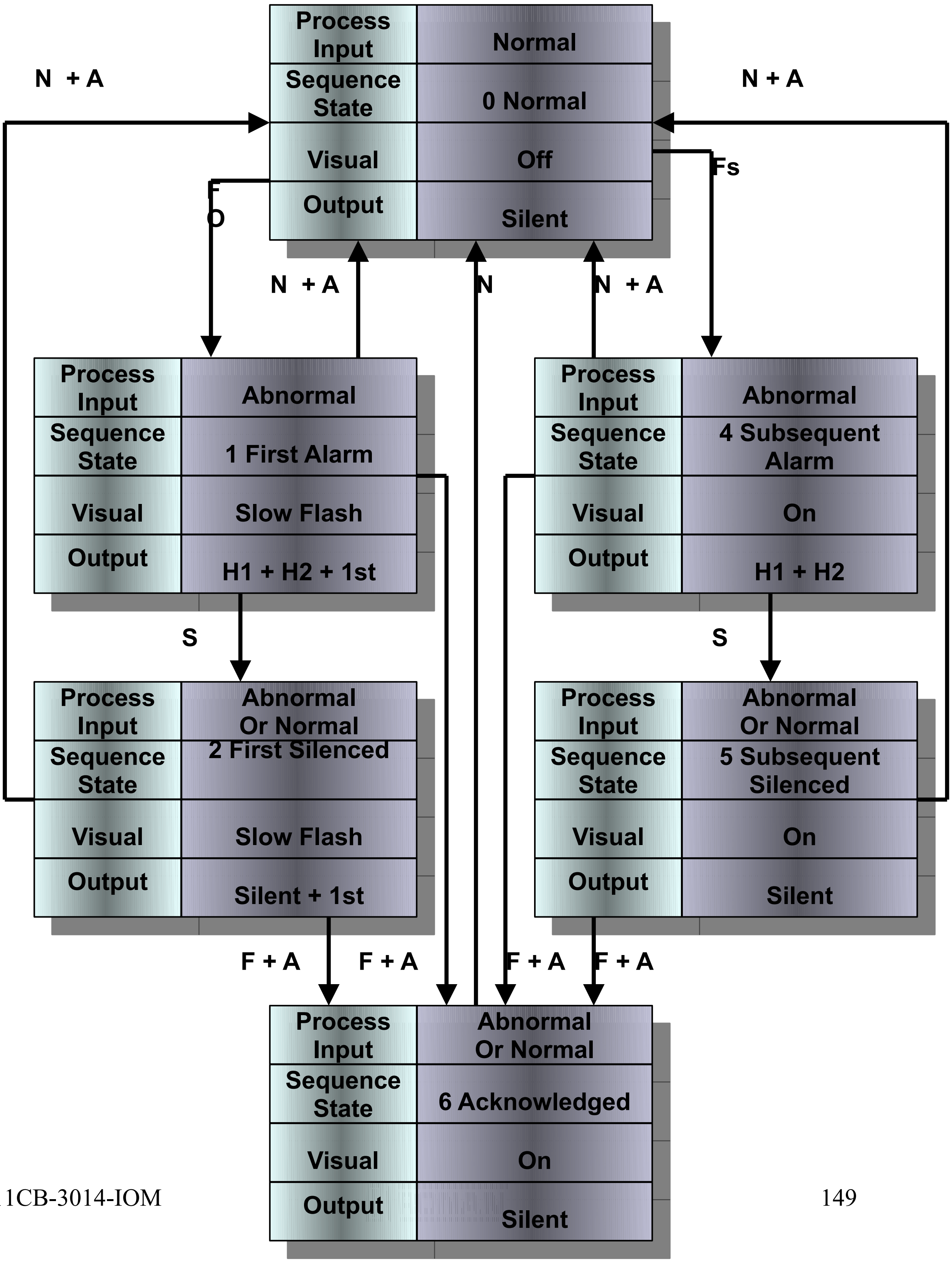
F2M-1



Process Input
Normal
Sequence State
0 Normal
Visual
Off
Output
Silent
N + R
F
O
Fs
Process Input
Abnormal
Sequence State
1 First Alarm
Visual
Slow Flash
Output
H1 + H2 + 1st
Process Input
Abnormal
Sequence State
4 Subsequent Alarm
Visual
On
Output
H1 + H2
S
A
S
A
Process Input
Abnormal Or Normal
Sequence State
2 First Alarm Silenced
Visual
Slow Flash
Output
Silent + 1st
Process Input
Abnormal Or Normal
Sequence State
5 Subsequent Alarm Silenced
Visual
On
Output
Silent
A
A
Process Input
Abnormal Or Normal
Sequence State
6 Acknowledged
Visual
On
Output
Silent
Legend:
1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

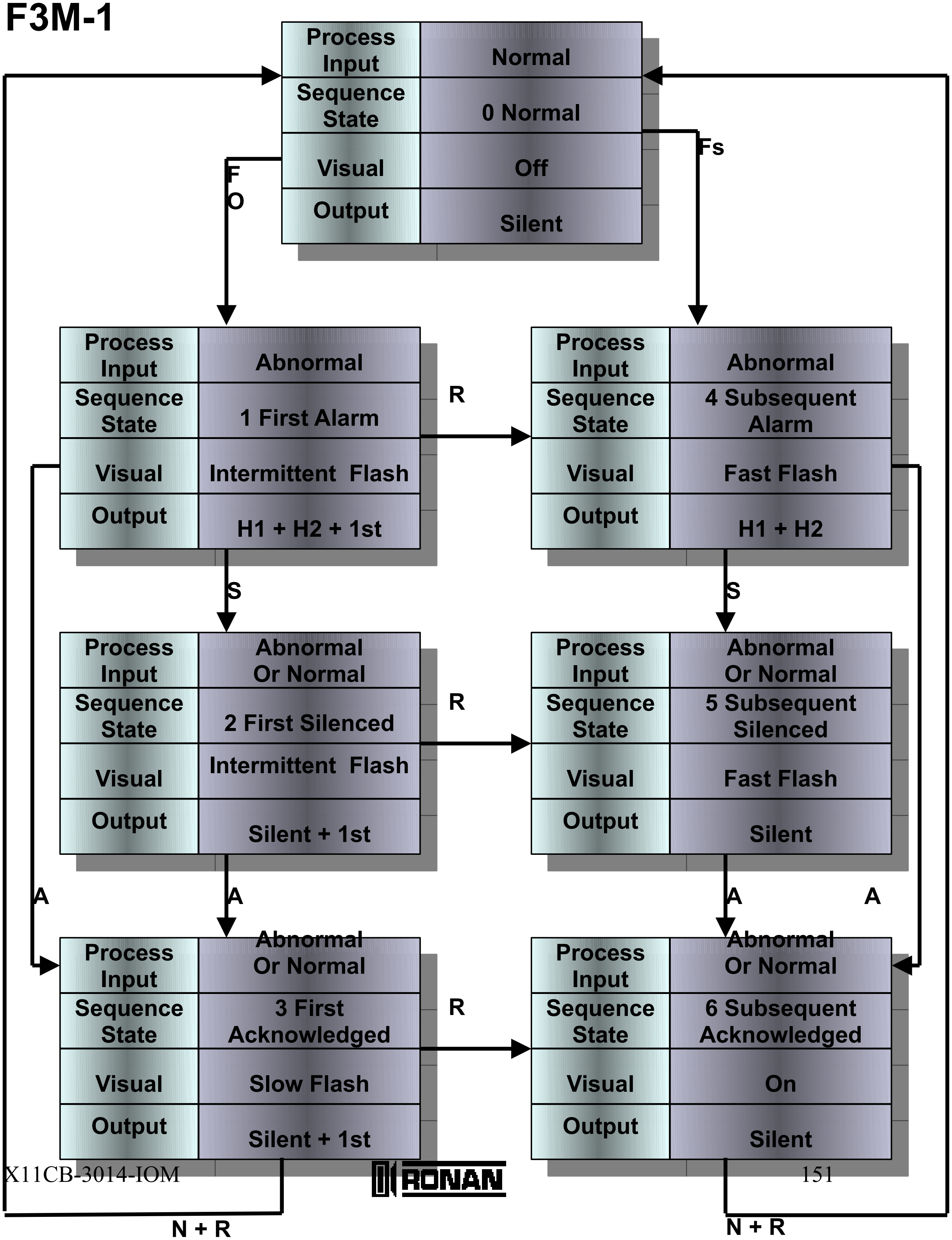
```
"F2A-1"
0,4,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,6,48          //  0x30 00110000 FCon Ack
1,0,80          //  0x50 01010000 FCoff Ack
1,2,1           //  0x01 00000001 Silence
2,6,48          //  0x30 00110000 FCon Ack
2,0,80          //  0x50 01010000 FCoff Ack
4,6,48          //  0x30 00110000 FCon Ack
4,0,80          //  0x50 01010000 FCoff Ack
4,5,1           //  0x01 00000001 Silence
5,6,48          //  0x30 00110000 FCon Ack
5,0,80          //  0x50 01010000 FCoff Ack
6,0,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,3,31          //  0x1F 00011111 (Slow Flash) RgBk/H2 1stOut Flash Fault Horn1
2,3,14          //  0x0E 00001110 (Slow Flash) 1stOut Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,1,23          //  0x17 00010111 (Solid On) RgBk/H2 Flash Fault Horn1
5,1,6           //  0x06 00000110 (Solid On) Flash Fault
6,1,2           //  0x02 00000010 (Solid On) Fault
```

F2A-1


Process Input
Normal
Sequence State
0 Normal
Visual
Off
Output
Silent
N + A
N + A
F
O
Fs
N + A
N
N + A
Process Input
Abnormal
Sequence State
1 First Alarm
Visual
Slow Flash
Output
H1 + H2 + 1st
Process Input
Abnormal
Sequence State
4 Subsequent Alarm
Visual
On
Output
H1 + H2
S
S
Process Input
Abnormal Or Normal
Sequence State
2 First Silenced
Visual
Slow Flash
Output
Silent + 1st
Process Input
Abnormal Or Normal
Sequence State
5 Subsequent Silenced
Visual
On
Output
Silent
F + A
F + A
F + A
F + A
Process Input
Abnormal Or Normal
Sequence State
6 Acknowledged
Visual
On
Output
Silent

```
"F3M-1"
0,4,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,8           //  0x08 00001000 Reset
1,3,16          //  0x10 00010000 Ack
1,2,1           //  0x01 00000001 Silence
2,5,8           //  0x08 00001000 Reset
2,3,16          //  0x10 00010000 Ack
3,0,72          //  0x48 01001000 FCoff Reset
3,6,8           //  0x08 00001000 Reset
4,6,16          //  0x10 00010000 Ack
4,5,1           //  0x01 00000001 Silence
5,6,16          //  0x10 00010000 Ack
6,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,5,31          //  0x1F 00011111 (Intermittent Flash) RgBk/H2 1stOut Flash Fault Horn1
2,5,14          //  0x0E 00001110 (Intermittent Flash) 1stOut Flash Fault
3,3,10          //  0x0A 00001010 (Slow Flash) 1stOut Fault
4,2,23          //  0x17 00010111 (Fast Flash) RgBk/H2 Flash Fault Horn1
5,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
6,1,2           //  0x02 00000010 (Solid On) Fault
255,255,255     //                Delimiter
```

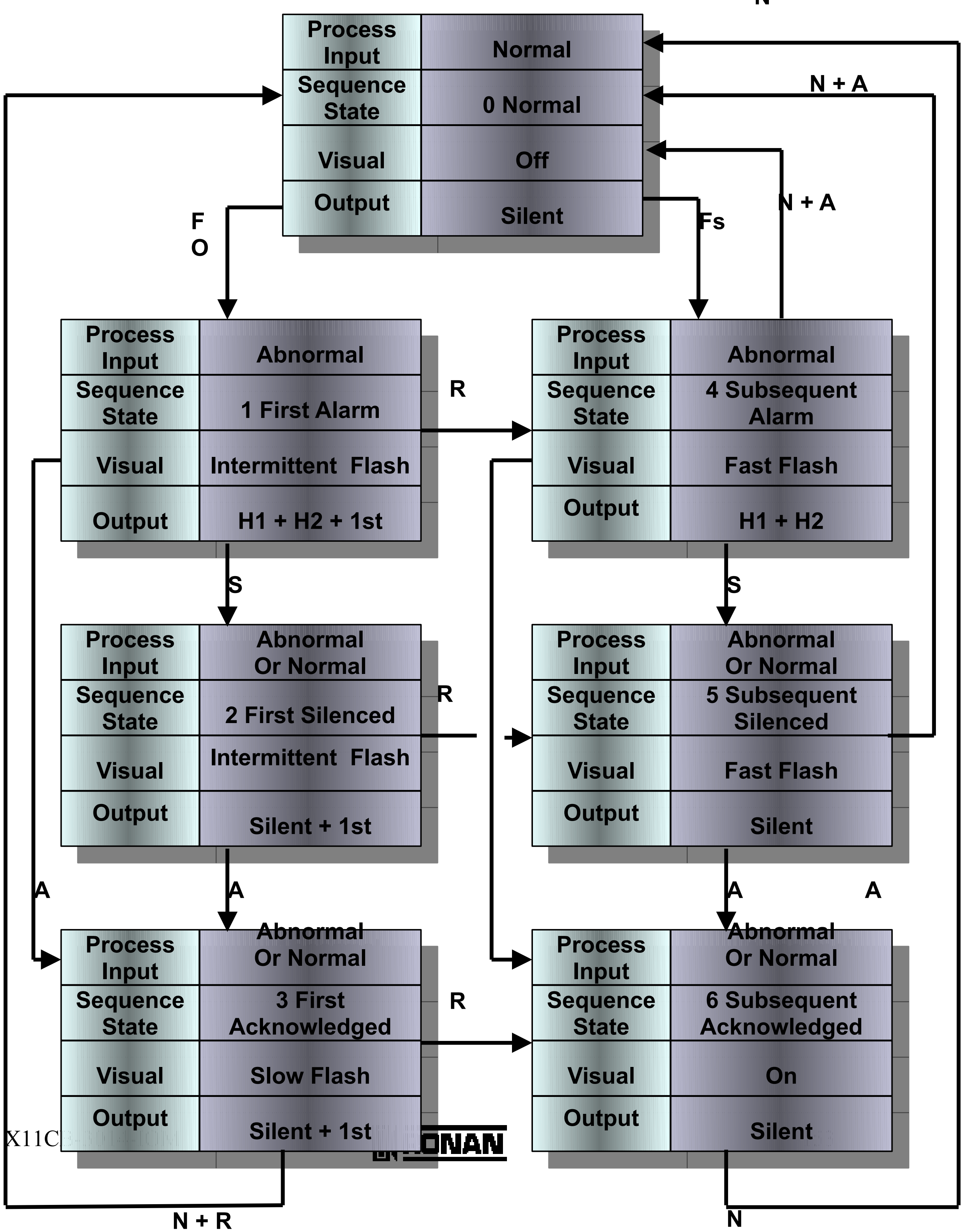
F3M-1



Process Input
Normal
Sequence State
0 Normal
Visual
Off
Output
Silent
F O
Fs
Process Input
Abnormal
Sequence State
1 First Alarm
Visual
Intermittent Flash
Output
H1 + H2 + 1st
R
Process Input
Abnormal
Sequence State
4 Subsequent Alarm
Visual
Fast Flash
Output
H1 + H2
S
S
Process Input
Abnormal Or Normal
Sequence State
2 First Silenced
Visual
Intermittent Flash
Output
Silent + 1st
R
Process Input
Abnormal Or Normal
Sequence State
5 Subsequent Silenced
Visual
Fast Flash
Output
Silent
A
A
A
A
Process Input
Abnormal Or Normal
Sequence State
3 First Acknowledged
Visual
Slow Flash
Output
Silent + 1st
R
Process Input
Abnormal Or Normal
Sequence State
6 Subsequent Acknowledged
Visual
On
Output
Silent
N + R
N + R

```
"F3A-1"
0,4,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,8           //  0x08 00001000 Reset
1,3,16          //  0x10 00010000 Ack
1,2,1           //  0x01 00000001 Silence
2,5,8           //  0x08 00001000 Reset
2,3,16          //  0x10 00010000 Ack
3,0,72          //  0x48 01001000 FCoff Reset
3,6,8           //  0x08 00001000 Reset
4,6,48          //  0x30 00110000 FCon Ack
4,0,80          //  0x50 01010000 FCoff Ack
4,5,1           //  0x01 00000001 Silence
5,6,48          //  0x30 00110000 FCon Ack
5,0,80          //  0x50 01010000 FCoff Ack
6,0,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,5,31          //  0x1F 00011111 (Intermittent Flash) RgBk/H2 1stOut Flash Fault Horn1
2,5,14          //  0x0E 00001110 (Intermittent Flash) 1stOut Flash Fault
3,3,10          //  0x0A 00001010 (Slow Flash) 1stOut Fault
4,2,23          //  0x17 00010111 (Fast Flash) RgBk/H2 Flash Fault Horn1
5,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
6,1,2           //  0x02 00000010 (Solid On) Fault
255,255,255     //                Delimiter
```

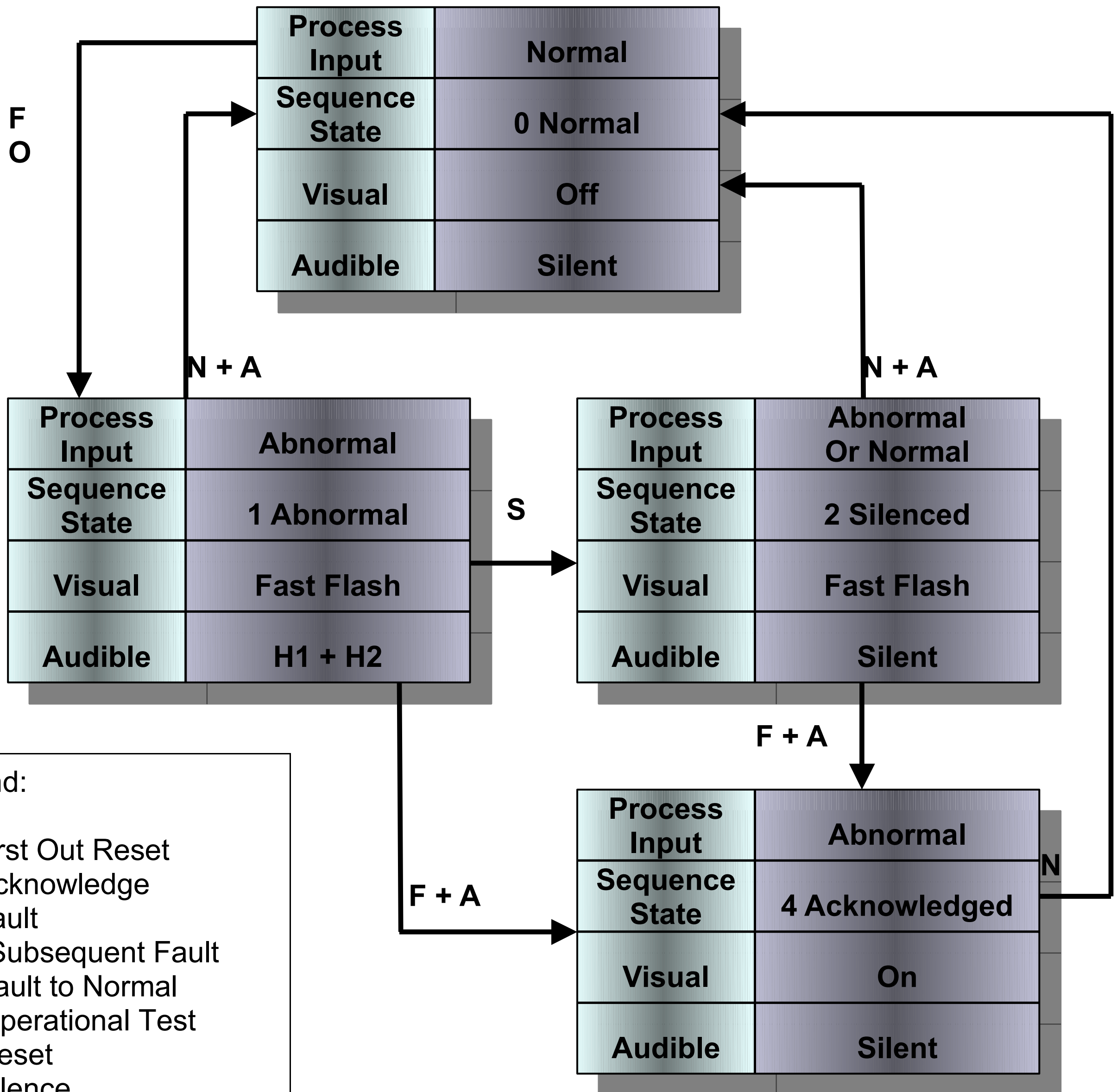
F3A-1



Process Input
Normal
Sequence State
0 Normal
Visual
Off
Output
Silent
N
N + A
N + A
F O
Fs
Process Input
Abnormal
Sequence State
1 First Alarm
Visual
Intermittent Flash
Output
H1 + H2 + 1st
R
Process Input
Abnormal
Sequence State
4 Subsequent Alarm
Visual
Fast Flash
Output
H1 + H2
S
S
Process Input
Abnormal Or Normal
Sequence State
2 First Silenced
Visual
Intermittent Flash
Output
Silent + 1st
R
Process Input
Abnormal Or Normal
Sequence State
5 Subsequent Silenced
Visual
Fast Flash
Output
Silent
A
A
A
A
Process Input
Abnormal Or Normal
Sequence State
3 First Acknowledged
Visual
Slow Flash
Output
Silent + 1st
R
Process Input
Abnormal Or Normal
Sequence State
6 Subsequent Acknowledged
Visual
On
Output
Silent
N + R
N

```
"A-1"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,48          //  0x30 00110000 FCon Ack
1,0,80          //  0x50 01010000 FCoff Ack
1,2,1           //  0x01 00000001 Silence
2,4,48          //  0x30 00110000 FCon Ack
2,0,80          //  0x50 01010000 FCoff Ack
4,0,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,23          //  0x17 00010111 (Fast Flash) RgBk/H2 Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,1,2           //  0x02 00000010 (Solid On) Fault
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

A - 1

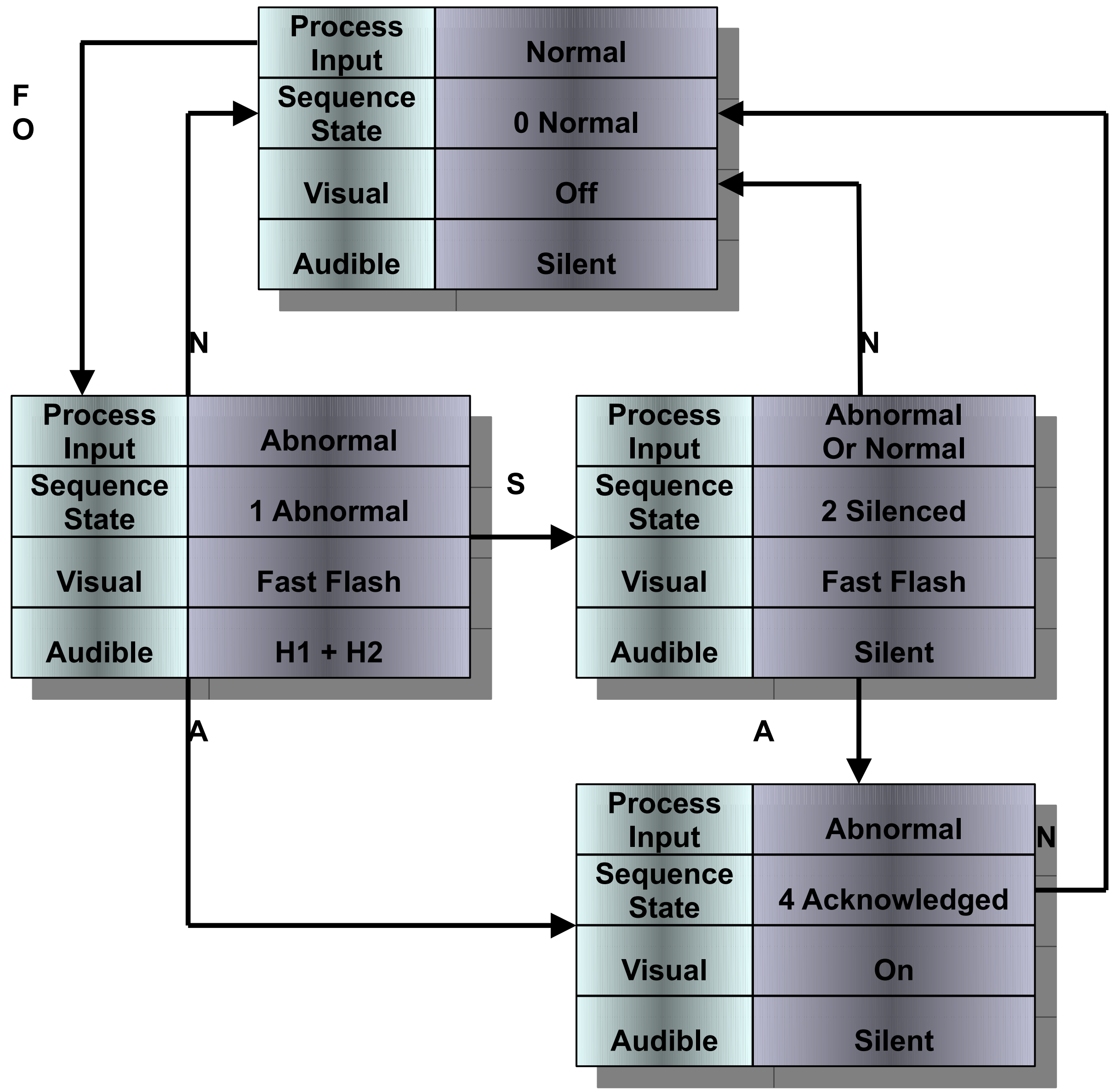


Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"A-4"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,48          //  0x30 00110000 FCon Ack
1,0,64          //  0x40 01000000 FCoff
1,2,1           //  0x01 00000001 Silence
2,4,48          //  0x30 00110000 FCon Ack
2,0,64          //  0x40 01000000 FCoff
4,0,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,23          //  0x17 00010111 (Fast Flash) RgBk/H2 Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,1,2           //  0x02 00000010 (Solid On) Fault
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

A - 4

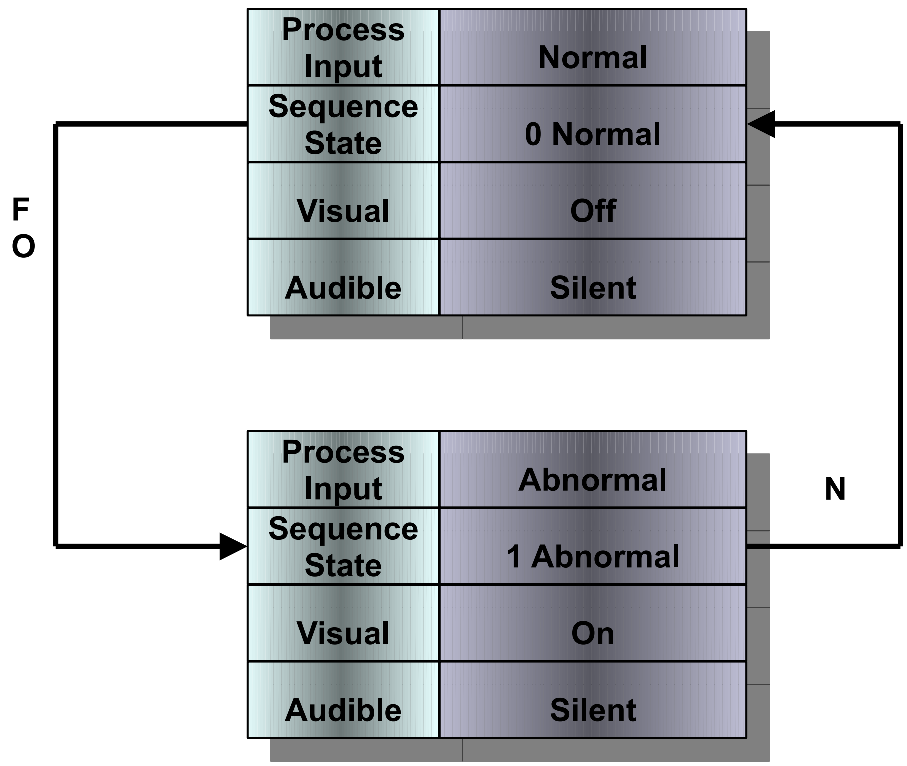


Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"A-4,5,6"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,0,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,1,2           //  0x02 00000010 (Solid On) Fault
2,0,0           //  0x00 00000000 (Solid Off)
3,0,0           //  0x00 00000000 (Solid Off)
4,0,0           //  0x00 00000000 (Solid Off)
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

A – 4, 5, 6

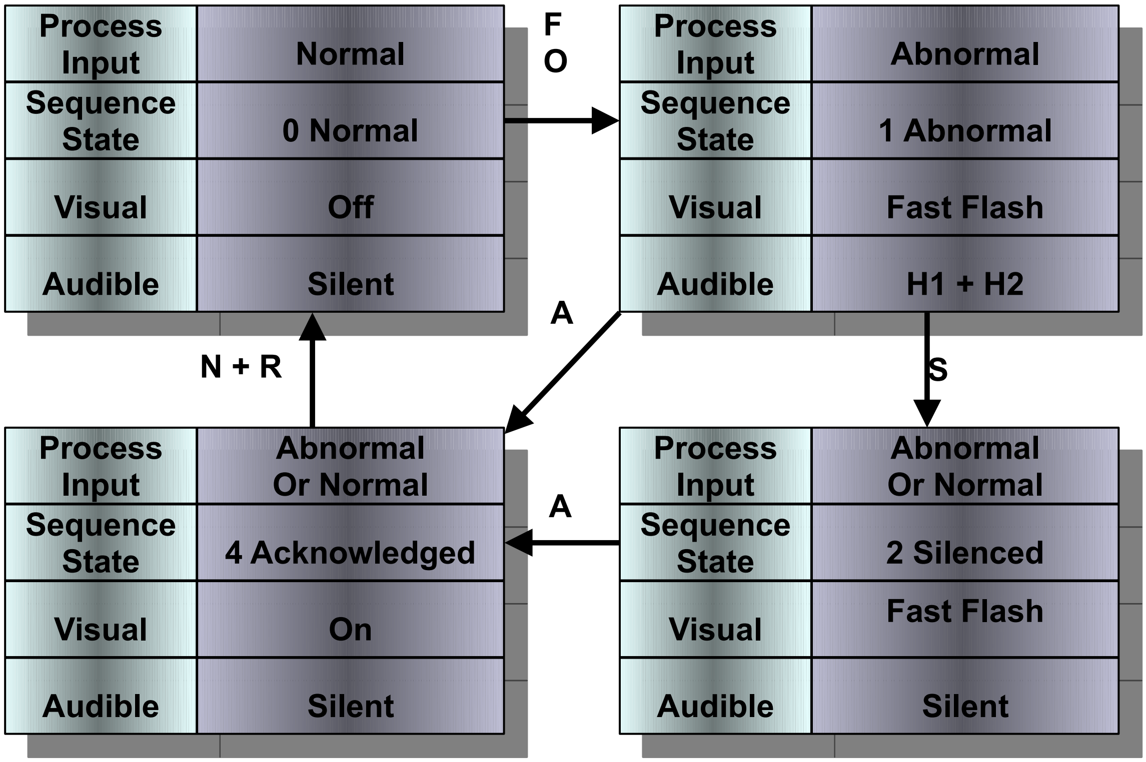


Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"M-1"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,16          //  0x10 00010000 Ack
1,2,1           //  0x01 00000001 Silence
2,4,16          //  0x10 00010000 Ack
4,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,23          //  0x17 00010111 (Fast Flash) RgBk/H2 Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,0,0           //  0x00 00000000 (Solid Off)
4,1,2           //  0x02 00000010 (Solid On) Fault
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

M – 1

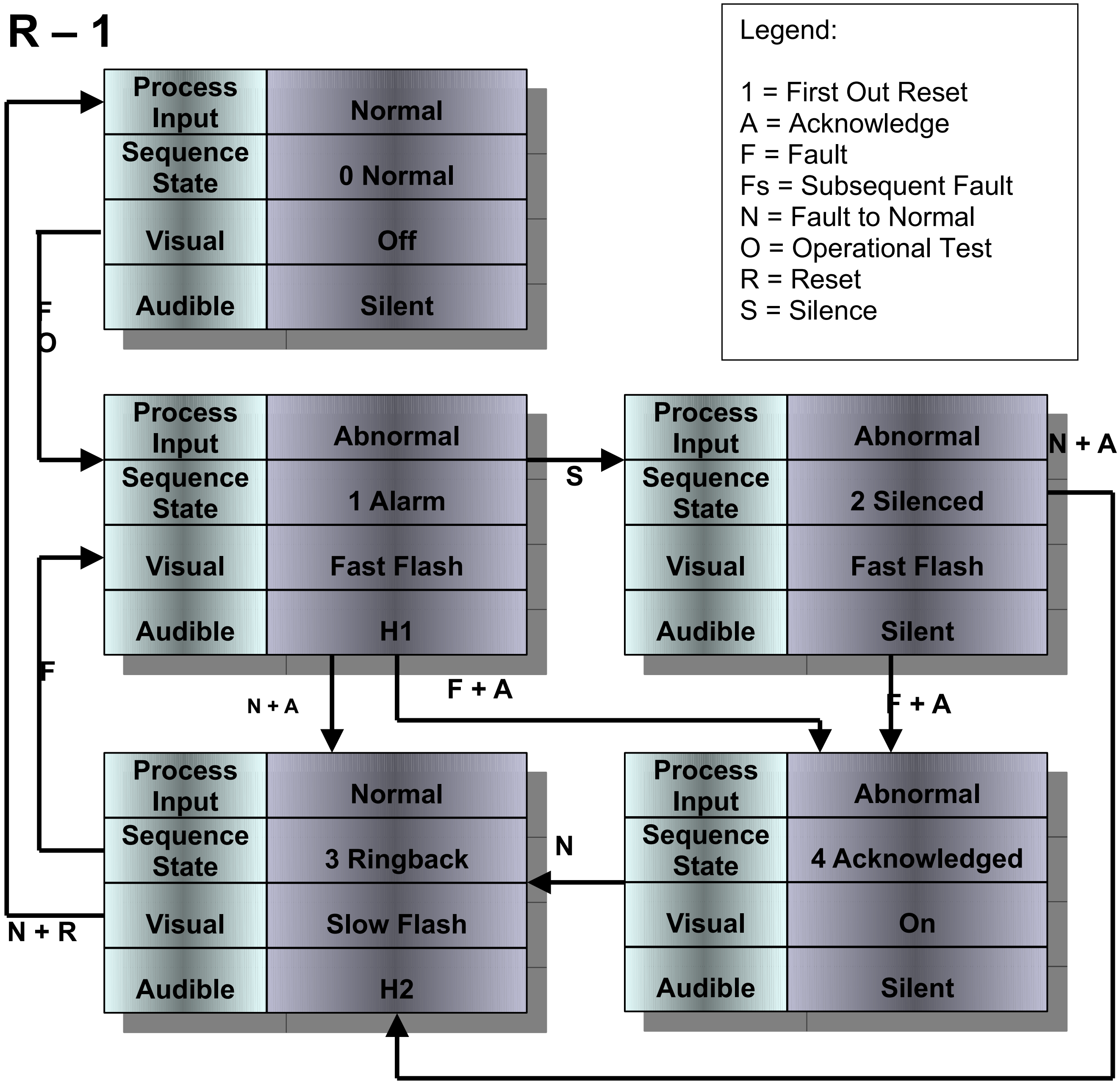


Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

```
"R-1"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,3,80          //  0x50 01010000 FCoff Ack
1,4,48          //  0x30 00110000 FCon Ack
1,2,1           //  0x01 00000001 Silence
2,3,80          //  0x50 01010000 FCoff Ack
2,4,48          //  0x30 00110000 FCon Ack
3,1,32          //  0x20 00100000 FCon
3,0,72          //  0x48 01001000 FCoff Reset
4,3,64          //  0x40 01000000 FCoff
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,7           //  0x07 00000111 (Fast Flash) Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,3,22          //  0x16 00010110 (Slow Flash) RgBk/H2 Flash Fault
4,1,2           //  0x02 00000010 (Solid On) Fault
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

R – 1

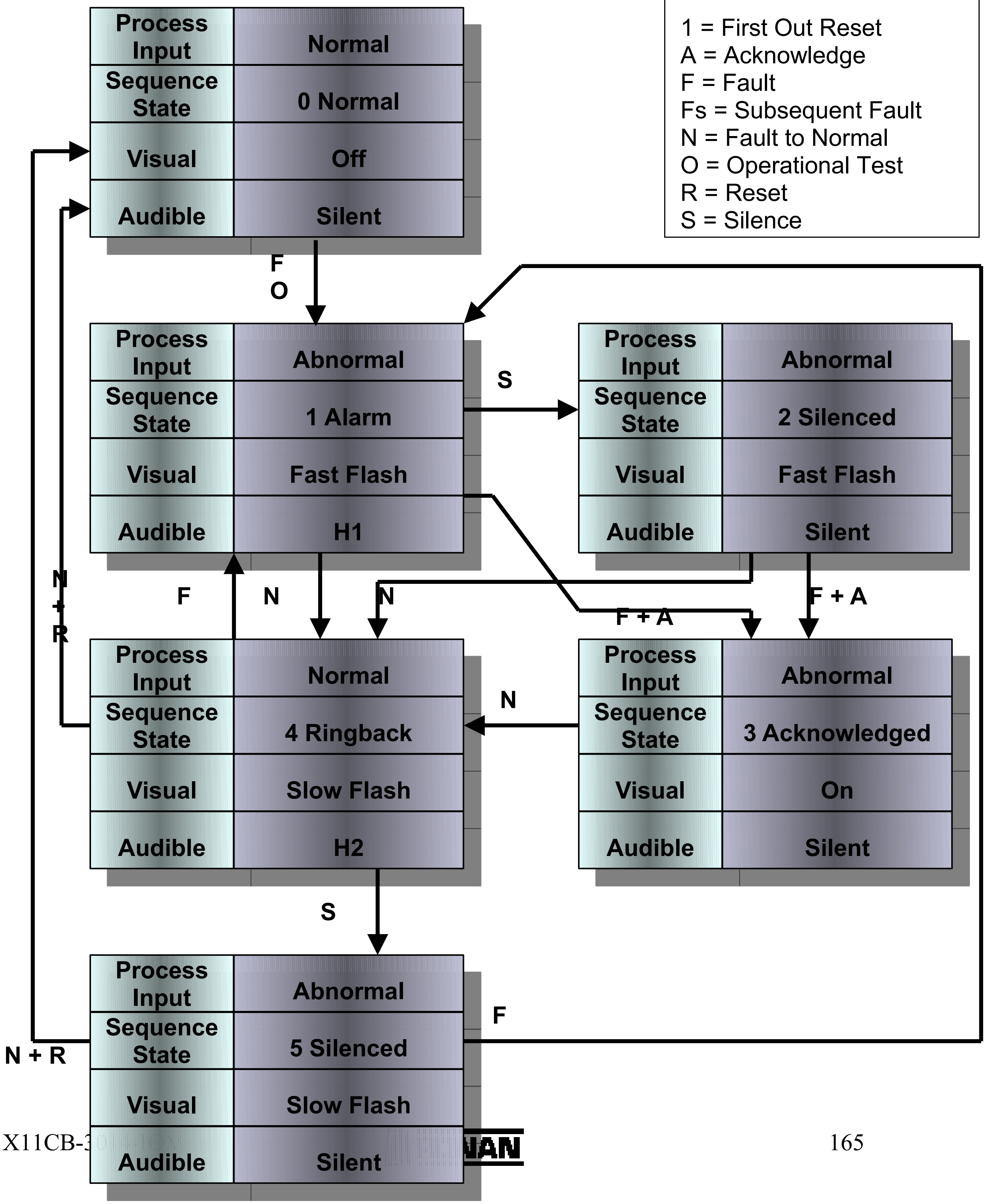

Legend:
1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence
Process Input
Normal
Sequence State
0 Normal
Visual
Off
Audible
Silent
F
O
Process Input
Abnormal
Sequence State
1 Alarm
Visual
Fast Flash
Audible
H1
S
Process Input
Abnormal
Sequence State
2 Silenced
Visual
Fast Flash
Audible
Silent
N + A
F
N + A
F + A
F + A
Process Input
Normal
Sequence State
3 Ringback
Visual
Slow Flash
Audible
H2
N
Process Input
Abnormal
Sequence State
4 Acknowledged
Visual
On
Audible
Silent
N + R

```
"R-12"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,64          //  0x40 01000000 FCoff
1,3,48          //  0x30 00110000 FCon Ack
1,2,1           //  0x01 00000001 Silence
2,4,64          //  0x40 01000000 FCoff
2,3,48          //  0x30 00110000 FCon Ack
3,4,64          //  0x40 01000000 FCoff
4,1,32          //  0x20 00100000 FCon
4,0,72          //  0x48 01001000 FCoff Reset
4,5,1           //  0x01 00000001 Silence
5,1,32          //  0x20 00100000 FCon
5,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,7           //  0x07 00000111 (Fast Flash) Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,1,2           //  0x02 00000010 (Solid On) Fault
4,3,22          //  0x16 00010110 (Slow Flash) RgBk/H2 Flash Fault
5,3,2           //  0x02 00000010 (Slow Flash) Fault
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                Delimiter
```

R – 12

Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence

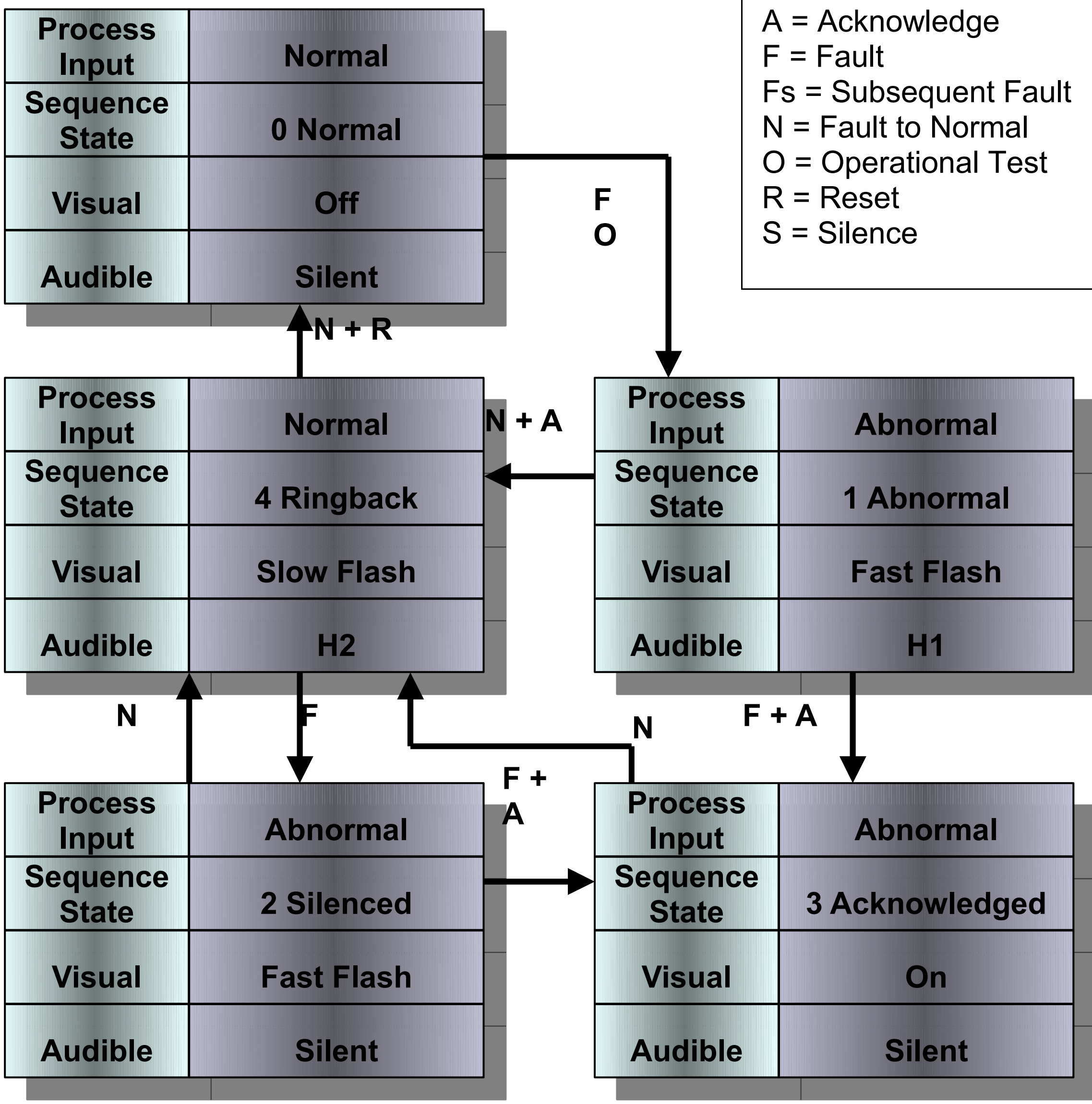


```
"RFAH"
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,4,80          //  0x50 01010000 FCoff Ack
1,3,48          //  0x30 00110000 FCon Ack
2,4,64          //  0x40 01000000 FCoff
2,3,48          //  0x30 00110000 FCon Ack
3,4,64          //  0x40 01000000 FCoff
4,2,32          //  0x20 00100000 FCon
4,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                 Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,7           //  0x07 00000111 (Fast Flash) Flash Fault Horn1
2,2,6           //  0x06 00000110 (Fast Flash) Flash Fault
3,1,2           //  0x02 00000010 (Solid On) Fault
4,3,18          //  0x12 00010010 (Slow Flash) RgBk/H2 Fault
5,0,0           //  0x00 00000000 (Solid Off)
6,0,0           //  0x00 00000000 (Solid Off)
255,255,255     //                 Delimiter
```

RFAH

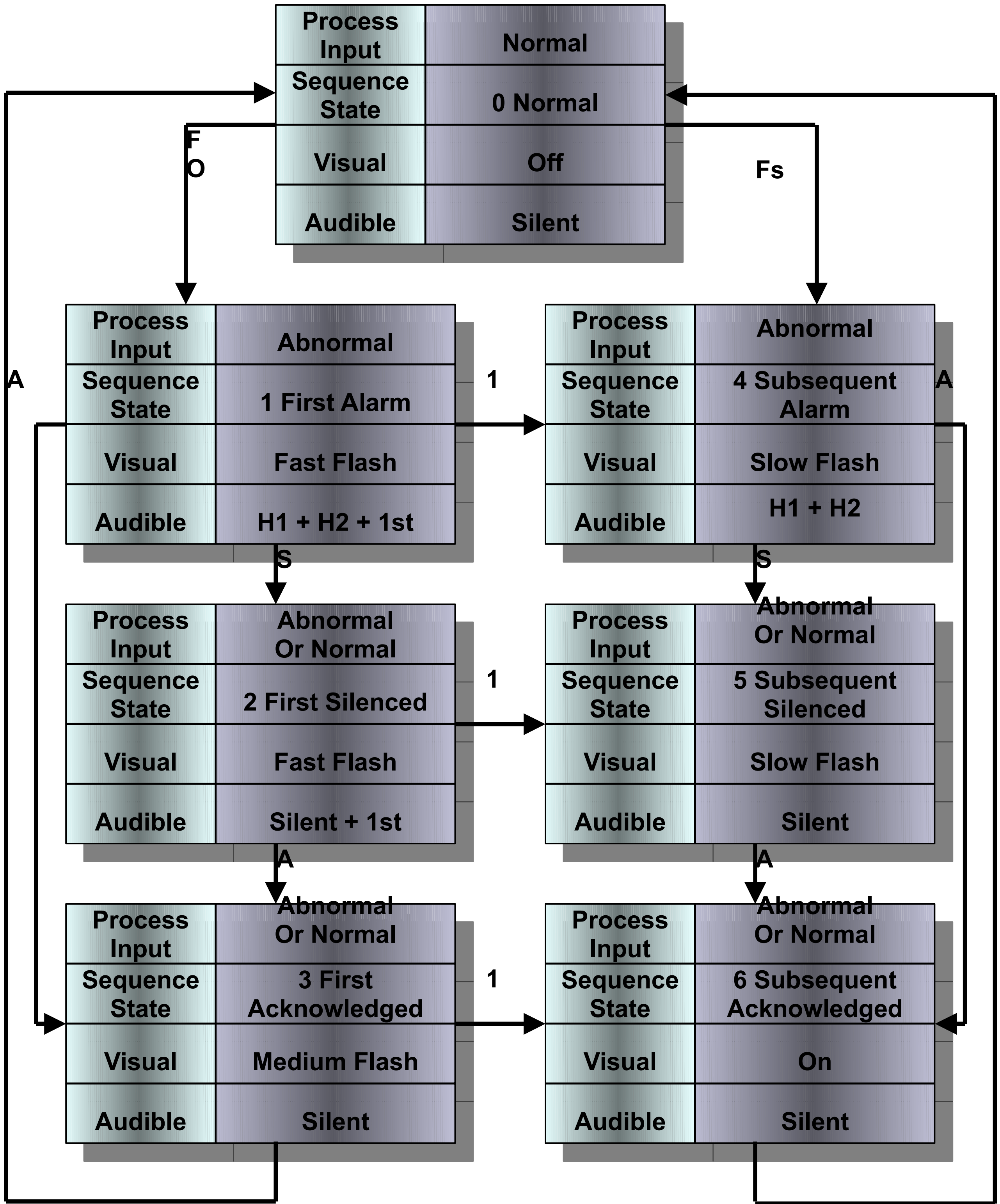
Legend:

1 = First Out Reset
A = Acknowledge
F = Fault
Fs = Subsequent Fault
N = Fault to Normal
O = Operational Test
R = Reset
S = Silence



```
"F3M-1B"
0,4,36          //  0x24 00100100 FCon ME
0,1,32          //  0x20 00100000 FCon
0,1,2           //  0x02 00000010 OpTest
1,1,2           //  0x02 00000010 OpTest
1,2,1           //  0x01 00000001 Silence
1,3,16          //  0x10 00010000 Ack
1,4,128         //  0x80 10000000 1st
2,3,16          //  0x10 00010000 Ack
2,5,128         //  0x80 10000000 1st
3,0,72          //  0x48 01001000 FCoff Reset
3,6,128         //  0x80 10000000 1st
4,4,2           //  0x02 00000010 OpTest
4,5,1           //  0x01 00000001 Silence
4,6,16          //  0x10 00010000 Ack
5,6,16          //  0x10 00010000 Ack
6,0,72          //  0x48 01001000 FCoff Reset
255,255,255     //                Delimiter
0,0,0           //  0x00 00000000 (Solid Off)
1,2,31          //  0x1F 00011111 (Fast Flash) RgBk/H2 1stOut Flash Fault Horn1
2,2,14          //  0x0E 00001110 (Fast Flash) 1stOut Flash Fault
3,4,2           //  0x02 00000010 (Medium Flash) Fault
4,3,23          //  0x17 00010111 (Slow Flash) RgBk/H2 Flash Fault Horn1
5,3,6           //  0x06 00000110 (Slow Flash) Flash Fault
6,1,2           //  0x02 00000010 (Solid On) Fault
255,255,255     //                Delimiter
```

F3M-1B


Process Input
Normal
Sequence State
0 Normal
Visual
Off
Audible
Silent
F O
Fs
A
A
Process Input
Abnormal
Sequence State
1 First Alarm
Visual
Fast Flash
Audible
H1 + H2 + 1st
1
Process Input
Abnormal
Sequence State
4 Subsequent Alarm
Visual
Slow Flash
Audible
H1 + H2
S
S
Process Input
Abnormal Or Normal
Sequence State
2 First Silenced
Visual
Fast Flash
Audible
Silent + 1st
1
Process Input
Abnormal Or Normal
Sequence State
5 Subsequent Silenced
Visual
Slow Flash
Audible
Silent
A
A
Process Input
Abnormal Or Normal
Sequence State
3 First Acknowledged
Visual
Medium Flash
Audible
Silent
1
Process Input
Abnormal Or Normal
Sequence State
6 Subsequent Acknowledged
Visual
On
Audible
Silent
N + R
N + R

Appendix E – IRIG Unit Setup

Time Code Output IRIG-B120 200-04 W/ IEEE1344

IRIG-B-120 IS DEFINED IN IRIG STANDARD 200-04 AS:

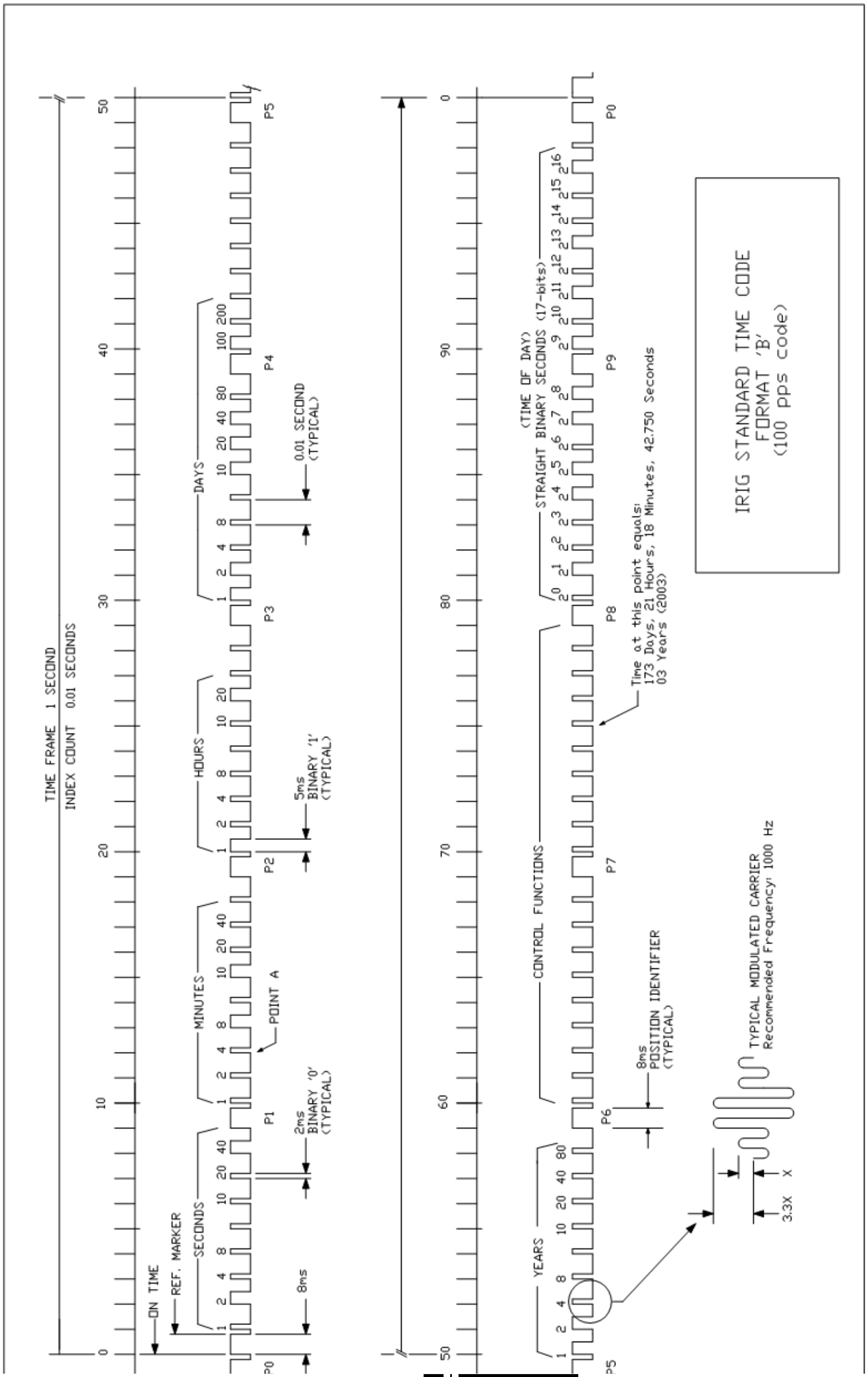
Format B 100 pps
1 = Sine wave amplitude modulated
2 = 1kHz carrier/1mSec resolution
0 = BCDTOY,CF,SBS

IEEE1344 as Defined in IEEE Std C37.118 TM-2005, Annex F:

IRIG-B format, <sync>SS:MM:HH:DDD<control bits> <binary seconds>

Where:

<sync> is the on time marker
SS seconds 00-59 (60 during leap seconds)
MM minutes 00-59
HH hour of day 00-23
DDD day of year 001-366
<control> 27 binary control characters
<binary seconds> binary seconds of day


TIME FRAME 1 SECOND
INDEX COUNT 0.01 SECONDS
ON TIME
REF. MARKER
SECONDS
MINUTES
HOURS
DAYS
POINT A
8ms
2ms BINARY '0' (TYPICAL)
5ms BINARY '1' (TYPICAL)
0.01 SECOND (TYPICAL)
P0 P1 P2 P3 P4 P5
YEARS
CONTROL FUNCTIONS
(TIME OF DAY) STRAIGHT BINARY SECONDS (17-bits)
8ms POSITION IDENTIFIER (TYPICAL)
P5 P6 P7 P8 P9 P0
Time at this point equals: 173 Days, 21 Hours, 18 Minutes, 42.750 Seconds 03 Years (2003)
TYPICAL MODULATED CARRIER Recommended Frequency: 1000 Hz
X
3.3X
IRIG STANDARD TIME CODE FORMAT 'B' (100 pps code)

Appendix F – ModBus Supported Operation Codes

This is a list of the supported ModBus Functions in the X11CB-IM:

01 Read Coil Status
02 Read Input Status
03 Read Holding Registers
04 Read Input Registers
05 Force Single Coil
15 Force Multiple Coils (0F Hex)

Functions 01 and 02 similar, in that they return the ModBus Points compressed 8 to a byte.

Function 01 returns the Field Contact status and does so for points, switches and outputs.
Function 02 returns channel alarm status and does so for points, switches but not outputs.

The 03 and 04 functions return bytes (as 16 bit values) that reflect the state table status of the Alarm Module Channel:

Read Holding Registers returns Output bits then Input Tests in that order in the buffer
Read Input Registers returns State then Pervious Input in that order in the buffer

Both 03 and 04 will return point and switches, but not outputs.

Please note that functions 03 and 04 are by no means standard as to what Holding and Input registers are supposed to contain.

Holding registers were originally intended to be a 16-bit scratch pad area for each point.
Input Registers were used for analog input values.

Appendix G – POST Error Blink Codes

IM CARD:

blinks on the IP Connector:

#define name	Blink Codes	Blink Code Definition
POSTERROR_FAULTISR	5-5-5	catastrophic error
POSTERROR_MEM_DBUSERR	1-1	SDRAM data bus error
POSTERROR_MEM_ABUSERR	1-2	SDRAM address bus error
POSTERROR_MEM_BANKERR	1-3	SDRAM Bank error
POSTERROR_MEM_DEVERR	1-4	SDRAM device error (can't read and write to all locations)

blinks on the Run Relay:

#define name	Blink Codes	Blink Code Definition
RUNERROR_AM_NOTRESPONDING	1-2	Alarm Module is not responding
RUNERROR_AM_INVALIDCONFIG	1-3	Alarm Module responds with invalid configuration
RUNERROR_AM_UNFINISHEDCONFIG	1-4	Unable to finish configuration
RUNERROR_AM_CANTIMEOUT	1-5	CAN Timeout
RUNERROR_AM_INVALIDASYSREC	2-1	Invalid ASys Record
RUNERROR_AM_REDUNDANTFAIL	2-2	Redundancy Failure
RUNERROR_AM_CANBUSFAILURE	2-5	CAN Bus Failure - ! An acknowledge error has occurred.
RUNERROR_IM_NEEDCONFIG	3-1	IM needs configuration
RUNERROR_IM_TXIPQOVFL	3-3	IM TX IP QUEUE Overflow
RUNERROR_IM_ZCRACECONDITION	4-1	Zero Crossing interrupt race condition

AM CARD Blink Codes:

Note MAXMODULES = 225 or 0xE1

```
if (cardID < 1 || cardID > MAXMODULES)
   AddPostError(0x0313);  // error 3-1-3
```

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