# Installation and Operation Instructions

Part Number 33CNSRVPAK

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## INSTALLATION

**Software Installation —** Service Pack software requires no special installation. The software can be run from any folder on a computer's hard drive. Service Pack software will not run from a CD-ROM or write-protected floppy disk. Service Pack is compatible with Windows 95, Windows 98, Windows Me, Windows NT 4.0 (with Service Pack 4 or later) and Windows 2000 operating systems. The Service Pack software supports baud rates of 1200 to 38,400 baud. Service Pack applications will only work on a locally connected network.

Service Pack software may be installed on the same computer as ComfortVIEW™, ComfortWORKS® or Network Service Tool IV. When a Service Pack application is launched on a computer with ComfortVIEW or ComfortWORKS, the communication driver for these programs will be disabled and re-enabled automatically by the Service Pack software. Any open ComfortVIEW or ComfortWORKS applications will be automatically closed while the Service Pack software is running.

The Service Pack consists of 3 applications:

- The Element Setup Utility is used to set up a CCN (Carrier Comfort Network) controller's bus/element numbers, baud rate, driver type, name and description
- The Point Trace Utility is used to trace up to 20 CCN variables (at a configured interval)
- The Bus Diagnostic Utility is used to view CCN communication traffic on the bus for troubleshooting and to perform diagnostics of a CCN communications bus

It is recommended, but not required, to create a folder on the computer hard drive called "SVCPACK." Service Pack applications must be able to write their settings to the hard drive for proper operation. Use the Windows Explorer program to create the directory and copy the following three files to the directory:

ElementSetupUtility.exe

PointTraceUtility.exe

BusDiagnosticUtility.exe

If the Service Pack programs will receive frequent use, create a shortcut to the Service Pack folder on the Windows desktop for easy access.

The Service Pack Utilities software may also be started by opening Windows Explorer, opening the folder where the software is stored, and then double-clicking on the selected Utility software icon.

The Service Pack will not make any system.ini file entries. It does not add or change the system registry and does not modify any PC configuration.

**Hardware Installation —** An RS485 converter approved by Carrier must be used. The recommended converter for temporary installation is the B&B electronics 485CARLP9A port powered 9-pin RS232 to RS485 converter. A standard 4-wire phone cable will need to be field-supplied for connection to the controller or wall thermostat.

If the converter is to be installed on a computer that is in continuous operation, an optically isolated RS232 to RS485 is recommended. Carrier recommends the following four devices for a permanent installation:

- Carrier Network Access Module 33CSNA--01 (NAM) (limited to 9600 baud maximum)
- Carrier Repeater CEAS420876-02 (two power cubes CEAS221045-01 are required for optical isolation) (limited to 9600 baud maximum)
- B&B Electronics internal PC cards 3PXOCC1 or 3PXOCC1A (compatible with all baud rates up to 38,400 baud)
- OPTO-22 AC24AT internal PC card (compatible with all baud rates up to 38,400 baud)

The B&B Electronics converters can be purchased from:

B&B Electronics
1500 Boyce Memorial Drive
P.O. Box 1040
Ottawa, IL 61350
(815) 434-0846
www.bb-elec.com

The OPTO-22 AC24AT can be purchased from:

OPTO-22
43044 Business Park Drive
Temecula, CA 92590-3665
1-800-321-6786
www.opto22.com

**Software Considerations —** Certain FAX, Palm Pilot, and other communication software drivers, upon initiation, take over the communications ports and do not allow other software access to the ports. If there is a conflict, it is recommended that the software be shut down or turned off when running Service Pack applications, to prevent blockage of the COM port.

## OPERATION

**Help Information —** During operation, help information is displayed on the bottom row in the active window. Help, in the form of "fly over" text is displayed when the mouse cursor is positioned over the desired item.

**Element Setup Utility Overview —** With the Element Setup Utility the user can perform the following actions:

- Check communication with a specific CCN element
- Search the network for active CCN elements
- Modify the network address of a CCN element
- Modify the CCN element's name, description and location in the element's ID table
- Determine the address, model number and software version number of a CCN element
- Modify the primary or secondary baud rate of a CCN element
- Set compatible CCN device's driver type to be broadcast acknowledgers for their bus

When the Element Setup Utility is executed, the main screen appears as shown in Fig. 1. There are six buttons which can be used to perform the following actions:

- The Number button is used to scan a single address which is specified at the top of the screen
- The Simple Scan button is used to perform a simple bus scan
- The Detailed Scan button is used to perform a detailed bus scan
- The Range button is used to specify a scanning range
- The Bus and Element configurations can be used to specify a single address to scan
- The Up and Down Arrow buttons can be used to scan up or down, starting at the address specified in the bus and element configuration decisions on the main screen

The actions can also be performed by accessing the Actions menu item in the menu bar at the top of the screen.

The Setup menu item is also in the menu bar at the top of the screen.

**Element Setup Utility Setup —** The Setup menu item is used to configure the Utility's communication driver. By clicking on the Setup menu item, the user can specify:

- the CCN communications port used
- the CCN communications baud rate
- the CCN communications retry count
- the device address that the Element Setup Utility is using

SET COMMUNICATION PORT — The user must first specify the local port on the computer which is directly connecting to the CCN network. See in Fig. 2. The "Set Com Port" menu item can be found under the Setup menu. Use this selection to choose the proper communications port. Acceptable selections include Com1, Com2, Com3 and Com4.

SET BAUD RATE — After the proper communications port is selected, the proper CCN network baud must be selected. See Fig. 3. This is typically 9600 baud. The "Set Baud Rate" menu item can be found under the Setup menu. Acceptable configurations are 1200, 2400, 4800, 9600, 19200, and 38400 baud.

SET RETRY COUNT — The user also has the ability to adjust the CCN communication driver's retry count. See Fig. 4. The retry count defaults to 2 and normally does not need to be changed. On busy CCN networks it may be necessary to increase the retry count, one unit at a time, until reliable CCN communications is achieved. The "Set Retry Count" menu item can be found under the Setup menu. Acceptable selections include 1 through 9 retries.

SET BUS ADDRESS — The set bus address option can be used to change the bus number and element number of the Element Setup Utility. See Fig. 5. The "Set this program's bus address" menu item can be found under the Setup menu. The bus number selected should match the number of the CCN bus on which the Element Setup Utility is communicating. The element number selected should be a unique address that is not currently being utilized by any other CCN device or CCN user interface. Typically, CCN user interfaces use addresses above 230, the default for the Element Setup Utility is 238. The Tool's Bus number can range from 0 through 239. The Tool's Element number can range from 1 through 239.

Multiple copies of the Element Setup Utility software can be used on the same bus as the same time. However some changes need to be made to the program's element location. There cannot be two setup utilities using the same element address. Standard element numbers are 231 to 239. Consideration must be made to avoid element numbering conflicts on the primary bus between ComfortVIEW™ or ComfortWORKS® software which is usually on bus 0 at element 239. The 'Restore Defaults' button will reset the tool to its default address of 0,238.

**Element Setup Utility Actions —** The Actions menu item is used to define and perform CCN element set ups. See Fig. 6. The actions can also be performed by pressing the buttons below the menu bar. The Actions menu item allows the user to:

- scan the single address specified at the top of the screen
- specify a high and low scan range that is to be used when performing a scan
- start a simple bus scan
- start a detailed bus scan

SCAN FOR A SINGLE ADDRESS — The Scan for a Single Address menu option is used to scan a single CCN element's address. Enter the desired target device's bus and element number at the top of the screen and press the Single Scan button to scan the single device. After entering an address, the user can also initiate a simple or detailed scan as described below. The Search for Element on Bus # can range from 0 through 239. The Search for Element # can range from 0 through 239.

NOTE: Newer CCN elements have an added feature that makes address determination easier. These modules will answer a request to bus 0, element 0. To use this feature, connect directly to the CCN device with the remainder of the CCN bus removed. Once the element is isolated, enter 0 for the bus and element numbers and press the Scan a Single Address button. If a valid response is received, information about the element (including its configured address) is read and displayed on the screen. If the element is of an older design or not responding, the message 'No Response' will appear.

SET SCANNING RANGE — The scanning range must be set before a bus scan can be performed. In order to specify the scanning limits, select the Set High and Low Limits for Bus Scan menu item. Configure the beginning and ending bus and element number. See Fig. 7. After valid entries have been made, click on the Set Address button. After entering an address range, the user can initiate a simple or detailed scan. The Beginning/Ending Bus to Scan has a range of 0 through 239. The Beginning/Ending Element to Scan has a range of 0 through 239. Pressing the ESC button or the SPACE BAR during a scan will stop the scan process.

NOTE: The beginning bus and element numbers respectively must be less than or equal to the ending bus and element numbers.


**Fig. 1 — Element Setup Utility Main Screen**

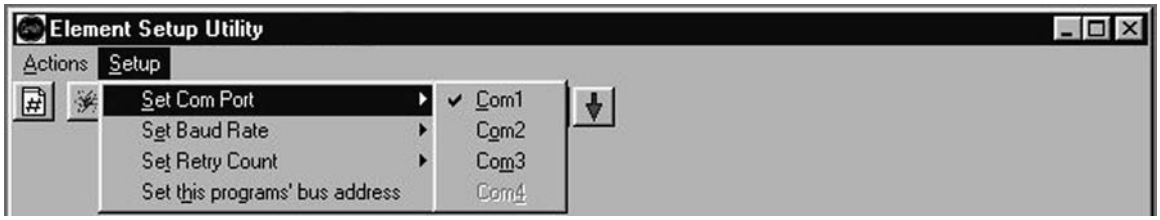



**Fig. 2 — Set Communication Port**

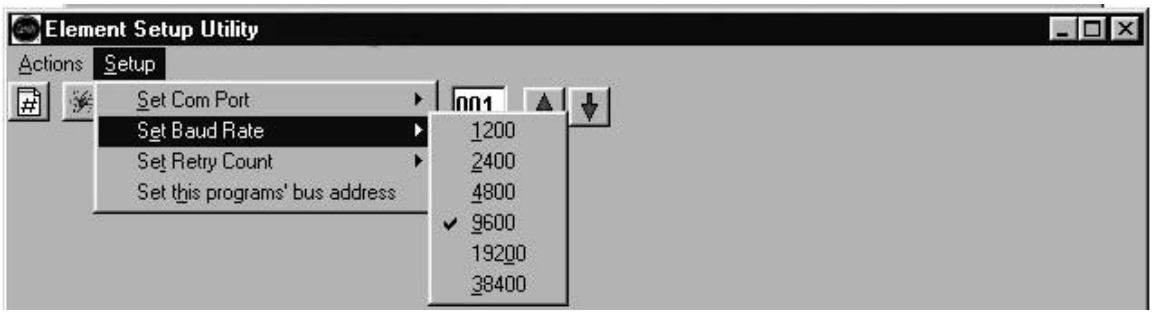



**Fig. 3 — Set Baud Rate**

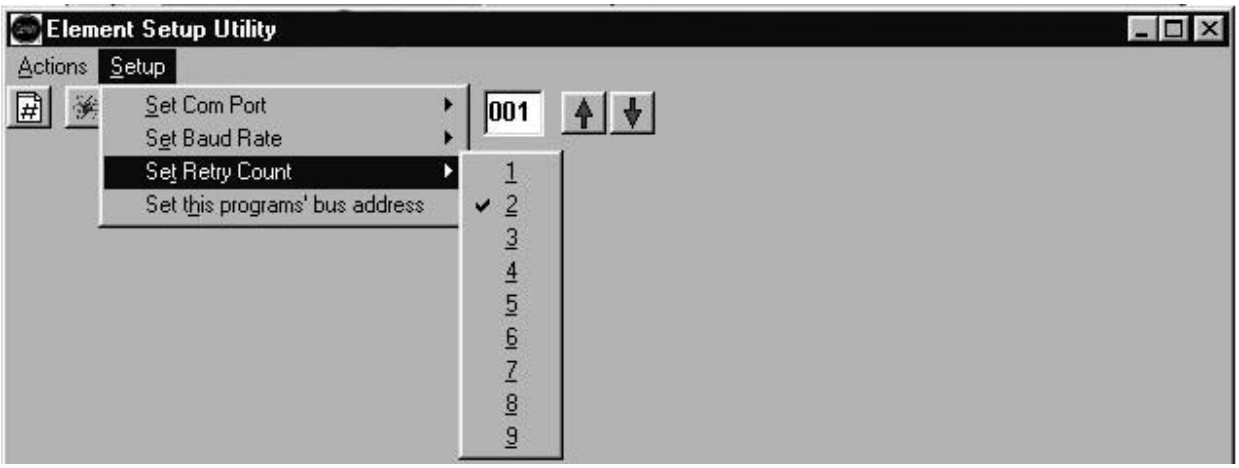



**Fig. 4 — Set Retry Count**

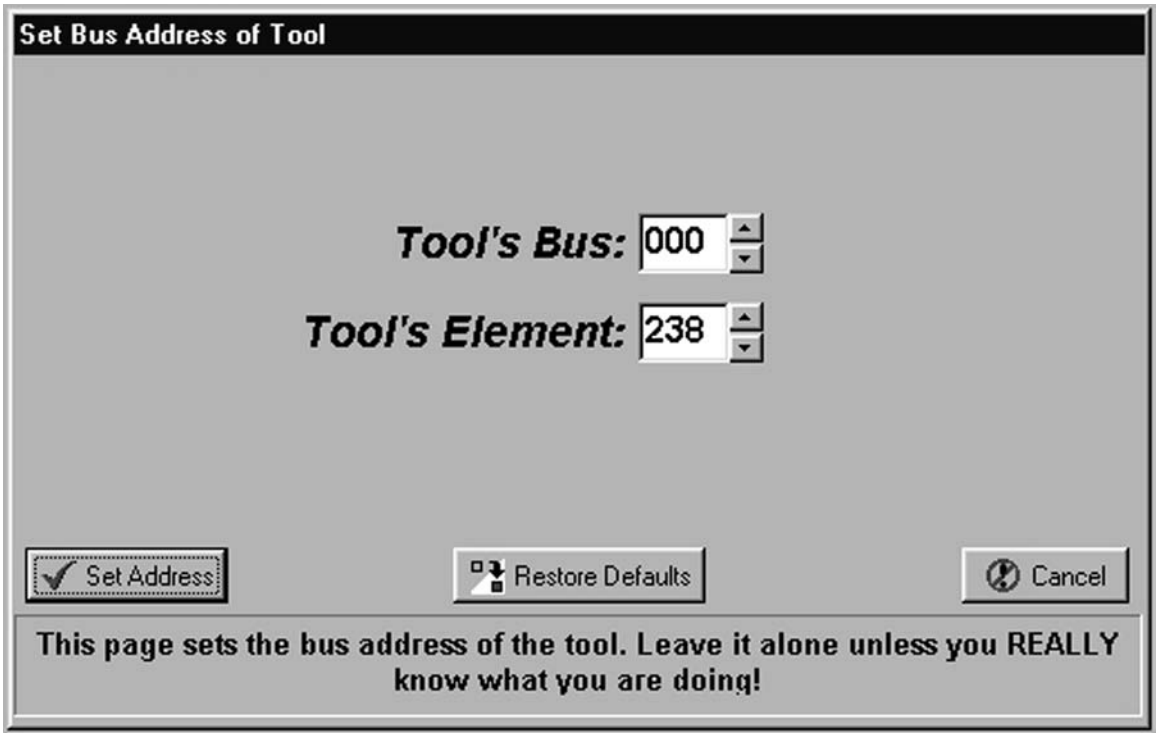



**Fig. 5 — Set Bus Address**


**Fig. 6 — Element Setup Utility Actions Menu**

SIMPLE BUS SCAN — The Element Setup Utility is capable of scanning a CCN network and displaying all CCN elements that are found. A simple bus scan or a detailed bus scan can be performed. A simple bus scan will display only the most important information for the user. See Fig. 8.

When a simple scan is performed the following data will be displayed:

- bus number
- element number
- device name (8 character)
- device description (24 character)
- device location description (24 character)
- software part number

If a device does not communicate the user will see a "No Response" message displayed on the screen.

DETAILED BUS SCAN — The Element Setup Utility is capable of scanning a CCN network and displaying all CCN elements that are found. A simple bus scan or a detailed bus scan can be performed. A detailed bus scan will display all the information for each bus element for the user. See Fig. 9. When a detailed scan is performed the following data will be displayed:

- bus number
- element number
- device type
- version
- device name (8 character)
- device description (24 character)
- device location description (24 character)
- software part number
- model number
- serial number
- reference number
- driver type
- primary baud rate
- secondary baud rate

If a device does not communicate the user will see a "No Response" message displayed on the screen.

CHANGING ELEMENT PARAMETERS — Once a simple or detailed can is performed, the parameters of an element can be changed. See Fig. 10. Double click on an element in order to change its parameters. Double click anywhere in the row of the desired element in order to enter edit mode. Once in element edit mode, the configuration can be changed and sent to the element. To make a change, select a field with the mouse, make the desired change and when finished press the Send Changes button.

The Refresh button can be used to read the latest data from the displayed device. It can also be used to verify that a previous change made to this configuration has taken place.

The following items are available in the edit element screen:

Bus Number — The Bus Number is used to configure the bus number of the connected CCN device.

| | |
|---|---|
| Display Range | 0 to 239 |
| Access | Read/Write |

NOTE: When changing a device's bus number, do not change any other parameters of that device at the same time. When changing a bus number it is necessary to change the Element Setup Utility's bus number to match the device's new bus number to make subsequent changes.

Element Number — The Element Number is used to configure the element number of the connected CCN device.

| | |
|---|---|
| Display Range | 1 to 239 |
| Access | Read/Write |

NOTE: When changing a device's element number do not change any other parameters of that device at the same time. To change other parameters perform a refresh and make additional changes as needed.

Device Type — The Device Type is used to display the Device Type of the connected CCN device. The ComfortWORKS® and ComfortVIEW™ software utilize this data when uploading.

| | |
|---|---|
| Display Range | ASCII |
| Access | Read Only |

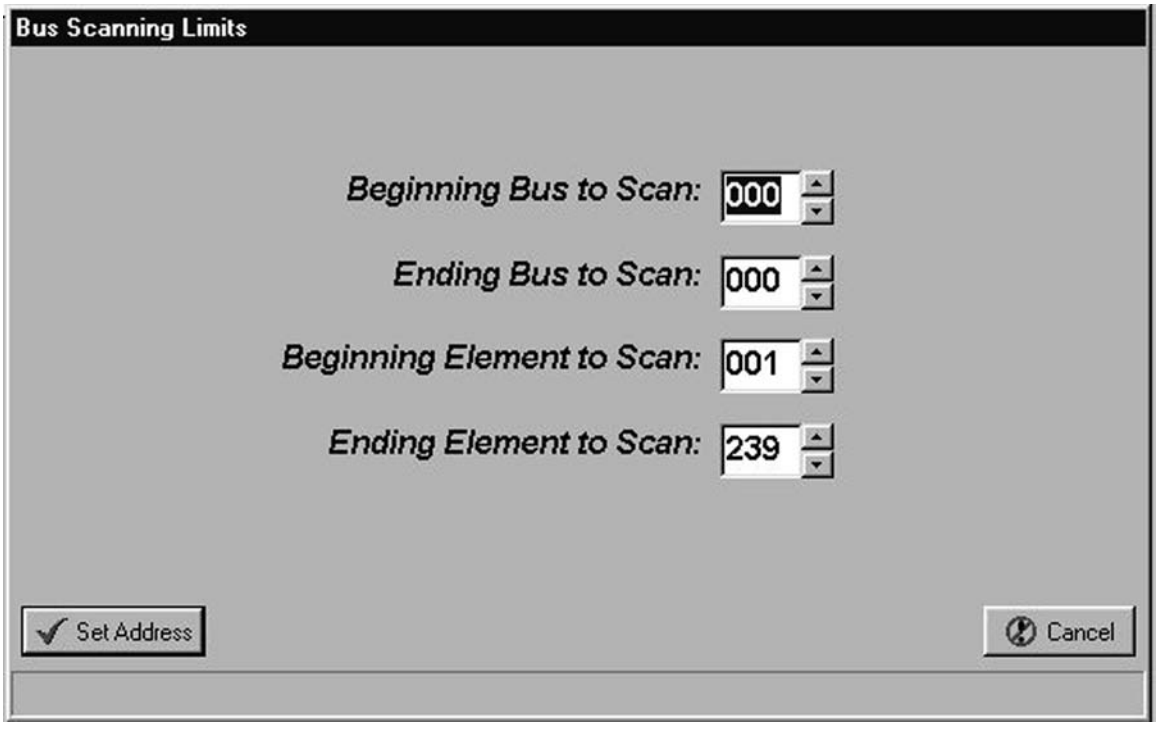
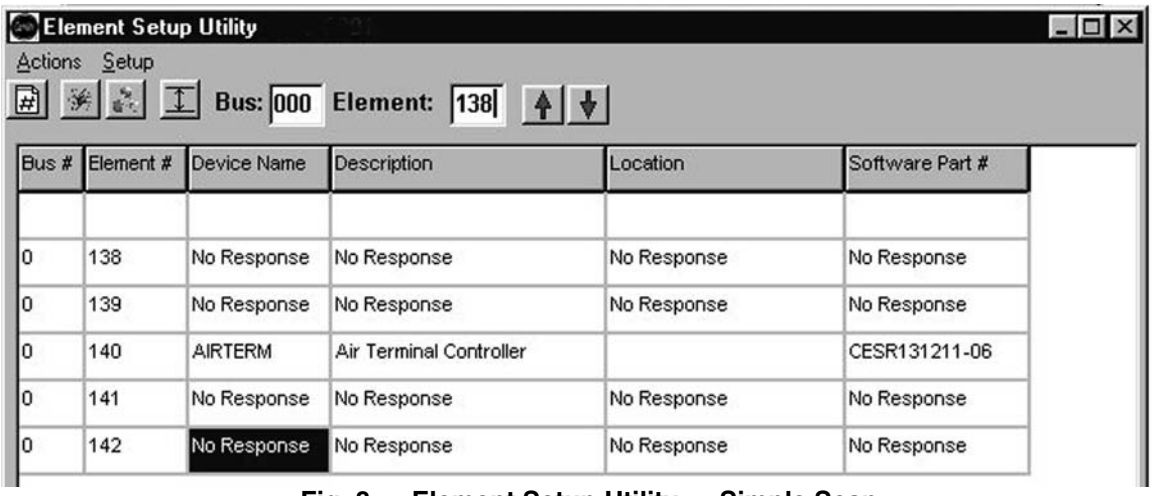
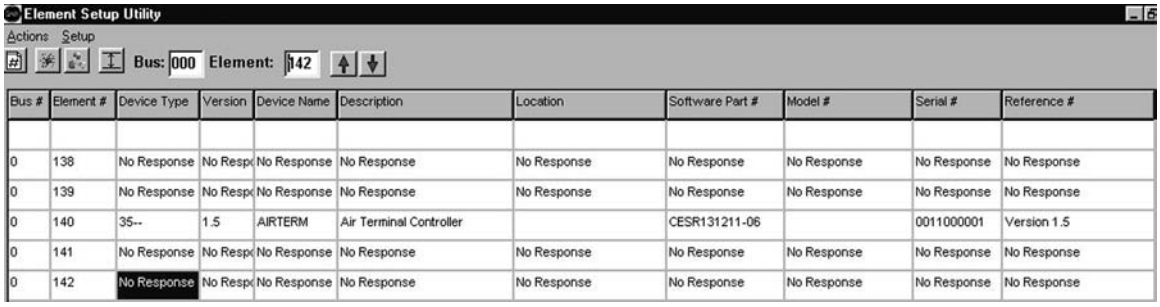



**Fig. 7 — Element Setup Utility Bus Scanning Limits**




| Bus # | Element # | Device Name | Description | Location | Software Part # |
|---|---|---|---|---|---|
| | | | | | |
| 0 | 138 | No Response | No Response | No Response | No Response |
| 0 | 139 | No Response | No Response | No Response | No Response |
| 0 | 140 | AIRTERM | Air Terminal Controller | | CESR131211-06 |
| 0 | 141 | No Response | No Response | No Response | No Response |
| 0 | 142 | No Response | No Response | No Response | No Response |

**Fig. 8 — Element Setup Utility — Simple Scan**




| Bus # | Element # | Device Type | Version | Device Name | Description | Location | Software Part # | Model # | Serial # | Reference # |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| 0 | 138 | No Response | No Resp | No Response | No Response | No Response | No Response | No Response | No Response | No Response |
| 0 | 139 | No Response | No Resp | No Response | No Response | No Response | No Response | No Response | No Response | No Response |
| 0 | 140 | 35-- | 1.5 | AIRTERM | Air Terminal Controller | | CESR131211-06 | | 0011000001 | Version 1.5 |
| 0 | 141 | No Response | No Resp | No Response | No Response | No Response | No Response | No Response | No Response | No Response |
| 0 | 142 | No Response | No Resp | No Response | No Response | No Response | No Response | No Response | No Response | No Response |

**Fig. 9 — Element Setup Utility — Detailed Scan**

Version — The Version is used to display the Version number of the connected CCN device. The ComfortWORKS® and ComfortVIEW™ software utilize this data when uploading.

Display Range Numeric

Access Read Only

Device Name — The Device Name field is used to configure the 8 character device name.

Display Range ASCII (8 characters)

Access Read/Write*

*If this field is dimmed, the data in the CCN element is read only.

Description — The Description field is used to configure the 24 character device description.

Display Range ASCII (24 characters)

Access Read/Write*

*If this field is dimmed the data in the CCN element is read only.

Location — The Location field is used to configure the 24 character device location.

Display Range ASCII (24 characters)

Access Read/Write*

*If this field is dimmed the data in the CCN element is read only.

Software Part Number — The Software Part Number field is used to display the CCN device's software part number. A device's software part number is programmed at the factory and cannot be changed.

Display Range Alpha-numeric

Access Read Only

Model Number — The Model Number field is used to display the CCN device's model number. A device's model number is programmed at the factory and cannot be changed.

Display Range Alpha-numeric

Access Read Only

Serial Number — The Serial Number field is used to configure the CCN device's hardware serial number. Generally, a device's serial number is programmed at the factory and should not be changed.

Display Range Alpha-numeric

Access Read/Write

Reference Number — The Reference Number field is used to configure the CCN device's reference number. Generally a device's reference number is programmed at the factory and should not be changed.

Display Range Alpha-numeric

Access Read/Write

Driver Type — The Driver Type field is used to configure the CCN device's Driver Type. A device's driver type is either a bridge or a non-bridge when shipped from the factory. A bridge's driver type cannot be changed. A non-bridge driver type can usually be changed between non-bridge and broadcast acknowledger if support by the connected CCN element.

Display Range 0 - Non-Bridge, 1 - Bridge, 3 - Broadcast Acknowledger

Access Read/Write

Primary Baud Rate — The Primary Baud Rate field is used to configure the CCN device's primary communication port baud rate. CCN devices are generally defaulted to 9600 baud. Consult each CCN device's installation and operation instructions to verify if its baud rate can be set above 9600 baud.

Display Range 1200, 2400, 4800, 9600, 19200, 38400 baud

Access Read/Write

Secondary Baud Rate — The Secondary Baud Rate field is used to configure the CCN device's secondary communication port baud rate. CCN devices are generally defaulted to 9600 baud. This field will only be available for edit if the selected device uses a secondary communications port. Consult each CCN device's installation and operation instructions to verify if its baud rate can be set above 9600 baud.

| | |
|---|---|
| Display Range | 1200, 2400, 4800, 9600, 19200 or 38400 baud |
| Access | Read/Write* |

*This field is not applicable to CCN devices that only utilize one communication port. If this field is dimmed the secondary baud rate cannot be changed.

**Point Trace Utility Overview —** With the Point Trace Utility the user can perform the following functions:

- trace up to 20 CCN variables
- save trace data to a file
- view a graphical representation of your trace data
- start or stop a trace based upon time, analog trigger point, or discrete trigger point.

**Point Trace Utility Setup —** The Setup menu item is used to configure the Utility's communication driver. By clicking on the Setup menu item, the user can specify:

- the CCN communications port used
- the CCN communications baud rate
- the CCN communications retry count
- the device address that the Point Trace Utility is using

SET COMMUNICATION PORT — The user must first specify the local port on the computer which is directly connecting to the CCN network. See Fig. 2. The "Set Com Port" menu item can be found under the Setup menu. Use this selection to choose the proper communications port. Acceptable selections include Com1, Com2, Com3 and Com4.

SET BAUD RATE — After the proper communications port is selected, the proper CCN network baud must be selected. See Fig. 3. This is typically 9600 baud. The "Set Baud Rate" menu item can be found under the Setup menu. Acceptable configurations are 1200, 2400, 4800, 9600, 19200, and 38400 baud.

SET RETRY COUNT — The user also has the ability to adjust the CCN communication driver's retry count. See Fig. 4. The retry count defaults to 2 and normally does not need to be changed. On busy CCN networks it may be necessary to increase the retry count, one unit at a time, until reliable CCN communications is achieved. The "Set Retry Count" menu item can be found under the Setup menu. Acceptable selections include 1 through 9 retries.

SET BUS ADDRESS — The set bus address option can be used to change the bus number and element number of the Point Trace Utility. See Fig. 5. The "Set this program's bus address" menu item can be found under the Setup menu. The bus number selected should match the number of the CCN bus on which the Point Trace Utility is communicating. The element number selected should be a unique address that is not currently being utilized by any other CCN device or CCN user interface. Typically, CCN user interfaces use addresses above 230, the default for the point Trace Utility is 238. The Tool's Bus number can range from 0 through 239. The Tool's Element number can range from 1 through 239.

Multiple copies of the Point Trace Utility software can be used on the same bus as the same time. However some changes need to be made to the program's element location. There cannot be two utilities using the same element address. Standard element numbers are 231 to 239. Consideration must be made to avoid element numbering conflicts on the primary bus between ComfortVIEW™ or ComfortWORKS® software which is usually on bus 0 at element 239. The 'Restore Defaults' button will reset the tool to its default address of 0,238.

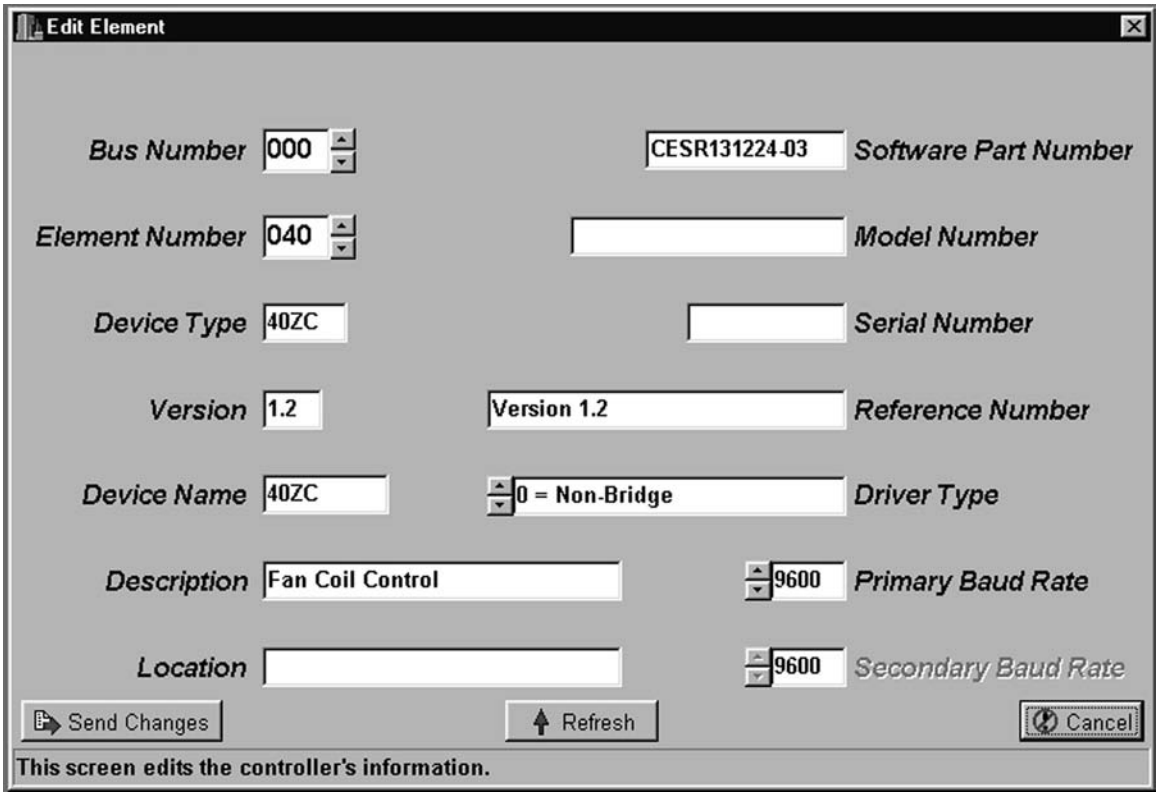



**Fig. 10 — Element Setup Utility Edit Element**

**Configuring Trace Points —** The main screen on the Point Trace Utility is shown in Fig. 11.

The main screen on the Point Trace Utility has the following buttons:

- the setup trace trigger points button
- the perform a trace or display a saved trace button
- the display a graph of saved trace button
- the clear and reset trace parameters button

The user can also configure the units of measure as a metric or imperial.

SPECIFY TRACE POINTS — On the main screen the user must specify up to 20 point names, bus and element addresses. The 20 points can be CCN variables can be from any number of different CCN controllers.

The user can select the point name, bus number and element number of each of the 20 points. The user can manually type in these parameters or use the point quick select feature. In order to utilize the point quick select feature, the user must specify the bus and element numbers of the device and then press the quick select button next to the element address. The point selection screen will be displayed and a list of available CCN point names will be displayed. See Fig. 12. To select a point, double click the desired point name and the name will then fill in on the main screen.

The point name has a display range of 8 characters. The bus number of the device has a display range of 0 to 239. The element number has a display range of 1 to 239.

**Point Trace Utility Actions —** The Actions menu items allow the user to select from the following commands:

- setup trace parameters including timing and triggers
- clear and reset all trace configuration parameters
- perform a new trace or display a saved trace
- display a saved trace graphically

The buttons under the menu items also perform the same actions. Either can be used. See Fig. 13.

SETUP TRACE TRIGGER POINTS — The Setup Trace Trigger Points Actions menu item is used to access the trace parameters configuration screen.

The user has the ability to select when the trace will be started and ended. The user must select a manual start, a timed start, or an event triggered (analog or digital) start. The user must also select a manual end, a timed end, or an event triggered (analog or digital) end. See Fig. 14. Additionally, scan frequency and post trigger buffer can be configured at the bottom of the Trace Parameters configuration screen. Any combination of start and end trigger types is acceptable.

As an example, to start a trace when the indoor fan is energized, click on the Digital Trace Trigger Point under Trace Starting Criteria. Enter the bus address and point name of the device. Click on the 1 in the State box. The trace is now set to start whenever the fan is energized.

To stop the trace whenever the room air temperature drops below 65 F, click on the Analog Trace Trigger Point below Trace Ending Criteria. Enter the bus address and point name for the room air temperature sensing device. Enter 65 (F) in the value field. Click on the less than (<) symbol. The trace will now end whenever the room air temperature drops below 65 F.

Digital Trace Trigger Point Starting/Ending Criteria — In order to specify a digital start or end trigger point the following parameters must be configured: the bus number of the device, the element number of the device, the point name of the device, and the digital trigger point (on or off).

NOTE: The point quick select feature, described in the Specify Trace Points section of this manual, is available to quick select point names.

After the device has been selected, the desired state of the digital trigger point to start or end the trace must be set. Set the value to 0 (logical off) or 1 (logical on).

Analog Trace Trigger Point Starting/Ending Criteria — In order to specify an analog start or end trigger point the following parameters must be configured: the bus number of the device, the element number of the device, the point name of the device, the analog trigger point, and whether the reading will be greater, equal to, or less than the analog trigger point.

NOTE: The point quick select feature, described in the Specify Trace Points section of this manual, is available to quick select point names.

Scheduled Starting/Ending Criteria — In order to specify a scheduled start or end trigger the desired date and time to start or end the trace must be specified. Click on the "Scheduled Start" or "Scheduled Stop" parameters and then enter the desired date and time.

Manual Start/Stop — In order to specify a manual start or stop, click on the "No Trigger, User Will Manually Start" or "No Trigger, User will Manually Stop" parameters.

Trace Scan Frequency — The trace scan frequency must be entered. This value determines the scan rate of the points to be traced. The Trace Scan Frequency has a range of 1 to 86,400 seconds. This determines how often the scan is performed.

NOTE: When tracing large numbers of points, it may not be possible for the utility to trace at the configured interval. In this case, the utility will trace at the fastest interval possible.

Post Stop Trigger Iterations — The post stop trigger iterations configuration specifies how many point samples will be recorded after the trace stop trigger has been activated. The Post Stop Trigger Iterations value has a range of 0 to 999,999 scans.

CLEAR AND RESET TRACE PARAMETERS — The Clear and Reset Trace Parameters Actions menu item is used to clear all point names, bus numbers and element numbers entered on the main screen.

PERFORM A TRACE/DISPLAY A SAVED TRACE — The Perform a Trace/Display Saved Trace Actions menu item is used to display a trace. See Fig. 15.

The following buttons are available on the Display Trace screen:

- The Start button is used to start a point trace. This button will be dimmed when a trace is active.
- The Stop button is used to stop a point trace. This button will be dimmed when a trace is inactive.
- The Open button is used to open a previously saved trace for viewing.
- The Clear button is used to clear the trace screen display.
- The Print button is used to print a previously saved trace.

Start a Configured Trace — To start the configured trace, press the Start button on the Display Trace screen. The user will be prompted to enter a filename. The utility will automatically save the trace to this filename. This trace file can later be reopened in text or graphical form. The trace will begin scanning. The trace parameter configuration will determine when the trace starts and ends. Traces can be configured to start immediately or start upon time or event triggers. For more information see the Trace Parameter Configuration section of this manual.

Stop a Configured Trace — To stop the configured trace, press the Stop button on the Display Trace screen. The trace will stop scanning. Additionally the traces can be configured to stop upon time or event triggers. For more information see the Trace Parameter Configuration section of this manual.

Open a Previously Saved Trace — To open a previously saved trace, press the Open button on the Display Trace screen. When pressed, this button allows the user to open a previously saved trace file. Trace files may be saved anywhere on the computer. Trace files have a ".trc" extension.

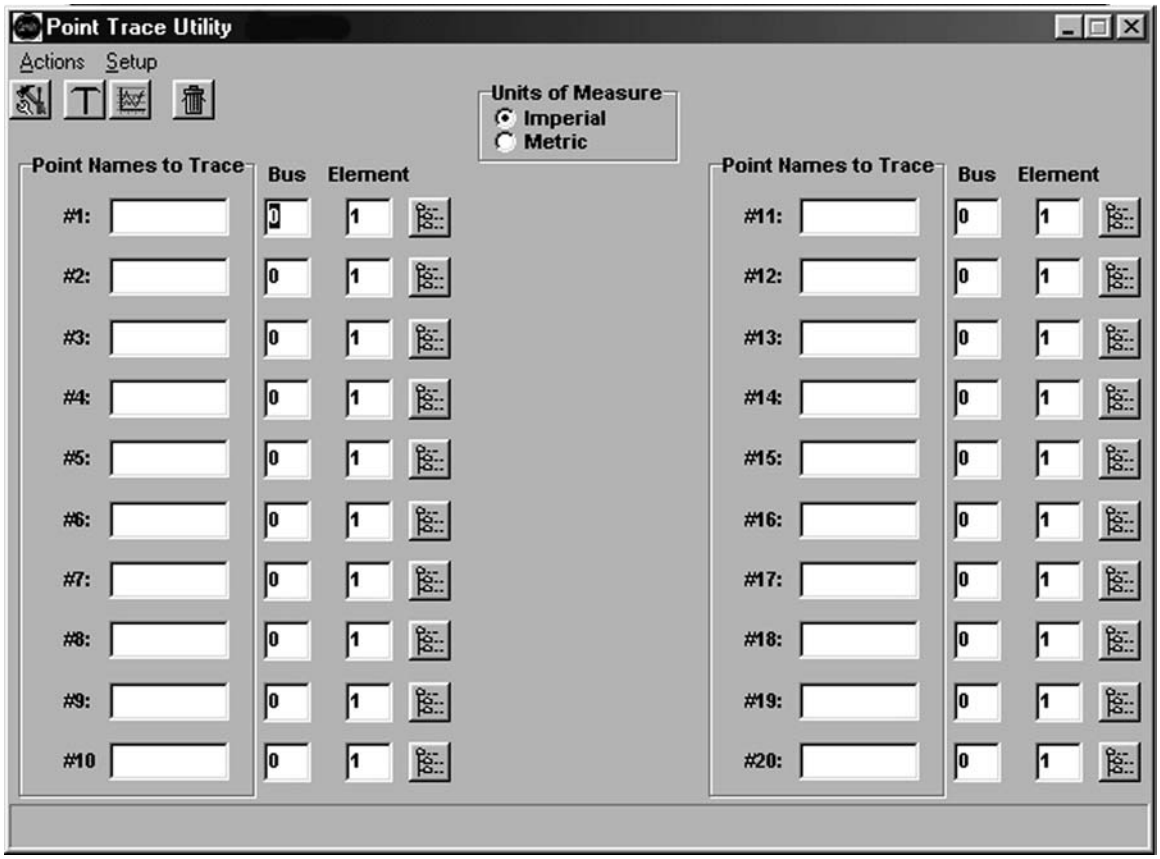



**Fig. 11 — Point Trace Utility Main Screen**


**Fig. 12 — Point Trace Utility Point Selection**

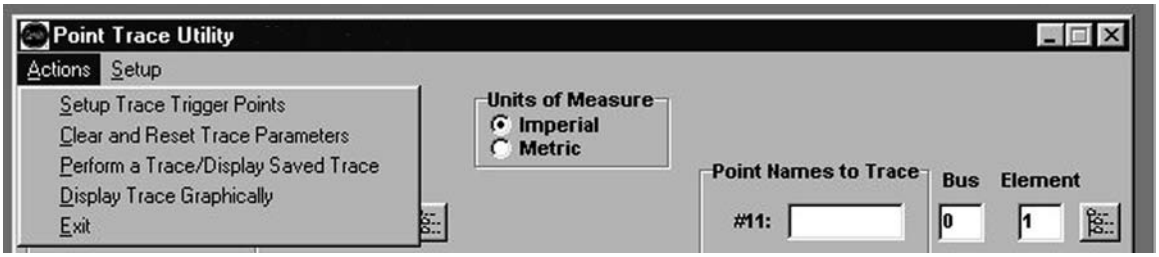



**Fig. 13 — Point Trace Utility Actions Menu**

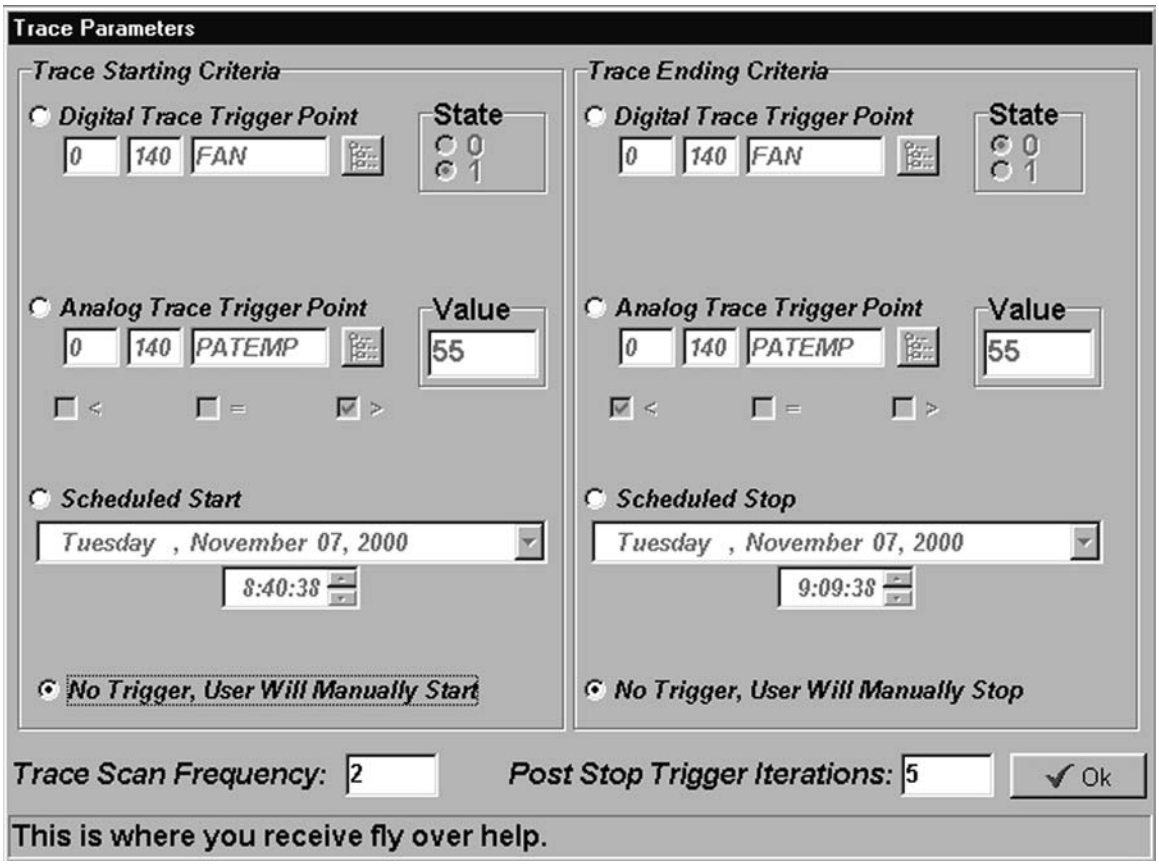



**Fig. 14 — Point Trace Utility Trace Parameter Configuration**

Clear a Display Trace — To clear the Display Trace window contents, press the Clear button on the Display Trace window. When this button is pressed all data within the window will be cleared.

Trace Display — When a trace is displayed, it contains point data column by column. Each column will contain the point name, address, value, force level and a time and date stamp. The time stamp will be formatted with hours, minutes, seconds and milli-seconds. The force levels are defined by numbers and correspond to the following force levels: 1 = Fire, 2 = Safety, 3 = Service, 4 = Supervisor, 5 = Monitor, 6 = Min Off, 7 = Control, 8 = BEST, 9 = Temp, 10 = Load.

DISPLAY TRACE GRAPHICALLY — The Display Trace Graphically Actions menu item is used to access the graphical trace display screen.

To open a previously saved trace file, press the Open button located at the top of the graphical display window. See Fig. 16. Pressing the Open button will open a file dialog box where the names of previously save traces will be displayed and the user will be able to select a trace for display.

The graph displays data from left to right. To zoom in on the trace, click and hold the left mouse button and draw a box from UPPER LEFT TO LOWER RIGHT, then release the mouse button. This then zooms on the trace section selected. Multiple zooms can be performed by repeating this procedure. The scaling on the right hand legend will become more detailed as the user zooms in. To zoom back out, click and hold the left mouse button and draw a box FROM LOWER RIGHT TO UPPER LEFT. Once you are zoomed in, click and hold the right mouse button to dynamically drag the grid for the desired view.

Print a Trace — To print a previously saved trace, press the Print button. Choose the desired trace from the list of saved trace files.

**Bus Diagnostic Utility Overview —** With the Bus Diagnostic Utility the user can perform the following functions:

- monitor CCN bus communications
- find CCN Broadcast Acknowledgers
- find CCN Alarm Acknowledgers
- find CCN Time Broadcasters
- find CCN Duplicate Addresses

**Bus Diagnostic Utility Setup —** The Setup menu item is used to configure the Utility's communication driver. Using the Setup menu item the user can specify:

- the CCN communications port used
- the CCN communications baud rate
- the CCN communications retry count
- the device address that the Bus Diagnostic Utility is using

SET COMMUNICATION PORT — The user must first specify the local port on the computer which is directly connecting to the CCN network. See in Fig. 2. The "Set Com Port" menu item can be found under the Setup menu. Use this selection to choose the proper communications port. Acceptable selections include Com1, Com2, Com3 and Com4.

SET BAUD RATE — After the proper communications port is selected, the proper CCN network baud must be selected. See Fig. 3. This is typically 9600 baud. The "Set Baud Rate" menu item can be found under the Setup menu. Acceptable configurations are 1200, 2400, 4800, 9600, 19200, and 38400 baud.

SET RETRY COUNT — The user also has the ability to adjust the CCN communication driver's retry count. See Fig. 4. The retry count defaults to 2 and normally does not need to be changed. On busy CCN networks it may be necessary to increase the retry count, one unit at a time, until reliable CCN communications is achieved. The "Set Retry Count" menu item can be found under the Setup menu. Acceptable selections include 1 through 9 retries.

SET BUS ADDRESS — The set bus address option can be used to change the bus number and element number of the Bus Diagnostic Utility. See Fig. 5. The "Set this program's bus address" menu item can be found under the Setup menu. The bus number selected should match the number of the CCN bus on which the Bus Diagnostic Utility is communicating. The element number selected should be a unique address that is not currently being utilized by any other CCN device or CCN user interface. Typically, CCN user interfaces use addresses above 230, the default for the point Trace Utility is 238. The Tool's Bus number can range from 0 through 239. The Tool's Element number can range from 1 through 239.

Multiple copies of the Bus Diagnostic Utility software can be used on the same bus as the same time. However some changes need to be made to the program's element location. There cannot be two utilities using the same element address. Standard element numbers are 231 to 239. Consideration must be made to avoid element numbering conflicts on the primary bus between ComfortVIEW™ or ComfortWORKS® software which is usually on bus 0 at element 239. The 'Restore Defaults' button will reset the tool to its default address of 0,238.

**Bus Diagnostic Utility Actions —** The Bus Diagnostic Utilities Actions menu allows the user to perform the following commands:

- start monitoring the bus
- stop monitoring the bus
- clear the bus monitor data
- trap messages to and from a specific element
- check the bus for broadcast acknowledger
- check the bus for alarm acknowledger
- check the bus for time broadcaster
- check for duplicate addresses
- print the bus information
- save a bus diagnostic scan
- load a previously saved diagnostic scan

The following buttons are on the Bus Diagnostic Utility main screen:

- The Monitor Bus Actions button is used to start a bus diagnostic trace. This button will be dimmed when a trace is active.
- The Stop Bus Actions button is used to stop the trace. This button is dimmed when a trace is inactive.
- The Clear button is used to clear the bus diagnostic trace screen.
- The Trap button is used to specify an address to trap messages to and from.
- The Identify Broadcast Acknowledger button is used to initiate the find broadcast acknowledger function.
- The Identify Alarm Acknowledger button is used to initiate the find alarm acknowledger function.
- The Identify Time Broadcaster button is used to initiate the find time broadcaster function.
- The Identify Duplicate Addresses button is used to check for duplicate addresses on the bus.
- The Print button is used to print the open a bus monitor trace file.
- The Open button is used to open a previously saved bus monitor trace file for graphical display.
- The Save button is used to save a bus monitor trace.

The actions can also be performed by accessing the Actions menu item in the menu bar at the top of the screen. See. Fig. 17.

MONITOR BUS ACTIONS — The Monitor Bus Actions button or menu item are used to start a bus diagnostic trace. When a trace is started, the bus diagnostic utility will display every message sent to the CCN bus. See Fig. 18. These messages will show the following: source bus/element numbers, destination bus/element numbers, message length (data len), bus command sent, the time between messages (latency), the message status, and the time the message was received.

Also, the bar at the top of the screen will display data regarding the messages trapped. It will contain the following information: Average Bus Load (measured over the last 5 minutes), peak bus load (over the last 5 seconds), total bytes captured, total message packets captured, total message collisions, total bad messages (bad CRCs), and percent of bad messages.

STOP MONITORING BUS ACTIONS — The Stop Monitoring Bus Actions menu item or button are used to stop a bus diagnostic trace.

CLEAR BUS MONITOR ACTIONS — The Clear Bus Monitor Actions menu item is used to clear the displayed bus diagnostic trace data.

TRAP SPECIFIC ADDRESS — The Trap Specific Address menu item or button are used to specify a CCN address to trap information. When using this option, the bus diagnostic utility will only display messages to and from the specified CCN bus and element number. See Fig. 19. Once the valid CCN bus and element numbers have been entered, press the Start Trap/Scan button to begin the trace.

To trap messages to and from all CCN elements, enter a value of 0 for the bus and element numbers.

IDENTIFY BROADCAST ACKNOWLEGER — The Identify Broadcast Acknowledger Actions menu item or button are used to find broadcast acknowledgers on a specified CCN bus. The desired CCN bus to be searched must be specified. See Fig. 20. The Start Search button is then used to start the process.

When broadcast acknowledgers are found, the utility will keep track of the total number found and their associated addresses. If multiple broadcast acknowledgers are identified on a single bus they should be reconfigured. Only one broadcast acknowledger should exist on a single CCN bus. The Stop Search button can be used to abort a search at any time.

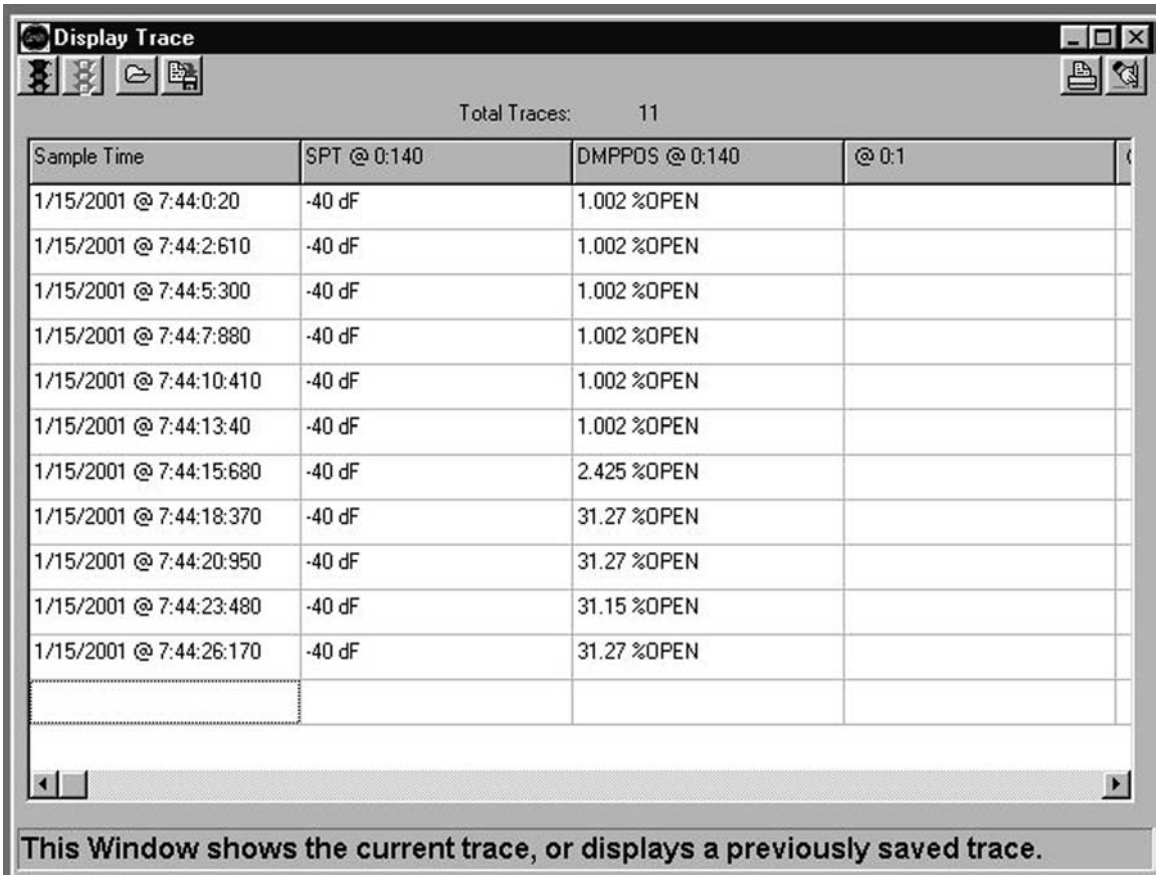



**Fig. 15 — Point Trace Utility Trace Display**

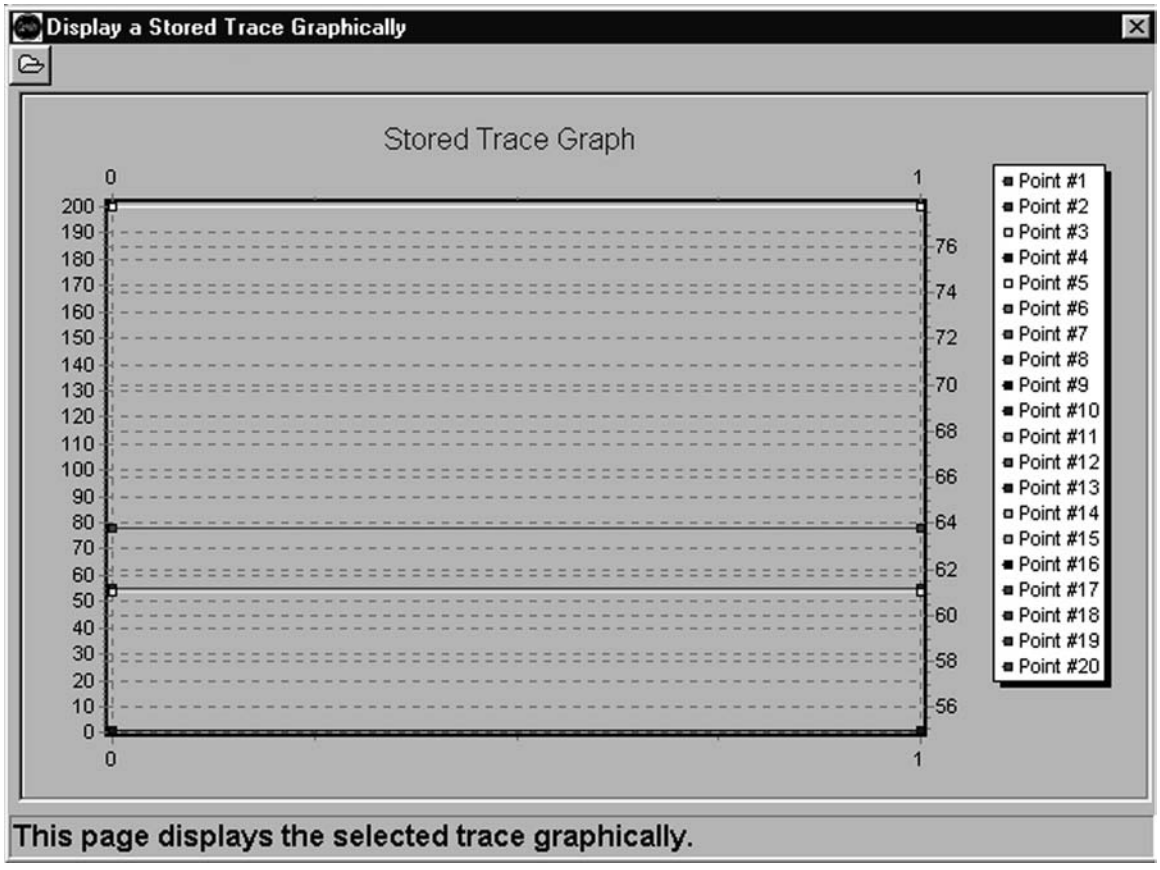



**Fig. 16 — Point Trace Utility Trace Graphical Display**

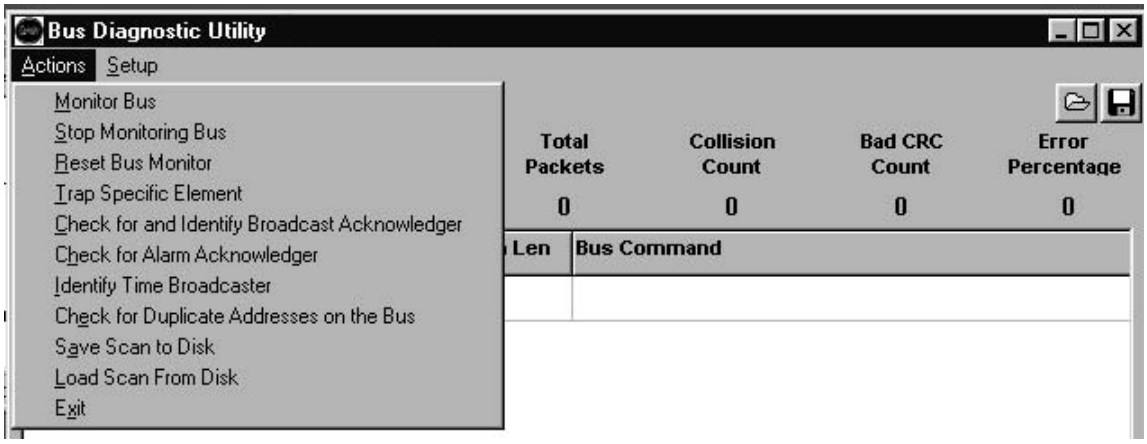



**Fig. 17 — Bus Diagnostic Utility Action Menu Items**

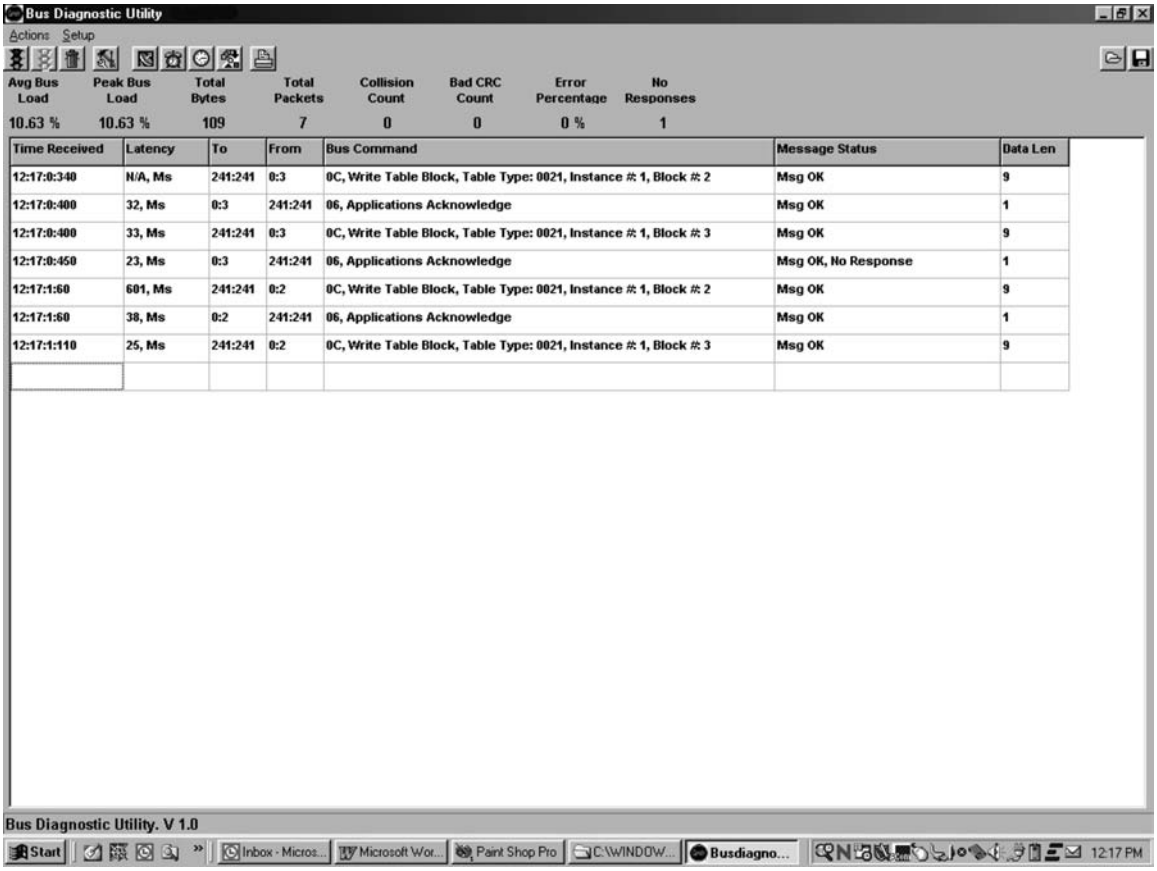



**Fig. 18 — Bus Diagnostic Utility Trace**

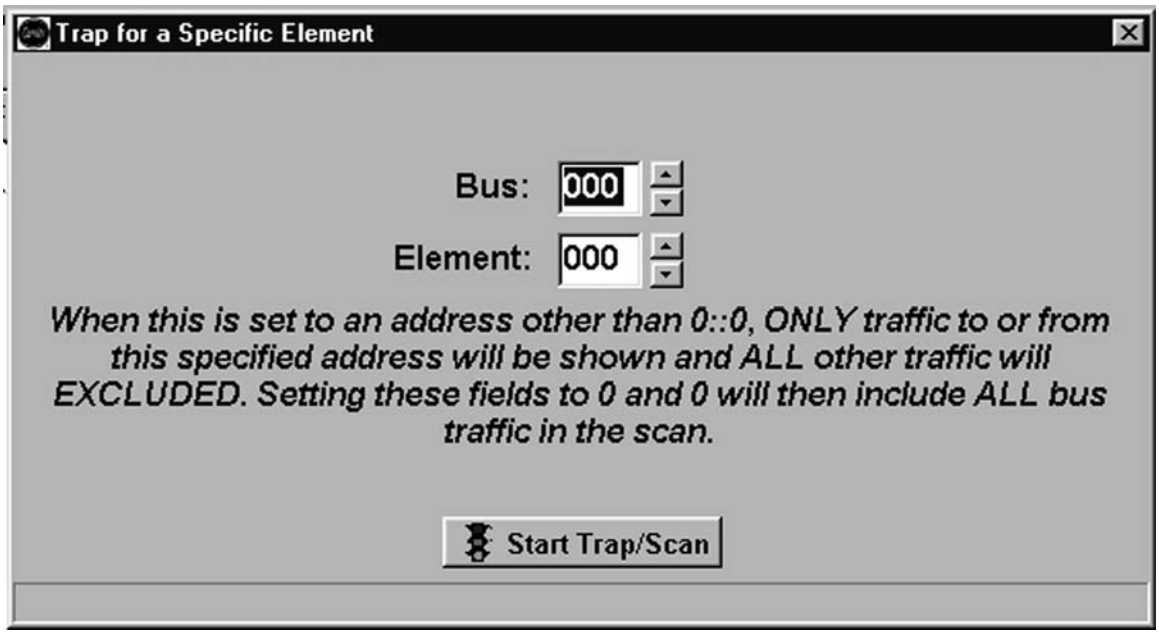



**Fig. 19 — Bus Diagnostic Utility Address Trap**

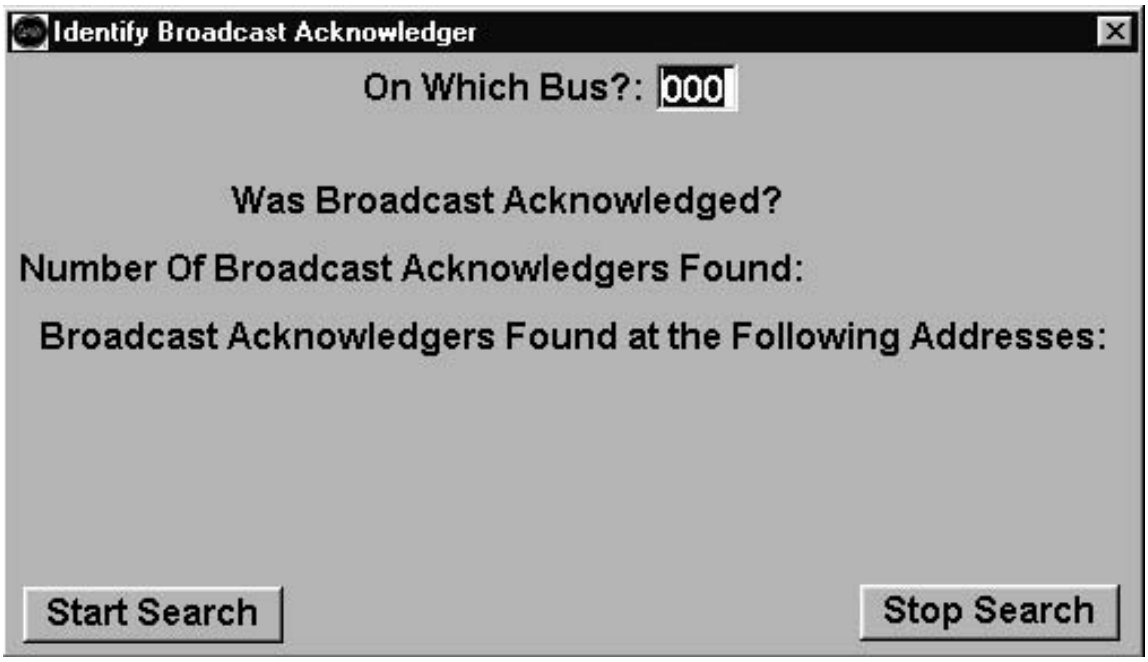



**Fig. 20 — Bus Diagnostic Utility Identify Broadcast Acknowledger**

IDENTIFY ALARM ACKNOWLEGDER — The Identify Alarm Acknowledger Actions menu item or button are used identify if there is a single alarm acknowledger on CCN bus. To begin the test, the Send Test Alarm button must be pressed. See Fig. 21. Once the Send Test alarm button is pressed, the utility will display a “No” if the alarm was not acknowledged or a “Yes” if it was successfully acknowledged. In order to ensure that a single alarm acknowledger exists it is recommended that this button be pressed two or three times to ensure that all alarms are acknowledged.

IDENTIFY TIME BROADCASTER — The Identify Time Broadcaster Actions menu item or button are used find a time broadcaster on a CCN bus. Once the Identify Time Broadcaster screen is displayed, the Start Search button can then be used to start the process. See Fig. 22.

When the search is started, the utility initiates a request for time and then waits 60 seconds for all responses. The utility will report the element number of each time broadcaster on the CCN. If multiple time broadcasters are identified, they should be reconfigured. Only one time broadcaster should exist on a CCN. The Stop Search button can be used to stop a search at any time.

CHECK FOR DUPLICATE ADDRESSES — The Check for Duplicate Addresses on Bus Actions menu item or button are used find duplicate address on a CCN bus. Once the Check for Duplicate Addresses screen is displayed, the Start Check button can then be used to start the process. See Fig. 23. The user can specify a single address to check or an entire CCN bus can be scanned. The Cancel Check button can be used to abort a search at any time.

PRINT BUS SCAN — The Print Bus menu item or button are used to print the results of the current, displayed bus action scan.

SAVE SCAN TO DISK — The Save Scan to Disk Actions menu item or button are used to save bus monitor trace data to disk. Data will be saved in text format and will be available to view later using the Load Scan from Disk Actions menu item.

LOAD SCAN FROM DISK — The Load Scan from Disk Actions menu item or button are used to load previously saved bus monitor trace data from disk.

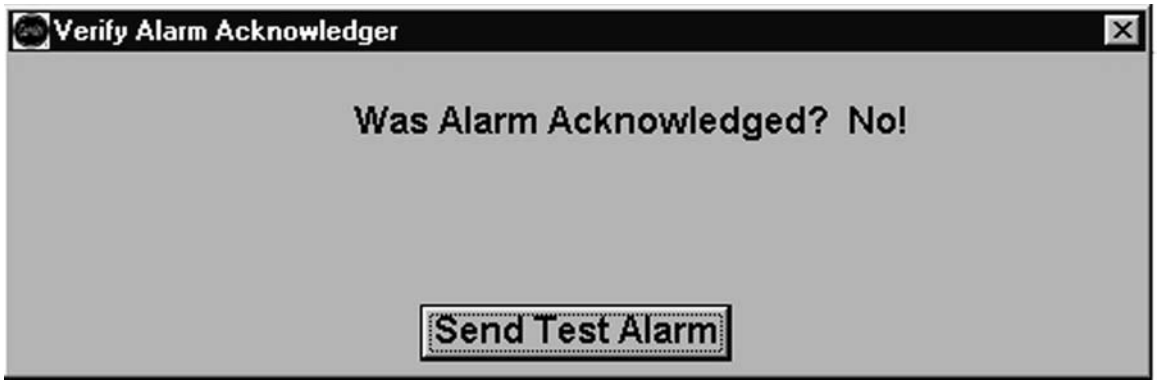



**Fig. 21 — Bus Diagnostic Utility Identify Alarm Acknowledger**

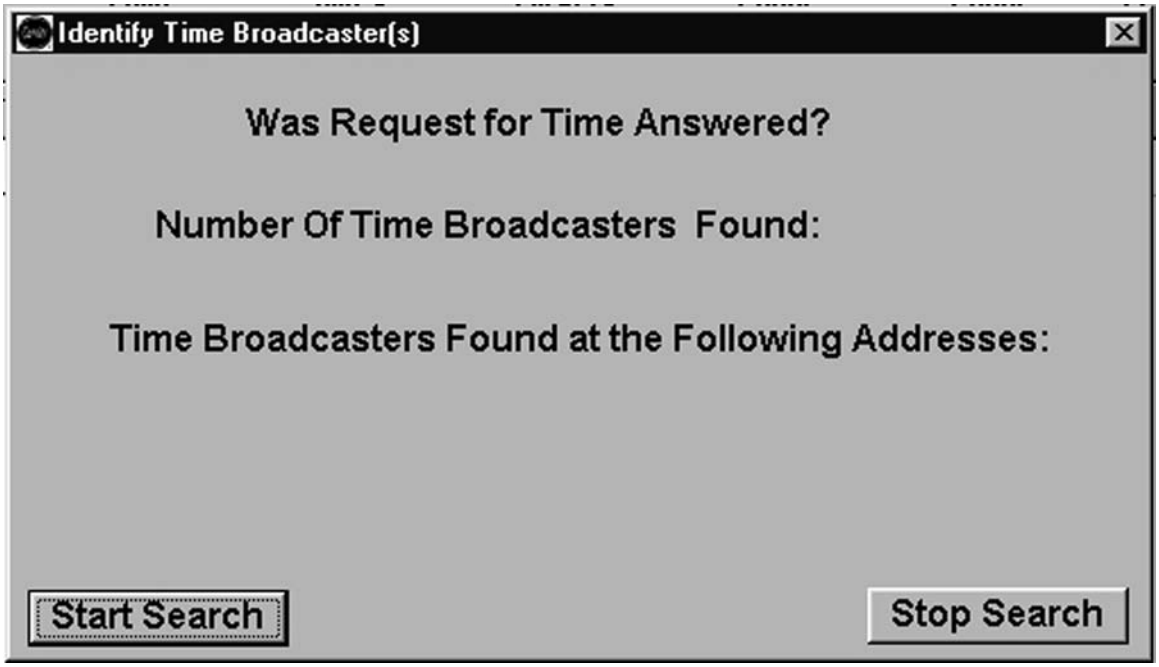



**Fig. 22 — Bus Diagnostic Utility Identify Time Broadcaster**

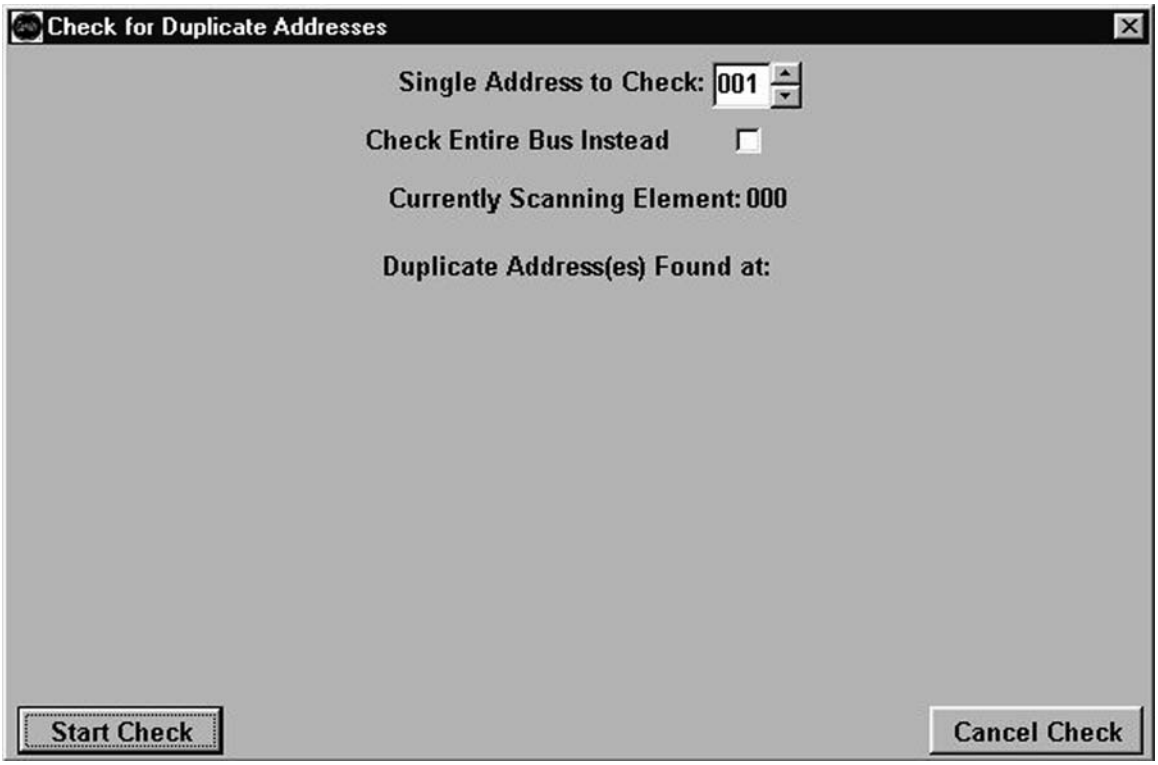



**Fig. 23 — Bus Diagnostic Utility Identify Duplicate Addresses**