

SST DeviceNet Interface Cards

32-Bit Software Reference Guide

Windows NT/95/98

Version 1.31



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--This Document Applies To --

32 bit software tools for
5136-DN ISA Interface Card
5136-DN-PCM PCMCIA Interface Card
5136-DN-104 PC104 Interface Card

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1 Introduction

1.1 Purpose of this Document

This document is a 32-bit software reference manual for the SST line of DeviceNet interface cards.

The DeviceNet interface cards have their own separate CPU that executes downloaded application software modules. Each of these software modules has an accompanying manual that describes its operation.

2 Software Installation

2.1 SETUP.EXE

SETUP.EXE is a 32-bit Windows setup program located on disk 1 of the setup disk set.

This program will install all files and create program icons for the Windows applications and utilities. Setup will also add configuration information to the system registry. This information is required by applications for proper operation. Setup will also allow you to add or modify the default card configuration created by the setup process. You must reboot the system for these changes to take effect.

All files on the release disks are compressed and must be installed using the setup program. It is *highly recommended* that you install using the default directory.

2.2 Application Modules

The release disks contain several application modules. These include utility applications and a variety of CAN and DeviceNet communication applications.

2.2.1 Application Help Files

Some of the applications contain context sensitive help. Icons are created during the installation for quick access to each of the available help files and quick start guides.

2.2.2 Shadow RAM

Shadow RAM provides faster access to information stored in ROMs by transferring it to RAM memory. Do not shadow the area where the card is located in memory. If you do, the shadow RAM and the card memory will conflict.

2.2.3 Pentium AMI BIOS

If you are using a Pentium computer with AMI BIOS, the wording for setting up shadow RAM in the AMI BIOS Advanced Setup is confusing. The default for 'Disable Shadow Memory size' is 'Disable', which in fact means that you're disabling the disable of shadow RAM! Instead, you must change the setting to match the size of the card, for example 32k or 16K. You must also set 'Disable Shadow Memory base' to match the start address of the card, for example D000.

In a computer with an AMI Plug and Play BIOS, in the advanced section, you must set the ISA shared memory size to match the size of the area to be occupied by the card, for example 16K, and the ISA shared memory base address to match the memory address of the card.

If there are other cards in the computer which require shadow RAM to be disabled, the area you specify must encompass these cards as well.

3 Direct-Link Configuration Utility

3.1 Introduction

The Direct-Link Configuration utility is used to create card configurations and setup module information for use with 32-bit applications under Windows 95, Windows 98, and Windows NT.

3.1.1 Card Information

Each card configuration requires a name. This name is used by applications to access a SST DeviceNet interface card located at the I/O address and memory location as specified in the card configuration.

Resource	Description
I/O Address	The I/O address (HEX) used to communicate with the SST DeviceNet interface card as configured by the dip switches. See the appropriate <i>Hardware Reference</i> for dip switch settings.
I/O Count	The number of I/O addresses required by the SST DeviceNet Interface card. Set to 8.
Memory Address	The physical memory address (HEX) memory at which the SST DeviceNet interface card is to be mapped. i.e. "D0000" (corresponds to D000:0000)
Memory Count	The size of the memory window (HEX) required by the SST DeviceNet interface card. Set to 4000 (16K).
Interrupt Level	Some applications may require an interrupt for correct operation. The SST DeviceNet Interface cards support interrupt levels 2, 5, and 7 but interrupts are typically optional.
Card Family	Indicates the family of interface card this configuration is defined for (i.e. 5136-DNP). This field is must be configured for proper operation.
Bus Type	Defines the type of bus interface the SST DeviceNet Card is designed for (i.e. PCMCIA or ISA)

3.1.2 Module Information

Configuring module information with the Direct-Link Configuration utility allows an application to load modules at runtime eliminating the need for a separate module loader application. Module information is organized separately for each family of SST interface cards.

Identifier	Description
Family Name	All SST DeviceNet interface cards have a family name "5136-DN" (standard DeviceNet card family) or "5136-DNP" (DeviceNet Pro family).
Family Code	All SST DeviceNet interface cards have a family code, "DN" or "DNP".
Module Type	All modules have the "SS1" (for DN interface cards) or "SS2" (for DNP interface cards) extension.
Module Id	Each module has a unique identifier. This allows an application to verify the correct module is loaded prior to running. See the table below.
Module Path	Specifies the location of the desired module.

3.1.3 Module ID Index

Module entries are created for all of the SST DeviceNet card modules during the setup process. The table below lists each module and its Module ID.

Module Name	Module ID
DNMON.SS1	10 _{hex}
CAN2A.SS1	11 _{hex}
CAN2B.SS1	12 _{hex}
DNSCAN.SS1	14 _{hex}
GRAB2A.SS1	15 _{hex}

These Module ID's are also listed in the host interface header block section in each application module reference manual.

4 DeviceNet Scanner

4.1 Introduction

The DeviceNet Scanner Demo is 32-bit Windows application which demonstrates the functionality of the Scanner module. The Scanner module performs all the tasks necessary to scan DeviceNet devices.

The DeviceNet Scanner Demo's main features are:

- Supports up to 63 I/O devices (one MAC ID is used by the Scanner)
- Supports client explicit messaging
- Supports Strobe, Poll, Change-of-State, and Cyclic I/O messaging
- UCMM capable group 2 server functionality
- Adjustable scan rate
- Independent Poll I/O update rates
- I/O data interlocks
- Scan list may be modified at run time for dynamic scan optimization

4.2 Running the Windows Demo

1. If a card configuration has not been created for your interface card you must create one using the Direct-Link Configuration utility. For proper operation you must reboot the system after modifying card configurations. See section 3 for more information.
2. Open the *DeviceNet Scanner Demo* icon in the application group created by the setup process.
3. Each time the Scanner Demo starts it will prompt you to select the configuration to be used (i.e. Driver250). You must select the appropriate configuration and click on OK. If an error occurs during initialization verify that the configuration for the select card is correct and that it matches the settings of the card itself.
4. The DeviceNet Scanner Demo includes context sensitive help and a quick-start guide. Select **Help | Quick Start** for instructions.

5 DeviceNet Monitor

5.1 Introduction

The DeviceNet Monitor is a Windows application for the SST DeviceNet family of interface cards which measures network loading and communications traffic statistics.

5.2 Starting the DeviceNet Monitor

1. If a card configuration has not been created for your interface card you must create one using the Direct-Link Configuration utility. For proper operation you must reboot the system after modifying card configurations. See section 3 for more information.
2. Open the *DeviceNet Monitor* icon in the application group created by the setup process.
5. Each time the DeviceNet Monitor starts it will prompt you to select the configuration to be used (i.e. Driver250). You must select the appropriate configuration and click on OK. If an error occurs during initialization verify that the configuration for the select card is correct and that it matches the settings of the card itself.

6 DeviceNet Analyzer

6.1 Introduction

The DeviceNet Analyzer is a Windows diagnostic tool which captures network traffic in real-time. Powerful filter and trigger capabilities permit specific message exchanges to be captured and examined.

6.2 Starting the DeviceNet Analyzer

1. If a card configuration has not been created for your interface card you must create one using the Direct-Link Configuration utility. For proper operation you must reboot the system after modifying card configurations. See section 3 for more information.
2. Open the *DeviceNet Analyzer* icon in the application group created by the setup process.
3. Each time the DeviceNet Monitor starts it will prompt you to select the configuration to be used (i.e. Driver250). You must select the appropriate configuration and click on OK. If an error occurs during initialization verify that the configuration for the select card is correct and that it matches the settings of the card itself.
4. The DeviceNet Analyzer includes context-sensitive help and a quick-start guide. Select **Help | Quick Start** for instructions.

7 DeviceNet Node Commissioning Tool

7.1 Introduction

The DeviceNet Node Commissioning Tool allows the user to configure a DeviceNet network. Using the tool the user can set the MAC ID or Baud Rate as well as any other attributes within the device using the Explicit messaging interface.

7.2 Starting the Node Commissioning Tool

5. If a card configuration has not been created for your interface card you must create one using the Direct-Link Configuration utility. For proper operation you must reboot the system after modifying card configurations. See section 3 for more information.
6. Open the *DeviceNet Node Commissioning Tool* icon in the application group created by the setup process.
7. From the menu select **Network | Setup** to select the configuration to be used and the MAC ID and baud rate at which to scan the network.
8. To perform a network browse, from the menu select **Network | Browse**.

8 5136-DN Status

8.1 Introduction

DNSTAT32.EXE is a utility program that displays status information for a specific SST DeviceNet interface card. This application should be used to gather information prior to getting technical support.

8.1.1 Card Name

To monitor an interface card you must select a configuration from the CardName combo box. The CardName is the identifier given to a specific interface card configuration as configured by the Direct-Link Configuration utility. The CardName combo box contains a list of all available card configurations.

8.1.2 Update Delay

The default update delay for the 5136-DN Status application is 250ms. The update delay time can be modified by clicking on the "Interval" button.

8.1.3 5136-DN Status Fields

Name	Description
Module Type	Contains "DN" (0444eh) or "ER" (04552h) if a kernel error is detected
Kernel Id	Kernel identification 0x01 = CAN 2.0A kernel 0x02 = CAN 2.0B kernel
Kernel Rev	Kernel Revision
Module Id	Module ID
Module Rev	Module revision 4 hex digits XX.XX (i.e. rev 1.0 = 0x0100)
Net Serial	DeviceNet serial number
Card Type	Card type. (i.e. "5136-DN-ISA")
Card Serial	Card Serial number (i.e. "9409001")
Irq Control	Card interrupt control word
Irq Status	Card interrupt status bytes
Main Code	Main Application Error Code
Can Status	CAN bus status word.
Can Tx	CAN transmit counter. Incremented when messages are submitted to the CAN controller.
Can Ack	CAN ack error counter. Incremented when a transmit message is aborted due to lack of acknowledgment from other stations. When CanAck is incremented, CanTx is decremented to compensate for a message not actually transmitted.
Can Rx	CAN receive counter. Incremented when messages are received. Messages that fail the receive filter still increment CanRx.
Can Error	CAN communication error counter. Incremented when a CAN frame error is detected.
Can Lost	CAN lost messages counter. Incremented when a CAN message is received before the previous message is placed into the receive queue.
Can Overrun	CAN receive queue overrun counter. Incremented when a CAN message is lost due to a full receive queue.
Add Code	Additional Application Error Code
Message	When ModuleType is "DN", contains the module identification string. When ModuleType is "ER", contains the kernel error string.

NOTE

All fields contain "N/A" if the Module Type read from the selected interface card is not "DN" or "ER". See the *Hardware Reference* for a description of the CAN status flags, IRQ Control Word and IRQ Status bytes.

Appendix A Technical Support

Before you call for help ...

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

- Card type and serial number
- Computer's make, model and hardware configuration (other cards installed)
- Operating system type and version
- Details of the problem you are experiencing: application module type and version, target network, circumstances that caused the problem

Getting Help

Technical support is available during regular business hours (eastern standard time) or by fax, mail, or e-mail.

Technical Support

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