



APA-1480 Enabler for DOS

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APA-1480 Enabler for DOS

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Introduction

This manual provides an overview of the Adaptec SlimSCSI 1480 CardBus Host Adapter (APA-1480) for DOS.

APA-1480 Enabler is a small, but powerful driver supporting Adaptec APA-1480 SlimSCSI CardBus cards and fully compatible with Adaptec ASPI Manager ASPI8DOS.SYS.

Due to the small memory footprint of the resident part the enabler is an ideal solution for use in various disk-cloning schemes. Both, Symantec Norton Ghost and Power Quest Disk Copy, are supported.

Features and Limitations

APA-1480 Enabler supports both, original DOS (e.g. MS-DOS 6.22) as well as DOS included with Windows 95/98. Resident part of APA-1480 Enabler occupies approximately 1 kB of memory or larger, depend from used features.

APA-1480 Enabler can be loaded via CONFIG.SYS, AUTOEXEC.BAT, or simply started from DOS command prompt. However for use APA-1480 Enabler with Adaptec ASPI manager ASPI8DOS.SYS you have to load driver in CONFIG.SYS.

APA-1480 Enabler can be unloaded, except if it is loaded from CONFIG.SYS. Besides APA-1480 Enabler prevents second load of itself.

APA-1480 Enabler may provide support of Adaptec APA-1480 SlimSCSI CardBus cards without load Adaptec ASPI Manager ASPI8DOS.SYS.

APA-1480 Enabler may provide support of SCSI devices without load driver for your device.

APA-1480 Enabler may provide full LBA support for disks of any size. Large disks are supported.

APA-1480 Enabler may provide full INT 13h support, including extension. Most utilities (FORMAT.COM, FDISK.EXE, Norton Utilities, etc.) are supported.

APA-1480 Enabler may support simultaneously up to 16 SCSI Hard Disks per one Adaptec APA-1480 SlimSCSI CardBus card. Number of supported partitions is limited only by number of available drive letters.

User may freely assign drive letters to partitions, except if APA-1480 Enabler is loaded from CONFIG.SYS.

APA-1480 Enabler does not provide hot-swap support. The APA-1480 CardBus Card and all SCSI devices should be connected to the computer before APA-1480 Enabler is started.

APA-1480 Enabler cannot be loaded in the Windows DOS session.

APA-1480 Enabler provides a set of flexible configuration options via command line or external .INI file.

APA-1480 Enabler is especially designed to work on CardBus adapters.

In case a CardBus adapter is not properly initialized, CB1480 is able to update the CardBus adapter configuration. Most of the required initialization can be done automatically without user intervention. However, if required, user will be able to control most settings, either via command line parameters or, in complicate cases, via external .INI file.

Installation

The APA-1480 Enabler may be installed either in CONFIG.SYS, AUTOEXEC.BAT or started from DOS command line. It's possible to relocate enabler into upper memory using DEVICEHIGH or INSTALLHIGH statements in CONFIG.SYS.

The APA-1480 Enabler provides several command line switches allowing fine-tuning of the driver. In more complicate cases you may create an initialization file with very detailed configuration instructions.

It is recommended that you fine-tune CardBus Enabler switches starting CardBus Enabler from the command line. After switches are set, you can place call of CardBus Enabler either to CONFIG.SYS or to AUTOEXEC.BAT.

Deployment

In order to use SCSI devices (such as JAZ drive or CD-ROM) you typically will need to load APA-1480 Enabler, Adaptec ASPI manager ASPI8DOS.SYS and driver for your device. E.g. usage of CD-ROM requires ASPICD.SYS; usage of SCSI Disk – ASPIDISK.SYS, etc. ASPI manager and required drivers could be found in the Adaptec EZ-SCSI package.

However APA-1480 Enabler may provide support of Adaptec APA-1480 SlimSCSI CardBus cards and SCSI devices without load any additional drivers.

For use CD-ROM you will also need to load MSCDEX.EXE in your AUTOEXEC.BAT.

If you are trying to use SlimSCSI with IOMEGA JAZ device we recommend that you be using IOMEGA GUEST.EXE application rather then stack of ASPI drivers. It gives more compact image on the floppy.

You can invoke APA-1480 enabler in the any point. For example:

Example of config.sys

```
...
DEVICE=C:\CB1480.EXE
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
```

```
...  
DEVICEHIGH=C:\ASPI8DOS.SYS /D  
...
```

Fine-tuning

If your BIOS configure CardBus Adapter properly, no command line parameters are necessary. Otherwise fine-tuning could be required.

The fine-tuning could be performed either in standard installation mode via command line options, or in advanced installation mode via an external INI file.

Following chapters describe both modes in detail.

In both modes several optional parameters require a numeric value. Any numeric value could be entered as decimal (default form) or hexadecimal (with 0x prefix) number. For example: /PI:10 and /PI:0x0A both specify IRQ 10.

In both modes several optional parameters require <use> values. Use values may typically be specified as ON, OFF or AUTO in upper or lower case.

Command Line Options.

Command line options can be specified in any order, either in upper case or in lower case. Typical parameters start with slash (/) or dash (-) followed by one or two letters (e.g. /H or /VR).

Some command line options require an additional value. In this case parameters should be followed by colon (:) or equal (=) then value (e.g. /M:0xEC000).

Command line options are separated by spaces.

Common Command Line Options

Following options are common for all versions of APA-1480 Enablers.

- /H | ? Print online help
- /E Silent mode: No display output.

Resource Management

- /M:n Start address of memory pool (Default: 0xD0000)
- /IO:n Start address of I/O pool (Default: 0x2000)
- /PI:n PCI Interrupt level (Default: 0x0B)

Diagnostics and Fine-tuning

- /V[:<file>] Verbose mode: Configuration steps will be outlined on console or to file (if file pathname is specified).
- /FL Flush log file to disk immediately after each update (may be useful in case of system hang).

- `/ID` Displays identified drive information.
- `/BS` Performs PCI bus scan and termination. Information will be displayed on console
- `/Ln:Letter` Specifies the drive letter assigned to SCSI partition 'n', where n could be in range of 0 to 9 (E.g., `/L0:M /L1:K /L2:Z.`)
- Drive letters selected by the user can only be taken into account if the APA-1480 Enabler is loaded in TSR mode (e.g., from AUTOEXEC.BAT or command line), and will be ignored if the device driver is loaded from CONFIG.SYS.
- User may assign more than 10 drive letters using the .INI file.
- `/FI` Force updating of PCI IRQ routing table for socket (even if selected IRQ is already in table)
- `/EC: <use>`
- | | |
|-----|---|
| ON | Use external power switch clock for adapter. |
| OFF | Use power switch clock generated by PCI clock |
- Note: This switch is ignored for all PC Card adapters except Texas Instruments PCI121x/122x and TI PCI125x/14xx/44xx families.
- `/IM:m` Set interrupt mode. Possible values are:
- | | |
|------|---|
| Par | TI1130/1x31: use parallel ISA-type interrupts |
| | TI12xx/14xx/44xx: use parallel ISA and PCI interrupts |
| | CL-6832, OZ6832: use External-Hardware Interrupt mode |
| | Ricoh RB5C478: use parallel interrupt mode |
| Ser | TI1130/1x31: use serialized interrupt type scheme |
| | TI12xx/14xx/44xx: use serialized ISA and PCI interrupts |
| | CL-6832, OZ6832: use PC/PCI Serial Interrupt protocol |
| | Ricoh RB5C478: use serialized interrupt mode |
| PPci | TI 12xx/14xx/44xx, CI-6832, OZ6832: use parallel PCI interrupts only |
| ISPP | TI 12xx/14xx/44xx only: use serialized ISA and parallel PCI interrupts. Will be ignored for all other adapters. |
| Pway | CL-6832, OZ6832: use PCI/Way Interrupt Signaling mode. Will be ignored for all other adapters |
- `/MX: <use>` Initialize the multiplex IRQ routing register. This switch is only used on TI PCI122x/125x/14xx/44xx adapters and is ignored for all other adapters.
- `/OZ: 97: <use>` O2Micro PC Card adapter only: set/reset PC97 IRQ bit

`/OZ:IL:<use>` O2Micro PC Card adapter only: set/reset ISA Legacy bit

`/F=filename` Specifies the initialization file pathname.

By default the initialization file has the same name as the Enabler, but with extension .INI (i.e., CB1480.INI). Enabler will be looking for the .INI file in the same subdirectory where enabler itself is located.

Using /F parameter user may override path and name of the default initialization file. (E.g., /F:E:\Settings\cb1480.ini)

ASPI Management

`/NA` Skip ASPI initialization.

In this case Adaptec ASPI manager ASPI8DOS.SYS and driver for your device is required.

`/I` Ignore (do not install) INT 13 interface support for SCSI hard disk devices. Also no drive letter will be created.

In this case driver for your device is required.

`/IC` Ignore (do not install) support for SCSI CD-ROM disk devices.

In this case driver for your device is required.

`/D:devname` Specifies device name of CD-ROM driver (Default: ASPICD01)

Can be used by MSCDEX.EXE to support SCSI CD-ROM disk devices.

`/L` Support LUNs 0-7 (otherwise supports only LUN 0).

`/RS:<use>` Reset SCSI bus during ASPI initialization.

Unloading

`/UL` Unload resident part (not supported, if driver is loaded via config.sys)

Initialization File

The initialization file is a text file that contains special settings. These settings allow you to configure computer hardware components so your CardBus adapters and/or APA-1480 card become functional.

Any text in the .INI file starting after the semicolon (;) to end of the line, is interpreted as a comment.

Using the INI file you may set PCI-2-PCI Bridges, CardBus bridges and APA-1480 card parameters in any combination.

PCI Sections

PCI Section describes PCI Device. Enabler supports any number of PCI Sections in the .INI file.

All section names are relative to original PCI subsystem configuration. You can see that configuration if you switch program to verbose mode. (/V key) or use the /BS switch.

In order to specify the required configuration of the PCI device, you need to know the location of the device. This location is specified in Bus:Device:Function form. Location 0:A:1 describes the first function of PCI device number 10 ("A" in hexadecimal format) located on PCI bus 0. Initialization file section used for the configuration of such a device should have the name [0:A:1].

Value names depend on device type.

For CardBus adapters, following values are defined: 'IoFilter0', 'IoFilter1', 'MemFilter0', 'MemFilter1', 'IRQ', 'ISAEnable', 'VGAEnable'.

For PCI-to-PCI bridges, following values are defined: 'IoFilter', 'MemFilter', 'PreFilter', and 'IRQ', 'ISAEnable', 'VGAEnable'.

For CardBus cards, following values are defined: 'IRQ', 'BARMask', 'BAR0', 'BAR1', 'BAR2', 'BAR3', 'BAR4', 'BAR5', 'BAR6'.

**MemFilter,
PreFilter,
MemFilter0,
MemFilter1**

These parameters define the CardBus or PCI-to-PCI bridge memory filter base and limit (or size) both memory filters (prefetchable and non-prefetchable).

The CardBus base and size values should have 4K alignments according to Yenta specification and limit (maximum address) should be aligned to 4K minus one.

Following formats could be used to specify bridge memory filter ranges:

BaseAddress:Limit. This means that we define the first and exactly the last integer number in a range (e.g., 0xA0000000:0xA0000FFF specifies 4K ranges). If you wish to disable positive decoding of PCI-to-PCI bridge's filter range, please specify something like: 200000:1ffff.

If you prefer to specify filter size rather than filter max address you should use BaseAddress,Size format, where Size by default is a literal decimal number. In this case you also could use 'M' or 'K' postfixes (e.g., 0xA0000000,1M specifies 1M memory filter starting at 0xA0000000 address).

Attention! All values are treated as hexadecimal even if there is no "0x" prefix.

Examples:

```
MemFilter0=A0000000h:A0000fffh      4K memory range
MemFilter0=A0000000h,4K             4K memory range
MemFilter0=A1000000h:A1001ffff,Pre 8K pref. memory
MemFilter0=A1000000h,8K,Pre        8K pref. memory
```

**IoFilter,
IoFilter0,
IoFilter1**

This is the bridge I/O range base and limit (or size). For CardBus base and size values must have double-word alignment.

Examples:

```
IoFilter = 0xD000:0xD00F           16-bytes I/O range
```

IRQ

CardBus interrupt line settings. According to PC/AT architecture this value must not exceed 15.

```
IRQ = 10                          10th interrupt
```

ISAEnable

Control setting of ISA Enable bit in Bridge Control Register. Valid values are 0 and 1.

Example:

```
ISAEnable = 1                      Set ISA Enable bit
```

VGAEnable

Control setting of VGA Enable bit in Bridge Control Register. Valid values are 0 and 1.

Example:

VGAEnable = 0 Reset VGAEnable bit

ExCABase

This option is used to mountain CardBus socket register/ExCA registers base address register. Available values: any 32-bit hexadecimal number aligned to 4K boundaries.

Example:

ExCABase = D800000h

LegacyBase

This is PC Card 16-Bit IF legacy mode base address. Available values: any 16-bit hexadecimal number aligned to double-word boundary.

Example:

LegacyBase = 3e0h

**PrimaryBus,
SecondaryBus,
SubordinateBus**

These options control bus number assignments for PCI-to-PCI and CardBus bridges. Available values: any decimal number not greater than 255.

Example:

```
[0:A:0] TI PCI1131 socket
ExCABase      = 0xD1000
PrimaryBus    = 0
SecondaryBus  = 1 Set sec. bus to 1
SubordinateBus = 3 Set sub. bus to 3
```

; Now socket 0 of TI PCI1131 CardBus adapter accepts
; I/O requests to buses from 1 to 3 inclusive

```
[0:A:1] TI PCI1131 socket
ExCABase      = 0xD2000
PrimaryBus    = 0
SecondaryBus  = 4 Set sec. bus to 4
SubordinateBus = 4 Set sub. bus to 4
```

BARMask

This option allows specifying mask of BARs that will be initialized by enabler. If bit in the mask is set, the Enabler will initialize corresponding BAR. If bit is reset, Enabler will ignore corresponding BAR.

Example:

BARMask = 3 Set BAR0 and BAR1

BAR0 - BAR6

These options allow specifying values for card base address registers (BARs).

Example:

BAR0	= 0xFFEFE000	Set BAR0
BAR1	= 0xFD00	Set BAR1

Additional information

How to get Technical Support for APA-1480 Enabler

Please send an E-mail in English (we can't process technical support questions in any other language) to [technical support](mailto:support@tssc.de) (support@tssc.de).

In your request please specify:

1. Description of your problem.
2. The card name **exactly** as it appears on the card.

Please attach to your e-mail following files:

1. Please run APA-1480 Enabler with /V[:<file>] switch (plus all parameters you normally use), capture the output to the file and attach it to your e-mail. E.g.
C:\>CB1480 /M:0xC8000 /V:LOG.TXT
or
DEVICE = CB1480.EXE /M:0xC8000 /V:LOG.TXT
2. CONFIG.SYS
3. AUTOEXEC.BAT
4. Enabler initialization file if one exists.

Example of INI file

Following sample shows an example of UN1480 initialization file for the system with one CardBus and one PCIC compatible adapter

```
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;          UN1480 Enabler. Sample of Initialization file
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

; PCI-2-PCI Bridge between bus 0 and bus2
[0:1E:0]
PreFilter=0x60000000:0x60FFFFFF

; CardBus socket 0
[2:B:0]
ExCABase      = 0xFFEF000
PrimaryBus    = 2
SecondaryBus  = 0x81
SubordinateBus = 0x81
MemFilter0    = 0xFFEF000,4K
MemFilter1    = 0xFAC00000:0xFEBFFFFFF
IOFilter0     = 0xFD00:0xFDFD
IOFilter1     = 0xFC00:0xFCFF
LegacyBase    = 0
IRQ           = 11
ISAEnable     = 0
VGAEnable     = 0

; APA-1480 Card
[81:0:0]
BARMask       = 3
BAR0          = 0xFD00
BAR1          = 0xFFEF000
IRQ           = 11
```

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