

# **SCSI Hostadapter Installation Guide**

**DOS™ / Windows 3.1™**

**OS/2™**

**Windows 95™**

**Windows 98™**

**Windows 2000™**

**Windows NT™**

**Novell™ NetWare™**

**14th Edition**

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## 1. Preface

Congratulations on your purchase of Dawicontrol SCSI hostadapters. This manual gives you easy-to-follow instructions on how to install and use the software that was included in the package. However, you should have some basic understanding of DOS operation like changing start-up files CONFIG.SYS and AUTOEXEC.BAT.

Although the manual describes all of the functions and capabilities, we are of course only a call away in case you need any further help or other information. Please refer to the READ.ME file included on the installation disk for all new developments that were completed after the copy deadline of this manual. To respond to technical development moving on incessantly, please fill in the enclosed Registration Card and return it to our address. This enables us to keep you informed about new device drivers or up-dates as they become available.

## 2. Special Features of the SCSI Interface

SCSI stands for Small Computer Systems Interface. As it is a general system interface and device-independent input/output system, it allows you to connect various types of peripherals to your computer without having to have an exact knowledge of each drive's hardware properties.

Please read the notes below if you are inexperienced with SCSI devices as yet. They contain information about some special technical features and will help you with installation.

### 2.1 SCSI ID Setup

A SCSI interface supports up to 8 (WIDE SCSI: 16) different devices, the SCSI hostadapter counting as one of them so that a maximum of 7 (WIDE SCSI: max. 15) SCSI peripherals can be connected to any one hostadapter. All SCSI devices interconnect via a shared cable, called the SCSI bus, and use it for transferring commands, data and messages. This requires every SCSI device to be assigned its specific address, the so-called SCSI-ID or target-ID. This SCSI-ID can be set on the devices (usually by jumper) to one in the range from 0 to 7 (WIDE SCSI: 0 to 15) (many systems reserve ID 7 for the SCSI hostadapter). Avoid setting two devices to the same ID because that would result in both devices responding to a command. It makes no difference in which order the SCSI devices are connected to the SCSI bus, i.e. every ID can be at any of the bus locations.

## 2.2 SCSI Bus Termination

To ensure perfect electrical operation of the SCSI bus, terminating resistors - or simply terminators - must be connected to both physical ends of the bus. The terminators are either integral parts of the SCSI device or you have to add them as separate components. Only if both ends of the cable are properly terminated can reflections be avoided. There are two different types of terminators, a passive and an active variant. While passive terminators are basically just a simple resistance network, active terminators feature a voltage source and a voltage regulator. This helps to better compensate for varying loads on the SCSI bus. The SCSI specifications for ULTRA and ULTRA WIDE hostadapters demand active terminators. However, it is best to use active terminators for FAST-SCSI hostadapters too, especially if several devices are connected and if the bus cable is very long. The hostadpater's terminators must be removed or disabled if both the internal and the external connectors are being used because in this case, the host adpater is no longer at the end of the line but located in the middle of the SCSI bus. When installing SCSI devices be sure to check whether they are terminating devices. If they are not, then their terminators must be removed or disabled too.

Many devices, such as scanners, are delivered without any termination. These devices must always be located in the middle of the bus, or you have to plug in a terminator (preferably active) if you connect them at the end of the bus. The supply voltage of 5 V required for proper bus termination (Termination Power, or just TERMPWR) is to be provided by at least one SCSI device on the bus. Normally, the hostadapter supplies this voltage. However, if the bus cable is very long, the device located the furthest away from the host adapter should also provide TERMPWR to make up for any power loss on the line. In many cases you can enable TERMPWR by a jumper on the device. You should therefore preferably connect a SCSI device to the end of the bus that features active termination and TERMPWR supply capability (hard disks are the best choice).

The illustration below shows a properly arranged and terminated SCSI bus:



## 2.3 SCSI Bus Line Interfacing

The SCSI devices connect to the SCSI hostadapter via the appropriate cables which are to comply with SCSI specifications. While internal ribbon cables usually cause no problems, external SCSI devices such as scanners or removable hard disks are quite a different matter, because the cables delivered with these devices do normally not support ULTRA SCSI but can only be used for FAST SCSI hostadapters. The max. cable lengths listed below apply to both the external and internal cable together. The added length of both cables must not exceed the following permissible cable lengths:

<u>SCSI Type</u>	<u>SCSI Extension</u>	<u>Transfer Rate</u>	<u>Devices</u>	<u>Max. Cable Length</u>
SCSI 1		5 Mbyte/s	7	6,0 m
SCSI 2	FAST	10 Mbyte/s	7	3,0 m
SCSI 3	ULTRA	20 Mbyte/s	3	3,0 m
SCSI 3	ULTRA	20 Mbyte/s	7	1,5 m
SCSI 3	ULTRA WIDE	40 Mbyte/s	3	3,0 m
SCSI 3	ULTRA WIDE	40 Mbyte/s	15	1,5 m
SCSI 3	ULTRA 2 WIDE (LVD)	80 MByte/s	15	12,0 m

As a basic rule, keep the cables as short as possible and only as long as necessary!

The maximum cable length can be reduced by cable adapters that are used to adapt a 50-pin cable to a 68-pin connector, for example.

In the case of ULTRA WIDE hostadapters with two internal and one external connector, you must only use two of the three connectors at the same time, the reason being that the SCSI bus must have two, and really only two, ends. If you use all three connectors you would produce a so-called star topology or T-junction. These are strictly forbidden and will lead to a fatal SCSI system failure. A T-junction is also produced by connecting the last SCSI device not as the last but as the last-but-one bus station which leaves an open end of the cable and may produce unwanted reflections.

With the DC-2980 U2W, the LVD connection may always be used, even if you are already using two connections on the ULTRA-Bus, because the LVD-Bus is electrically separated. If you connect an ULTRA WIDE device to the LVD-Bus, the hostadapter switches to the Single Ended Mode which means that the maximum cable length must be reduced to 1,5 meters, depending on the number of devices and the transfer rate!

Installation will be no problem if you keep this information in mind.

### 3. Dawicontrol SCSI Software Concept

SCSI devices are normally directly supported by neither the IBM-PC's BIOS nor the operating system. Their operation therefore requires some additional software which is stored partly in the SCSI hostadapter's ROM-BIOS, partly in the various device drivers.

There are two basically different methods to install SCSI devices: installation via the hostadapter's BIOS and installation via a device driver.

SCSI BIOS installation is particularly well-suited for hard disks. Although it is possible to also run removable disks as BIOS drives, this option entails a particular risk: hard disks cannot normally be changed while the computer is on which is why the BIOS interface has no way of telling the operating system that the medium was changed. Consequently, the possibility of a changed data structure will not be taken into account. Should you decide to run a removable disk as a BIOS-compatible drive, nevertheless, make sure to always restart your computer after changing the medium.

Driver-based installation of SCSI devices, on the other hand, knows of no such limitations. In the past, a problem ensued from the non-existence of standardised software: this made it necessary to adapt the drivers of the various device types to the hardware of a specific SCSI hostadapter. Thus manufacturers of back-up software for streamers found it almost impossible to support all major hostadapters. In the meantime, however, two standards have evolved: one is the ASPI interface (Advanced SCSI Programming Interface) developed by Adaptec, the other is the CAM interface (Common Access Method) defined by an independent committee. In both cases, the device drivers are no longer based on the specific hostadapter's hardware but on the software interface provided by the SCSI hostadapter.

Dawicontrol SCSI hostadapter supports both SCSI interface standards (CAM and ASPI) so that device drivers based on either of the two can be used simultaneously. This gives you maximum flexibility and provision for the future because Dawicontrol SCSI hostadapter allows you to use device drivers of various other manufacturers.

The names of the driver files vary depending on the type of your specific SCSI hostadpater. References to DCxxxx in the text below thus stands for DC93M1, DC93M2, DC1368, DC-2964, DC2974, DC2975, DC2976, DC2980 etc.



## 3.1 Synchronous and Asynchronous Data Transfer

The SCSI interface supports two different types of data transfer: synchronous and asynchronous data transfer. At startup, all SCSI devices default to the asynchronous data transfer method. Synchronous data transfer is faster providing a transfer rate of 5 MByte per second (or 10 MByte/second in the case of FAST-SCSI, 20 MByte/second in the case of ULTRA-SCSI, 40 MByte/second in the case of ULTRA-Wide SCSI interfaces and 80 MByte/second in the case of ULTRA2-Wide). This method is enabled only after the SCSI hostadapter and the relevant SCSI device have exchanged messages to agree on synchronous data transfer setting the data transfer rate at the same time.

Your Dawicontrol SCSI hostadapter supports both data transfer methods. Most SCSI devices designed for synchronous data transfer automatically request the host adapter so activate the synchronous transfer mode. Adding the "SN=.." parameter or a corresponding setting to the SCSI setup routine forces the host adapter to automatically enable synchronous data transfer for certain SCSI devices. In this case, the SCSI device concerned will receive an appropriate message with every Inquiry and Request Sense command. The "!SN=.." parameter or the SCSI setup of specific SCSI devices works the other way around: you can use it to suppress synchronous data transfer even if the device automatically requests activation of the synchronous transfer mode.

Please note that a lot of devices do not support synchronous data transfer. Also, the measurable actual transfer capacity is hardly increased by synchronous data transfer in everyday praxis because, in the case of hard disks for example, the actual rate depends on the speed and the number of sectors per track. The faster data transfer method and the reduced load on the SCSI bus going with it will noticeably improve the overall performance only if a very fast disk or several SCSI devices are connected to the hostadapter.

## 3.2 Parity Check

The SCSI interface checks the parity of data being transferred from the hostadapter to the device or vice versa. Every byte transferred is checked so that a repetition of the transfer process can be requested if any errors occur. Many SCSI devices allow you to enable or disable the parity check (usually by changing the jumber setting). Disabling the parity check normally involves only doing without the check of incoming data while a parity bit is still added to secure all data sent by the device. There are also some devices that support no parity check at all. Your Dawicontrol SCSI hostadapter automatically realises which of the connected devices support parity checking and then sets the parity check option for every device separately.

## 3.3 SCSI Drive Power Management

Your Dawicontrol SCSI hostadapter allows you to automatically switch off all types of rotating storage media, i.e. hard disk, removable disk and CD-ROM drives, when they have remained inactive for a specified period of time.

These drives will automatically start up again when they are being accessed. This is an easy way of saving energy and to considerably reduce the noise at your desk environment. Enable the Power Save function by setting the "PS=.." parameter and specifying the maximum inactivity interval after which the drives are to be switched off. The timer will be reset after every access to one of the devices.

## 3.4 Hard Disk BIOS Installation

The easiest method of installing SCSI hard disk drives is via the SCSI hostadapter's ROM-BIOS when booting the computer. This involves assigning the drive specifiers, in ascending order, according to the set SCSI-IDs.

**Tip:** For internal hard disks use IDs greater 0 (1, 2, ..., etc.). This allows you to boot the computer from an external drive (with ID 0) without having to open the computer.

Please note that SCSI hard disks are never installed by changing the computer's CMOS settings. The ROM installation message (during the computer's self test) lists all SCSI disks found together with their allocated drive letters. If any of these has not been formatted, further installation uses the standard DOS programs, FDISK and FORMAT. For further information please refer to your DOS manual.

An alternative approach is to partition the drive by means of the SCSIFMT program included in the Dawicontrol SCSI hostadapter package. You can use SCSIFMT also for low-level formatting as may be required after some time due to disappearing magnetisation, changing of track positions caused by mechanical wear and tear, etc. Please note that not all hard disks support low-level formatting.

To further increase data throughput we recommend installing the appropriate SCSI driver for your operating system even if you intend using it for hard disks only.

## 3.5 Booting from CD-ROM

Hostadapters DC-2974 PCI, DC-2975 U and DC-2976 UW and DC-2980U2W allow you to boot from a bootable CD-ROM without having to install a DOS driver for the CD-ROM drive. While DC-2974 PCI always checks whether there is a bootable CD-ROM in the drive, this option can be enabled or disabled via the SCSI setup of DC-2975 U, DC-2976 UW and DC-2980 U2W. There are three different formats of bootable CD-ROMs: "no emulation", "floppy emulation" and "hard disk emulation". Booting from a "floppy emulation" format CD-ROM requires you to let the boot sequence of the mainboard's BIOS start with A, i.e. Boot Sequence A,C, for example.

## 1. Driver-Based Installation of SCSI Devices

Driver-based installation of SCSI devices involves adding driver-specific lines to the CONFIG.SYS file to start the relevant driver. Installation of the different SCSI devices is based on driver DCxxxx.SYS that provides the ASPI and CAM interfaces required for the installation of device-specific drivers. The DCxxxx.SYS line must therefore come before the starting commands of any other driver.

If you intend to use a PCI SCSI hostadapter in conjunction with Microsoft's EMM386 driver, verify the version number of the EMM386 driver. It should be 4.49 or higher because older versions of that driver are not fully compatible with the PCI standard which results in system crashes triggered by 32-bit I/O accesses. Version 4.49 of driver EMM386 is included in the MS-DOS package, version 6.22 or higher.

### 1.1 Summary of DCxxxx.SYS Command Line Switches

The parameters below allow you to influence the DCxxxx.SYS driver settings during installation.

- /PORT=xxx** If you are working with several SCSI hostadapters, type in the adapter number (for PCI hostadapters, starting with zero) or the I/O address (for ISA hostadapters) as the parameter's attribute. In this case, you will have to start the driver by specifying the adapter number or I/O address resp. for every connected hostadapter separately. This parameter is not required if you are working with only one SCSI hostadapter.
- /PS=x** This parameter controls the Power Save function by specifying the maximum inactivity period (from 1 to 60 minutes). If the set value is exceeded, any hard disks, removable disks and CD-ROM drives will be switched off automatically. The relevant device will be started again when it is accessed later. Not setting this parameter means that the function is disabled.
- /ID=x** x = hostadapter's SCSI-ID. The SCSI-ID of the host adapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Host adapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Host adapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

- /!SN=x,...,x** This parameter defines the devices that are to run in asynchronous instead of in synchronous mode even if the device tries to switch into synchronous mode. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,...,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices. If you do not set this parameter only devices that can switch into synchronous mode themselves will be operated in this mode, all other devices will remain in asynchronous mode. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

During installation, driver DCxxxx.SYS displays a list of settings and devices on the screen. When DCxxxx.SYS has been started this can be used as a basis for installing device-specific drivers.

## 1.2 Typical Contents of the File CONFIG.SYS

```
.  
DEVICE = ...\\DC2974.SYS      SCSI CAM/ASPI device driver for DC-2974 PCI  
DEVICE = ...\\DISKDRV.SYS    driver for hard/removable disk drives  
DEVICE = ...\\CDROM.SYS      driver for CD-ROM drives  
.
```

Driver DCxxxx.SYS automatically realises which SCSI drives are managed by BIOS and installs a "RAMBIOS" function to accelerate the access to these devices. Device drivers cannot access these drives. If they try to send any commands this will cause a Timeout Error message to be output.

This avoids hard disks that may be managed by BIOS to be installed under an additional drive letter by a hard disk driver.

## 2. Driver-Based Installation of Disk Drives

Driver-based installation is the best option to choose for removable disks because it gives full support to media changes.

Prior to installation use the SCSIFMT program to partition the disk drive or, in the case of removable disks, the FORMAT command to prepare the latter for DOS operation. You will find SCSIFMT's functionality explained later in this manual.

After the above preparatory steps have been taken, the disk driver can be installed and the disk be used. Start automatic driver installation by calling up the DOSINST installation program. Insert the Dawicontrol driver diskette into your floppy drive and type A:\dosinst at the prompt. Choose the driver(s) to be installed from the menu displayed. To install a removable disk drive, choose SCSI CAM/ASPI Driver and Disk Driver, move the bar cursor to Install and press Enter. The remaining installation is done automatically; reboot your system to load the driver after installation.



You can also install the device manually. Please note that the command to load driver DCxxxx.SYS must be located before the device driver for disk drives in CONFIG.SYS.

**Ex:** DEVICE = ... \DC2974.SYS

Installs the SCSI driver for the DC-2974 hostadapter

DCxxxx.SYS, by making both the ASPI and the CAM interfaces available at the same time, is the basis for the installation of any further (device-specific) drivers. The command line for DCxxxx.SYS in CONFIG.SYS must be followed by the line for the DISKDRV.SYS driver which is used to install disk drives.

**Ex:** DEVICE = ... \DISKDRV.SYS

Installs the driver for hard/removable disks

We recommend placing DISKDRV.SYS very high up in the CONFIG.SYS file making sure to install it before any disk drive cache programs, because otherwise the cache may have no positive effect on the SCSI drives managed by DISKDRV. DISKDRV.SYS can be customised by setting additional parameters.

## 2.1 Summary of DISKDRV.SYS Command Line Switches

- /MF** Configures the driver for hard disks only.
- /MR** Configures the driver for removable disks only. The /M parameter is only required if you are using hard and removable disks together. If not, the driver will auto-configure.
- /R=x** Reserves "x" logical drives for every removable disk (if this is not specified, one drive letter will be reserved for removable disks).
- /HOST=x** x = CAM hostadapter number. Management will only extend to drives connected to this host adapter.
- /TARGET=y** y = SCSI drive target-ID.  
Management will only extend to drives with this ID.
- /INSTALL** Enforces driver installation even if the relevant device has not been switched on (only in conjunction with the "/TARGET" parameter).

Calling up the driver without any parameters, the disk drives of all SCSI hostadapters will be installed by DISKDRV.SYS. This includes the different types of removable disks such as magnetic and magneto-optical drives (MO drives) or "floptical" drives.

If various types of drives are operated jointly on one hostadapter then the data throughput may be improved by having the various drive types handled by a specially configured driver. Thus for example some versions of the cache program "SMARTDRV" activates the write-cache function depending on the status of the removable attribute of the corresponding device driver. If handling of the drives by separate drivers is required, this is possible by repeated loading of DISKDRV.SYS with various parameters.

**Ex.:** DEVICE = ... \DISKDRV.SYS/MF      Installation of the hard disk  
          DEVICE = ... \DISKDRV.SYS/MR      Installation of the removable disks

Use the "R" parameter when installing removable disks to reserve a specified number of drive letters for every removable disk. If you do not set the "R" parameter, the system will assign a drive letter. The DISKDRV.SYS installation message lists all disk drives found together with drive letters assigned to them.

### 3. Using SCSIFMT to Set Up Disk Drives

Disk drives are to be partitioned and formatted before use. If you are deploying ROM management for your SCSI disk you can use DOS programs FDISK and FORMAT as always.

The FDISK program is not suitable for driver-based disk drives. For these use SCSIFMT instead.

If required, removable disks can be formatted by using DOS command FORMAT exclusively. This will produce a data structure similar to that found on diskettes, called the "superfloppy" format, which is required for exchanging data with OS/2-compatible media, for example. Under DOS and Windows you can work with both formats (partitioned or superfloppy). DISKDRV.SYS automatically recognises the structure encribed on the data carrier even after a change of media.

The SCSIFMT program is fully adapted to the SCSI host adapter so that no other drivers are necessary. Normally, you can start SCSIFMT directly without any parameters. In some special cases, however, e.g. if several SCSI host adapters are installed in one computer, you can choose from any of the parameters below to be added to the SCSIFMT command line.



## 3.1 Summary of SCSIFMT Command Line Switches

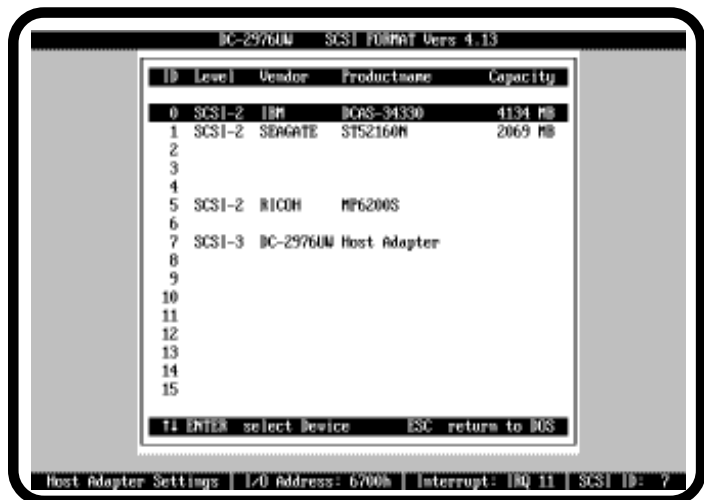
**/PORT=xxx** If you are working with several SCSI hostadapters, type in the adapter number (for PCI hostadapters, starting with zero) or the I/O address (for ISA hostadapters) as the parameter's attribute. In this case, you will have to start the driver by specifying the adapter number or I/O address resp. for every connected hostadapter separately. This parameter is not required if you are working with only one SCSI hostadapter.

**/ID=x** x = hostadapter's SCSI-ID. The SCSI-ID of the hostadapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

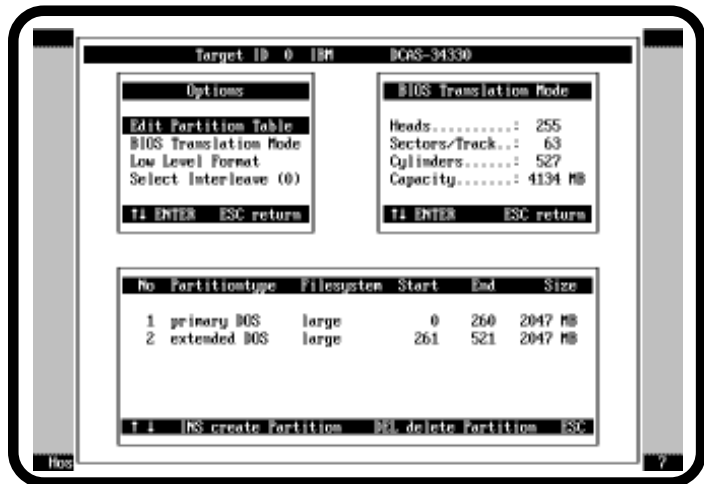
SCSIFMT is controlled by so-called cursor bar menus so that program handling is easy even for inexperienced users. Use cursor keys ArrowUp and ArrowDown to select a function and press Enter to confirm your choice. Pressing the ESC key always takes you back to the previous selection.

If any errors are encountered during program execution, a window will be displayed on the screen containing detailed information about the type of error. You must press the ENTER key to acknowledge that you have read the error message.

When you start the SCSIFMT program, the first screen displayed is a list of devices connected:



Press the ESC key to quit the program. You will either return to DOS or the computer will reboot if you used SCISIFMT to change the partitioning of one of the connected drives. Use the cursor keys and ENTER to choose one of the drives in the list for further editing. The screen displayed next lists the logical drive data (BIOS Translation Mode) as well as the current partitioning:



The Options menu contains several functions for preparing the drive:

**"Edit Partition Table"** activates the bottom half of the screen to allow you create and delete partitions.

**"BIOS Translation Mode"** activates the top right panel to allow you change the BIOS-compatible translation of drive parameters.

**"Low Level Format"** starts an initial formatting run on that drive; choose Select Interleave to previously specify the interleave factor to be used for formatting.

### 3.2 Edit Partition Table: Creating and Deleting Partitions

This menu supports the INS and DEL keys that control the functions to create and delete partitions. Use the cursor keys to scroll through the list if not all of the partitions can be shown on the screen at once. The information listed for every partition includes the operating system used, the disk space covered by the partition (by specifying the first and last cylinder of that range), and the length of a partition in MByte.

To create a new partition press the cursor keys to move the bar cursor to an unoccupied section and press INS. This calls up an option dialog suggesting the start and end cylinders of the partition to be created, depending on any limitations set by your version of DOS. Press ENTER to accept the suggestions or type in other values as required. The program will automatically check the plausibility of your entries to avoid the new partition overlapping with any existing ones. When creating a partition, SCSIFMT automatically goes through all necessary initialisation steps (creating FAT, boot sector, and root directory) so that no further processing is required. If you wish you can afterwards the DOS "SYS" command to copy the operating system to the new drive.

To delete a partition move the bar cursor to the partition to be deleted and press DEL. To avoid the unintended loss of valuable data, the program requests you to acknowledge your decision before actually deleting a partition.

**Caution:** When you delete a partition, the data and programs stored in that partition will be irretrievably lost even if you afterwards create a new partition within exactly the same hard disk range.

### 3.3 BIOS Translation Mode: Changing the Drive Parameters

This menu allows you to change the type of translation mode used by the SCSI ROM-BIOS to translate SCSI block addresses into the BIOS notation based on sectors, heads and cylinders. However, you only have this option as long as the relevant drive has not been partitioned yet or if all partitions of that drive have been removed.

SCSI devices can only be accessed by means of a block address that is numbered consecutively. The IBM-PC's BIOS, however, relies on a disk drive address consisting of cylinder, head and sector numbers. This clash of methods makes it mandatory to appropriately translate the SCSI block address into the BIOS coordinates. The ROM installed on the SCSI hostadapter applies the following algorithm to determine the BIOS coordinates:

if drive is partitioned:

then derive number of heads and sectors from the partition data and verify whether the data is plausible

else (if partition data is invalid or not plausible) use the following default parameters:

if capacity is smaller than or equal to 1 GByte, then  
set heads = 64 and set sectors = 32

else (for capacities larger than 1 GByte)  
set heads = 255 and set sectors = 63

This method ensures that any drive can be operated via the ROM even if the drive was previously connected to another SCSI hostadapter.

If you choose to have the driver DISKDRV.SYS manage the drive, you need not worry about the appropriate translation mode, because DISKDRV.SYS does not rely on the BIOS notation for addressing.

Changing the drive parameters is practical when a drive is to be connected to another SCSI hostadapter that uses a different translation method; if you intend to operate the drive via just one SCSI hostadapter, we recommend you do not change the default parameters.

Specifying the number of sectors and heads is a prerequisite for determining the translation method; the number of cylinders is then calculated by dividing the drive's capacity by the product of heads and sectors.

The maximum admissible value for the number of sectors is 63 while that for the number of heads is 255. In any case, the number of cylinders is limited to 1024 because the BIOS concept of IBM-PCs does not allow for any higher values. The set data will be stored when the drive is being partitioned afterwards using the chosen translation method; otherwise the system will be reset to the default parameters.

### 3.4 Low Level Format: Initial Formatting

This option allows you to do a low-level formatting run on the chosen drive. As a rule, all SCSI drives are formatted in the factory so that you will need this function in exceptional cases only.

**Caution:** All data and programs stored on the drive will be irretrievably lost.

For security reasons and to avoid unintended loss of valuable data, the program will request you to acknowledge your decision before it starts formatting. Formatting uses the interleave factor set by the Select Interleave option; if that factor is 0, then the default interleave value set by the manufacturer will be used. Formatting can take quite a while, depending on the capacity of the drive to be formatted. By rule of thumb you can calculate about one minute per 10 MByte of capacity.

Some drive prevent Low-Level formatting. In these cases, the process is finished suspiciously fast or it is cancelled straight away and a corresponding error message output to the screen.

## 4. Installing CD-ROM Drives

The installation of CD-ROM drives requires the MSCDEX program (part of the DOS operating system) to be present on your system: the data structure of CD-ROMs is entirely different from that of hard or floppy disks, for example. However, DOS's file system structure is based on FAT and directories so that the communication between DOS and CD-ROM drive is only possible via the file system management provided by MSCDEX. When booting, MSCDEX is loaded into the computer's RAM as a resident program.

Start automatic CD-ROM drive installation by calling up the DOSINST installation program. Insert the Dawicontrol driver diskette into your floppy drive and type `A:\dosinst` at the prompt. Choose the driver(s) to be installed from the menu displayed. To install a CD-ROM drive, choose SCSI CAM/ASPI Driver and CD-ROM Driver, move the bar cursor to Install and press Enter. The remaining installation is done automatically; reboot your system to load the driver after installation.



It takes three steps to manually install CD-ROM drives: first of all, you include driver DCxxxx.SYS in your CONFIG.SYS file, then you add CDROM.SYS, the device driver for CD-ROM drives, to CONFIG.SYS. After that you can actually install the CD-ROM drives by adding a command line to your AUTOEXEC.BAT file that calls up MSCDEX.

**Ex.:**     DEVICE = ... \DC2974.SYS   CAM/ASPI driver for DC-2974  
           DEVICE = ... \CDROM.SYS   driver for CD-ROM drives

After installation of the CD-ROM drive by the CONFIG.SYS file, the MSCDEX program is to be started (usually via AUTOEXEC.BAT).

**Ex.:**     ... \MSCDEX /D:CDROM001  
           installs MSCDEX for driver "CDROM001"

MSCDEX uses the driver name specified by the "/D:" switch to make the link to the relevant device driver for CD-ROM drives. Therefore, the name of the CD-ROM driver told MSCDEX must be the same as the one of CDROM.SYS because otherwise MSCDEX cannot communicate with the CD-ROM driver.

After MSCDEX has been successfully installed, you can access the CD-ROM drive, like all conventional drives, via the appropriate drive letter. Add further parameters to customise your CD-ROM driver.

## 4.1 Summary of CDROM.SYS Command Line Switches

- /D=nnnnnnnn** Use the "/D:" switch to define the name of the driver by which MSCDEX addresses the CD-ROM driver. The name may consist of up to 8 characters. If you do not specify a name, the program will default to "CDROM001" as the CD-ROM driver's name.
- /HOST=x** x = hostadapter's CAM number. CDROM.SYS only manages drives that are connected to this host adapter.
- /TARGET=y** y = SCSI drive's Target-ID. Only drives with this ID will be included in drive management.
- /UNITS=x** This parameter defines the number of Logical Units that can be used with a drive which is required for CD-ROM jukeboxes if you do not wish to operate all units. Valid entries are numbers from 1 to 8. As a rule, all available units are supported if the Logical Units option was enabled for driver DCxxxx.SYS or in the SCSI setup resp.
- /SCSI2** Tells the driver to use the SCSI-2 set of commands only. The effect of this parameter is that drives are controlled by SCSI-2 commands exclusively. However, most drives have their own, vendor-specific commands to control the audio functions. If you do not set this parameter, the driver will use the vendor-specific set of commands. In most cases, up-to-date drives support both sets of commands while older SCSI-1 drives often only "know" the vendor-specific one.
- /INSTALL** Forces the driver to be installed even if the corresponding device has not been switched on (in conjunction with the "/TARGET" parameter only).

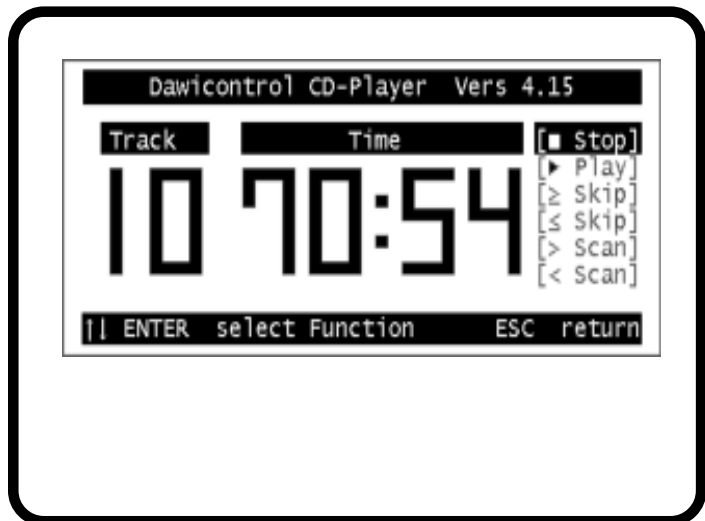
## 4.2 Running Music CDs

The CDPLAYER.COM program allows you to run music CDs under DOS. This program is a so-called "resident Pop-Up utility" which means that after installation of the program in the computer's main memory you can activate it by pressing a certain hotkey at any time - no matter which application you are currently working with.

You can take advantage of the above only after installation of the CD-ROM driver and the CD-ROM extension MSCDEX as described in the previous chapter. Then type "CDPLAYER" into the command line to start the program. The following parameters can be added to the command:

- /?** displays a list of valid command line switches
- /U** removes the program from main memory
- /T** limits program start to text screens; in this configuration, the program requires less than 10 KByte of RAM
- /K=[tn]** defines the hotkey for starting the program: t = A,S,C n = 1..10  
e.g: /K = S5            Shift-F5  
      /K = A1            Alt-F1  
      /K = C10          Ctrl-F10 etc.  
Ctrl-F1 is the default hotkey if you do not specify this switch
- /D=[x]** selects the CD-ROM drive, x representing the drive letter of the CD-ROM drive; if you do not set this switch, the CD-PLAYER program will be automatically installed for the first CD-ROM drive by default..

After successful installation simply press the hotkey (normally Ctrl-F1) to call up CD-PLAYER. A simple operating panel will appear on the screen:





Use the cursor keys and ENTER for operation. Pressing ESC will quit the CD-player and return control to the application program. The options in the function list are as follows:

- Stop:** Interrupts music output keeping the CD-ROM drive at its current position. Selecting Play afterwards continues music output at that position. If you choose the Stop function again, the drive will be reset to its starting position and the total disc time will be displayed.
- Play:** Starts or continues music output. Selecting the Play function again with a track being played will return output to the beginning of the current track and start playing it again. The Track/Time panel displays the current track and the time this track has been running.
- Skip:** Shifts the CD-ROM drive's head to the beginning of the next or previous track.
- Scan:** Moves the CD-ROM drive's head forward or backwards through the current track taking but small steps at first. Selecting this function several times at short intervals will make the steps bigger with every call-up.

### 5. Installing Other SCSI Devices

Your SCSI hostadapter package contains drivers for the different types of mass storage media. However, there is a vast number of specialised SCSI devices requiring additional software. These include but are not limited to streamers, scanners or CD writers.

Your Dawicontrol SCSI hostadapter basically supports all types of SCSI peripherals that are delivered with driver software which is either based on the CAM or ASPI standards or supports these standards.

For example, all commercially available back-up program support the ASPI interface so that running them via your SCSI hostadapter will cause no problems.

## 1. General Information

Windows 95 as well as Windows 98 has a built-in standardised SCSI interface that allows you to adapt your specific hardware to the different SCSI hostadapters. Hardware adaptation is done by driver "DCxxxx.MPD" located in the "\WIN95" directory on your installation diskette. The file "DCxxxx.INF" (also stored in the "\WIN95" directory) controls the Windows 95 Installer.

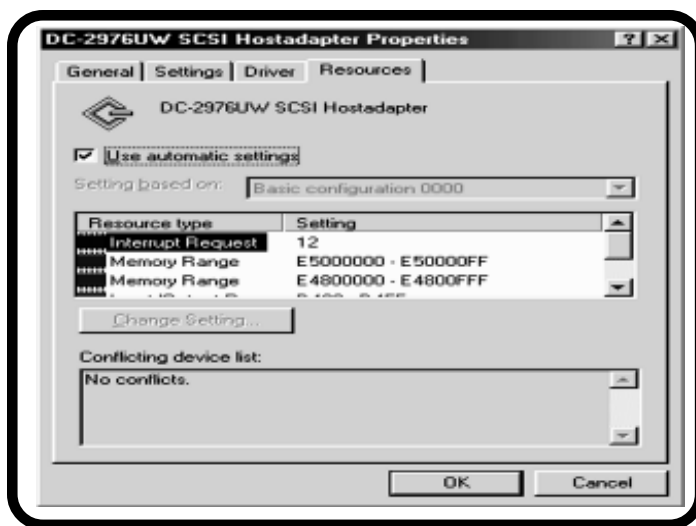
The device drivers required for running CD-ROM or removable disk drives etc. are part of the Windows 95 operating system providing an automatic setup procedure which much facilitates the installation process. Start Control Panel, double-click on the Hardware icon and choose SCSI Controller.

Then select the Diskette option; the installation files are located in the "\WIN95" directory on your installation diskette. When you have specified the drive and folder, Windows 95 displays a dialog indicating the exact type and name of your SCSI hostadapter.



In the case of SCSI hostadapters based on the ISA bus technology, Windows 95 then suggests a hardware configuration (I/O address and interrupt) that has proved to produce not conflicts with any previous adapter cards. PCI SCSI hostadapters are automatically configured by the PCI BIOS, i.e. the SCSI hostadapter is assigned a free interrupt and a free I/O address which cannot be changed via Windows' Device Manager.

To ensure trouble-free operation of the driver, the hardware settings of the SCSI hostadapter must be the same as the driver configuration data: thus you will either have to change the jumper settings for I/O address and interrupts on the adapter card or modify the configuration of the driver to reflect the actual settings. The latter method uses the Resources tab of Windows' Device Manager.



After PC restart the SCSI hostadapter and all SCSI devices connected to it will be listed in Windows' Device Manager. Should Windows 95 have recognised your SCSI hostadapter and installed the appropriate driver automatically, we still recommend using the driver contained in the hostadapter package. Start Control Panel, double-click the System icon, choose Device Manager, and select the icon representing the installed SCSI hostadapter. Then activate the Drivers tab and choose the Other Driver or Updated Driver option to install the original driver delivered on diskette.

## 2. Summary of DCxxxx.MPD Command Line Switches

If you wish to use the Power Save function or if any problems are caused by customised configurations, you can add the following switches to the SCSI driver by means of the options provided on the Settings tab in Windows' Device Manager:

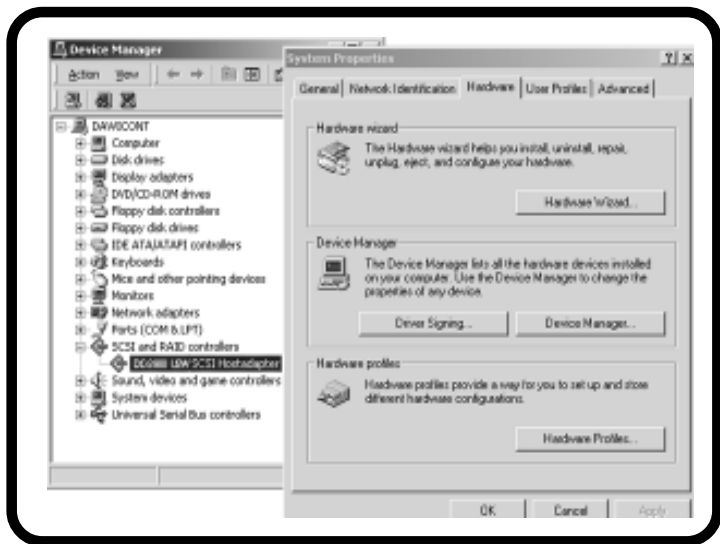
- /PS=..** Specifies the interval (in minutes) after which inactive drives are to be switched off
- /ID=x** x = SCSI ID of the hostadapter. The SCSI-ID of the host adapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /\*SN=..** Specifies the Target-IDs for which the synchronous/asynchronous data transfer settings of Windows' Device Manager are to be ignored, i.e. for which control is to be given to the SCSI device. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /!SN=x,..,x** This parameter defines the devices that are to run in asynchronous mode instead of in synchronous mode even if the device tries to switch into synchronous mode. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,..,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices, independent of the Windows settings. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

## 1. General Information

Windows 2000 has a built-in standardised SCSI interfacethat allows you to adapt your specific hardware to the different SCSI hostadapters. Hardware adaptation is done by driver "DCxxxx.SYS" located in the "WIN2000" directory on your installation diskette. The file "DCxxxx.INF" (also stored in the "WIN2000" directory) controls the Windows 2000 Installer.

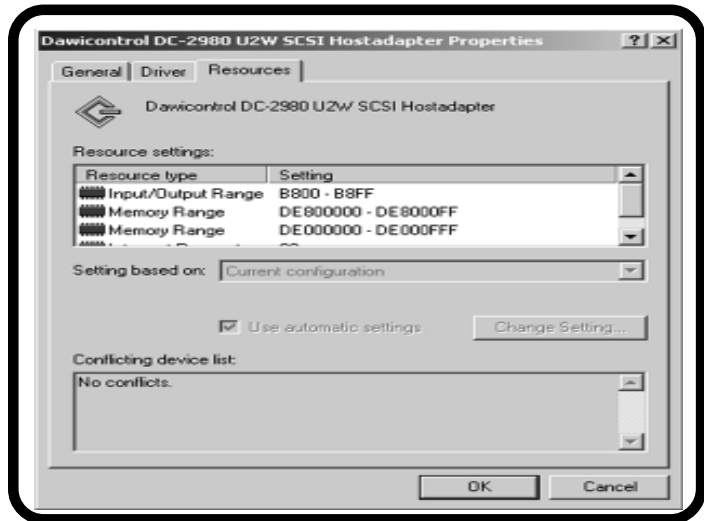
The device drivers required for running CD-ROM or removable disk drives etc. are part of the Windows 2000 operating system providing an automatic setup procedure which much facilitates the installation process. Windows 2000 recognizes your SCSI hostadapter automatically and installs a suitable standard Windows driver. To install the delivered driver or a current one from the Internet, open the symbol "System" in the control panel and choose the category "Hardware".

Then click the "Device Manager" and choose the SCSI hostadapter under the section SCSI and RAID controller. Choose "Driver Update" under the catagory "Drivers". The assistant starts to update the device drivers. Please follow the instructions on the screen. The necessary files for the installation are located in the "WIN2000" directory of your installation diskette. After you have determined the corresponding drive and directory, a window with the exact model description of your SCSI hostadapter appears.



In the case of SCSI hostadapters based on the ISA bus technology, Windows 2000 then suggests a hardware configuration (I/O address and interrupt) that has proved to produce not conflicts with any previous adapter cards. PCI SCSI hostadapters are automatically configured by the PCI BIOS, i.e. the SCSI hostadapter is assigned a free interrupt and a free I/O address which cannot be changed via Windows' Device Manager.

To ensure trouble-free operation of the driver, the hardware settings of the SCSI hostadapter must be the same as the driver configuration data: thus you will either have to change the jumper settings for I/O address and interrupts on the adapter card or modify the configuration of the driver to reflect the actual settings. The latter method uses the Resources tab of Windows' Device Manager.



After PC restart the SCSI hostadapter and all SCSI devices connected to it will be listed in Windows' Device Manager.

## 2. Summary of DCxxxx.SYS Command Line Switches

If you wish to use the Power Save function or if any problems are caused by customized configurations, you can add the following switches to the SCSI driver by means of the options provided on the Settings tab in Windows' Device Manager:

Start the "REGEDT32" program. Display the SCSI adapter parameters by opening "HKEY\_LOCAL\_MACHINE", "SYSTEM", "CurrentControlSet", and "Services" in that sequence. Then choose "DCxxxx" and select Device. A "DriverParameter" entry listing the current settings will be displayed on the right panel. Click on "DriverParameter" to open a dialog that allows you to change the parameter settings.

- /PS=..** Specifies the interval (in minutes) after which inactive drives are to be switched off
- /ID=x** x = SCSI ID of the hostadapter. The SCSI-ID of the host adapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Host-adapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /^SN=..** Specifies the Target-IDs for which the synchronous/asynchronous data transfer settings of Windows' Device Manager are to be ignored, i.e. for which control is be given to the SCSI device. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /!SN=x,...,x** This parameter defines the devices that are to run in asynchronous instead of in synchronous mode even if the device tries to switch into synchronous mode. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,...,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices, independent of the Windows settings. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead

## 1. General Information

Windows NT has a built-in standardised SCSI interface that allows you to adapt your specific hardware to the different SCSI hostadapters. Hardware adaptation is done by driver "DCxxxx.SYS" located in the "\WINNT95" directory on your installation diskette. The device drivers required for running CD-ROM or removable disk drives etc. are part of the Windows NT operating system providing an automatic setup procedure which much facilitates the installation process. Windows NT differentiates between two installation methods:

- SCSI hostadapter installation during installation of Windows NT. This method is deployed when the boot disk or the CD-ROM drive containing the Windows NT installation CD is connected to your SCSI hostadapter.
- Separate installation of your SCSI hostadapter on a fully configured Windows NT system. You can choose this installation method also when first installing Windows NT if the devices connected to your SCSI hostadapter are not required for installation.

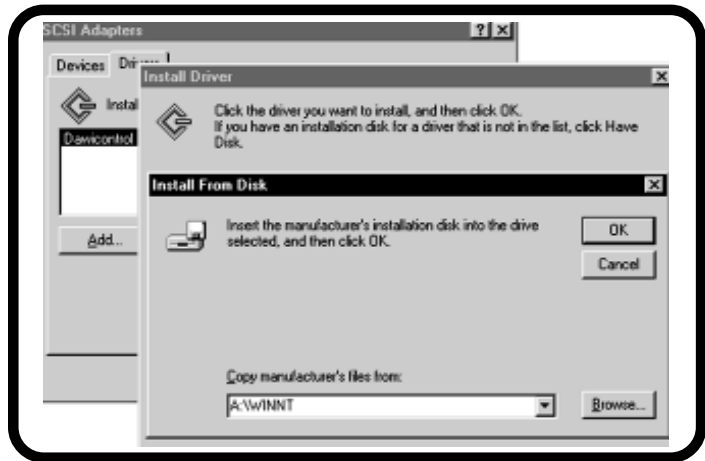
### 1.1 Installation During Windows NT Installation

First install Windows NT as described in the manual and keep your SCSI driver diskette ready. Should you not work with the original diskette make sure that the disk you are using contains the file TXTSETUP.OEM in the root directory and all other Windows NT file in the "\WINNT" subdirectory. In the course of Windows NT installation the installer gives you the option to set up additional SCSI hostadapters. Insert your SCSI driver diskette into drive A: when prompted for it. The setup program displays the exact name and type of your SCSI hostadapter and asks you to press ENTER to confirm the information. Afterwards it installs your SCSI hostadapter.

### 1.2 Separate Installation

Run the SCSI Adapter utility from Windows' Control Panel and activate the Drivers tab. On this tab first click on Add and then on Diskette. You will then be requested to insert the driver disk into the drive and specify the appropriate directory. If you are using the original driver diskette, the files required for installation are located in the "\WINNT" subdirectory.



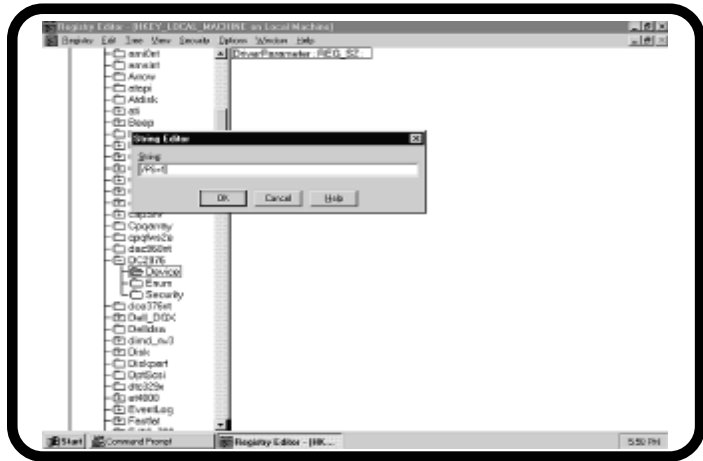


If the specified drive and directory are not correct, Windows will default to automatic installation of your SCSI hostadapter. Should Windows NT have recognised your SCSI hostadapter and installed the appropriate driver automatically, we still recommend using the driver contained in the host adapter package. In this case you would have to uninstall the driver at this point by selecting the driver and clicking on the Delete button. Restart Windows NT so that you can access the connected devices.

## 2. Summary of DCxxxx.SYS Command Line Switches

If you wish to use the Power Save function or if any problems are caused by customised configurations, you can add the following switches to the SCSI driver

Start the "REGEDT32" program. Display the SCSI adapter parameters by opening HKEY\_LOCAL\_MACHINE, SYSTEM, CurrentControlSet, and Services in that sequence. Then choose "DCxxxx" and select Device. A DriverParameter entry listing the current settings will be displayed on the right panel. Click on DriverParameter to open a dialog that allows you to change the parameter settings.



The following parameters are supported by Windows NT:

- /PORT=..** Specifies the hostadapter's I/O address. This address is usually found automatically which may, however, cause to conflicts with other adapter cards under certain unfavourable conditions. This parameter must not be used with PCI SCSI hostadapters.
- /PS=..** Specifies the interval (in minutes) after which inactive drives are to be switched off
- /ID=x** x = SCSI ID of the hostadapter. The SCSI-ID of the hostadapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

- /SN=..** Specifies the Target-IDs for which the synchronous/asynchronous data transfer settings of Windows' Device Manager are to be ignored, i.e. for which control is to be given to the SCSI device. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /!SN=x,...,x** This parameter defines the devices that are to run in asynchronous instead of in synchronous mode, independent of the Windows mode setting for these devices. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,...,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices, independent of the Windows settings. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

## 1. General Information

As opposed to other operating systems that do not know how to handle SCSI devices therefore requiring installation of special drivers for every device type, OS/2 supports SCSI devices straight away.

OS/2 has a built-in separate software interface provided for this special purpose by means of which the specific hardware can be adapted to the different SCSI hostadapters. Thus you only need one driver containing the hardware adaptation data for every SCSI hostadapter. For your Dawicontrol SCSI hostadapter the relevant driver is DCxxxx.ADD (ADD = Adapter Device Driver). Device accesses from higher operating system levels rely on this Adapter Device Driver.

OS/2 provides a variety of so-called DMDs (Device Manager Driver) to control data transfer between the different device types on the one hand and the operating system, the application programs, and the appropriate Adapter Device Driver on the other:

<b>OS2DASD.DMD</b>	Device Manager for hard and removable disk drives
<b>OS2CDROM.DMD</b>	Device Manager for CD-ROM drives
<b>OS2SCSI.DMD</b>	Device Manager for all other SCSI devices
<b>OS2ASPI.DMD</b>	Device Manager for the SCSI/ASPI interface

## 2. Installation

### 2.1 Automatic Installation

You can install your Dawicontrol SCSI hostadapter either during OS/2 installation or later in a complete operating system environment.

During installation of OS/2, after a large portion of the operating system has been copied to the hard disk, the Extended Options dialog will pop up allowing you to choose Install Diskette for Unit Support to call up the Unit Driver Installation dialog.

If the OS/2 system has been fully installed already, first open the System folder located on the OS/2 desktop, then from this folder choose the System Configuration folder and finally select the Install Unit Driver icon.

In both cases, the screen will display the source and the target directories the latter specifying the location to copy the relevant drivers to. In most cases you can accept the default setting of C:\. If you are using the original OEM diskette, you will find the necessary files in the "\OS2" subdirectory. Click on the Browse button to select the appropriate disk drive and directory and then click on Install. A line with the exact name and type of your SCSI hostadapter will appear on the screen. Click on this line to select it and confirm your entry by clicking on the OK button. This will be followed by automatic installation which involves copying all necessary files and adding a command line to the file CONFIG.SYS to call up the SCSI driver. Restart your system. You can now work with all the devices connected to your SCSI hostadapter.

### 2.2 Manual Installation

Alternatively you can also install the hostadapter manually by copying driver DCxxxx.ADD from your installation diskette to the "C:\OS2" subdirectory and using any text editor program to add the command line for starting the driver (do not include path) to CONFIG.SYS:

```
BASEDEV=DC2974.ADD    installs the SCSI driver for DC-2974 PCI
```

Please note that the position of the command line in CONFIG.SYS may influence the driver letters assigned. Therefore the driver for the boot directory (disk C:) is to be loaded prior to any other drivers for hard disk management as booting will stop because drive letter C: is no longer assigned to the original disk. Arrange the sequence of drivers loaded by the BASEDEV= command as follows (listed by filename extensions):

```
".SYS", ".BID", ".VSD", ".TSD", ".ADD", ".I13", ".FLT", ".DMD"
```

The drivers carrying the same filename extensions are loaded by CONFIG.SYS corresponding to their sequence.

If you are booting OS/2 from an IDE disk, for example, while further disks are connected to your SCSI hostadapter then driver IBM1S506.ADD which is responsible for IDE hard disks must be loaded prior to driver DCSCSI.ADD because otherwise C: will be assigned to the first SCSI disk as its drive letter and booting will be discontinued. If you find that you can no longer boot your system because the file CONFIG.SYS was damaged, then refer to your OS/2 manual to learn how your original CONFIG.SYS can be restored.

In emergency cases you can also try to press the ALT and F1 keys simultaneously when booting the system: this will cause OS/2 to copy backups of the files CONFIG.SYS, OS2.INI; AND OS2SYS.INI from the \OS2\INSTALL directory onto the "real" files. The backup copies were previously made during OS/2 installation. The files at the C:\ location will be renamed and the whole process documented by an on-screen message.

### 2.3 Installing OS/2 from CD-ROM

Proceed as follows to install OS/2 from a CD-ROM drive connected to your Dawicontrol SCSI hostadapter:

- Verify that your CD-ROM drive is supported by the version of OS/2 you are working with.
- Make a copy of "OS/2 Disk 1" by using DOS's DISKCOPY command, for example. Make sure that your original disk is Write-protected.
- Copy driver DCxxxx.ADD to the root directory of the disk you just created.
- At the end of the file CONFIG.SYS on the disk you just created add the line BASEDEV=DC2974.ADD (example for DC-2974 host adapter).
- From now on, this is your "OS/2 Disk 1". Now start installation as described in the manual. Upon being prompted for "Disk 1" during installation use the copy with the above changes instead of the original diskette.

### 2.4 Summary of DCxxxx.ADD Command Line Switches

You can normally start DCxxxx.ADD without adding any parameters because the driver automatically and reliably finds the I/O address and the connected devices and automatically configures itself accordingly.

In case you are using the Power Save function, you are working with special configurations or with other adapter cards the driver DCSCSI.ADD can be configured with the following parameters:

- /PORT=xxx** If you are working with several SCSI hostadapters, type in the adapter number (for PCI hostadapters, starting with zero) or the I/O address (for ISA hostadapters) as the parameter's attribute. In this case, you will have to start the driver by specifying the adapter number or I/O address resp. for every connected hostadapter separately. This parameter is not required if you are working with only one SCSI hostadapter.
- /PS=x** This parameter controls the Power Save function by specifying the maximum inactivity period (from 1 to 60 minutes). If the set value is exceeded, any hard disks, removable disks and CD-ROM drives will be switched off automatically. The relevant device will be started again when it is accessed later. Not setting this parameter means that the function is disabled.
- /ID=x** x = hostadapter's SCSI-ID. The SCSI-ID of the hostadapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /!SN=x,...,x** This parameter defines the devices that are to run in asynchronous instead of in synchronous mode even if the device tries to switch into synchronous mode. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,...,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices. If you do not set this parameter only devices that can switch into synchronous mode themselves will be operated in this mode, all other devices will remain in asynchronous mode. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

- /!SM=x,...,x** Use this parameter to specify a list of SCSI-IDs representing the devices that are not to be supported by OS/2's Device Manager. As a rule, all connected devices can be controlled by the SCSI Device Manager. "/!SM=4,5", for example, means that the devices assigned SCSI-ID 4 and 5 cannot be addressed by the SCSI Device Manager.
- /!DM=x,...,x** Use this parameter to specify a list of SCSI-IDs representing the devices that are not to be supported by OS/2's DASD Manager (Device Manager for disk drives). As a rule, all connected devices can be controlled by DASD Manager. "/!DM=3,6", for example, means that the devices assigned SCSI-ID 3 and 6 cannot be addressed by DASD Manager.
- /Q** Suppresses all on-screen messages (including error messages) during driver installation.

### 3. Working With Removable Disks

OS/2 treats removable disks like high-capacity disk drives. Under OS/2 removable disks are therefore not partitioned by simply formatted like any other floppy disk.

If you intend to use data carriers created under DOS also in an OS/2 environment (or vice versa) you would have to take that into account when setting up the disk by not partitioning it under DOS. OS/2 will otherwise not be able to access these data carriers.

Use DOS's FORMAT command exclusively to prepare this type of data carrier.

The driver DISKDRV.SYS responsible for DOS supports the disk format of removable disks allowing you to access your removable in both the DOS and the OS/2 environments.



## 1. General Information

Running your SCSI hostadapter under NetWare requires additional software to control communication and data transfer between operating system and peripherals and to provide appropriate support for multi-tasking. These programs are referred to as NetWare Loadable Modules (NLMs).

Your Dawicontrol SCSI hostadapter relies on the ASPI standard developed by Adaptec and by now firmly established in the world of computers. This enables you to install SCSI devices by means of either the modules contained on the installation diskette or modules provided by other vendors such as the CorelSCSI package. The following modules for NetWare operation are delivered with your Dawicontrol SCSI hostadapter:

<b>UPGRD312.NLM</b>	- extra module for NetWare 3.11 and 3.12
<b>ASPITRAN.DSK</b>	- ASPI layer for operating ASPI-compatibles
<b>DCxxxx.DSK</b>	- ASPI module for the SCSI host adapter
<b>DISKDRV.DSK</b>	- module for hard/removable disks
<b>CDROMDRV.DSK</b>	- module for CD-ROM drives

Typically, these modules are loaded via the file STARTUP.NCF. They can also be loaded via AUTOEXEC.NCF unless NetWare is started from a SCSI disk drive.

Typical contents of the file STARTUP.NCF:

```
load C:\...\ ASPITRAN
load C:\...\ DC2974
load C:\...\ DISKDRV
load C:\...\ CDROMDRV
```

The above example refers to the DC-2974 PCI hostadapter. It is mandatory to type in the command lines for the individual modules in exactly the above order. You need to load the ASPITRAN.DSK module only once even if you are working with several hostadapters. This module provides a layer shared by all ASPI-based modules, i.e. for both the hardware-specific modules (DCxxxx.DSK) and modules such as DISKDRV.DSK and CDROMDRV.DSK that are not specific to any particular hardware.

ASPITRAN.DSK will be loaded automatically if it has not been loaded prior to installing DCxxxx.DSK. However, this requires DCxxxx.DSK and ASPITRAN.DSK to be stored in the same subdirectory. If you are working with NetWare version 3.12 (or older), then you will have to also load module UPGRD312.NLM. This module provides functions not yet implemented in NetWare version 3.12. Therefore, UPGRD312.NLM is to be loaded before DCxxxx.DSK. This module is not required for higher NetWare version.

## 2. Summary of DCxxxx.DSK Command Line Switches

The parameters below allow you to influence the DCxxxx.DSK driver settings during installation.

- /PORT=xxx** If you are working with several SCSI hostadapters, type in the adapter number (for PCI hostadapters, starting with zero) or the I/O address (for ISA hostadapters) as the parameter's attribute. In this case, you will have to start the driver by specifying the adapter number or I/O address resp. for every connected hostadapter separately. This parameter is always required for ISA hostadapters. It is not required if you are working with only one SCSI hostadapter.
- /PS=x** This parameter controls the Power Save function by specifying the maximum inactivity period (from 1 to 60 minutes). If the set value is exceeded, any hard disks, removable disks and CD-ROM drives will be switched off automatically. The relevant device will be started again when it is accessed later. Not setting this parameter means that the function is disabled.
- /ID=x** x = hostadapter's SCSI-ID. The SCSI-ID of the hostadapter will be set automatically if this parameter is not specified. Valid SCSI-ID values are 0 to 7. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /LUN** This parameter enables the device's support of several LUNs (Logical Units). However, most SCSI devices only have LUN 0 available to them so that you will need this parameter only for special cases. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /!SN=x,...,x** This parameter defines the devices that are to run in asynchronous instead of in synchronous mode even if the device tries to switch into synchronous mode. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.
- /SN=x,...,x** This parameter specifies the devices to be operated in Synchronous Data Transfer mode if this mode is supported by these devices. If you do not set this parameter only devices that can switch into synchronous mode themselves will be operated in this mode, all other devices will remain in asynchronous mode. Entering "/SN=1,4", for example, enables the synchronous mode for SCSI-IDs 1 and 4. Hostadapters supplied with a SCSI setup ignore this parameter and use the setup settings instead.

During installation, driver DCxxxx.DSK displays a list of settings and devices on the screen. When DCxxxx.DSK has been started this can be used as a basis for installing device-specific drivers or modules. The universally applicable ASPI interface allows you to also work with device drivers supplied by other vendors (e.g. COREL SCSI!).

## 3. Installing Disk Drives

The operation of hard/removable disks requires the DISKDRV.DSK module to be installed. DISKDRV.DSK is based on the ASPI interface which is why the ASPITRAN.DSK and DCxxxx.DSK modules are to be installed previously.

After call-up, DISKDRV.DSK will be the manager for all disk drives of all hostadapters. If you wish to select a specific drive, you can customise DISKDRV.DSK by adding command line switches:

### 3.1 Summary of DISKDRV.DSK Command Line Switches

**/HOST=x**            x = ASPI hostadapter number,  
                         only drives connected to this host adapter will be  
                         included in the management

**/TARGET=y**        y = SCSI drive Target-ID,  
                         only drives set to this SCSI-ID will be  
                         included in the management

The installation message of DISKDRV.DSK contains a list of all drives installed including the drive letters assigned to them. DISKDRV.DSK automatically differentiates between hard disk and removable disk drives. After installation run the NetWare utilities as usual to set up any of the drives managed by DISKDRV.DSK. This includes special NetWare security features such as Mirroring and Duplexing.

### 3.2 Booting NetWare from a SCSI Drive

Booting NetWare from a SCSI drive requires you to previously activate the BIOS of the SCSI hostadapter. Also, NetWare's startup file, STARTUP.NCF, must contain commands to call up all of the modules required for running the boot disk drive:

Contents of the STARTUP.NCF file:

```
load C:\...\ ASPITRAN
load C:\...\ DC2974
load C:\...\ DISKDRV
```

## 3.3 Formatting SCSI Drives

Use NetWare utility INSTALL.NLM to do a low-level formatting of any drive. As a rule, all SCSI drives are formatted in the factory so that you will have to use this function in exceptional cases only. Formatting requires the relevant drive to be previously installed by the DISKDRV.DSK module.

**Caution:** Formatting causes all data and programs stored on the drive to be irretrievably lost!

Immediately before formatting starts, INSTALL.NLM will prompt you for the interleave factor. If you choose this factor to be "0", then formatting will default to the interleave factor set by the manufacturer. Depending on the capacity of your drive, formatting may take quite some time. As a rule of thumb, reckon with about one minute of formatting time for every 10 MByte of disk capacity. Some drives disallow formatting. In this case, the process is either completed suspiciously fast or it will be cancelled straight away.

## 3.4 Special Notes on Removable Disks

NetWare utility MONITOR.NLM provides a physical mount/dismount feature to meet with the peculiarities of removable disks. Always do a dismount prior to changing media because otherwise there is the risk of losing data due to the possibility of the internal write cache of the operating system still containing data which has not been written onto the medium concerned.

This physical mount/dismount relates to the relevant devices and must not be confused with the logical mount/dismount which relates to NetWare volumes that may extend across several devices.

We recommend you do a logical dismount of all relevant volumes prior to changing any media. Then do the physical dismount of the device. Use the Lock/Unlock function to prevent the medium from being unintentionally removed.

## 4. Installing CD-ROM Drives

The operation of CD-ROM drives requires the CDROMDRV.DSK module to be installed. The host adapter supports all standard data CDs as well as multi-session photo CDs on all standard drive makes.

Furthermore, there is support of so-called jukeboxes (drives for multiple CD-ROMs) and a logical drive is installed for every unit. If you do not wish to use this feature, then specify the number of drives to be installed via the "/UNITS=" parameter.

As DISKDRV.DSK before, CDROMDRV.DSK too is based on the ASPI interface which means that the ASPITRAN.DSK and DCxxxx.DSK modules need to be installed prior to calling up CDROMDRV.DSK. After call-up, CDROMDRV.DSK will be the manager for all CD-ROM drives connected to all host adapters. If you wish to select a specific drive, you can customise DISKDRV.DSK by adding command line switches

## 4.1 Summary of CDROMDRV.DSK Command Line Switches

- /HOST=x**     x = hostadapter's ASPI number. CDROMDRV.DSK only manages drives that are connected to this host adapter.
- /TARGET=y**   y = SCSI drive's Target-ID. Only drives with this ID will be included in drive management.
- /UNITS=x**     This parameter defines the number of Logical Units that can be used with a drive which is required for CD-ROM jukeboxes if you do not wish to operate all units. Valid entries are numbers from 1 to 8. As a rule, all available units are supported if the Logical Units option was enabled for driver DCxxxx.DSK or in the SCSI setup resp.

The installation message of CDROMDRV.DSK contains a list of all drives installed including the drive letters assigned to them. You need NetWare module CDROM.NLM to make these drives available as NetWare volumes. This NLM is part of the NetWare software package. Its task is to create a logical dummy drive for every physical CD-ROM drive found and to map the CD-ROM drive's file structure onto the dummy drive just as MSCDEX does under DOS. CDROM.NLM provides you with some extra commands to be used with the relevant CD-ROM drive. Major commands include:

### **CDDEVICE LIST**

**CD MOUNT x**           x = device number or volume label

The CD DEVICE LIST commands displays a list of all connected CD-ROM drives including the device numbers and volume labels assigned to them.

The CD MOUNT command creates a dummy drive containing the corresponding volume. After that you can make full and unrestricted use of the CD-ROM drive.

## Frequently Asked Questions

### Which information should I have ready when I call the Support line?

Type of system, number/name of mainboard and chipset, operating system (DOS, Windows 3.x, Win 95/98, Win NT 4/5, OS/2, Novell, Linux), SCSI hostadapter, list of all connected devices, length of SCSI bus (internal + external cable), copy of error messages, location of terminators (active or passive), new configuration?, did configuration work before?, what was changed before problem occurred?

Looking at this list, it seems that you need a lot of information. However, it makes troubleshooting a lot easier for us and yourself because the above questions will be asked during the support call at the latest.

### Can I connect a SCSI-1 device with a 25-pin connector (e.g. scanner) to a 50-pin or 68-pin hostadapter?

You can indeed by using an adapter. Just make sure to terminate the bus properly.

### Can I update the BIOS of DC-2974 PCI by software?

No, you cannot. DC-2974 PCI is equipped with an EPROM and no FlashROM. You can either write your own EPROM or order a prefab EPROM from Dawicontrol. For further information please visit our website [www.dawicontrol.com](http://www.dawicontrol.com).

### Can I use IDE hard disks/CD-ROMs and SCSI devices in one computer?

Yes, that causes no problem. If you wish to boot from a SCSI hard disk, start the SCSI BIOS of your host adapter and change the Boot Sequence entry of the mainboard's BIOS to SCSI first.

### The maximum hard disk partition size supported by SCIFMT is 2 Gbyte, but I have a ) Gbyte hard disk?

DOS limits the maximum partition size to 2048 Mbyte. If you have Microsoft's FAT32 support utility, you can use FDISK to create larger partitions.

### If I connect a SCSI-1 device to my SCSI-2 hostadapter, does that influence the performance of the SCSI-2 devices?

No. The hostadapter sets a separate transfer rate for every SCSI device.

### **Can I connect a SCSI-2 device to either the 50-pin or the 68-pin connector of a SCSI-3 hostadapter?**

Yes, just use an adapter. Make sure to terminate the bus properly.

### **How do I access the BIOS of DC-2974 PCI?**

DC-2974 PCI has no BIOS setup.

### **Can I connect a WIDE device to my NARROW hostadapter?**

Yes, just use an adapter.

### **Can I install two SCSI hostadapters in my system?**

Basically yes. If you use two hostadapters of the same type, the drivers are support this kind of configuration.

### **My CD-ROM drive works with Windows but not with DOS?**

Install the DOS drivers for the CD-ROM drive first, see chapter II 4.

### **I used a different hostadapter before, now I can't access my data. Why not?**

Manufacturers use different mapping methods for low-level formatting. Thus, a hard disk set up for adapter X doesn't necessarily have to work with adapter Y too. Back up your data before you change host adapters and run the low-level formatting routine of the new host adapter. Then set up your hard disk as per usual and copy your backup data afterwards.

### **My drive letter assignment is not as it should be. Why not?**

Microsoft use the following algorithm for drive letter assignment: IDE comes before SCSI, hard disks come before CD-ROM drives, primary partitions come first, followed by extended partitions with logical drives. If you wish to maintain your old order of drive letters, avoid setting up primary partitions on new hard disk drives. In the case of CD-ROM drives, use Windows' Device Manager program which allows you to specify drive letters for this type of drive yourself. If you choose Z: for the CD-ROM drive, for example, this letter will remain unchanged, no matter how many drives you install later.

## **Error Messages**

An on-screen message is displayed if a problem occurs during the installation of any of the drivers. This error message summary is meant to help you with removing these problems.

### **Drive C and Drive D already installed**

The SCSI BIOS is unable to install further drives because there are two BIOS hard disk drives already. Use the appropriate device drivers to install further disk drives.

### **no Disk Drives found at SCSI ID 0,1 or 2**

The SCSI BIOS only checks SCSI IDs 0,1 and 2. Any SCSI hard disks you want to operate via BIOS need to be set to one of these IDs first.

### **invalid Parameter**

One or several command line parameters are either invalid or contain an invalid argument.

### **SCSI Hostadapter not found**

The system was unable to find the SCSI hostadapter. This may be caused by either a conflict of addresses of the adapter checked and another adapter card or by a wrong I/O address.

### **Interrupt not found**

The set interrupt was not found. This interrupt may be used by another adapter card.

### **SCSI Hostadapter read/write failed**

The integrity test of the data paths on the host adapter failed. This may be a bus timing problem; for further information please refer to your hostadapter's installation instructions.

### **no Devices found**

The driver was unable to find any compatible SCSI devices or the selected devices could not be accessed. Check that the SCSI cables are connected correctly and the devices properly supplied with power.



## **incorrect DOS Version**

Outdated version of DOS; you need DOS version 3.1 or higher.

## **no SCSI Hostadapter to support**

The driver was unable to access the host adapter. Check whether the driver was configured for a host adapter that is absent from your system.

## **SCSI/CAM Driver not installed:**

CAM driver DCxxxx.SYS has not been installed.

## **Read Error**

Due to a system read error, the hard disk could not be installed. Check whether all cables are connected correctly and the SCSI bus properly terminated. You may have to re-format the hard disk to the low-level format.

## **active Devices may be attached**

The system outputs this warning message when you try to use the UNLOAD command to remove NetWare module DCxxxx.DSK from main memory. The message also tells you that after execution of the command, the devices connected to the host adapter concerned can no longer be accessed.

## **invalid Partition Table**

The hard disk could not be installed because the partition table is invalid. Use the SCSIFMT program to partition the drive. You will then be able to access the drive via its drive letter.

## **Inquiry to SCSI/CAM Driver failed**

The device driver was unable to access the CAM driver specified for this hostadapter; this may be a compatibility problem.

## **not enough Drive Letters available**

Installation of the device driver was aborted because there are no further drive letters available.

## **unknown Graphic Card**

Installation of the CD player was aborted because the graphic card could not be identified. Check the settings of your graphic card.

## **CD-ROM Extensions not installed**

CD player installation was aborted because the MSCDEX program had not been previously started.

## **cannot release Memory**

The system was unable to de-install the CD player because there was a DOS memory management problem. Restart your system in this case.

## **unable to open CD-ROM Device Driver**

The CD player was unable to access the appropriate CD-ROM device driver. This may be a compatibility problem.

## **invalid Drive selected**

CD player installation was aborted because the drive you specified is not CD-ROM drive.

## **Interrupt Chain corrupted**

The system was unable to de-install the CD player because the relevant interrupts are blocked by other resident programs.

## **out of Memory**

The OS/2 operating system has not enough memory available for the management of the SCSI devices connected.

## **cannot register Adapter Device Driver**

The OS/2 operating system rejected registration of the SCSI host adapter. The operating system may be out of memory.

## **cannot register Hardware Options**

The NetWare operating system rejected allocation of the set I/O address. The address may be used by another adapter card already.

### **cannot allocate Hardware Interrupt**

The NetWare operating system rejected allocation of the set interrupt. The interrupt may be used by another adapter card already.

### **cannot register to ASPI Layer**

The ASPI layer (ASPITRAN.DSK) rejected allocation of the SCSI host adapter. Verify that the ASPITRAN.DSK module loads correctly.