DeviceNet Diagnostic

User Guide

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This document applies to the DeviceNet Diagnostic software application.

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Preface

Preface Sections:

- Purpose of this Guide

- Conventions

Purpose of this Guide

This guide contains technical and product-related information on the DeviceNet Diagnostic software application.

The DeviceNet Diagnostic is used to detect and display the DeviceNet network, card and device status information, and configuration. It also allows you to change network I/O values and to send explicit messages.

Conventions

This guide uses stylistic conventions, special terms, and special notation to help enhance your understanding.

Style

The following stylistic conventions are used throughout this guide:

Bold	indicates field names, button names, tab names, executable files, and options or selections
Italics	indicates keywords (indexed) or instances of new terms and/or specialized words that need emphasis
CAPS	indicates a specific key selection, such as ENTER, TAB, CTRL, ALT, DELETE
Code Font	indicates command line entries or text that you'd type into a field
<u>Underlining</u>	indicates a hyperlink
">" delimiter	indicates how to navigate through a hierarchy of menu selections/options
"0x"	indicates a hexadecimal value

Terminology

The following special terms are used throughout this guide:

Console   The software tool used to configure the DeviceNet network for a Woodhead DeviceNet interface card.

Diagnostic   The DeviceNet Diagnostic application.

Special Notation

The following special notations are used throughout this guide:

Warning

Warning messages alert the reader to situations where personal injury may result. Warnings are accompanied by the symbol shown, and precede the topic to which they refer.

Caution

Caution messages alert the reader to situations where equipment damage may result. Cautions are accompanied by the symbol shown, and precede the topic to which they refer.

Note

A note provides additional information, emphasizes a point, or gives a tip for easier operation. Notes are accompanied by the symbol shown, and follow the text to which they refer.

1

Overview

Chapter Sections:

- Main Features

- Guidelines for Use

- System Requirements

1.1 Main Features

The Diagnostic is used with one or more Woodhead DeviceNet interface cards to provide scanner diagnostic information and help diagnose scanner-related problems. It can perform the following functions:

- Automatically detects DN network devices and allows you to go online with the detected list

- Can run at the same time as other DN scanner applications that control DN cards.
  The Diagnostic queries all DN cards in the computer and reads the current configuration for each of them without disturbing other applications

- Loads the current network configuration generated by the Console, or an exported Console configuration XML file, and uses this data to configure DN cards in the computer

- Displays information regarding the DN network, including the status of the scanner, server, CAN counters and bus

- Displays information on the status of the DN card, scanner module and application kernel

- Displays the host interface memory block for a DN card

- Displays the configuration information for the master, server and DN network devices

- Displays and allows changes to the I/O data for the server and DN network devices

- Allows explicit messages to be sent to DN network devices

1.2 Guidelines for Use

The Diagnostic can be used in the following modes:

- **Auto-Detect Mode** – The Diagnostic can auto-detect DN network devices. It allows you to select which DN card will establish the network connection, as well as the baud rate and MAC ID. The Diagnostic then allows you to go online/scan.

- **Monitoring Mode** – If you have configured the DN cards in your computer, the Diagnostic can query them to determine the existing card and network configuration. This allows the Diagnostic to be used at the same time as a customer application (including the DN Console when it is online, and the DN OPC Server).

- **Active Console Configuration Mode** – If you have configured the DN network inside the DN Console and saved the configuration, you can open the current Console configuration in the Diagnostic. The Diagnostic will then configure the cards and allow you to go online/scan.

- **File Mode** – If you have configured the DN network inside the DN Console and exported the configuration file to a different location than the active configuration folder, you can import the configuration file into the Diagnostic. The Diagnostic will then configure the cards and allow you to go online/scan.

When used alongside the Console, the Diagnostic can be run via a toolbar command from within the Console or by executing the Diagnostic directly. The configuration files (configuration.xml) generated by the Console will be opened by the Diagnostic in Active Console Configuration or File Mode. The configuration files contain the network configuration, server configuration and device scan list information for one or more DN cards.

In Monitoring Mode, the Diagnostic uses a special sharing mode to access the DN cards, even if other applications are using them. As such, the Diagnostic can always be run in Monitoring Mode.

Note

If the Diagnostic is currently displaying a list of cards in the Tree View (one or more cards are open), no other application will be able to write to the cards. If this occurs, use the **Clear Configuration** command, which will close all cards, thus allowing them to be opened with another application. You can then use the **Query Configuration** command to obtain the configuration information for the cards in the computer, as defined by the other application.

1.3 System Requirements

The Diagnostic is designed to work with the Woodhead DeviceNet family of interface cards. It is used in conjunction with the DN scanner module and hardware driver DLL, and requires that the hardware driver (SSDN32.DLL) be version 3.7.4.0 or higher.
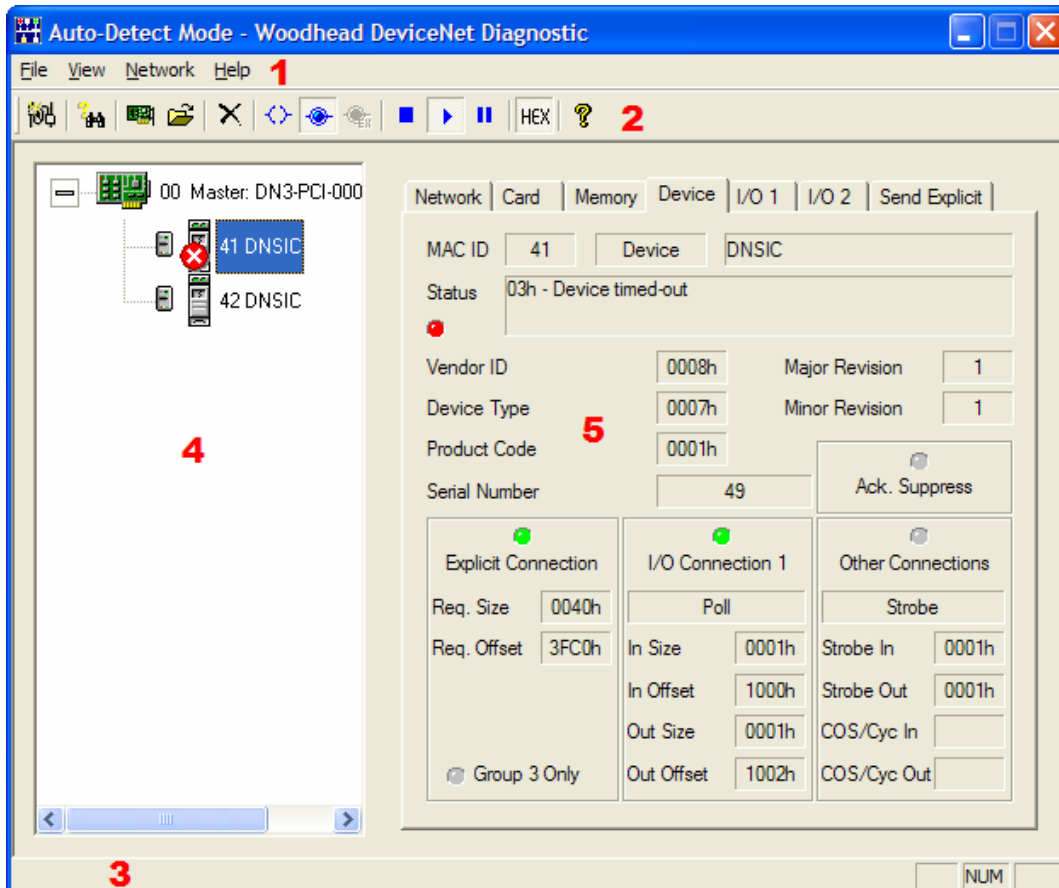
2

Working Environment

Chapter Sections:

- General Overview

- Menu Bar and Toolbar

- Entering Numerical Values

2.1 General Overview

The Diagnostic working environment is a stand-alone application, consisting of a user interface containing five different regions, as indicated below.

Figure 2.1-1: Diagnostic Working Environment

Region 1: Menu Bar

The Menu Bar contains all of the Diagnostic commands. When a command is highlighted, a brief description is displayed.

Region 2: Toolbar

The Toolbar contains iconic representations of many Diagnostic commands. When the mouse is on top of an icon, a brief description of the command is displayed.

Region 3: Status Bar

The Status Bar displays the description of any Menu or Toolbar item that the mouse is on top of.

Region 4: Configuration Tree View

The Configuration Tree View is located on the left side of the application window. It displays the current configuration information, consisting of a list of masters (DN cards), servers and devices. The selection within the Tree View determines the information that is displayed and the actions available in the Tabbed Property Pages. By displaying different icons for each state, it indicates whether a card is offline or online, whether a server is idle or being scanned, and whether a device is idle, being scanned or has an error status. If server information cannot be obtained (i.e. the Diagnostic is in Monitoring Mode), the Tree View will indicate this as well.

Region 5: Tabbed Property Pages

The Tabbed Property Pages are located on the right side of the application window. They display network, card and memory information, as well as the configuration data for the master, server and devices. The pages also display and allow manipulation of the device and server I/O data, and provide a mechanism to send explicit messages to devices. The contents of the property pages update to reflect the selection within the Configuration Tree View. The property pages are updated frequently, so that they always display the current data associated with the selection.

2.2 Menu Bar and Toolbar

The Menu Bar contains all of the Diagnostic commands, and the Toolbar contains icons for many of these commands. A description of each command is provided below.

Table 2.2-1: Menu/Toolbar Items

Menu/Toolbar Item Name	Icon	Description
File Menu		
Open Current Console Network Configuration		Open the current network configuration XML file (created by the Console), and load/parse the configuration data and topics within it. Places the Diagnostic in Active Console Configuration Mode.
Import Console Network Configuration…		Open an exported network configuration XML file (created by the Console), and load/parse the configuration data and topics within it. Places the Diagnostic in File Mode.
Clear Configuration and Close All Cards		Go offline and close all card connections, clear the card configuration settings, and remove the cards from the maintained list.
MRU list (4 entries)		Open a Console-generated XML configuration file listed in the recent files list, and load/parse the configuration data and topics within it. Places the Diagnostic in File Mode.
Exit		Quit the application.
View Menu		
Toolbar		Show or hide the Toolbar.
Status Bar		Show or hide the Status Bar.
View as Hex		View numerical values in hexadecimal as opposed to decimal.
Always On Top		Toggle whether or not the application window is topmost always.
Network Menu		
Auto-Detect Network Configuration…		Search for all cards installed in the computer and ask the user which card, MAC ID and baud rate to use for auto-detecting the network; browse the network to obtain the possible configurations of each device, and configure each device to use the first possible connection. Places the Diagnostic in Auto-Detect Mode.
Obtain Configuration From Card(s)		Search for all cards installed in the computer and obtain their existing configuration. Places the Diagnostic in Monitoring Mode.
Go Online		Start communications and go online with a card. Not available in Monitoring Mode.
Go Online (Only Explicit Connections)		Start communications and go online with a card using only explicit connections. This allows other DeviceNet masters to simultaneously establish I/O connections to the same devices. Not available in Monitoring Mode.
Go Offline		Stop communications and go offline with a card. Not available in Monitoring Mode.
Start Scan		Start the I/O scan for a card. Not available in Monitoring Mode.
Stop Scan		Stop the I/O scan for a card. Not available in Monitoring Mode.
Place I/O in Idle State		Toggle the I/O state between idle and active for a card. Not available in Monitoring Mode.

Menu/Toolbar Item Name	Icon	Description
Help Menu		
About DeviceNet Diagnostic	❓	Display the product version number and copyright information.

2.3 Entering Numerical Values

When numerical values are entered into an edit field within the Diagnostic, either decimal or hexadecimal values can be used. A valid hexadecimal value is indicated by the "0x" prefix, or the "h" postfix (e.g., 0x14 or 14h = decimal 20).

3

Using the Diagnostic

Chapter Sections:

- Auto-Detecting the Network

- Obtaining Existing Card Configurations

- Using the Active Console Configuration

- Importing a Console Configuration File

- Viewing Network Information

- Viewing Card Information

- Viewing the Host Interface Memory Block of a Card

- Viewing the Master, Server, and Device Configuration

- Viewing and Changing the Device and Server I/O Data

- Sending Explicit Messages to a Device

3.1 Auto-Detecting the Network

In Auto-Detect Mode, the Diagnostic can be used to auto-detect DN network devices. This mode allows you to select which DN card will establish the network connection, as well as the baud rate and MAC ID. The Diagnostic then allows you to go online/scan.

To begin auto-detecting network devices, use the **Auto-Detect Network Configuration** command via the Menu or Toolbar.

Network > Auto-Detect Network Configuration…

A dialog is then displayed, allowing you to select the name of the card to be used for auto-detection, the network baud rate and the scanner's MAC ID. You can also set the scan interval and reconnect interval to be used by the master when going online (following auto-detection).

Figure 3.1-1: Scanner Settings for Auto-Detect Dialog
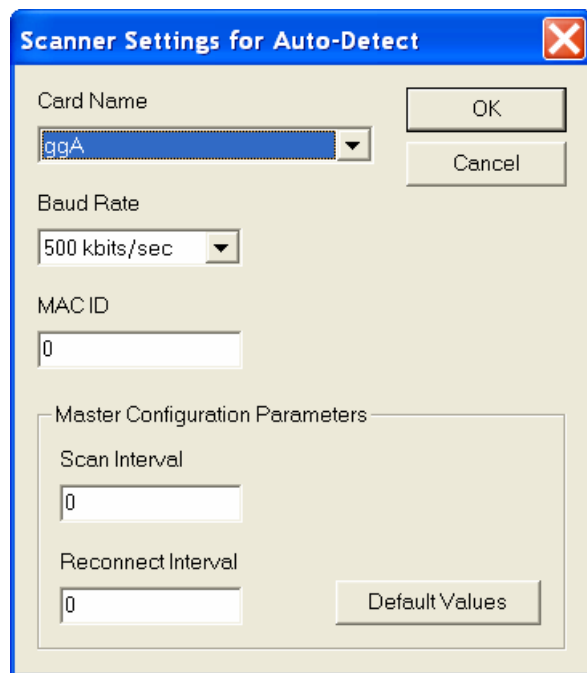
Click **OK** to begin auto-detecting the network. The dialog shown below is displayed during the detection process to indicate th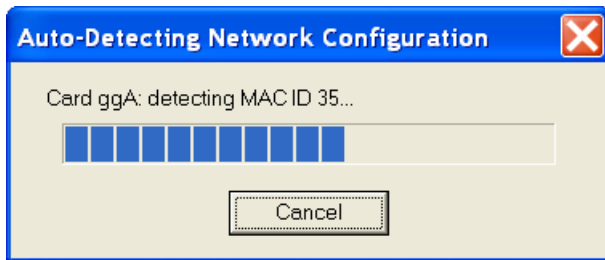e status of the operation. Auto-detection involves opening the DN card, placing it online, searching for network devices and then returning the card to an offline state.

Figure 3.1-2: Auto-Detecting Network Configuration Dialog

Once detection is complete, the Configuration Tree View will display the detected network configuration (a master and one or more devices), and the Diagnostic title bar will indicate Auto-Detect Mode.

In this mode, you can go online, scan the devices and toggle the I/O idle state for any card listed in the Configuration Tree View. If any I/O connection types are detected, the first one, along with the detected I/O sizes, will be used when defining the configuration. This will be, in order, one of poll, strobe, COS, or cyclic. If you use the **Go Online** command, this configuration will be used. If you use the **Go Online (Only Explicit Connections)** command, then the Diagnostic will only establish explicit connections with each of the detected devices.

Note

If you want to detect and diagnose more than one network at once, simply run another instance of the Diagnostic and select a different card name.

3.2 Obtaining Existing Card Configurations

If you have configured the DN cards in your computer, you can run the Diagnostic in Monitoring Mode to query the cards and determine the card and network configuration. This allows you to use the Diagnostic at the same time as a customer application (including the DN Console when it is Online and the DN OPC Server).

> **Note**
>
> If an application tries to send commands to a card while the Diagnostic is querying its configuration, the application may time out or issue an error message. Therefore, we recommend that you temporarily stop any commands that could be sent by the application (for example, I/O Active or Scan Active heartbeats, adding/deleting devices, going online/offline, starting/stopping the scan) until the query is complete.

To begin searching for all installed cards, use the **Obtain Configuration From Card(s)** command via the Menu or Toolbar.

Network > Obtain Configuration From Card(s)

The dialog shown below is displayed during the card query to indicate the status of the operation, which involves opening each DN card and querying it for configuration data.

Figure 3.2-1: Searching Cards for Configuration Data Dialog
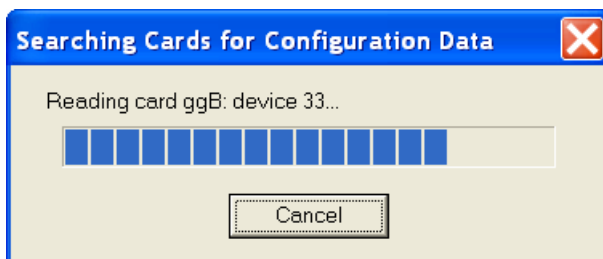
Once searching is complete, the Configuration Tree View will display the detected configuration for each card (a master, server and one or more devices), and the Diagnostic title bar will indicate Monitoring Mode. Note that the server configuration information cannot be obtained from the DN card.

In Monitoring Mode, you are not able to go online, scan devices, or toggle the I/O idle state for any card listed in the Configuration Tree View. The Diagnostic does not alter the state of any cards found, as the cards remain under another application's control. Each card's state will be updated in the Configuration Tree View and Tabbed Property Pages if it changes.

3.3 Using the Active Console Configuration

In Active Console Configuration Mode, the Diagnostic can open the current network configuration XML file created by the Console and load/parse the configuration data and topics within it. Once you have configured the DN network inside the DN Console and saved the configuration, you can open it in the Diagnostic. The Diagnostic will then configure the cards and allow you to go online/scan.

To open the network configuration, use the **Open Current Console Network Configuration** command, via the Menu or Toolbar.

 File > Open Current Console Network Configuration

The Diagnostic will then open the configuration XML file generated by the Console and retrieve the configuration data for one or more cards, as defined in the file.

Once this is complete, the Configuration Tree View will display the configuration for each card: a master, server (if defined) and one or more devices. The Diagnostic title bar will indicate Active Console Configuration Mode.

In Active Console Configuration Mode, you can go online, scan devices and toggle the I/O idle state for any card listed in the Configuration Tree View.

3.4 Importing a Console Configuration File

In File Mode, the Diagnostic can open an exported network configuration XML file (created by the Console) and load/parse the configuration data and topics within it. Once you have configured the DN network inside the DN Console and exported the configuration file to a different location than the currently active configuration folder, you can import the configuration file into the Diagnostic. The Diagnostic will then configure the cards and allow you to go online/scan.

Opening a Console-generated XML configuration file listed in the recent files list also places the Diagnostic in File Mode. The list of recent files is based on the recently imported network configuration files.

To open an exported network configuration, use the **Import Console Network Configuration…** command via the Menu or Toolbar.

File > Import Console Network Configuration…

A dialog is then displayed, allowing you to select the name of the configuration XML file to be opened. Clicking **Open** opens the configuration file and retrieves the configuration data for one or more cards, as defined in the file.

Once you have opened the configuration file, the Configuration Tree View will display the configuration data for each card: a master, server (if defined) and one or more devices. The Diagnostic title bar will be updated with the name of the configuration file to indicate that it is in File Mode.

In File Mode, you can go online, scan devices and toggle the I/O idle state for any card listed in the Configuration Tree View.

3.5 Viewing Network Information

The Network page (see Figure 3.5-1) displays information regarding the DN network, including the status of the scanner, server, CAN counters and bus. The network information for the card associated with the master, server, or device selected in the Configuration Tree View will be shown.

The network information is divided into four sections: Scanner Status, Server Status, CAN Counters and Bus Status. A description of each field is provided below.

Table 3.5-1: Network Page Status Fields

Field Name	Description	Host Interface Memory Block Offset
Scanner Status		
Online State	The scanner "Online"/"Offline" status indicates whether the CAN interface has been initialized and is ready to communicate. A light is also displayed – light green if "Online"; gray otherwise.	0x30 – bit 0x01
Scan State	The scanner "Scanning"/"Not scanning" status indicates the current status of the scanner's client function. A light is also displayed – light green if "Scanning"; gray otherwise.	0x140 – bit 0x01
I/O Activity State	The "I/O active"/"I/O idle" status indicates whether the scanner is transmitting Idle output messages (zero length, no data) to all devices in the scan list. A light is also displayed – light green if "I/O active"; gray otherwise. This field will display a status of "I/O idle" if the scanner is not scanning.	0x140 – bit 0x02
Baud Rate	The baud rate of the network. This field is only displayed when the scanner is online.	0x30 – bit 0x1000, 0x2000, and 0x4000
Status Flags	Reports the status of the scanner's client function.	0x141
Event Status	Scan event flags that inform the host of event occurrences related to the scanner's client function.	0x142
Server Status		
Configuration State	The server "Configured"/"Not configured"/"Unknown" status. This field displays a status of "Configured" if the server exists in the configuration or if the Activity State is "Active", "Not configured" if a server does not exist in the configuration or "Unknown" if the Diagnostic is in Monitoring Mode. A light is also displayed – light green if "Configured"; dark green if "Unknown"; gray otherwise.	0x160
Activity State	The server "Idle"/"Active"/"Unknown" status indicates whether the Group 2 Master/Slave Connection Set is allocated for the scanner's server function.	0x160
Status Flags	Reports the status of the scanner's server function.	0x161
Alloc. G2	Allocated G2 connection flags indicating the currently allocated Group 2 connections for the scanner module's server function.	0x166
Event Status	I/O event flags that inform the host of event occurrences related to the scanner's server function.	0x162
Expl. Status	Explicit request event flags that inform the host of event occurrences related to the server Explicit Request Message Buffer.	0x164

Field Name	Description	Host Interface Memory Block Offset
CAN Counters		
Tx	CAN transmit counter. Incremented when messages are submitted to the CAN controller.	0x32
Rx	CAN receive counter. Incremented when messages are received. Messages that fail the receive filter still increment the receive counter.	0x36
No Ack.	CAN ack error counter. Incremented when a transmit message is aborted due to lack of acknowledgement from other stations. When the ack error counter is incremented, the transmit counter is decremented to compensate for a message not actually transmitted.	0x34
Error	CAN communication error counter. Incremented when a CAN frame error is detected.	0x38
Lost	CAN lost messages counter. Incremented when a CAN message is received before the previous message is placed into the receive queue.	0x3A
Overrun	CAN receive queue overrun counter. Incremented when a CAN message is lost due to a full receive queue.	0x3C
Bus Status		
SA	Scanner Active – at least one I/O or explicit connection is established.	0x30 – bit 0x8000
O5	Online at 500 kbaud.	0x30 – bit 0x4000
O2	Online at 250 kbaud.	0x30 – bit 0x2000
O1	Online at 125 kbaud.	0x30 – bit 0x1000
BP	Bus Power Detect – bus power present (zero if power sense not supported). Indicates the presence or absence of network power. This flag is clear if the physical bus interface is not powered.	0x30 – bit 0x0200
ER	CAN Bus Error – CAN communication error. This flag is set each time a CAN communication error is detected. An excessive number of errors indicates a faulty physical media component (cable, connector, etc.) or excessive noise from external sources (check cable routing and shield connection).	0x30 – bit 0x0100
ML	Message Lost – CAN controller/receive ISR. This flag is set when a message is received from the bus while the previous message is still in the receive buffer. A lost message indicates a lower-layer application error (in the kernel interrupt handler).	0x30 – bit 0x80
RO	Receive Buffer Overrun – host application too slow emptying receive queue. This flag is set when messages are received from the bus faster than the application can process them. An overrun receive buffer indicates an upper-layer application error (in the application module).	0x30 – bit 0x40
TO	Transmit Timeout – transmit failed due to timeout (flooded network). This flag is set when a pending transmission is incomplete within 25-50ms. A transmit timeout indicates excessive message traffic at a higher priority than the aborted message.	0x30 – bit 0x20
TA	Transmit Ack Error – transmit failed due to ack error (no other nodes connected). This flag is set when a pending transmission is not acknowledged within 25-50ms. A transmit ack error indicates that no other nodes are present (or online) on the network.	0x30 – bit 0x10

Field Name	Description	Host Interface Memory Block Offset
A	Network Activity Detected – messages received or transmitted. This flag is set when any message is transmitted or received.	0x30 – bit 0x08
BO	Bus Off – this node has been disconnected due to excessive errors. This flag is set when an excessive number of communication errors are detected and the CAN chip automatically goes offline. This flag is cleared when the CAN interface is reinitialized. A bus off condition indicates a serious communication fault, such as an incorrect baud rate or physical layer error (short, open, etc.). To recover from a bus off condition, the application can issue the following command sequence: stop scan, offline, online, start scan.	0x30 – bit 0x04
BW	Bus Warning – this node is experiencing a large number of errors. This flag is set when an abnormal number of communication errors are detected and the CAN chip stops transmitting error frames. This flag is cleared when the error count returns to normal levels or the CAN interface is reinitialized. A bus warning indicates a potentially serious communication fault such as an out-of-tolerance baud rate or physical layer error (electrical noise, signal attenuation, intermittent connection, etc.).	0x30 – bit 0x02
OL	Online – CAN interface has been initialized and is ready to communicate.	0x30 – bit 0x01

Figure 3.5-1: Network Page
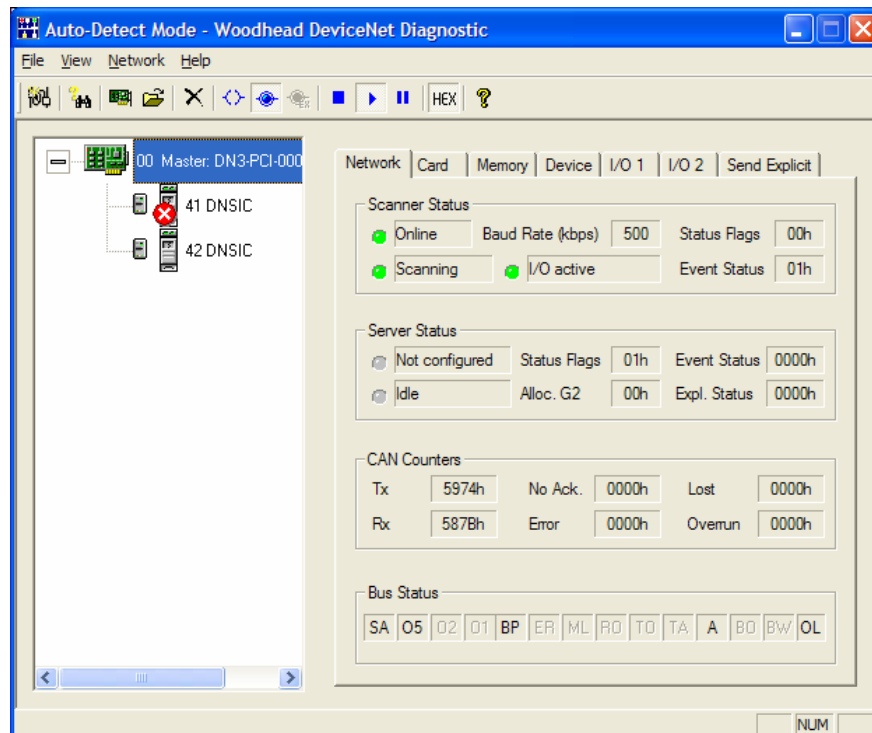
3.6 Viewing Card Information

The Card page (see Figure 3.6-1) displays information regarding the status of the DN card, scanner module and application kernel. The status information for the card associated with the master, server or device selected in the Configuration Tree View will be shown.

The card information is divided into three sections: Card, Module and Kernel. A description of each field is provided below.

Table 3.6-1: Card Page Status Fields

| Field Name	Description	Host Interface Memory Block Offset
Card		
Card Type	Type of card (e.g. SST-DN3-PCI-2).	0x12
Serial No	Card serial number.	0x22
DeviceNet Serial No	DeviceNet serial number.	0x0E
Module		
Type	Type of module loaded onto the card. This field displays "DN" or "ER" if a kernel error is detected.	0x00
ID	Module identification number.	0x0A
Revision	Module revision number.	0x0C
Main App. Error Code	Module main application error code.	0x2E
Add. App. Error Code	Module additional application error code.	0x3E
Name	Module identification string. This field will be empty if the module type is "ER" (which indicates a kernel error).	0x40
Kernel		
ID	Kernel identification number.	0x06
Revision	Kernel revision number.	0x08
Irq. Control	Reports the status of the card interrupt control flags, which are used to enable the generation of a physical interrupt for each of up to 8 logical interrupt sources.	0x2A
Irq. Status A	Reports the state of the card interrupt flags, which are set when each of up to 8 logical interrupts occur.	0x2C
Irq. Status B	Reports the state of the card interrupt flags, which are set when each of up to 8 logical interrupts occur.	0x2D
Status	Kernel error string. A light is also displayed – light green if no errors were detected; red otherwise. This field is only applicable when the module type is "ER" (which indicates a kernel error). Otherwise, this field displays "No errors detected".	0x40

Figure 3.6-1: Card Page
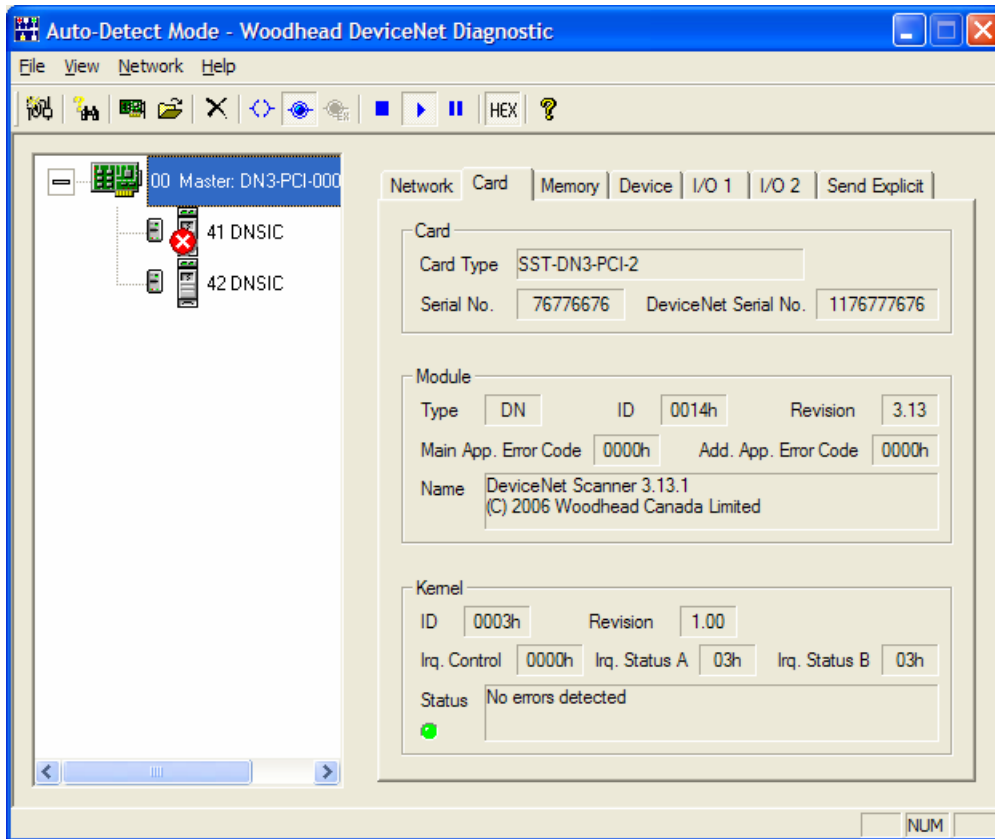
3.7 Viewing the Host Interface Memory Block of a Card

The Memory page (see Figure 3.7-1) displays the DN card's host interface memory block. The host interface memory block for the card associated with the master, server, or device selected in the Configuration Tree View will be shown.

The data display grid contains the current host interface memory block (first 16KB of card memory) for the selected card. The card memory can be saved to a file by clicking the **Save To File** button. The file will contain the hexadecimal value of each byte of the host interface memory block, along with each byte's character representation.

Figure 3.7-1: Memory Page
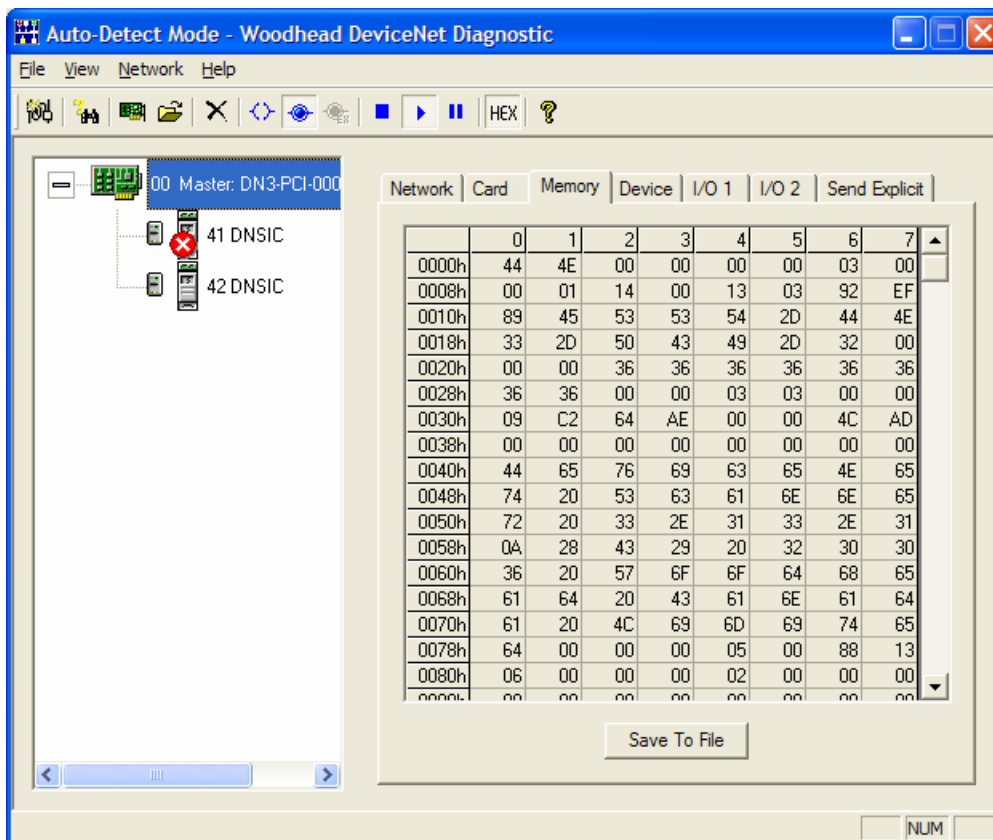
3.8 Viewing the Master, Server, and Device Configuration

The Device page (see Figures 3.8-1, 3.8-2, and 3.8-3) displays the configuration data for the master, server and devices on a DN network. The configuration data specific to the master, server or device selected in the Configuration Tree View will be shown.

3.8.1 Master or Server Selected

When a master or server is selected, the master/scanner settings or server configuration (if any) will be displayed in the Status field. Note that no server will exist in the Configuration Tree View when the Diagnostic is in Auto-Detect Mode.

If a master is selected, the status is obtained from the Client Status Block (host interface memory block offset 0x140). The status will be "Idle (not scanning)" if bit 0x01 is clear. Otherwise, it will be "Active (scanning); Tx Idle (I/O not active)" if bit 0x02 is set, or "Active (scanning); I/O active" if bit 0x02 is clear. A light is also displayed – light green if the client is scanning; dark green otherwise.

If a server is selected, the status is obtained from the Server Status Block (host interface memory block offset 0x160). The status will be "Idle (Group 2 Master/Slave Connection Set not allocated)" if the status byte is 0x00, "Active (Group 2 Master/Slave Connection Set allocated)" if the status byte is 0x01 or "Unknown" otherwise. A light is also displayed – light green if the server is active, dark green if the server is idle, and yellow if the server status is unknown.

If the Diagnostic is in Monitoring Mode, all other fields on the Device page will be empty when a master or server is selected, as the master/scanner settings and the server configuration cannot be obtained from the DN card. For other modes, the remaining fields will be displayed.

The MAC ID associated with the master/scanner is displayed, along with the network baud rate defined in the configuration. Additionally, the scan interval (default I/O update interval used for strobe and poll I/O connections with an I/O interval of 0) and the reconnect interval (period to wait before attempting to reconnect when a connection to a device is lost) associated with the master are shown.

The server configuration data is also provided. This includes the server connection flags, I/O connection update intervals, explicit connection request and response buffer sizes and offsets and I/O connection input and output buffer sizes and offsets.

Figure 3.8-1: Device Page in Auto-Detect Mode, Master Selected
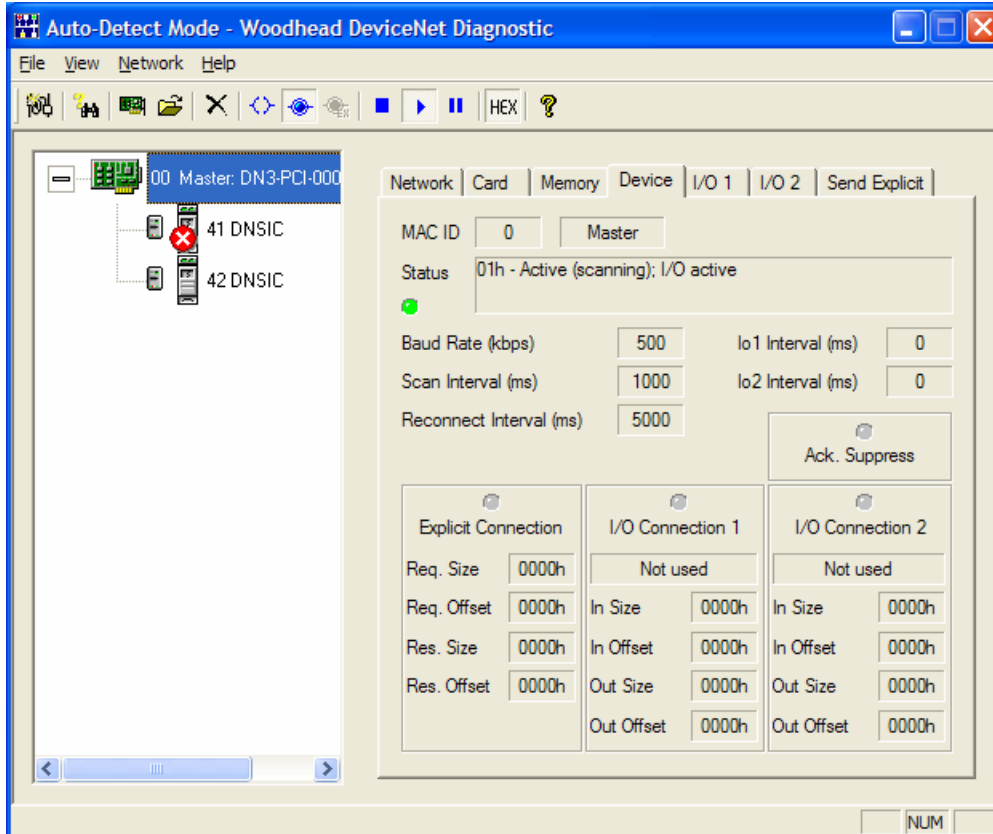
3.8.2 Device Selected – Auto-Detect Mode

In Auto-Detect Mode, the Status field will reflect the status of the selected device, as obtained from the Device Status Table (host interface memory block offset 0x1C0 + 16 * MAC ID). Refer to the DN Scanner Module 32-Bit DLL API Reference Guide for a list of possible error codes and their meaning. A light is also displayed – light gray if the device is not in the device list, dark green if the device is idle, light green if the device is scanning and red if the device is in error.

The MAC ID associated with the device is displayed, along with the product name, vendor ID, device type, product code, serial number and major and minor revision numbers.

The configuration data for the detected device is also provided. This includes the explicit connection request buffer size and offset, as well as the in-use and potential I/O connection settings.

If any I/O connection types are detected, the first one, along with the detected I/O sizes, will be used when defining the configuration. This will be, in order, one of poll, strobe, COS, or cyclic. If you use the **Go Online** command, this configuration will be used. If you use the **Go Online (Only Explicit Connections)** command, then the Diagnostic will only establish explicit connections with each of the detected devices. The configuration is displayed in the Device page's I/O Connection 1 section. The other potential connections and I/O sizes are displayed in the Device page's Other Connections section. Note that the COS and cyclic I/O connections always have the same input and output sizes.

Figure 3.8-2: Device Page in Auto-Detect Mode, Device Selected
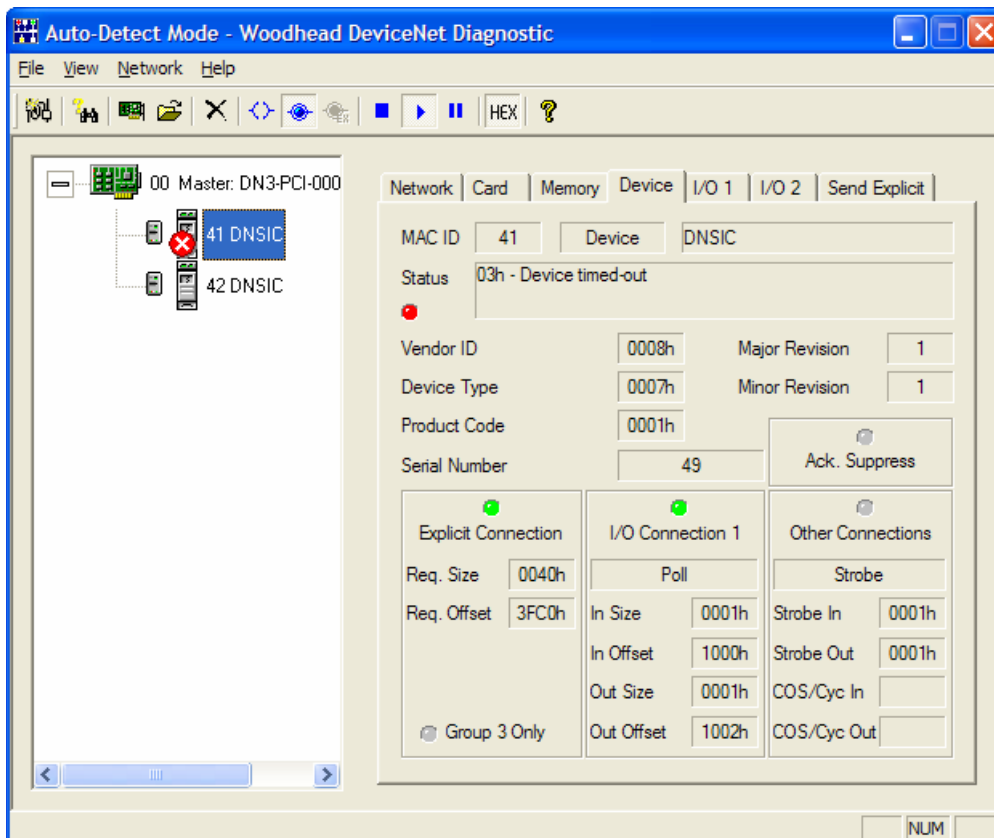
Figure 3.8-3: Device Page in Auto-Detect Mode, Device Selected, Only Explicit Connections
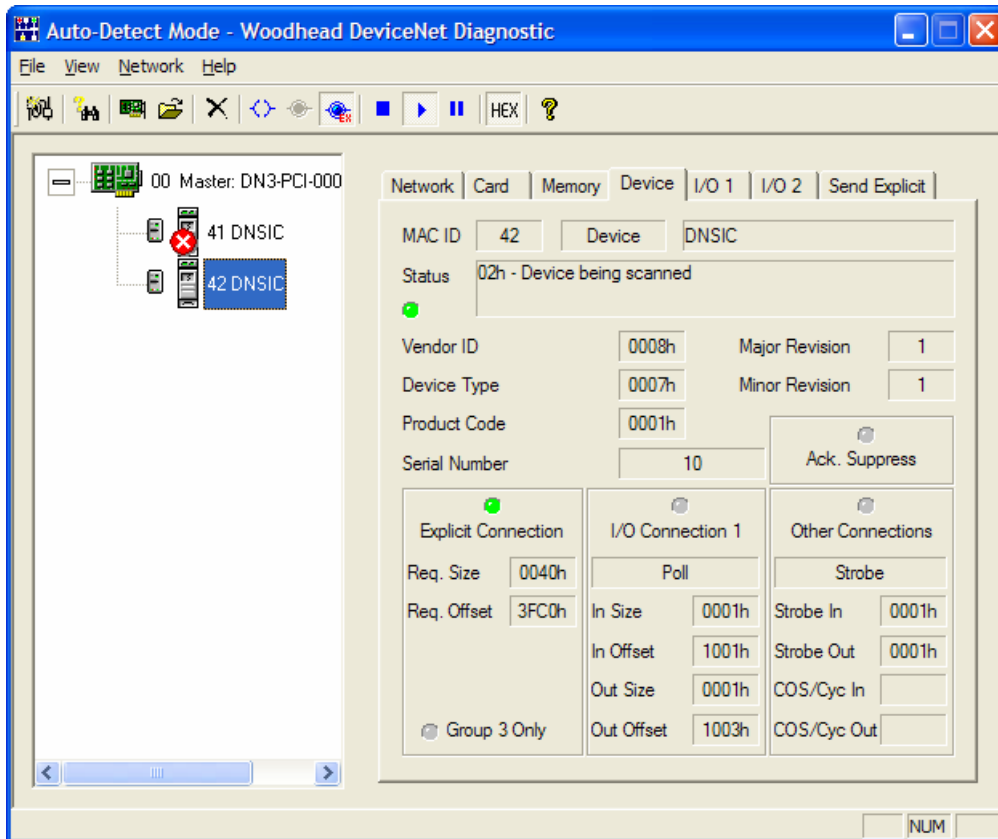
3.8.3   Device Selected – Other Than Auto-Detect Mode

If a device is selected while in a mode other than Auto-Detect, the Status field will reflect the detected device's status, as obtained from the Device Status Table (host interface memory block offset 0x1C0 + 16 * MAC ID). Refer to the DN Scanner Module 32-Bit DLL API Reference Guide for a list of possible error codes and their meaning. A light is also displayed – light gray if the device is not in the device list, dark green if the device is idle, light green if the device is scanning and red if the device is in error.

The device's MAC ID is displayed, along with the vendor ID, device type, product code and production inhibit time (only applicable to COS connections).

The device configuration data is also provided. This includes the device connection flags, I/O connection update intervals, explicit connection request buffer size and offset, and the I/O connection input and output buffer sizes and offsets for each of the two possible connections.

Figure 3.8-4: Device Page in Active Console Configuration Mode, Device Selected
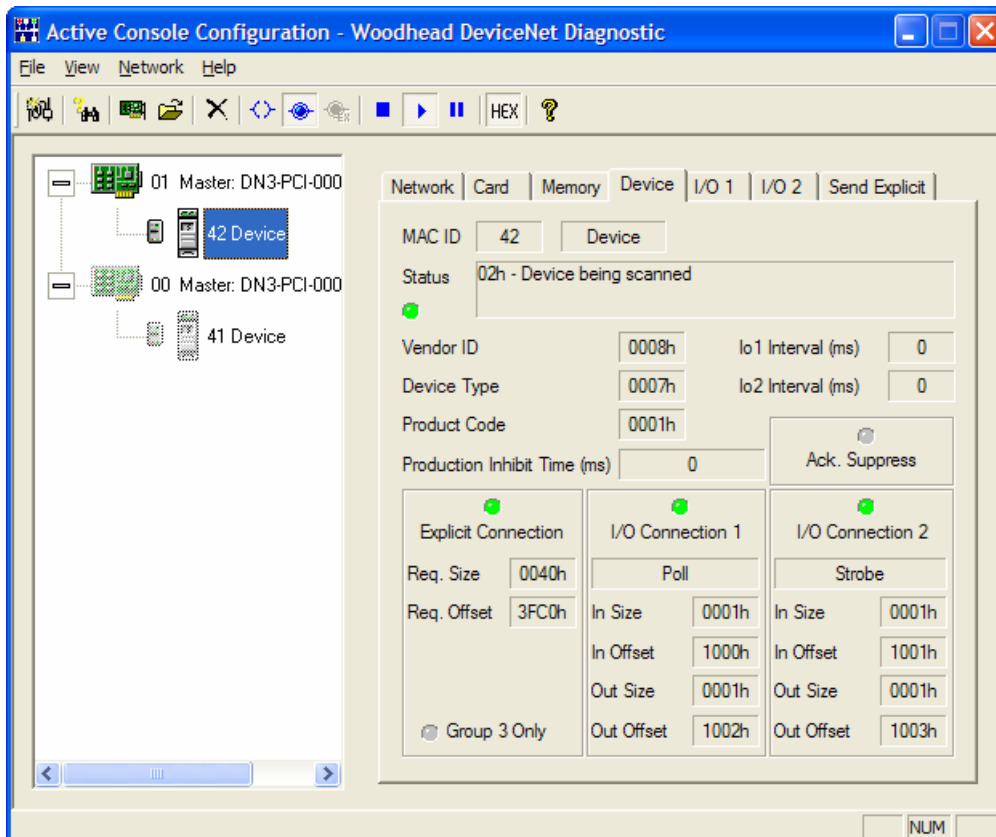
3.9 Viewing and Changing the Device and Server I/O Data

The I/O 1 and I/O 2 pages (see Figure 3.9-1) display and allow changes to the I/O data for the DN network's server and devices. The I/O 1 page is associated with the device's first connection, and the I/O 2 page is associated with the second connection. The I/O data specific to the device or server selected in the Configuration Tree View will be shown. Selecting a master, or a server when in Monitoring Mode (and therefore the server has an unknown configuration), results in no data being displayed.

The upper data display grid is read-only and contains the current input data of the selected device, or the current output data of the selected server. The lower data display grid is editable and contains the current output data for the selected device, or the current input data for the selected server. Also displayed is the number of bytes of data associated with these data grids and the MAC ID of the server or device selected in the Configuration Tree View.

Selecting **Use Device Offsets** allows you to specify whether to use the device offsets when displaying the numerical row names in the grids or just offsets of 0 (within the input or output buffer). Note that this setting affects both the I/O 1 and I/O 2 pages.

The lower section of the page is used to control the automatic generation of values (device outputs or server inputs). The method used to generate the values can be one of "Tx+1" (each byte of outgoing data = each byte of outgoing data + 1), "Rx to Tx" (each byte of outgoing data = each byte of incoming data) or "Rx+1 to Tx" (each byte of outgoing data = each byte of incoming data + 1). The interval at which the auto-generation of values occurs can be specified as a value between 10 and 60000 ms.

Click **Start** to begin generating outgoing values automatically. The relevant device or server's MAC ID will be shown, and a light will also displayed – light green while values are being generated; light gray otherwise. Note that only one device or server can have its outgoing values auto-generated for each of the two I/O connections. For example, you can auto-generate values for I/O connection 1 and 2 of device 26, or values for I/O connection 1 of device 26 and I/O connection 2 of a different device or a server, but you cannot auto-generate values for I/O connection 1 of two different devices or a server at the same time. Click **Stop** to stop automatically generating values.

Figure 3.9-1: I/O 1 Page
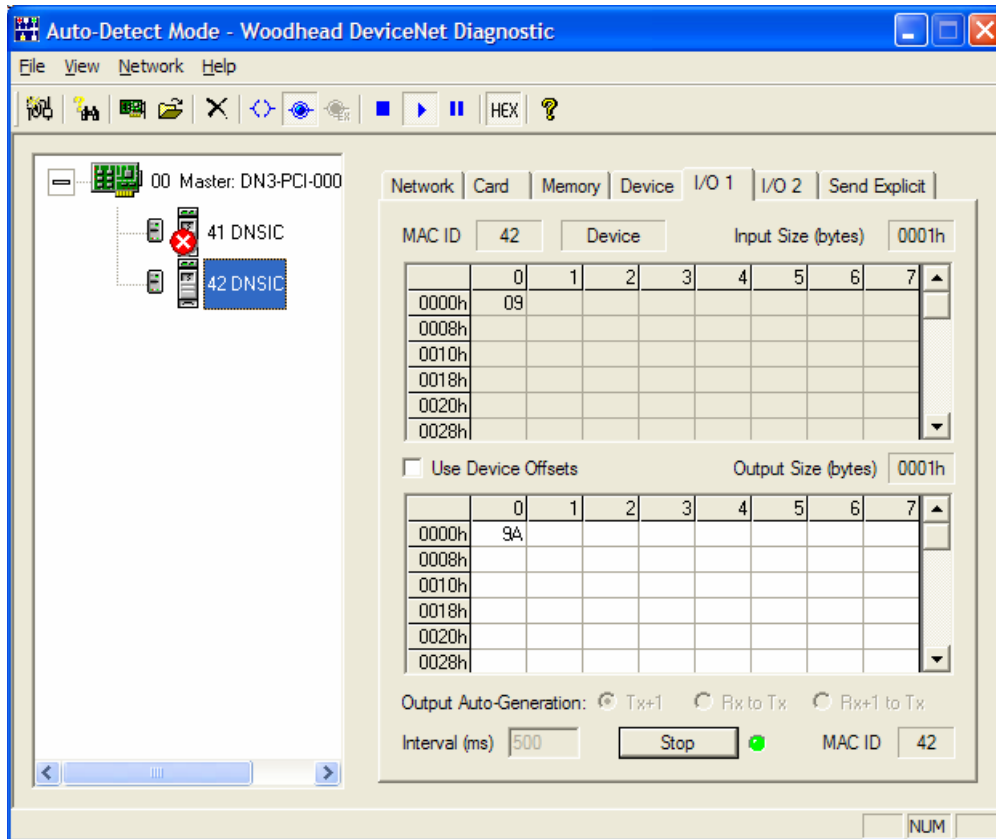
3.10 Sending Explicit Messages to a Device

The Send Explicit page (see Figure 3.10-1) allows sending explicit messages to DN network devices.

The messages will be sent to the selected device's MAC ID. The service, class, instance, and service data (which includes any attribute) of the relevant message can be entered. The service and class can also be selected from the corresponding list of available codes. The service data must be entered in hexadecimal format, which consists of up to 256 byte values, optionally separated by spaces. For example, "000a1200cc", "00 0a 12 00 cc", and "0 0a 12 0 cc" all specify valid service data.

The middle-left section of the page is used to send one or more explicit messages to the selected device. The number of times the explicit message should be sent can be specified as a value between 1 and 1000. Click **Send** to send the defined explicit message.

The middle-right section of the page is used to control the automatic sending of explicit messages. The interval at which auto-sending occurs can be specified as a value between 10 and 60000 ms. Click **Start** to begin generating outgoing values automatically. The relevant device's MAC ID will be shown, and a light is also displayed – light green when explicit messages are being sent; light gray otherwise. Note that explicit messages can only be sent to one device at a time. Click **Stop** to stop automatically sending explicit messages.

All responses (to both manual and auto-generated explicit messages) will be displayed in the history window at the bottom of the page, with the most recent responses listed first. You can clear the history any time by clicking **Clear**. The message count is also displayed. This is reset each time **Send** or **Start** is clicked or the history is cleared.

Figure 3.10-1: Send Explicit Page
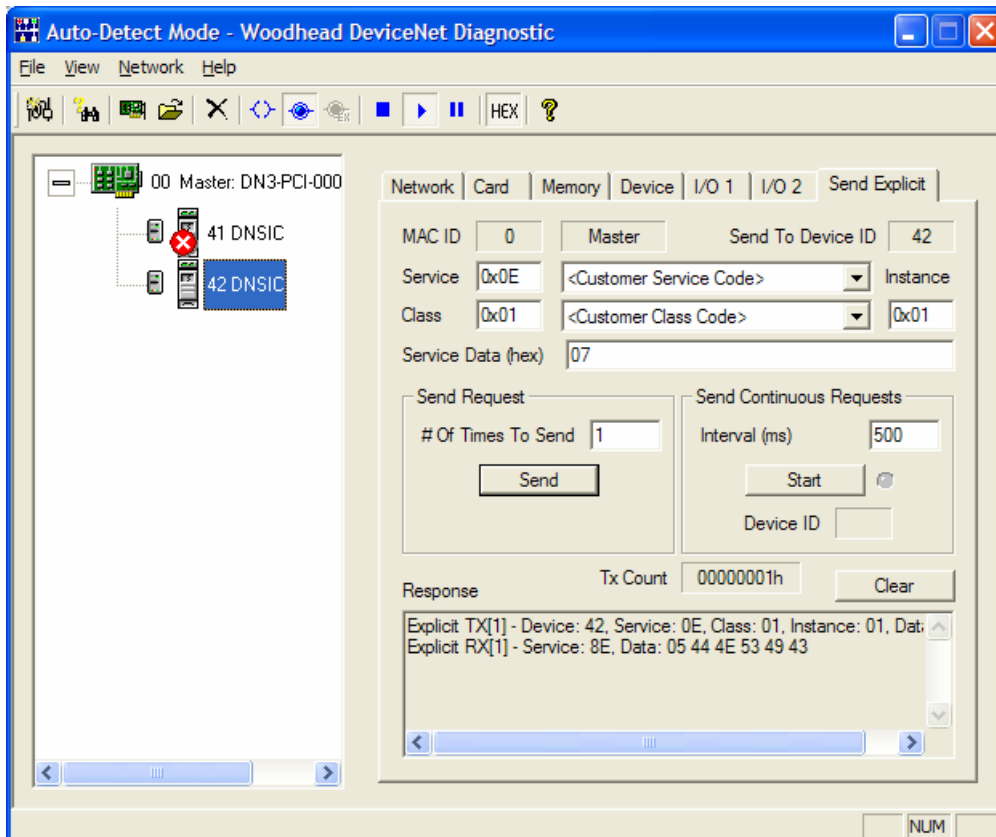
4

Troubleshooting

Chapter Sections:

- Required Software Components

4.1 Required Software Components

The Diagnostic depends on other software components to correctly function. A list of these dependencies is provided below.

Table 4.1-1: Required Software Components

Name	Version # (Or Higher)	Description
Msflxgrd.ocx	6.1.97.82	Microsoft FlexGrid Control (located in the Windows "system32" folder; registered)
Dnerr32.dll	1.8.7.0	Woodhead DeviceNet Error DLL (installed as part of the DeviceNet driver)
Ssdn32.dll	3.7.4.0	Woodhead DeviceNet Hardware Driver DLL (installed as part of the DeviceNet driver)
Wsexml.dll	1.0.0.10	Woodhead XML Parsing DLL (located in the folder that the Diagnostic is installed in)

Additionally, you should only have one copy of the Ssdn32.dll installed on your computer, in the Windows "system32" folder. If you have multiple copies, problems can occur when using the DN scanner module.

A
Warranty and Support

Appendix Sections:

- Warranty

- Technical Support

A.1 Warranty

For software warranty information, refer to http://www.mysst.com/warranty.asp.

A.2 Technical Support

Please ensure that you have the following information readily available before calling for technical support:

- Software version

- Computer's make, model, CPU speed and hardware configuration (cards installed)

- Operating system type and version

- Details of the problem you are experiencing: application module type and version, target network, and circumstances that may have caused the problem

A.2.1 Getting Help

Technical support is available during regular business hours by telephone, fax or email from any Woodhead Software & Electronics office, or from http://www.woodhead.com. Documentation and software updates are also available on the Web site.

North America

Canada:
Tel: 1-519-725-5136
Fax: 1-519-725-1515
Email: WoodheadSupportNA@molex.com

Europe

France:
Tel: 33-(0)2-32-96-04-22
Fax: 33-(0)2-32-96-04-21
Email: WoodheadSupportEU@molex.com

Germany:
Tel: 49-711-782-374-22
Fax: 49-711-782-374-11
Email: WoodheadSupportEU@molex.com

Italy:
Tel: 39-010-595-4052
Fax: 39-010-595-6925
Email: WoodheadSupportEU@molex.com

Other countries:
Tel: 33-(0)2-32-96-04-23
Fax: 33-(0)2-32-96-04-21
Email: WoodheadSupportEU@molex.com

Asia-Pacific

Japan:
Tel: 81-3-5791-4621
Fax: 81-3-5791-4688
Email: WoodheadSupportAP@molex.com

Singapore:
Tel: 65-6261-6533
Fax: 65-6261-3588
Email: WoodheadSupportAP@molex.com

China:
Tel: 86-21-5835-9885
Fax: 86-21-5835-9980
Email: WoodheadSupportAP@molex.com

For the most current contact details, please visit http://www.woodhead.com.

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