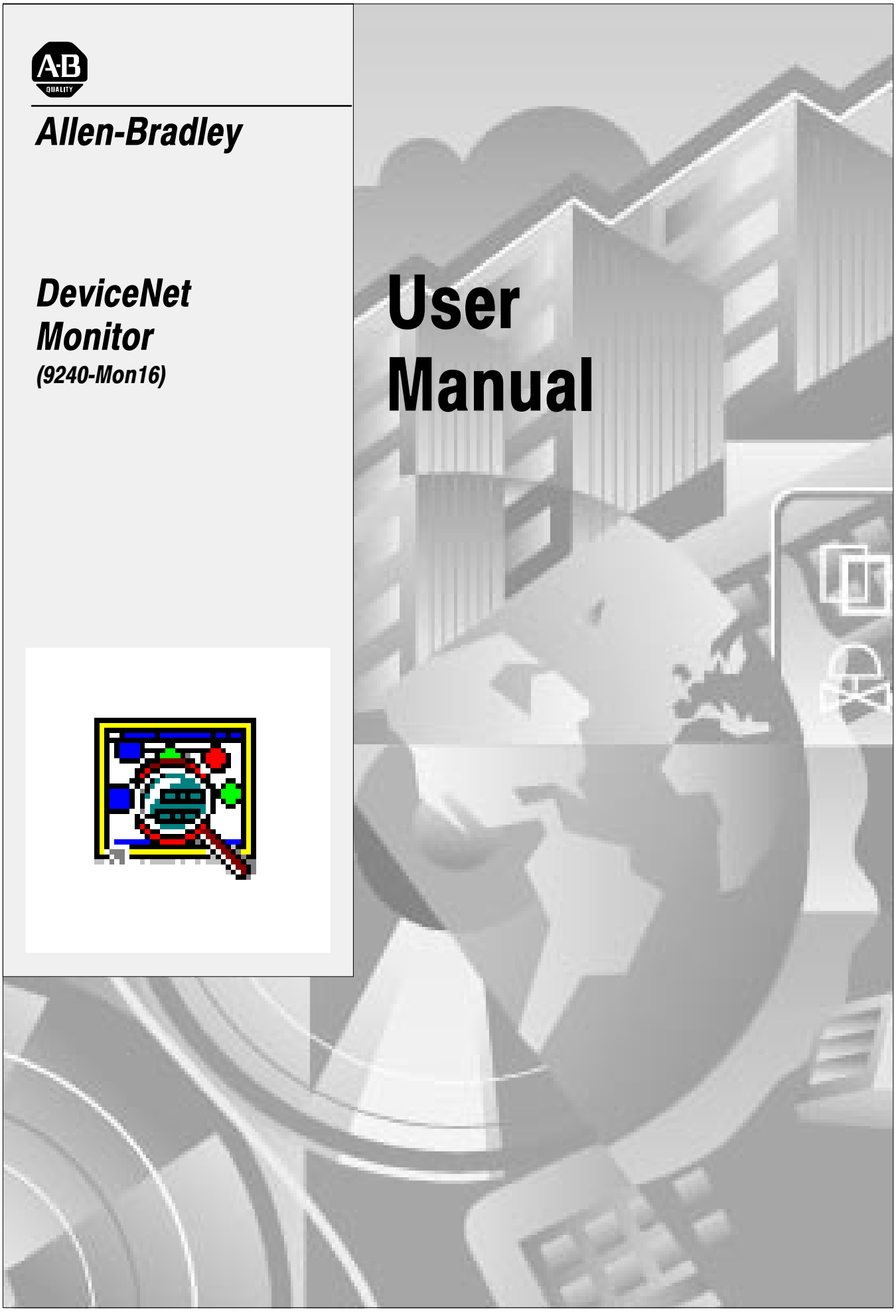
Allen-Bradley

DeviceNet Monitor

(9240-Mon16)

User Manual



Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards.

The illustrations, charts, sample programs, and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

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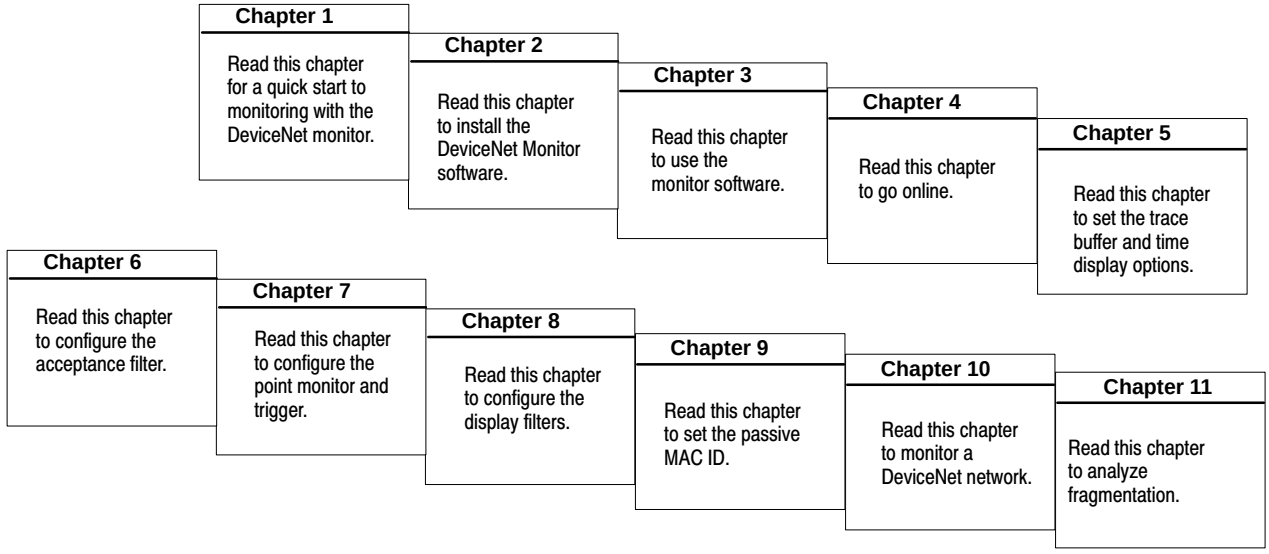
About This Manual

Read this preface to familiarize yourself with the rest of the manual. This preface covers the following topics:

- what's in this manual
- who should use this manual
- about the conventions
- about Allen-Bradley support services

What's in This Manual

This manual provides a general overview of the DeviceNet™ Monitor software.



Who Should Use This Manual

This documentation is geared for control engineers, application engineers, or system integrators who need to monitor activity on the DeviceNet network.

About the Conventions

The following conventions are used throughout the manual.

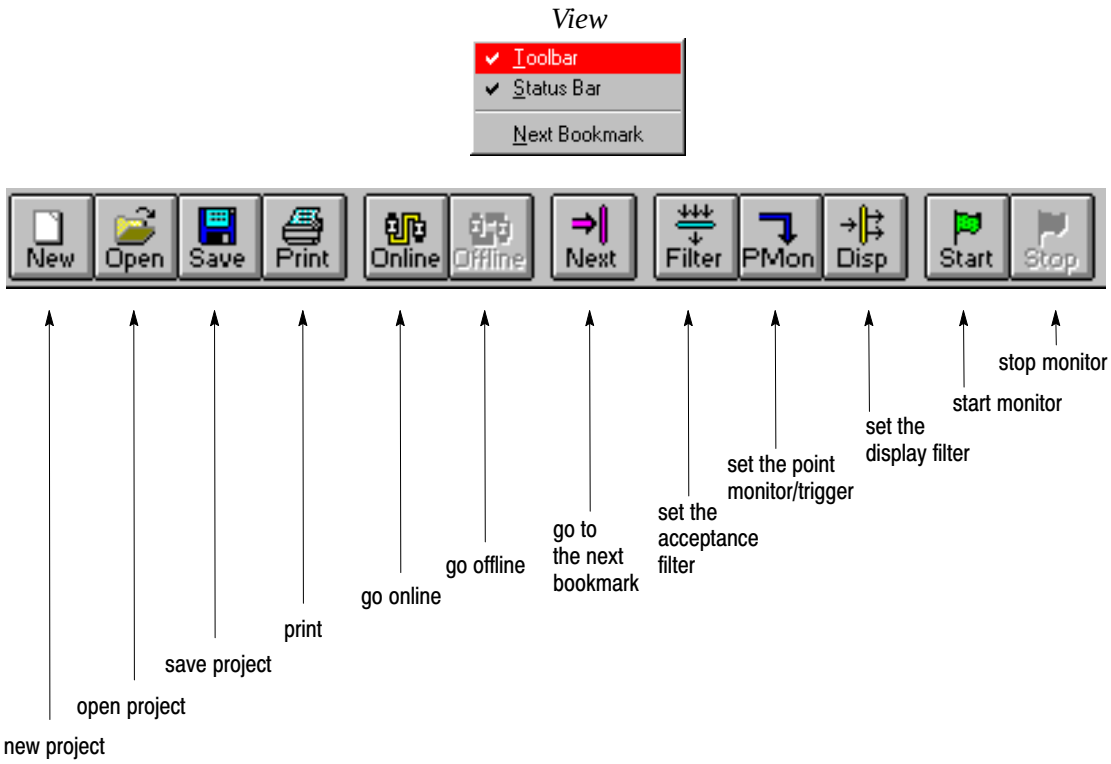
Type of text	Example
Menu names	*Utilities*
Text references to buttons	**OK**
Text that you enter	`setup`

Understanding the Screens

This manual uses screen captures to represent the actual software. This section describes the various screen captures you'll see.

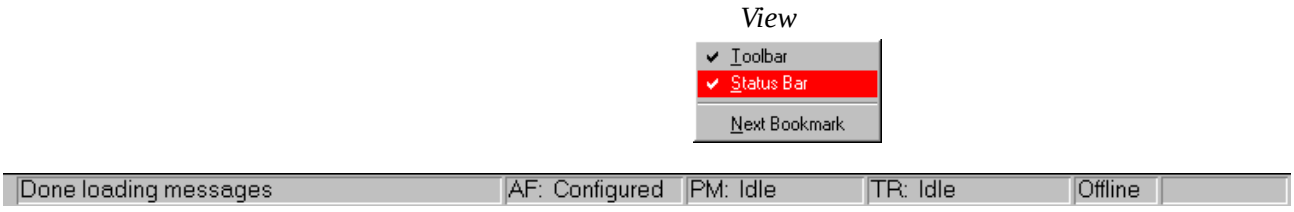
Menu and Tool Bars

Through the *View* menu, you can toggle the tool bar or status bar menu item, choosing to show or hide the bar. A checkmark indicates that it's visible.



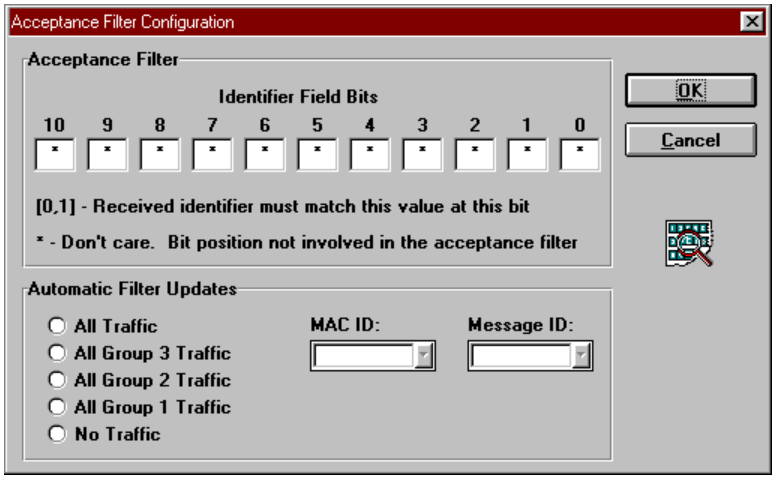
Status Bar

The status bar appears at the bottom of your screen and provides the current status of an application.



Dialog Boxes

Dialog boxes contain buttons you choose to cause a particular action to occur.



Terminology

Term	Definition
CAN	(Controller Area Network) A serial communications protocol upon which the DeviceNet network is based.
MAC ID	The address of a DeviceNet node.
Message ID	The unique identifier that defines a particular connection within a message group. The message ID enables the establishment of multiple connections within a single message group.
Message Groups	The way in which the eleven CAN bits available on the DeviceNet network are divided.
Node	Hardware that has a single address on the network.

About Allen-Bradley Support Services

At Allen-Bradley, customer service means experienced representatives at Customer Support Centers in key cities throughout the world for sales, service, and support. Our value-added services include:

Technical Support

- SupportPlus programs
- telephone support and 24-hour emergency hotline
- software and documentation updates
- technical subscription services

Engineering and Field Services

- application engineering assistance
- integration and start-up assistance
- field service
- maintenance support

Technical Training

- lecture and lab courses
- self-paced computer and video-based training
- job aids and workstations
- training needs analysis

Repair and Exchange Services

- your only “authorized” source
- current revisions and enhancements
- worldwide exchange inventory
- local support

Quick Start to Monitoring a DeviceNet Network

What's in This Chapter?

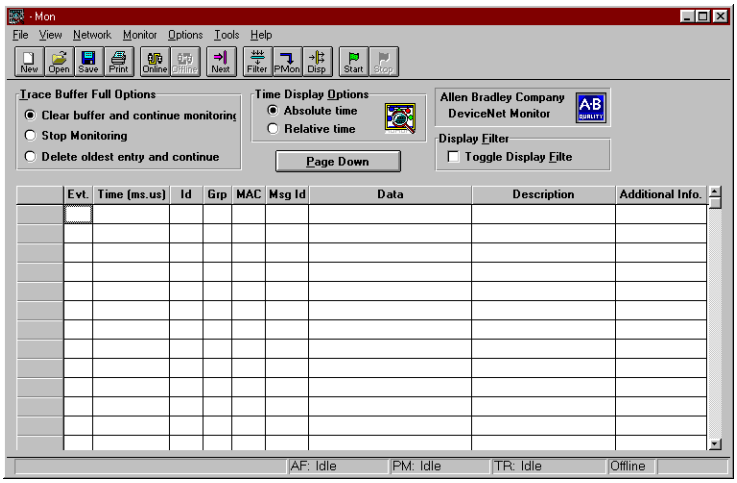
Read this chapter to quickly begin monitoring a DeviceNet network with the DeviceNet Monitor software.

Monitoring a DeviceNet Network

Follow these directions to start monitoring a DeviceNet Network.

1. To start the monitor software, double-click on the DeviceNet Monitor icon.

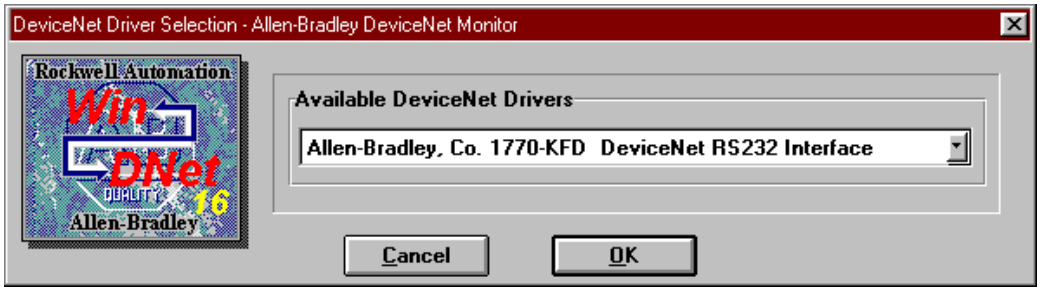
   You see this screen.



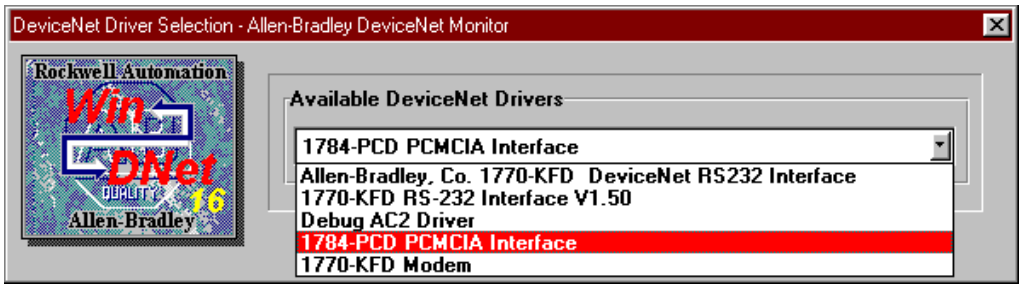
2. From the *Network* menu, choose **Connect**.

Network

You see this screen.



3. From the pull-down menu, choose your driver.

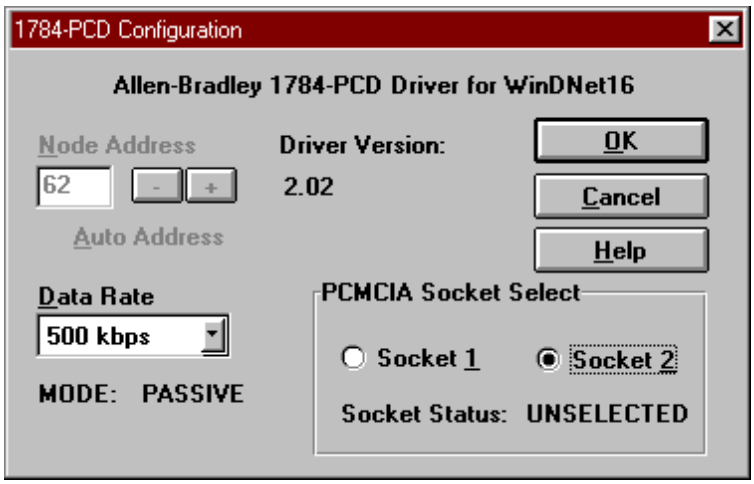


Important: You cannot go online with the Allen-Bradley 1770-KFD DeviceNet RS-232 interface module. You must use an interface card such as the 1784-PCD PCMCIA interface card or any other WinDNet16™ interface card.

4. Choose **OK**

You see a screen similar to this one depending upon your driver.

The software automatically enters your last used node address and data rate for the driver.



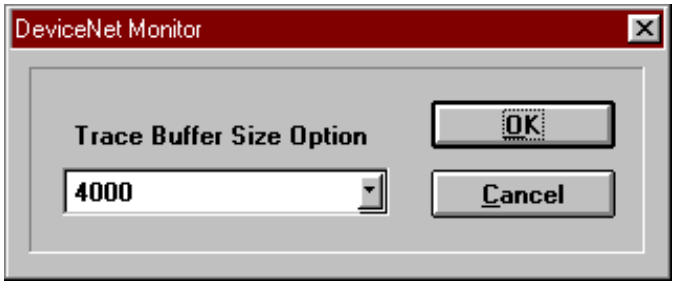
ATTENTION: Make sure that all devices are set to the proper data rate. Attempting to go online at the wrong data rate may cause some or all devices on the network to fault.

5. Select the proper settings and choose **OK**

Once you are online, the status bar indicates you are online and the proper baud rate.

6. From the *Options* menu, choose **Set Trace Buffer Size**.

   You see this screen.



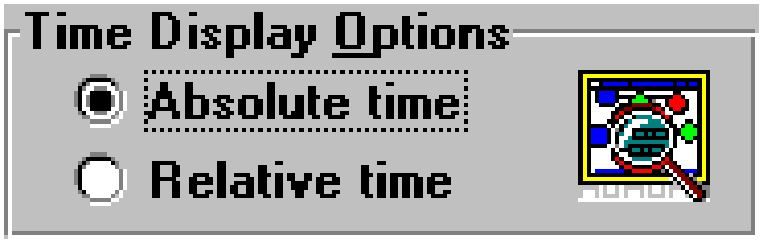
7. Click on the arrow and choose the appropriate trace buffer size.

   See page 5–1 for more information.

8. Choose 

9. Click on the radio button next to the appropriate time display option.

This allows you to view a snapshot of the interface's "time tick" when the message was received.
You can also view the relative time between messages by choosing the relative time option. All times are displayed in ms/μs).



   See page 5–2 for more information.

10. From the *Monitor* menu, choose **Start Monitor**.

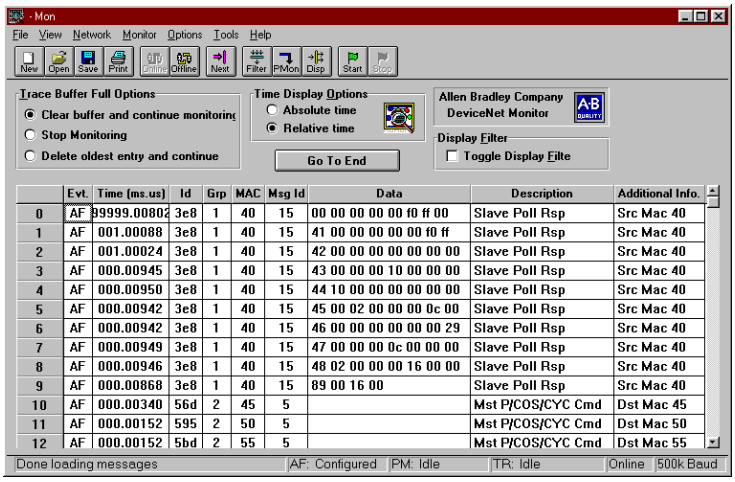
Monitor

11. To stop the monitor, from the *Monitor* menu, choose **Stop Monitor**.

Monitor

Since the default configuration settings were used, all network traffic is captured in a trace buffer size of 4,000 messages.

Notice the messages are displayed.



Installing the DeviceNet Monitor Software

What's in This Chapter?

Read this chapter to install the DeviceNet Monitor software.

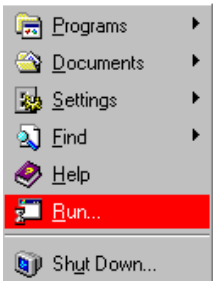
For information on	See page
Installing the software	2–1
Exiting the installation	2–4

Installing the Software

Follow these steps to install the software.

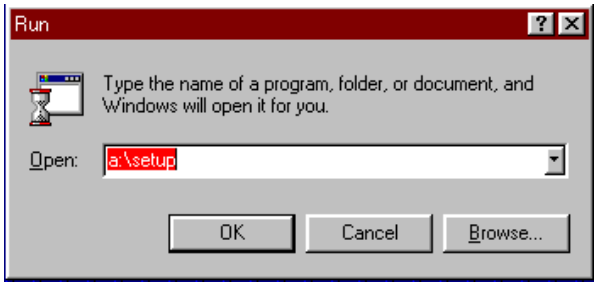
1. Start Windows.
2. Insert the software disk into the 3.5" disk drive.
3. Click on the Start button in the task bar.

4. Choose *Run*.



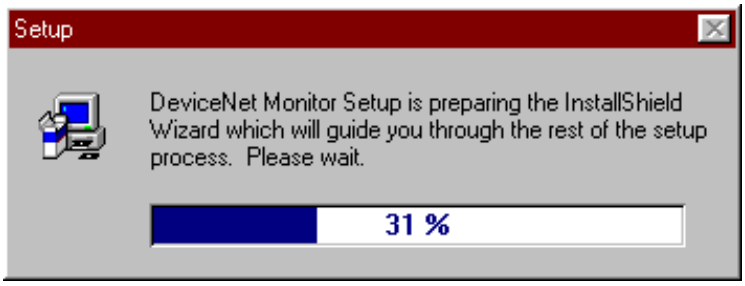
5. Type `a:\setup.exe` at the Command Line.

If you inserted the software disk into another disk drive, use the appropriate drive letter instead of a :

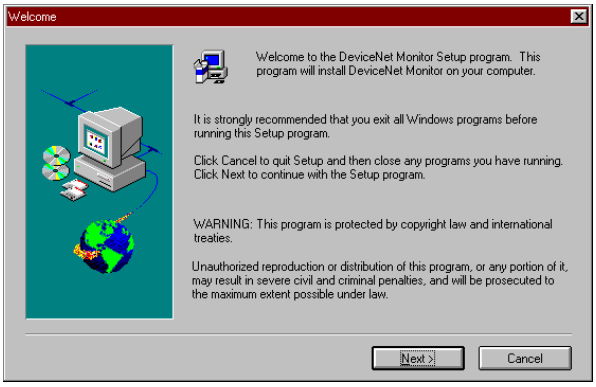


6. Choose OK

You see this installation screen.

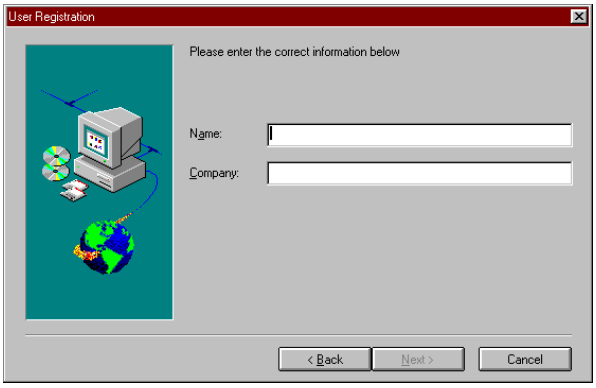


You see this screen after the setup is complete.



7. Choose Next > to proceed with the installation.

You see this installation screen.



8. Click on the respective fields and enter your name and company name.

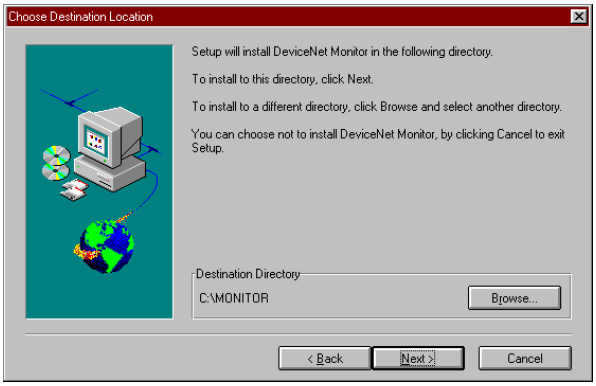
9. Choose Next >

You see this screen with the information you entered.

10.

To	Choose
Approve the information	Yes
Go back and make corrections	No

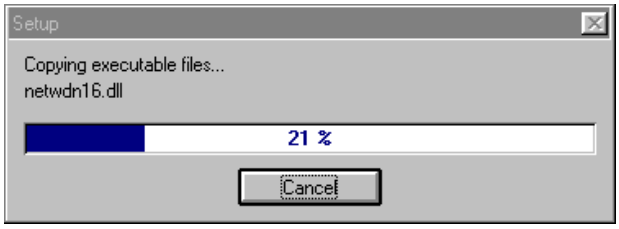
The software creates a default directory on the host hard drive called *Who* for the test application. All other related files will be placed in this directory.



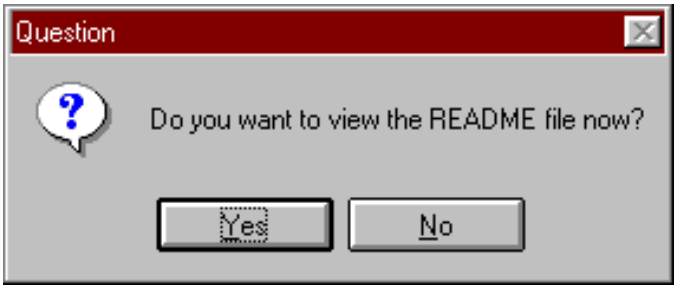
11.

If you want to	Then
Use the default settings	Choose Next >
Change the default settings	a. Choose Browse... b. Select the new directory. c. Choose OK d. Choose Next >
Exit the installation process and go to page 2–4	Choose Cancel

When you choose Next, you see this installation screen.



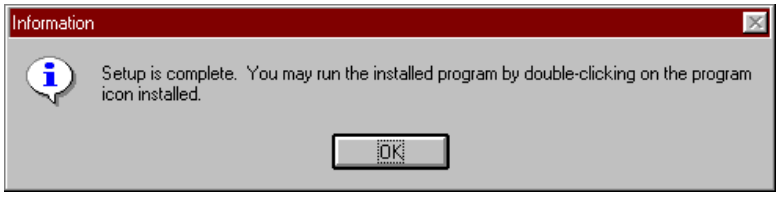
You see this message.



12.

To	Choose
View the README file	Yes
Continue without viewing the README file	No

You see this message.



13. Choose **OK**

An icon now appears in your Program Manager.

Exiting the Installation

When available, you may stop the installation process by choosing Cancel

Using the Monitor Software

What's in This Chapter?

Read this chapter to use the basic functions of the DeviceNet Monitor software.

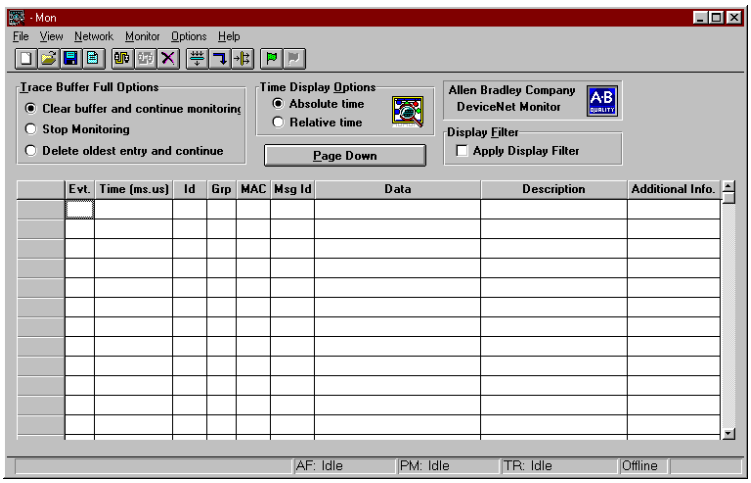
For information on	See page
Creating a new file	3–1
Opening an existing file	3–2
Saving a file	3–3
Printing a file	3–4
Using bookmarks	3–5
Exiting the monitor software	3–6

Creating a New File

From the *File* menu, choose **New**.

File

You see this screen.

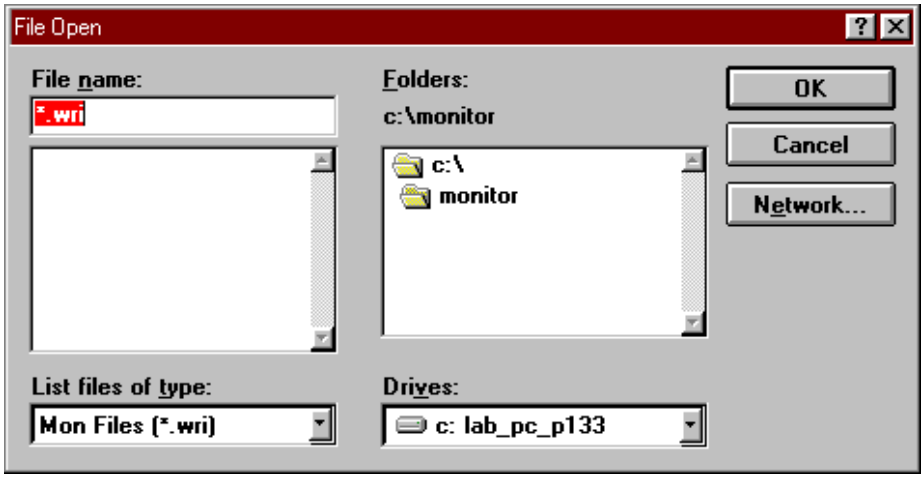


Opening an Existing File

Follow these directions to open an existing file.

1. From the *File* menu, choose **Open**.

   You see this screen.



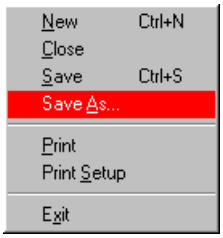
2. Choose the appropriate drive and folder and double-click on the file name.
3. Choose OK

Saving a File

Follow these directions to save a file.

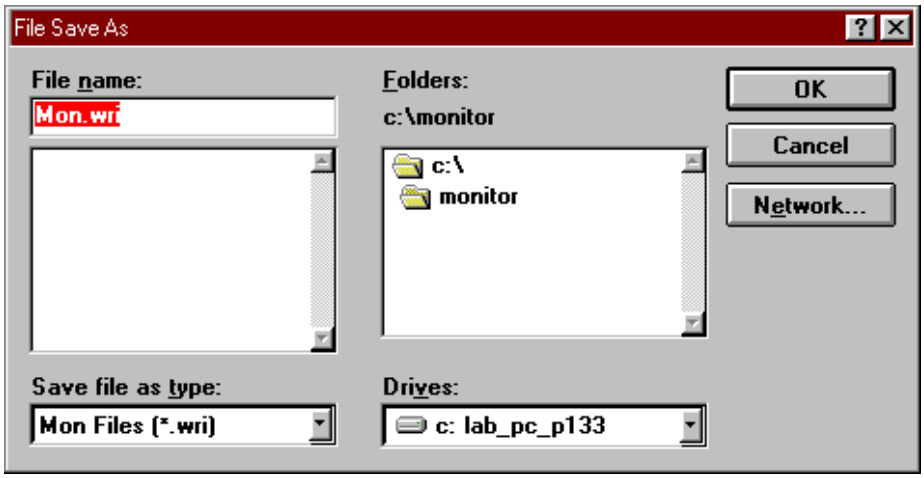
1. From the *File* menu, choose **Save As**.

File



▶ If you've already named the file, from the *File* menu, choose **Save** to automatically save the file to the predetermined location.

You see this screen.



2. To save a file, enter the file name in the file name field and select the directory to which the project will be saved.
3. Choose OK

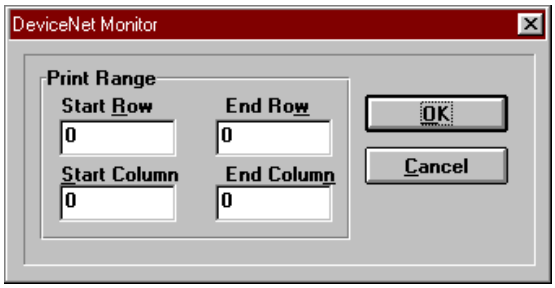
Printing a File

Follow these directions to print a file.

1. From the *File* menu, choose **Print**.

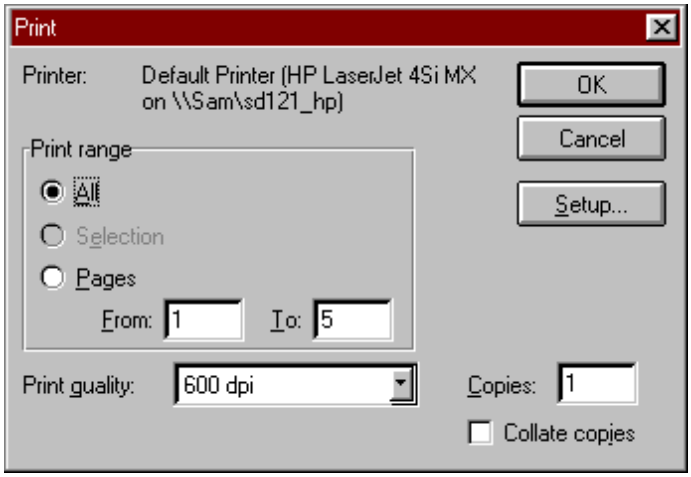
File

You see this screen.



2. Click in the appropriate field and enter the range of data you would like to print.
3. Choose OK

You see this screen.



▶ To access the print setup screen, from the *File* menu, choose **Print Setup**.

4. Click on the appropriate radio button to determine how much of the file you wish to print.

5. Choose OK

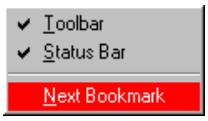
Using Bookmarks

Once the messages are loaded, you can set bookmarks on specific messages.

To set a bookmark, double-click on the specific message in the left-most column (the numbered column). The text becomes red indicating it is a bookmark.

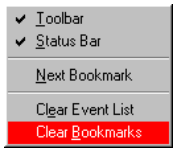
To view bookmarks you already set, from the *View* menu, choose **Next Bookmark**.

View



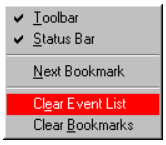
To clear a bookmark, from the *View* menu, choose **Clear Bookmark**.

View



To clear the event list, from the *View* menu, choose **Clear Event List**.

View



Exiting the Monitor Software

To exit the monitor software, from the *File* menu, choose **Exit**.

File

If you haven't saved your changes, you see this screen.

To	Choose
Save changes to the file	Yes
Exit without saving changes to the file	No
Return to the application	Cancel

Online Operation

What's in This Chapter?

Read this chapter to go online with a DeviceNet network.

For information on	See page
Going online	4–1
Going offline	4–2

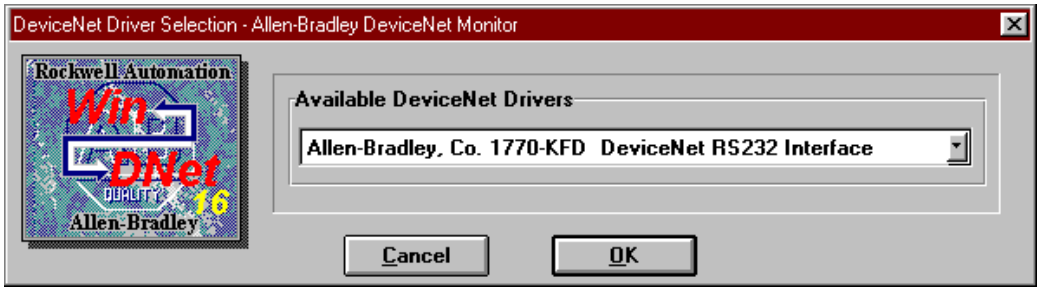
Going Online

Follow these directions to go online.

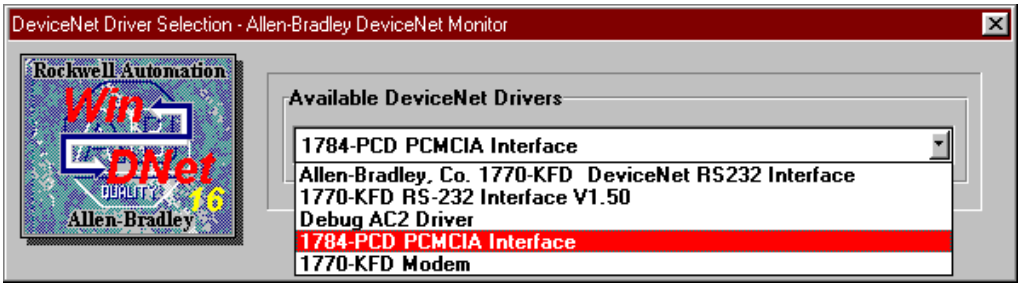
1. From the *Network* menu, choose **Connect**.

Network

You see this screen.



2. From the pull-down menu, choose your driver.

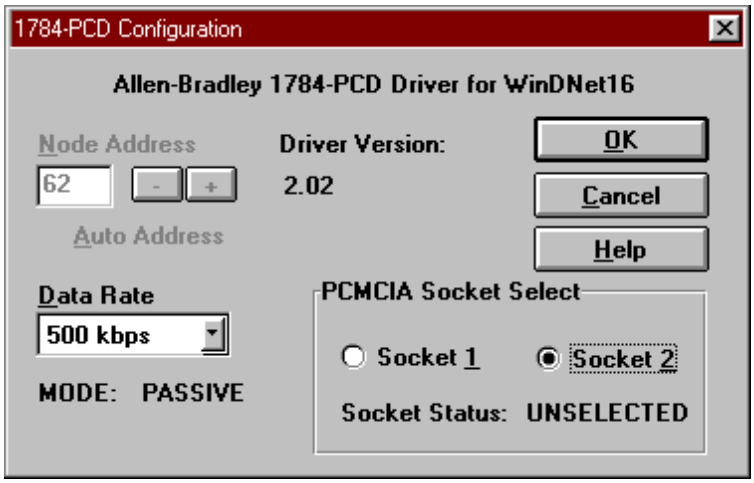


Important: You cannot go online with the Allen-Bradley 1770-KFD DeviceNet RS-232 interface module. You must use an interface card such as the 1784-PCD PCMCIA interface card or any other WinDNet16 interface card.

3. Choose OK

You see a screen similar to this one depending upon your driver.

The software automatically enters your last used node address and data rate for the driver.



ATTENTION: Make sure that all devices are set to the proper data rate. Attempting to go online at the wrong data rate may cause some or all devices on the network to fault.

4. Select the proper settings and choose OK

Once you are online, the status bar indicates you are online and the proper baud rate.

Going Offline

To go offline, from the *Network* menu, choose **Disconnect**.

Network

Setting the Trace Buffer and Time Display Options

What's in This Chapter?

Read this chapter to set the trace buffer and time display options.

For information on	See page
Setting the trace buffer options	5–1
Setting the time display options	5–2

Setting the Trace Buffer Options

The monitor tool has the ability to capture up to 10,000 messages. This equals about 10 to 15 seconds of data on a network operating at 500k baud. However, the default is 4000 for optimum performance.

The time it takes to display data depends upon the configuration you are running:

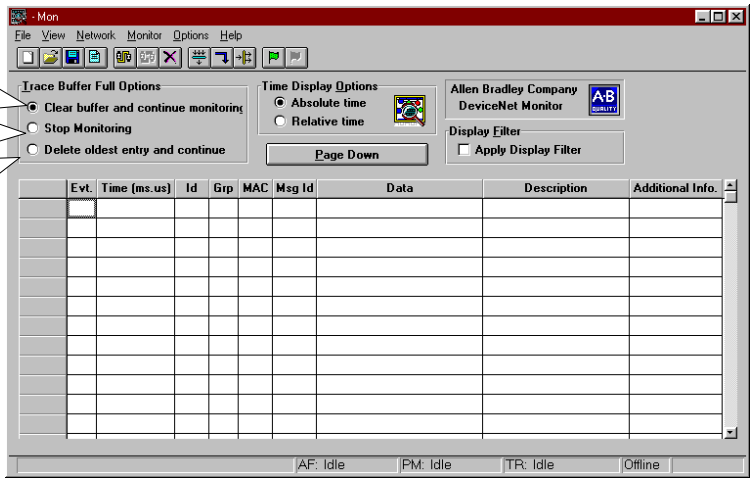
- poll and strobe only
- poll, strobe, change of state, and cyclic

Another factor in the time it takes to display data is how often changes occur in a change of state configuration.

Click on this radio button to clear the buffer once it is full and continue monitoring.

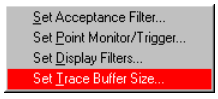
Click on this radio button to stop the monitor once the buffer is full.

Click on this radio button to delete the oldest entry and continue to monitor the network.

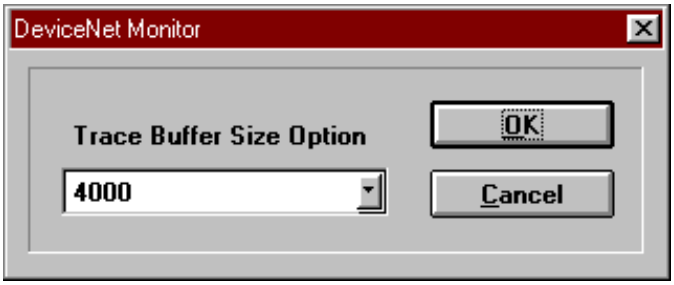


1. From the *Options* menu, choose **Set Trace Buffer Size**.

Options



You see this screen.



2. Click on the arrow and choose the appropriate trace buffer size.

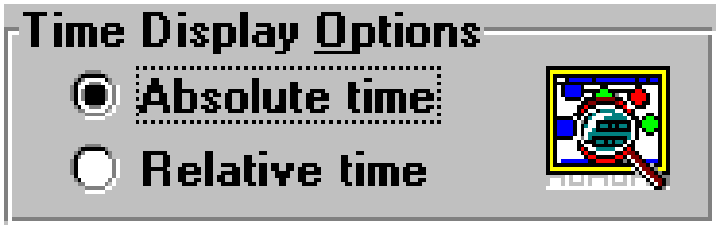
   Important: If you are running Windows™ 95 or Windows, version 3.1, with 16MB of RAM, *do not* select a buffer size of more than 6000 bytes. Doing so can lock up your computer. You need 32MB of RAM to allow a 10000 byte buffer size.

3. Choose OK

Setting the Time Display Options

The time display option allows you to view a snapshot of the interface's "time tick" when the message was received. The time stamp default is absolute time (displayed in ms/µs).

You can also view the relative time delay between messages (displayed in ms/µs) by choosing the relative time option.



Setting the Acceptance Filter

What's in This Chapter?

Read this chapter to set the acceptance filter. The acceptance filter informs the DeviceNet interface which types of messages should be received and passed up to the Monitor software to be displayed.

Configuring the Acceptance Filter

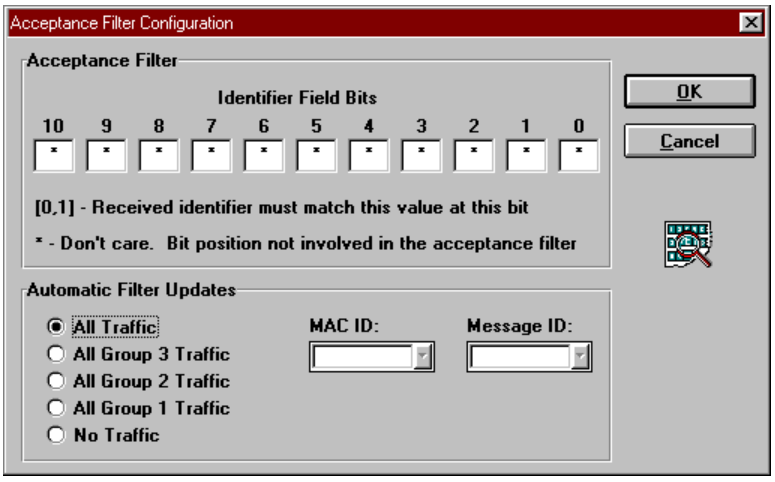
Setting the acceptance filter for "All Traffic" will pass all Group 1, Group 2, and Group 3 messages to the DeviceNet Monitor software. Setting the acceptance filter to a special value (ie., Group 3, Msg ID 5, MAC ID 63) informs the software to automatically capture data for the 11-bit CAN identifier field for that particular set of values.

Follow these directions to configure the acceptance filter.

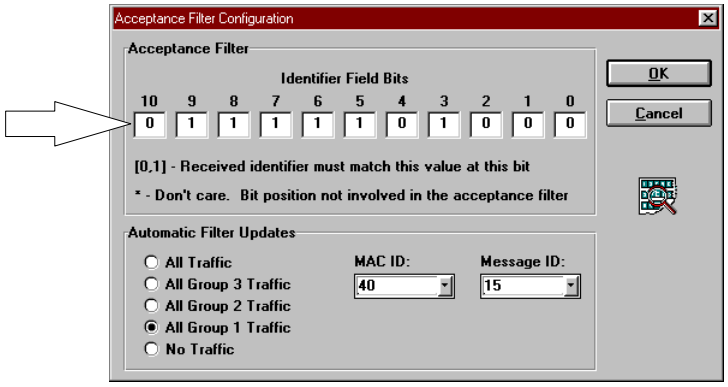
1. From the *Options* menu, choose **Set Acceptance Filter**.

Options

You see this screen.

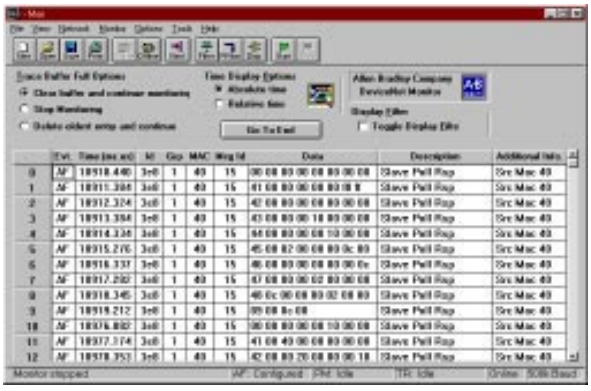


2. Enter the appropriate information in the Identifier Field Bits edit box.



3. Click on the radio button next to the type of messaging you would like to receive.
4. If you clicked on a radio button other than All Traffic, go to step 4. If you click on the All Traffic radio button, go to step 6.
5. Click on the arrow in the MAC ID field and choose the appropriate MAC ID from the list.
6. Click on the arrow in the Message ID field and choose the appropriate Message ID from the list.
7. Choose OK

   You return to the main screen.



Setting the Point Monitor and Trigger

What's in This Chapter?

Read this chapter to set the point monitor and trigger. The point monitor and trigger begins capturing data after a pre-defined condition (trigger) has been fulfilled.

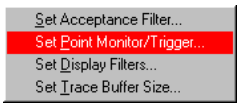
Configuring the Point Monitor and Trigger

The point monitor and trigger allows you to start capturing data only after a particular event has occurred on the network. This event is defined by the trigger, which lets you access the bit-level of a particular event.

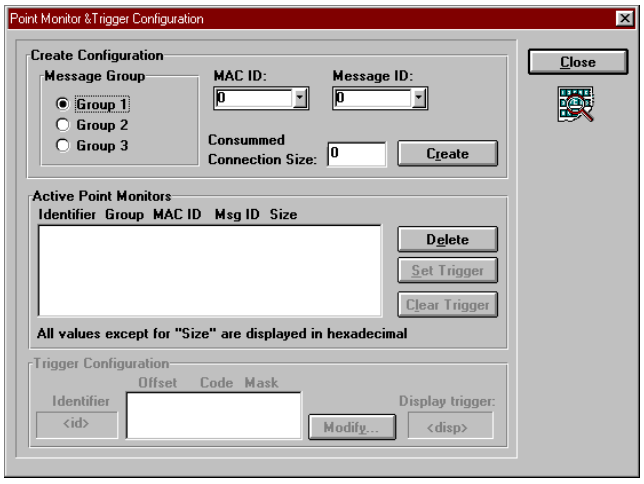
Follow these directions to configure the point monitor and set the trigger.

1. From the *Options* menu, choose **Set Point Monitor Trigger**.

Options



You see this screen.

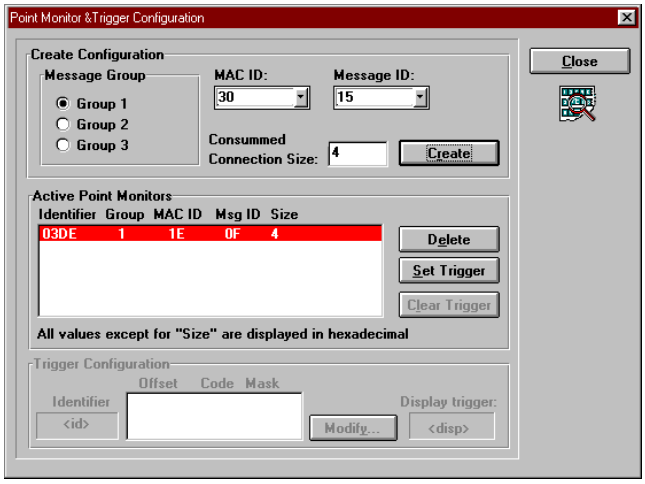


2. Click on the appropriate radio button next to the group you wish to configure.

3. Click on the arrow in the MAC ID field and choose the appropriate MAC ID from the list.
4. Click on the arrow in the Message ID field and choose the appropriate Message ID from the list.
5. Enter the consumed connection size.

   The consumed connection size is the received packet data size.
6. Choose Create

Notice the screen updates to include the new information.



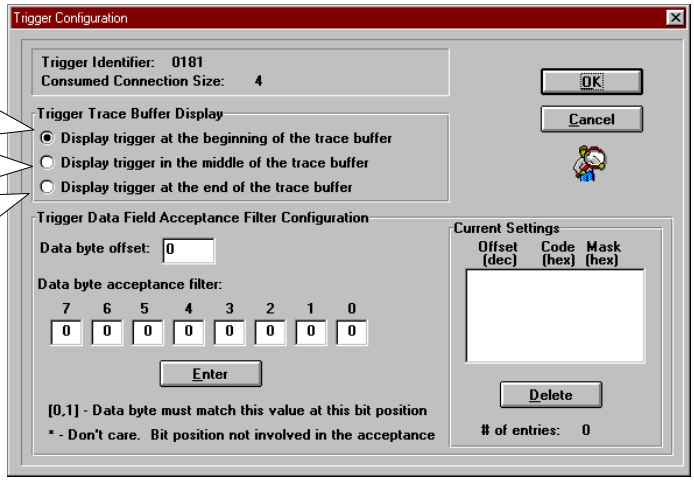
7. Once you've finished creating point monitors, click on the point monitor for which you would like to set a trigger.
8. Choose Set Trigger
9. Choose Modify...

   You see this screen.

Click on this radio button to capture data after the trigger has been detected.

Click on this radio button to capture data before and after the trigger has been detected.

Click on this radio button to capture data before the trigger was detected.



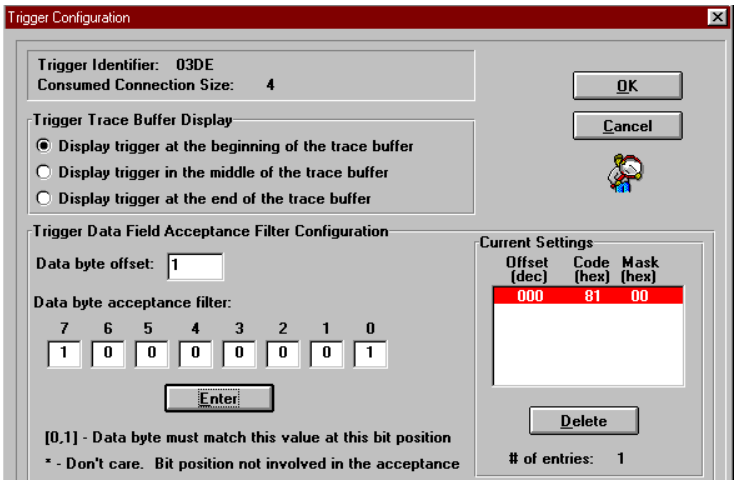
10. Click on the radio button next to the appropriate trigger trace buffer display option.

This will be automatically filled in if you choose **Enter**.

11. Click in the Data Byte Offset field and enter the appropriate value.

12. Enter the data byte acceptance filter in the appropriate fields.

13. Choose **Enter**



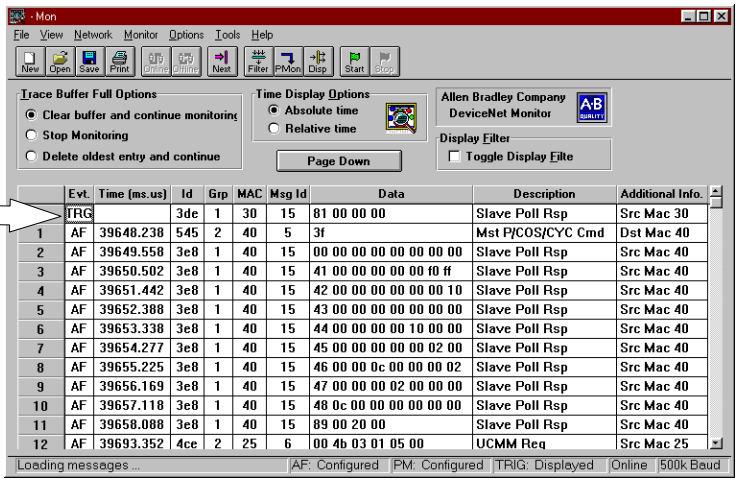
14. Choose **OK**

You return to the Point Monitor and Trigger configuration screen.

15. Choose **Close**

You return to the main screen.

Notice the trigger and then data is captured.



Setting the Display Filters

What's in This Chapter?

Read this chapter to set the display filters. The display filters further separate the messages once the monitor has stopped and all necessary data has been captured.

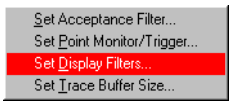
Configuring the Display Filters

Follow these directions to configure the display filters.

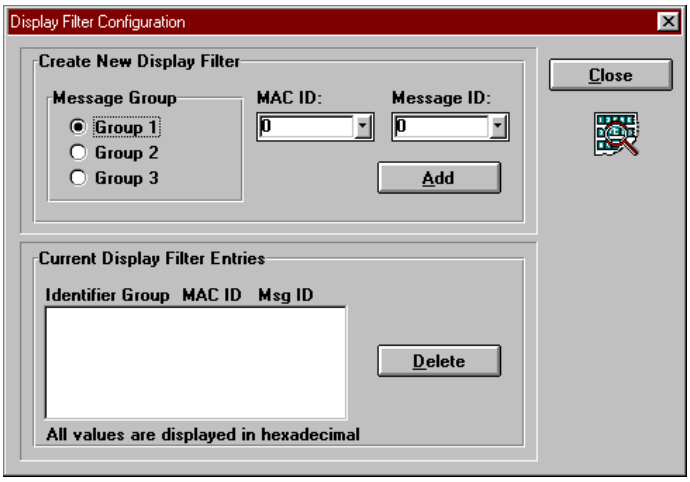
You can filter after the monitor has captured data or even offline. You can even bring up an existing file, and set the display filters then.

1. From the *Options* menu, choose **Set Display Filters**.

Options

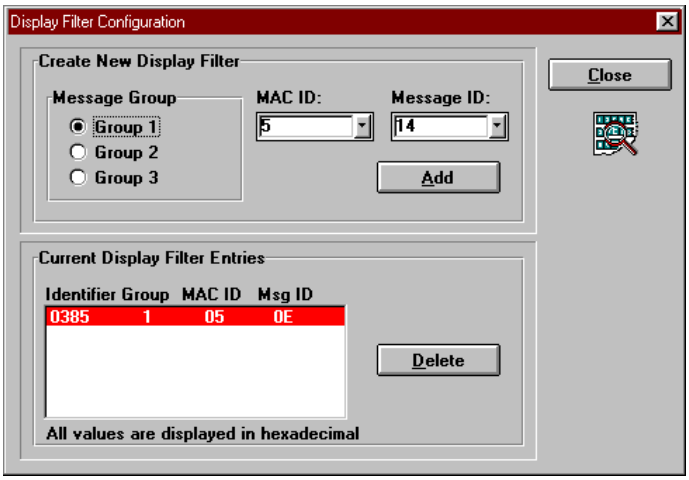


You see this screen.



2. Click on the appropriate radio button next to the group you wish to configure.
3. Click on the arrow in the MAC ID field and choose the appropriate MAC ID from the list.
4. Click on the arrow in the Message ID field and choose the appropriate Message ID from the list.

5. Choose **Add**

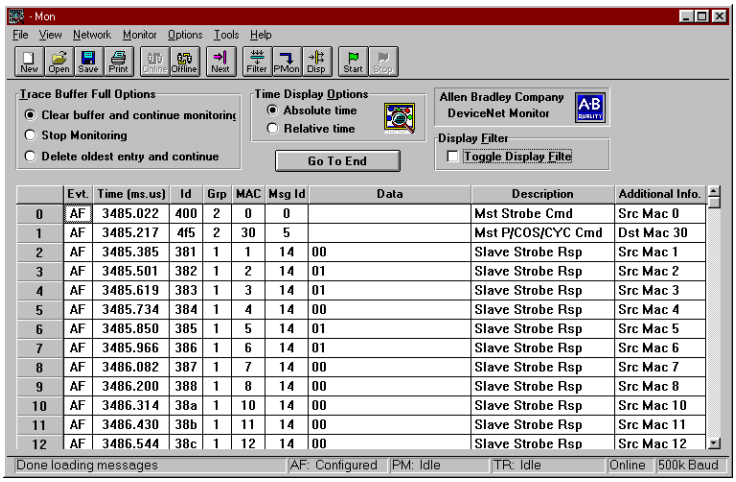


6. Choose **Close**

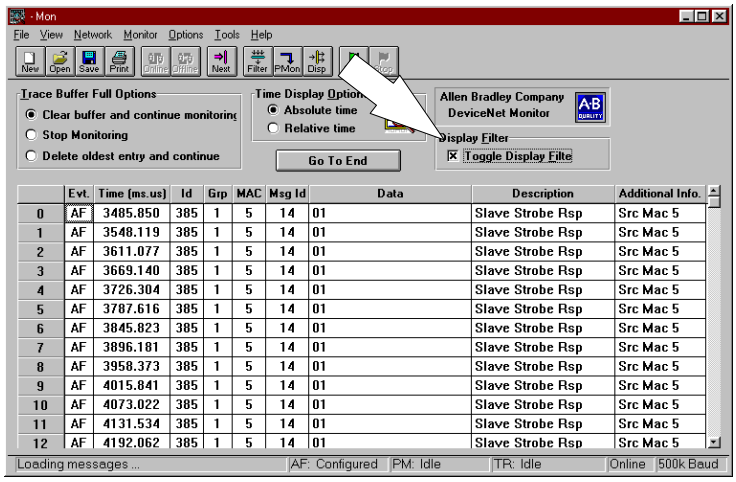
You return to the main screen.

7. Begin monitoring the network.

Once the monitor has captured the data, if the display filter check box is not marked, all data will appear in the list.



If the display filter check box is marked, only the data you set appears in the list.



Deleting a Display Filter

1. Click on the current display filter you wish to delete so it is highlighted.
2. Choose 

3. Choose 

Setting the Passive MAC ID

What's in This Chapter?

Read this chapter to set the passive MAC ID option.

Configuring the Passive MAC ID

The passive MAC ID displays a list of active nodes on a network by doing a who and listening for nodes talking on the network.

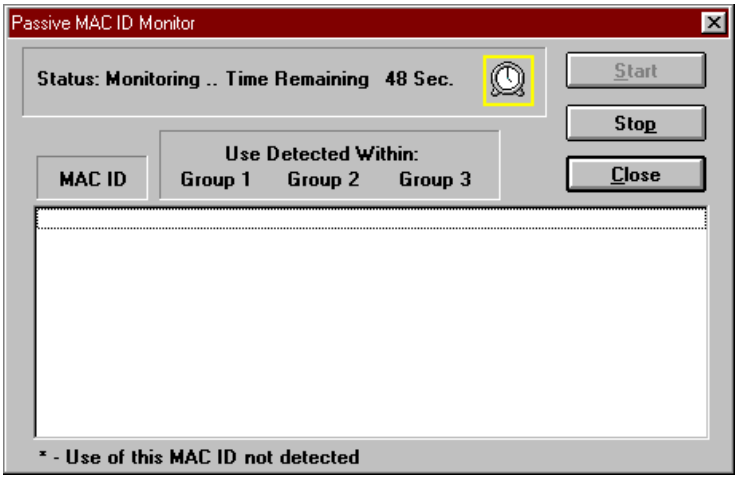
If a node is not displayed, it does not necessarily indicate that the node is not present. It may only indicate that the node was not active during the listening period.

The passive MAC ID listens to the network for a period of 60 seconds. You may decrease this time by choosing the **STOP** button.

Follow these directions to configure the passive MAC ID.

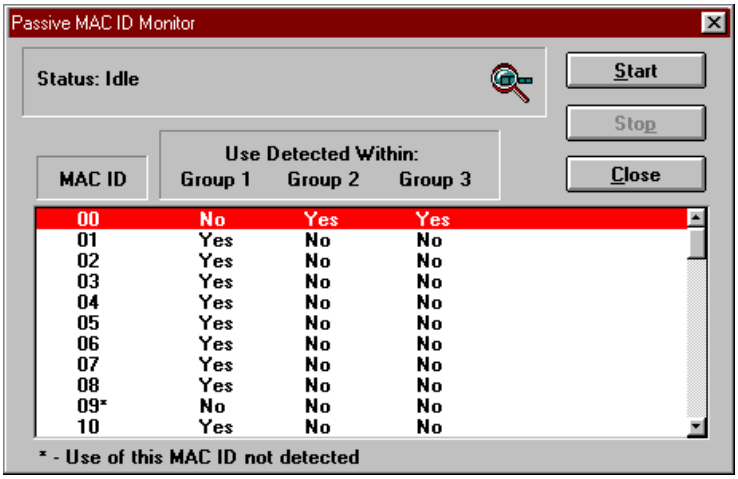
1. From the *Tools* menu, choose **Passive MAC IDs**.

You see this screen.



2. To activate the passive MAC ID tool, choose 

Once 60 seconds has passed, you will see the active nodes on the network.



To stop the passive MAC ID tool before 60 seconds, choose Stop

3. Once you've finished viewing the passive MAC IDs, choose Close

Monitoring a DeviceNet Network

What's in This Chapter?

Read this chapter to monitor a DeviceNet network once all of your parameters are set.

Monitoring a DeviceNet Network

Follow these directions to start monitoring a DeviceNet Network.

Important: You must be online to monitor traffic on a DeviceNet network.

1. From the *Monitor* menu, choose **Start Monitor**.

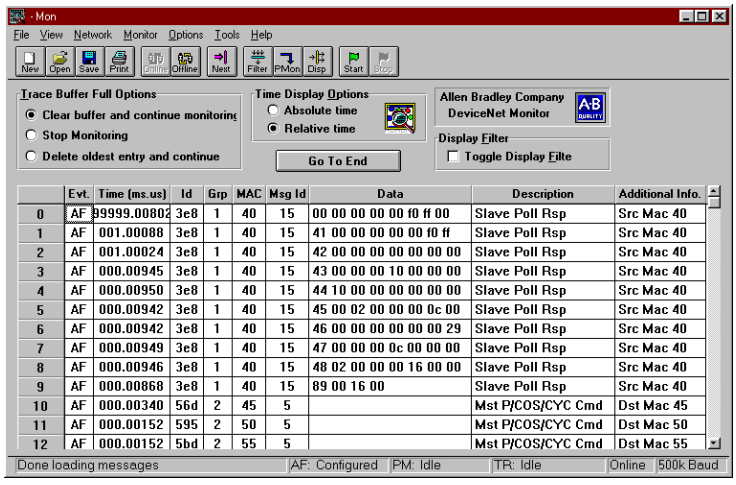
Monitor

2. To stop the monitor, from the *Monitor* menu, choose **Stop Monitor**.

Monitor

Since the default configuration settings were used, all network traffic is captured in a trace buffer size of 4,000 messages.

Notice the messages are displayed.



Analyzing Fragmentation

What's in This Chapter?

Read this chapter to begin understanding fragmentation using several examples from the DeviceNet Monitor Tool software.

Understanding Fragmentation Examples

In the following fragmentation examples, the 1771-SDN scanner module and the 1794-ADN FLEX I/O adapter module are configured for change of state messaging.

The 1771-SDN scanner module is the master at node 1.
The 1794-ADN FLEX I/O adapter module is the slave at node 13.

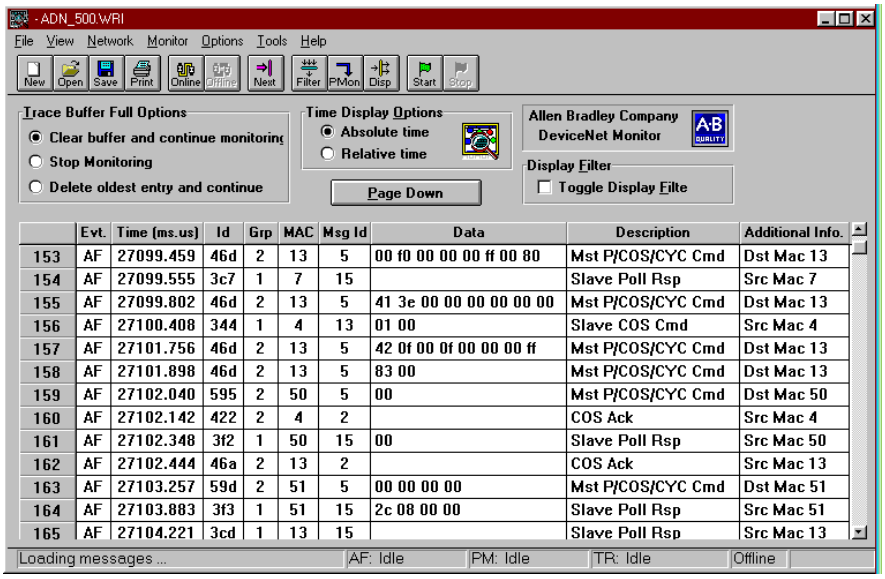
Transmitting and receiving sizes for the 1794-ADN adapter are relative to the 1771-SDN scanner module as it is the master.
These are the 1794-ADN byte sizes:

- Tx (transmit) size 22 bytes
- Rx (receive) size 30 bytes

Slot	Module	Tx Size (bytes)	Rx Size (bytes)
—	1794-ADN	0	2
0	1794-OB16	2	2
1	1794-IB16	2	2
2	1794-IE8	2	18
3	1794-OE4	12	2
4	1794-IA8	2	2
5	1794-OA8	2	2

For more information about packet structures, refer to Volume I of the ODVA DeviceNet Communication Model and Protocol, release 2.0, section 4-4.1.

Analyzing Buffer 153 (Master's Change of State)



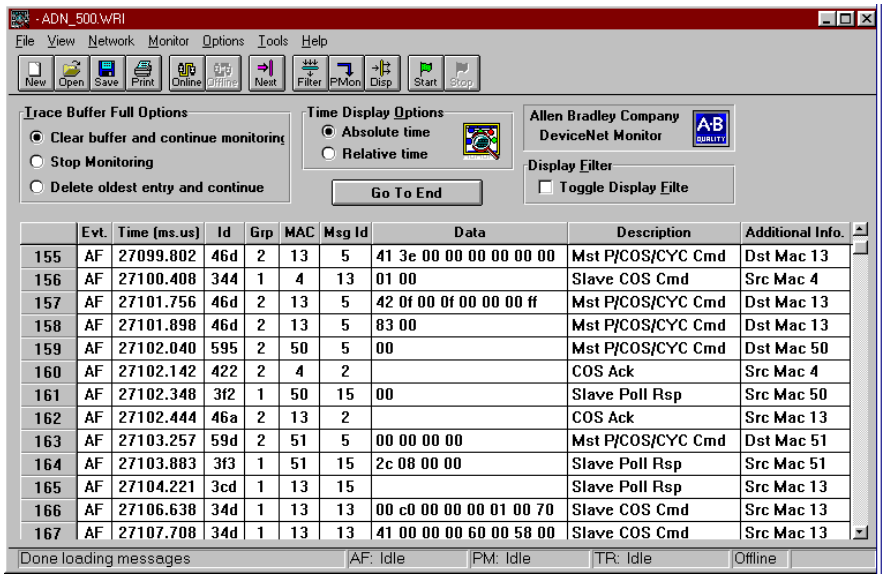
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
153	AF	27099.459	46d	2	13	5	00 f0 00 00 00 ff 00 80	Mst P/COS/CYC Cmd	Dst Mac 13
154	AF	27099.555	3c7	1	7	15		Slave Poll Rsp	Src Mac 7
155	AF	27099.802	46d	2	13	5	41 3e 00 00 00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 13
156	AF	27100.408	344	1	4	13	01 00	Slave COS Cmd	Src Mac 4
157	AF	27101.756	46d	2	13	5	42 0f 00 0f 00 00 00 ff	Mst P/COS/CYC Cmd	Dst Mac 13
158	AF	27101.898	46d	2	13	5	83 00	Mst P/COS/CYC Cmd	Dst Mac 13
159	AF	27102.040	595	2	50	5	00	Mst P/COS/CYC Cmd	Dst Mac 50
160	AF	27102.142	422	2	4	2		COS Ack	Src Mac 4
161	AF	27102.348	3f2	1	50	15	00	Slave Poll Rsp	Src Mac 50
162	AF	27102.444	46a	2	13	2		COS Ack	Src Mac 13
163	AF	27103.257	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
164	AF	27103.883	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
165	AF	27104.221	3cd	1	13	15		Slave Poll Rsp	Src Mac 13

The data captured for buffer 153 is described in the table below.

00 f0 00 00 00 ff 00 80

Byte(s)	Data	Description
0	00	This is the first fragment. Packet count is 0.
1 and 2	f0 00	This is the 1794-OB16 output data from the 1771-SDN scanner where f0 is the low byte (terminals 00 to 07) and 00 is the high byte (terminals 08 to 15).
3 and 4	00 00	This is the 1794-IB16 output data from the 1771-SDN scanner where 00 is the low byte and 00 is the high byte for the delay time.
5 and 6	ff 00	This is for the 1794-IE8/A. Since the appropriate bits are set to 1 in byte 5, the channels default to –10 to +10V dc.
7	80	This is for the 1794-OE4/A. This is the low byte of channel 0.

Analyzing Buffer 155 (Master's Change of State)



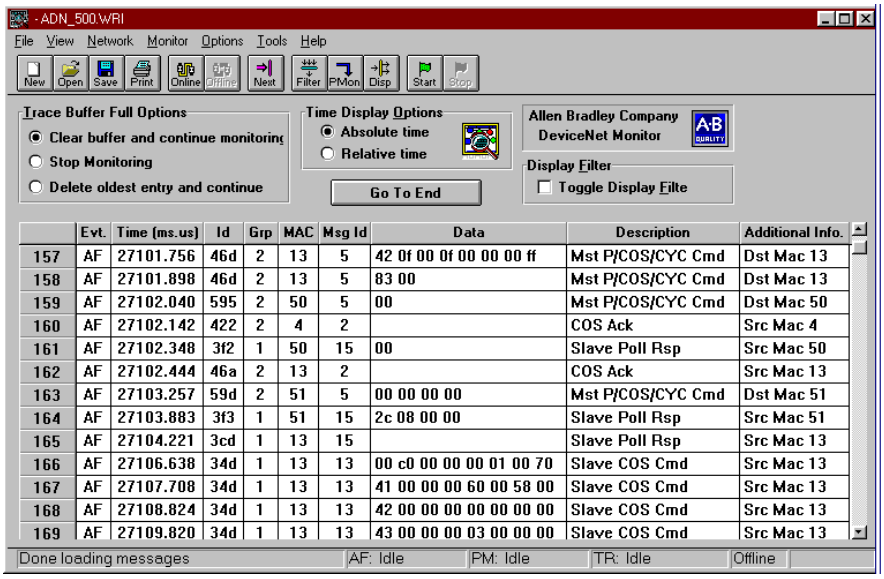
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
155	AF	27099.802	46d	2	13	5	41 3e 00 00 00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 13
156	AF	27100.408	344	1	4	13	01 00	Slave COS Cmd	Src Mac 4
157	AF	27101.756	46d	2	13	5	42 0f 00 0f 00 00 00 ff	Mst P/COS/CYC Cmd	Dst Mac 13
158	AF	27101.898	46d	2	13	5	83 00	Mst P/COS/CYC Cmd	Dst Mac 13
159	AF	27102.040	595	2	50	5	00	Mst P/COS/CYC Cmd	Dst Mac 50
160	AF	27102.142	422	2	4	2		COS Ack	Src Mac 4
161	AF	27102.348	3f2	1	50	15	00	Slave Poll Rsp	Src Mac 50
162	AF	27102.444	46a	2	13	2		COS Ack	Src Mac 13
163	AF	27103.257	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
164	AF	27103.883	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
165	AF	27104.221	3cd	1	13	15		Slave Poll Rsp	Src Mac 13
166	AF	27106.638	34d	1	13	13	00 c0 00 00 00 01 00 70	Slave COS Cmd	Src Mac 13
167	AF	27107.708	34d	1	13	13	41 00 00 00 60 00 58 00	Slave COS Cmd	Src Mac 13

The data captured for buffer 155 is described in the table below.

41 3e 00 00 00 00 00 00

Byte(s)	Data	Description
0	41	This is the middle fragment. Packet count is 1.
1	3e	This is the high byte of channel 0s data for 1794-OE4.
2 and 3	00 00	This is data from the 1794-OE4s channel 1.
4 and 5	00 00	This is data from the 1794-OE4s channel 2.
6 and 7	00 00	This is data from the 1794-OE4s channel 3.

Analyzing Buffer 157 (Master's Change of State)



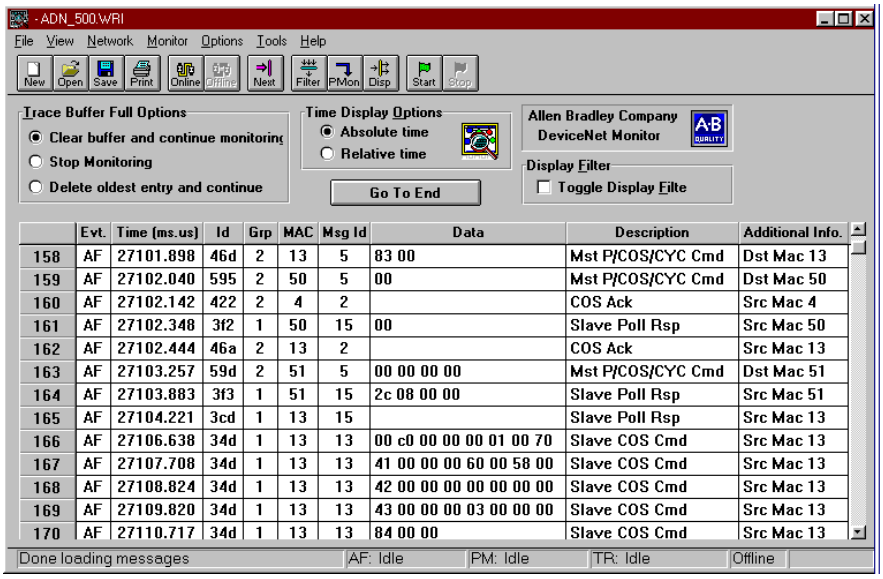
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
157	AF	27101.756	46d	2	13	5	42 0f 00 0f 00 00 00 ff	Mst P/COS/CYC Cmd	Dst Mac 13
158	AF	27101.898	46d	2	13	5	83 00	Mst P/COS/CYC Cmd	Dst Mac 13
159	AF	27102.040	595	2	50	5	00	Mst P/COS/CYC Cmd	Dst Mac 50
160	AF	27102.142	422	2	4	2		COS Ack	Src Mac 4
161	AF	27102.348	3f2	1	50	15	00	Slave Poll Rsp	Src Mac 50
162	AF	27102.444	46a	2	13	2		COS Ack	Src Mac 13
163	AF	27103.257	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
164	AF	27103.883	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
165	AF	27104.221	3cd	1	13	15		Slave Poll Rsp	Src Mac 13
166	AF	27106.638	34d	1	13	13	00 c0 00 00 00 01 00 70	Slave COS Cmd	Src Mac 13
167	AF	27107.708	34d	1	13	13	41 00 00 00 60 00 58 00	Slave COS Cmd	Src Mac 13
168	AF	27108.824	34d	1	13	13	42 00 00 00 00 00 00 00	Slave COS Cmd	Src Mac 13
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13

The data captured for buffer 157 is described in the table below.

42 0f 00 0f 00 00 00 ff

Byte(s)	Data	Description
0	42	This is the middle fragment. Packet count is 2.
1 and 2	0f 00	Multiplex control of the 1794-OE4. Use words 0, 1, 2, and 3 as directed by the channel number n. That is, use the analog-data value and not the safe-state value.
3 and 4	0f 00	Full range bits for the individual channels are in byte 3, which is the value 0f. Only the lower nibble, bits 0 to 3, is actually used. Byte 4 has the configure-select bits. This has the value 00. Actually only bits 8 to 11 are used. Since the full-range bits are "1" and the configure-select bits are "0", select 0 to 10V dc/0 to 20mA.
5 and 6	00 00	Bits 0 to 2 in byte 5 have the delay times for the 1794-IA8.
7	ff	This is the lower byte of the 1794-OA8 data terminals 0 to 7.

Analyzing Buffer 158 (Master's Change of State)



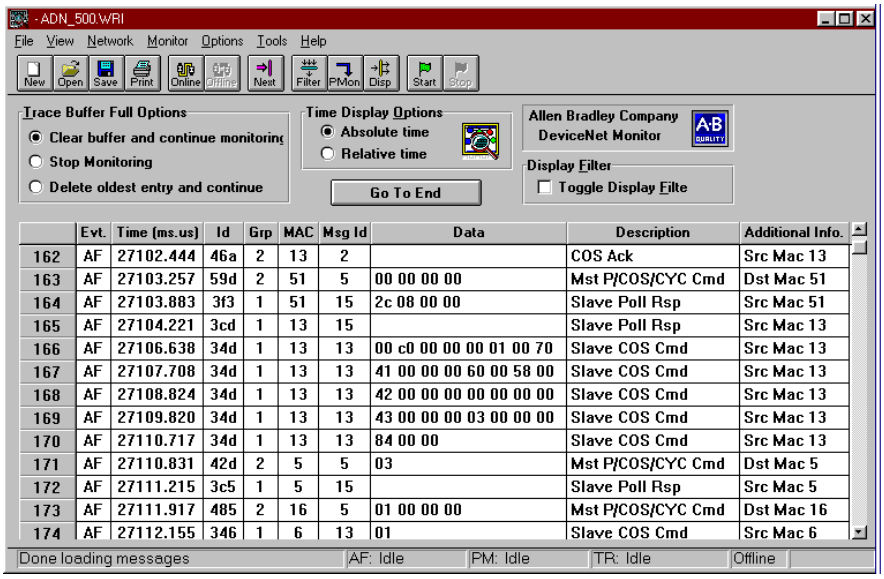
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
158	AF	27101.898	46d	2	13	5	83 00	Mst P/COS/CYC Cmd	Dst Mac 13
159	AF	27102.040	595	2	50	5	00	Mst P/COS/CYC Cmd	Dst Mac 50
160	AF	27102.142	422	2	4	2		COS Ack	Src Mac 4
161	AF	27102.348	3f2	1	50	15	00	Slave Poll Rsp	Src Mac 50
162	AF	27102.444	46a	2	13	2		COS Ack	Src Mac 13
163	AF	27103.257	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
164	AF	27103.883	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
165	AF	27104.221	3cd	1	13	15		Slave Poll Rsp	Src Mac 13
166	AF	27106.638	34d	1	13	13	00 c0 00 00 00 01 00 70	Slave COS Cmd	Src Mac 13
167	AF	27107.708	34d	1	13	13	41 00 00 00 60 00 58 00	Slave COS Cmd	Src Mac 13
168	AF	27108.824	34d	1	13	13	42 00 00 00 00 00 00 00	Slave COS Cmd	Src Mac 13
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13

The data captured for buffer 158 is described in the table below.

83 00

Byte(s)	Data	Description
0	83	The upper nibble "8" indicates this is the final fragment. The lower nibble "3" indicates this is packet count 3.
1	00	This is the upper byte of the data from 1794-OA8. This byte is not usually used.

Analyzing Buffer 162 (Master's Change of State Ack)



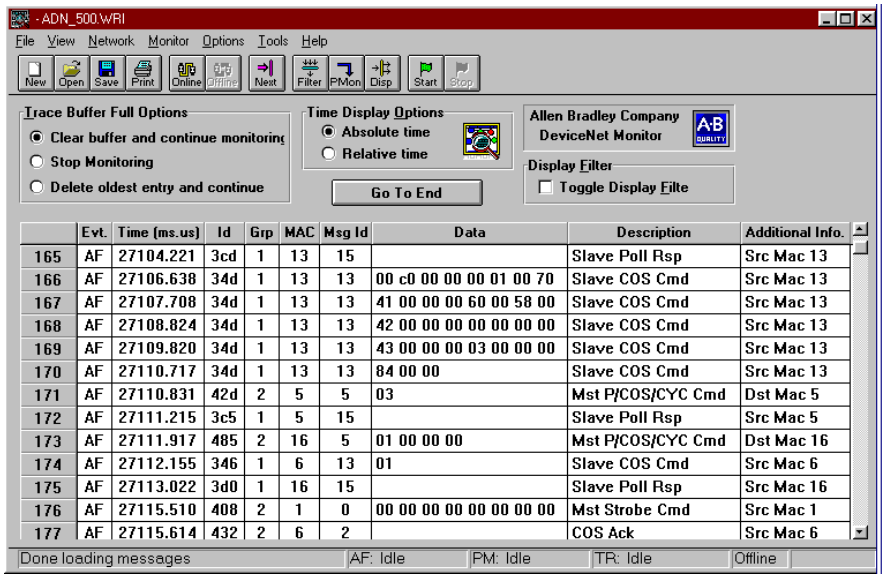
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
162	AF	27102.444	46a	2	13	2		COS Ack	Src Mac 13
163	AF	27103.257	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
164	AF	27103.883	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
165	AF	27104.221	3cd	1	13	15		Slave Poll Rsp	Src Mac 13
166	AF	27106.638	34d	1	13	13	00 c0 00 00 00 01 00 70	Slave COS Cmd	Src Mac 13
167	AF	27107.708	34d	1	13	13	41 00 00 00 60 00 58 00	Slave COS Cmd	Src Mac 13
168	AF	27108.824	34d	1	13	13	42 00 00 00 00 00 00 00	Slave COS Cmd	Src Mac 13
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13
171	AF	27110.831	42d	2	5	5	03	Mst P/COS/CYC Cmd	Dst Mac 5
172	AF	27111.215	3c5	1	5	15		Slave Poll Rsp	Src Mac 5
173	AF	27111.917	485	2	16	5	01 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 16
174	AF	27112.155	346	1	6	13	01	Slave COS Cmd	Src Mac 6

The data captured for buffer 162 is described in the table below.

Nothing

This is the master's change of state ack of data previously received from slave node 13.

Analyzing Buffer 165 (Slave's Change of State Ack)

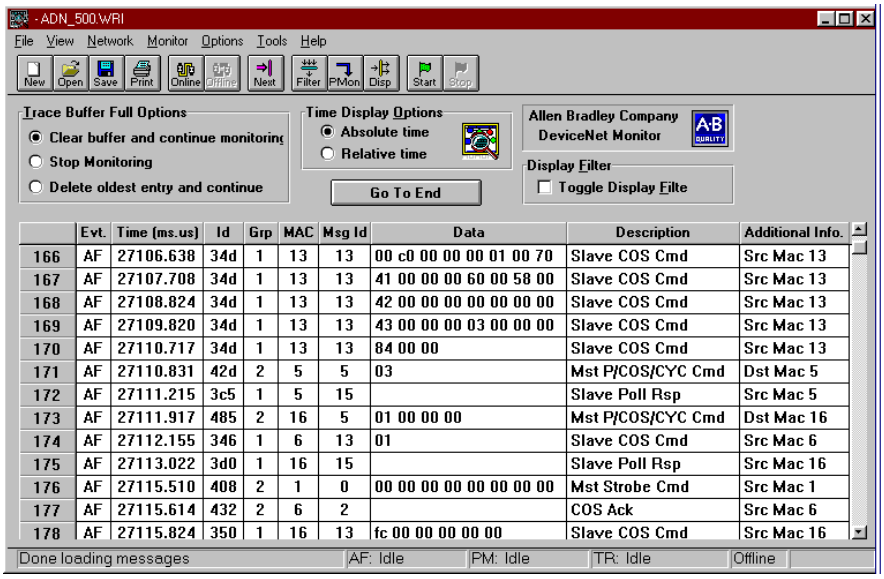


The data captured for buffer 165 is described in the table below.

Nothing

This is the slave's (node 13) change of state ack of data received from the master.

Analyzing Buffer 166 (Slave's Change of State)



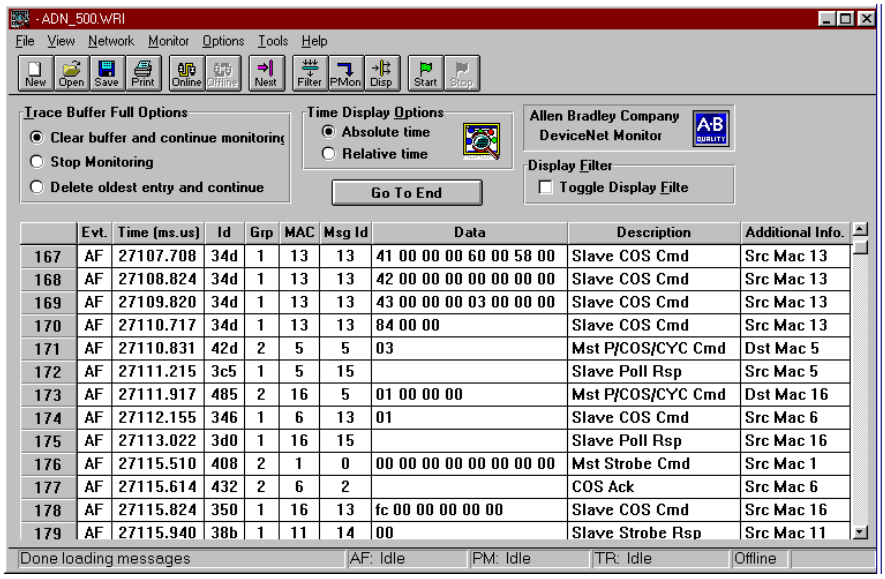
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
166	AF	27106.638	34d	1	13	13	00 c0 00 00 00 01 00 70	Slave COS Cmd	Src Mac 13
167	AF	27107.708	34d	1	13	13	41 00 00 00 60 00 58 00	Slave COS Cmd	Src Mac 13
168	AF	27108.824	34d	1	13	13	42 00 00 00 00 00 00 00	Slave COS Cmd	Src Mac 13
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13
171	AF	27110.831	42d	2	5	5	03	Mst P/COS/CYC Cmd	Dst Mac 5
172	AF	27111.215	3c5	1	5	15		Slave Poll Rsp	Src Mac 5
173	AF	27111.917	485	2	16	5	01 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 16
174	AF	27112.155	346	1	6	13	01	Slave COS Cmd	Src Mac 6
175	AF	27113.022	3d0	1	16	15		Slave Poll Rsp	Src Mac 16
176	AF	27115.510	408	2	1	0	00 00 00 00 00 00 00 00	Mst Strobe Cmd	Src Mac 1
177	AF	27115.614	432	2	6	2		COS Ack	Src Mac 6
178	AF	27115.824	350	1	16	13	fc 00 00 00 00 00	Slave COS Cmd	Src Mac 16

The data captured for buffer 166 is described in the table below.

00 c0 00 00 00 01 00 70

Byte(s)	Data	Description
0	00	This is the first fragment. Packet count is 0.
1 and 2	c0 00	This is the 1794-ADN adapter status word.
3 and 4	00 00	This word of data from the 1794-OB16 is not used and should be set to 0.
5 and 6	01 00	This is the input data from the 1794-IB16. This data 01 is the data from terminals 0 to 7. The data 00 is from terminals 8 to 15.
7	70	This is the low byte of data from the 1794-IE8s channel 0 data.

Analyzing Buffer 167 (Slave's Change of State)

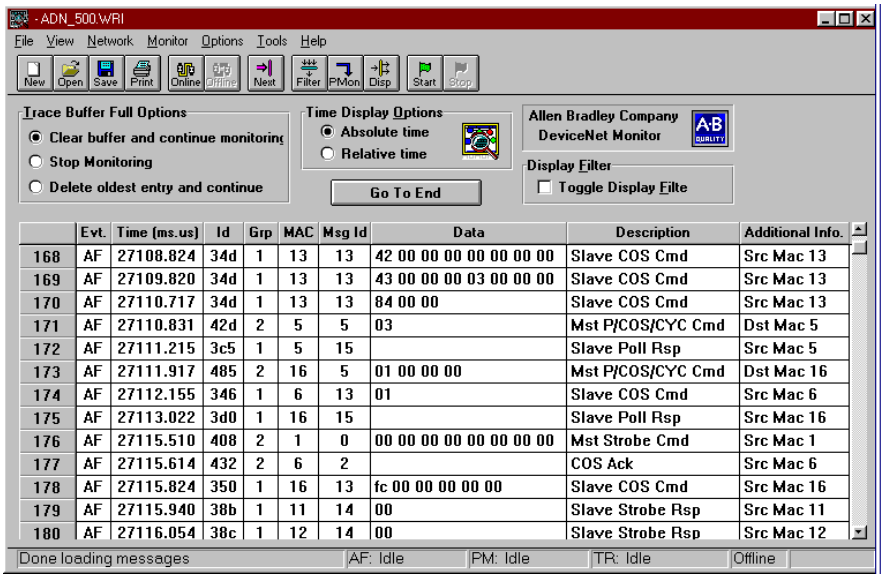


The data captured for buffer 167 is described in the table below.

41 00 00 00 60 00 58 00

Byte(s)	Data	Description
0	41	This is the middle fragment. Packet count is 1.
1	00	This is the high-data byte from the 1794-IE8s channel 0.
2 and 3	00 00	Data from the 1794-IE8s channel 1.
4 and 5	60 00	This is data from the 1794-IE8s channel 2.
6 and 7	58 00	This is data from the 1794-IE8s channel 3.

Analyzing Buffer 168 (Slave's Change of State)



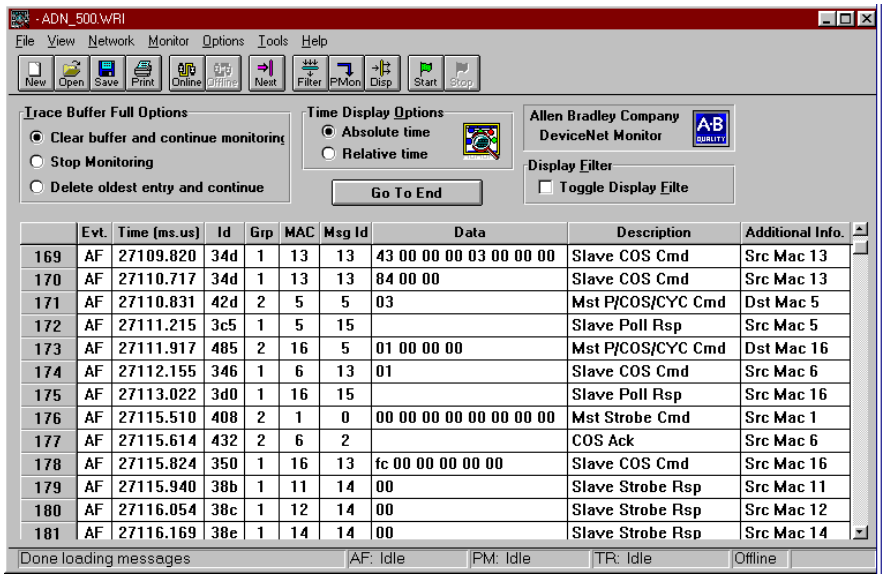
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
168	AF	27108.824	34d	1	13	13	42 00 00 00 00 00 00 00	Slave COS Cmd	Src Mac 13
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13
171	AF	27110.831	42d	2	5	5	03	Mst P/COS/CYC Cmd	Dst Mac 5
172	AF	27111.215	3c5	1	5	15		Slave Poll Rsp	Src Mac 5
173	AF	27111.917	485	2	16	5	01 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 16
174	AF	27112.155	346	1	6	13	01	Slave COS Cmd	Src Mac 6
175	AF	27113.022	3d0	1	16	15		Slave Poll Rsp	Src Mac 16
176	AF	27115.510	408	2	1	0	00 00 00 00 00 00 00 00	Mst Strobe Cmd	Src Mac 1
177	AF	27115.614	432	2	6	2		COS Ack	Src Mac 6
178	AF	27115.824	350	1	16	13	fc 00 00 00 00 00	Slave COS Cmd	Src Mac 16
179	AF	27115.940	38b	1	11	14	00	Slave Strobe Rsp	Src Mac 11
180	AF	27116.054	38c	1	12	14	00	Slave Strobe Rsp	Src Mac 12

The data captured for buffer 168 is described in the table below.

42 00 00 00 00 00 00 00

Byte(s)	Data	Description
0	42	This is a middle fragment. Packet count is 2.
1 and 2	00 00	This is data from the 1794-IE8s channel 4.
3 and 4	00 00	This is data from the 1794-IE8s channel 5.
5 and 6	00 00	This is data from the 1794-IE8s channels 6.
7	00	This is data from the 1794-IE8s channel 7. This is the lower data byte only.

Analyzing Buffer 169 (Slave's Change of State)



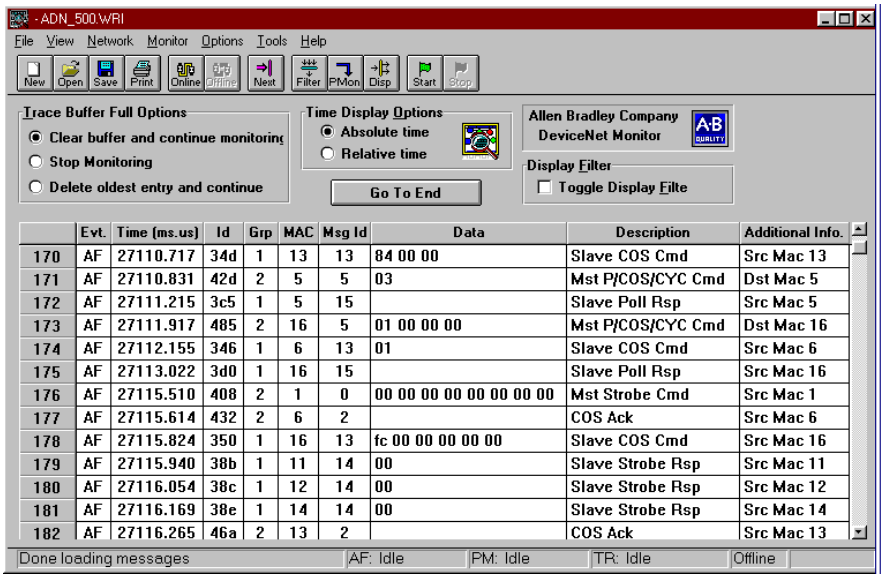
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
169	AF	27109.820	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13
171	AF	27110.831	42d	2	5	5	03	Mst P/COS/CYC Cmd	Dst Mac 5
172	AF	27111.215	3c5	1	5	15		Slave Poll Rsp	Src Mac 5
173	AF	27111.917	485	2	16	5	01 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 16
174	AF	27112.155	346	1	6	13	01	Slave COS Cmd	Src Mac 6
175	AF	27113.022	3d0	1	16	15		Slave Poll Rsp	Src Mac 16
176	AF	27115.510	408	2	1	0	00 00 00 00 00 00 00 00	Mst Strobe Cmd	Src Mac 1
177	AF	27115.614	432	2	6	2		COS Ack	Src Mac 6
178	AF	27115.824	350	1	16	13	fc 00 00 00 00 00	Slave COS Cmd	Src Mac 16
179	AF	27115.940	38b	1	11	14	00	Slave Strobe Rsp	Src Mac 11
180	AF	27116.054	38c	1	12	14	00	Slave Strobe Rsp	Src Mac 12
181	AF	27116.169	38e	1	14	14	00	Slave Strobe Rsp	Src Mac 14

The data captured for buffer 169 is described in the table below.

43 00 00 00 03 00 00 00

Byte(s)	Data	Description
0	43	This is a middle fragment. Packet count is 3.
1	00	This is upper data byte from the 1794-IE8s channel 7.
2 and 3	00 00	These bytes are also from the 1794-IE8. The lower byte, byte 2, gives us the under range bits for 4 to 20mA. This does not apply to this set up. The upper byte has only the most significant bit being used. This is for the power-up bit.
4 and 5	03 00	These two bytes are status information from the 1794-OE4.
6 and 7	00 00	This is the input data from the 1794-IA8.

Analyzing Buffer 170 (Slave's Change of State)



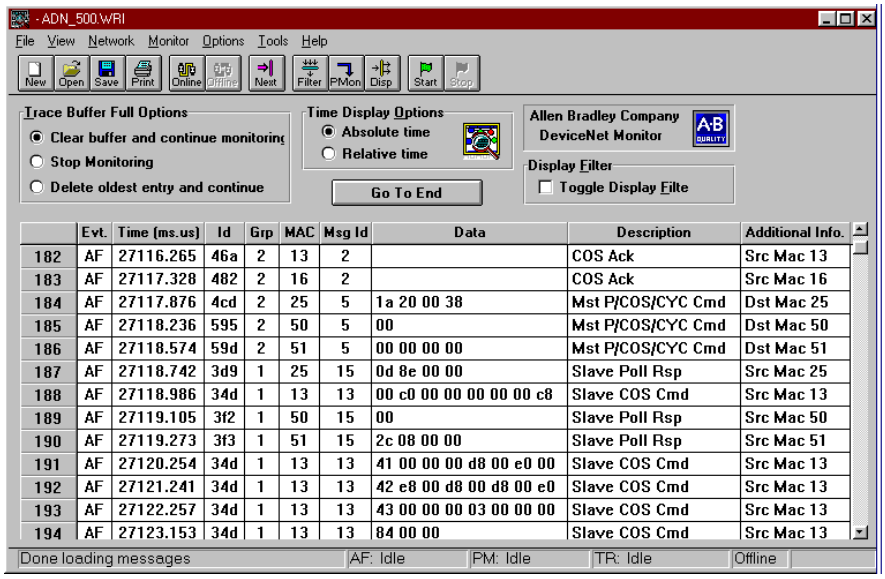
	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
170	AF	27110.717	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13
171	AF	27110.831	42d	2	5	5	03	Mst P/COS/CYC Cmd	Dst Mac 5
172	AF	27111.215	3c5	1	5	15		Slave Poll Rsp	Src Mac 5
173	AF	27111.917	485	2	16	5	01 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 16
174	AF	27112.155	346	1	6	13	01	Slave COS Cmd	Src Mac 6
175	AF	27113.022	3d0	1	16	15		Slave Poll Rsp	Src Mac 16
176	AF	27115.510	408	2	1	0	00 00 00 00 00 00 00 00	Mst Strobe Cmd	Src Mac 1
177	AF	27115.614	432	2	6	2		COS Ack	Src Mac 6
178	AF	27115.824	350	1	16	13	fc 00 00 00 00 00	Slave COS Cmd	Src Mac 16
179	AF	27115.940	38b	1	11	14	00	Slave Strobe Rsp	Src Mac 11
180	AF	27116.054	38c	1	12	14	00	Slave Strobe Rsp	Src Mac 12
181	AF	27116.169	38e	1	14	14	00	Slave Strobe Rsp	Src Mac 14
182	AF	27116.265	46a	2	13	2		COS Ack	Src Mac 13

The data captured for buffer 170 is described in the table below.

84 00 00

Byte(s)	Data	Description
0	84	This is the final fragment. The packet count is 4.
1 and 2	00 00	This is from the 1794-OA8. This data is not really used and should be set to 0.

Analyzing Buffer 182 (Master's Change of State Ack)



	Evt.	Time (ms.us)	Id	Grp	MAC	Msg Id	Data	Description	Additional Info.
182	AF	27116.265	46a	2	13	2		COS Ack	Src Mac 13
183	AF	27117.328	482	2	16	2		COS Ack	Src Mac 16
184	AF	27117.876	4cd	2	25	5	1a 20 00 38	Mst P/COS/CYC Cmd	Dst Mac 25
185	AF	27118.236	595	2	50	5	00	Mst P/COS/CYC Cmd	Dst Mac 50
186	AF	27118.574	59d	2	51	5	00 00 00 00	Mst P/COS/CYC Cmd	Dst Mac 51
187	AF	27118.742	3d9	1	25	15	0d 8e 00 00	Slave Poll Rsp	Src Mac 25
188	AF	27118.986	34d	1	13	13	00 c0 00 00 00 00 00 c8	Slave COS Cmd	Src Mac 13
189	AF	27119.105	3f2	1	50	15	00	Slave Poll Rsp	Src Mac 50
190	AF	27119.273	3f3	1	51	15	2c 08 00 00	Slave Poll Rsp	Src Mac 51
191	AF	27120.254	34d	1	13	13	41 00 00 00 d8 00 e0 00	Slave COS Cmd	Src Mac 13
192	AF	27121.241	34d	1	13	13	42 e8 00 d8 00 d8 00 e0	Slave COS Cmd	Src Mac 13
193	AF	27122.257	34d	1	13	13	43 00 00 00 03 00 00 00	Slave COS Cmd	Src Mac 13
194	AF	27123.153	34d	1	13	13	84 00 00	Slave COS Cmd	Src Mac 13

Nothing

This is the master's change of state ack of data it received from the 1794-ADN adapter.

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Check Problem(s) Type:	Describe Problem(s):	Internal Use Only
☐ Technical Accuracy	☐ text ☐ illustration	
☐ Completeness What information is missing?	☐ procedure/step ☐ illustration ☐ definition ☐ example ☐ guideline ☐ feature ☐ explanation ☐ other	☐ info in manual (accessibility) ☐ info not in manual
☐ Clarity What is unclear?		
☐ Sequence What is not in the right order?		
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Publication ICCG-5.21-August 1995 PN 955107-82

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