



DP83820 GigMAC LINUX Release Notes

Release 1.0

10/09/2000

Read This Document Before Attempting To Install Or Use This Product!

This document contains information about factors that must be considered before, during, and after installation.

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National Semiconductor DP83820 Gigabit Ethernet Adapter

1.0 Introduction

This document presents information to users about National Semiconductor's DP83820 Gigabit Ethernet adapter and the relevant LINUX software driver version 1.0.0.0 for LINUX operating system kernel version 2.2.x

2.0 Product Overview

The DP83820 is a PCI Gigabit Ethernet adapter from National Semiconductor which supports a 33/66MHz, 32/64 bit PCI 2.1/2.2 bus interface. It complies with the emerging 1000 Mbps Ethernet 802.3z specification and supports full duplex operation.

Other features include:

- Maximized PCI efficiency and performance
- Pause Frames
- Checksum Offloading
- Jumbo Frames
- Wake-on-LAN
- VLAN support

The driver for this adapter on LINUX is designed to be a NIC driver for processing Ethernet data packets.

3.0 Installation

3.1 Release Media

The release media consists of the National Semiconductor's DP83820 GigMAC LINUX driver which is available on disk.

3.2 Installation Procedure

This section describes the installation of the adapter and the driver software for making the adapter functional on the Windows platforms.

3.2.1 Hardware Installation

This section describes the installation of the GigMAC demo card into a personal computer (PC). To install the card, you need:

- the GigMAC demo card
- a PC with an available PCI slot
- screwdrivers to open the PC and secure the GigMAC demo card
- a Category 5 twisted-pair RJ-45 cable
- a wrist strap
- a blank, formatted floppy disk

Installing the card consists of one optional and three required stages: Copying the Driver to a Floppy Disk (optional), Inserting the Card, Connecting the Network, and Installing the Driver. If the PC into which you are installing the GigMAC demo card is equipped with a CD-ROM, you may skip the first stage and begin with stage II.

Inserting the Card

The second stage in the installation sequence is inserting the card into the PC. For this stage you will need the GigMAC demo card and the screwdrivers. Unplug the PC before opening it to avoid electrocution. Be sure to ground yourself before handling the GigMAC card to avoid ElectroStatic Discharge (ESD) damage to the card.

1. Shutdown the PC, and disconnect the power cord.
2. Open the chassis of the PC.
3. Choose an unused PCI slot and remove its metal bracket by loosening the screw on the inside. You will no longer need this metal bracket as the GigMAC demo card has its own. You will need the screw, however.
4. Remove the GigMAC demo card from the ESD-safe packaging.
Warning: Static charge from your body can permanently damage the GigMAC demo card. Do not handle the card without first electrically grounding yourself via wrist strap or by touching a large piece of metal.

5. Insert the GigMAC demo card into the empty PCI slot in the PC. Orient the card so that the RJ-45 connector points out of the computer (See Figure 2).

Warning: The card may fit backwards (with the RJ-45 pointing in) into the PCI slot. Starting the computer with the card inserted backwards may damage the card and/or the PC.

6. When you are certain the card is oriented correctly, press firmly on the card to ensure that it is completely seated in the PCI slot. Secure the GigMAC demo card using the screw from step 3.
7. Close the computer, and reconnect the power cord.

Connecting the Network

The third stage in the installation sequence is connecting the GigMAC demo card to the network. In this stage, you will need only the twisted-pair Category 5 network cable.

After you have inserted the card and closed the PC, connect one end

of the twisted-pair cable to the RJ-45 connector on the GigMAC demo card, and the other end to another PC or a network hub or switch (see Figure 4). When connecting the card to another PC, the cable will need to be *crossover*, meaning that pins 1 and 2 must be swapped with pins 3 and 6, respectively, between the two ends of the cable. A crossover cable should not be used when connecting the GigMAC demo card to a network hub or switch. The difference between a crossover and non-crossover ("straight") cable is shown

The next time you turn on the PC, one of the two green link lights on the GigMAC demo card should become illuminated almost immediately. This signifies that the card has established link with the device at the other end of the cable and is ready to send and receive data.

3.2.2 Software Installation and Configuration

The fourth stage in the installation sequence is installing the driver for the GigMAC demo card. The following subsections describe the procedure for installing the driver for LINUX.

LINUX Driver Installation

Follow this sequence for installation under LINUX.

1. To freshly make the driver

go to the /nsc directory

and execute "make"

2. To remove the binaries

execute "make clean"

3. If the machine on which the testing is done is an SMP machine, please include the flag -D__SMP__ in the CFLAGS of the Makefile.

4. After the dpm.o (The driver module) is made, to load the driver execute the command "insmod dpm". We can unload the driver by doing "rmmod dpm".

5. After loading the driver, get the interface name(eg: eth0, eth1 etc) for the device. The last line in the messages listed will indicate the name of the interface for the driver. If the message is not coming on the console, we can see the messages in the kernel buffer by executing "dmesg" on the command line. The last line in that will indicate the interface name

6. To configure IP for the interface.

```
ifconfig <interface-name> <ip-addr>
```

eg: ifconfig eth0 10.10.10.1

To shutdown the interface.

```
ifconfig <interface-name> down
```

eg: ifconfig eth0 down

Please note that it may appear to hang on doing an "ifconfig", but it is just momentary and it will soon come out of that. The link becomes active only after about 20 seconds since the "ifconfig".

7. Now we are all set to go with the driver.

8. To make the driver load when the system boots up, the following lines needs to be put in any of the startup scripts like /etc/rc.d/rc.local or /etc/rc.d/init.d/network

```
/sbin/insmod /working/oct1/dpm.o  
/sbin/ifconfig <interface-name> <ip-addr>
```

9. The tunable parameters of the driver like the Receive and Transmit buffers are put in the file nsm.h under the heading "Tunable parameters". Right now the value of RX_QUEUE_SZ is 100, on a high end system putting a value of 200 for RX_QUEUE_SZ can give better performance.

10. To try jumbo frames, the mtu size can be increased using the ifconfig utility, as follows

```
ifconfig <interface-name> mtu <mtu-size>  
eg: ifconfig eth0 mtu 3000
```

The BUF_SIZE_MAX value in nsm.h (Tunable parameter) should be changed to 4096.

<mtu-size> can be increased upto 4000 bytes for sane operation.

3.2.3 Installation Troubleshooting

3.2.4 Disk Space Requirements

3.2.5 Errata

This section describes the features and issues to be provided upon final release of the driver.

Wake on LAN / Power Management Support

LINUX driver architecture specifies no specific support required for Power Management.

TCP/IP Checksum Offload Support

Although the DP83820 chip does support checksum offload, the beta release of this driver does NOT support checksum offload.

VLAN (802.1Q) & QoS (802.1P) Support

LINUX driver architecture specifies no specific support required for VLAN and QoS.

4.0 Product Documentation

This release notes document, *National Semiconductor Corp DP83820 Gigabit Ethernet Adapter Driver Release Notes*, provides detailed information about installing the National Semiconductor Corp DP83820 Gigabit Ethernet Adapter and Driver software.

5.0 Problem Reporting

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