Installation Guide

DTC 2x77VL VL-Bus to IDE Cacheing Controller

Part Number 400510-89A

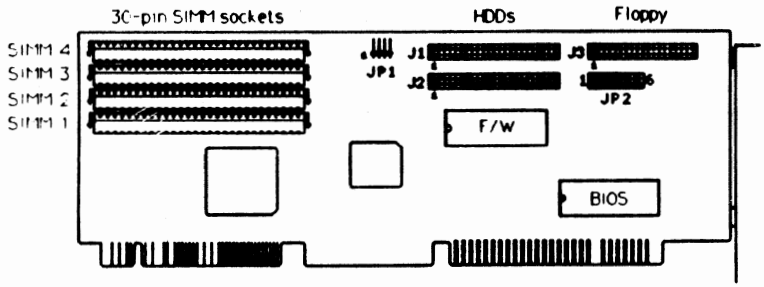

Figure 1 Diagram of the DTC 2x77VL Controller

DTC DATA TECHNOLOGY
CORPORATION

Features

- VESA Local Bus (VL-Bus) operation to 50 MHz
- 32-bit host interface
- On-board BIOS supports up to four IDE drives per adapter
- Compatible with all available IDE hard drives
- Automatic IDE drive recognition
- Auto sensing, auto sizing capability for drive type and memory
- Average disk access time is less than 0.3 msec
- Data transfer rate up to 20 MByte per second
- Uses standard 256Kx9, 1Mx9 and 4Mx9 SIMM DRAMs
- Expandable from 512KB to 16MB using pairs of SIMMs
- On board processor handles cache management
- Supports all major operating systems through the on board BIOS. (OS/2 2.x, DOS, Windows 3.11, and Novell NetWare)
- ANSI ATA-2 compliant
- Uses standard IRQ 14
- Dimensions (w x H) 4.0" x 9.75"
- Power consumption less than 5 watts
- Operating temperature 0° C to 45° C
- One year parts and labor warranty

Floppy Support

Floppy Disk Drives are supported on the DTC 2277VL Only.

SIMM Modules

SIMM Technical Specifications

SIMM Modules installed in the DTC 2x77VL must meet the following requirements:

- Standard 30-Pin ,3-Chip or 9-Chip SIMMs
- 100 ns (Nano Second) or less speed
- Supports 256Kx9, 1Mx9, or 4Mx9 SIMMs

SIMM Installation

A pair of like SIMMS (i.e. two 256x9) MUST be installed in the SIMM sockets at locations SIMM1 and SIMM2. The DTC 2x77VL will NOT operate in a 0K configuration.

For additional Cache Memory, a second pair of SIMMs can be installed in the SIMM sockets at locations SIMM3 and SIMM4. This second pair of SIMMs DO NOT have to be the same configuration as the first pair.

NOTE

The On-Board BIOS contains a Diagnostics routine to test the SIMMs installed in the DTC 2x77VL. It is recommended that this test be run; 1) On first installation of the DTC 2x77VL, 2). After installing additional SIMMs, or 3) After replacing SIMMs. (See the Diagnostics option in the Configuration section).

Hardware Jumpers

Defaults

I/O address	1F0H - 1F7H
HDD Interrupt	IRQ14
BIOS Address	DC000 - DFFFF

JP2 - BIOS Address

JP2 is a jumper block with six horizontally aligned, two-pin jumpers. Position '1' is the two pins closest to the SIMM sockets. The following table lists the available BIOS addresses that may be used to avoid conflicts with existing equipment. The default setting is recommended for most applications and typically does not need to be changed.

JP2 - BIOS Address			
1	**2**	**3**	**BIOS Address**
On	**On**	**On**	**DC000-DFFFF (Default)**
On	Off	On	D8000-DBFFF
Off	Off	On	D4000-D7FFF
On	On	Off	D0000-D3FFF
Off	On	Off	CC000-CFFFF
On	Off	Off	C8000-CBFFF
Off	Off	Off	Disabled

JP2-4	off	Factory Reserved
JP2-5	on	Primary HDD Port
JP2-6	on	Factory Reserved

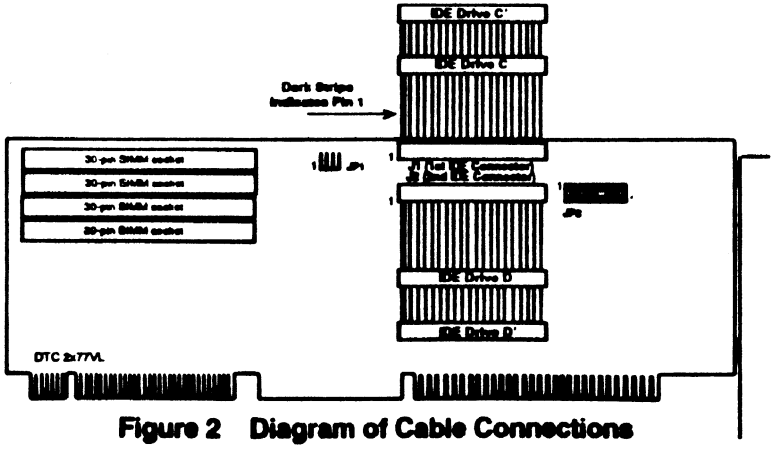

Figure 2 Diagram of Cable Connections

Installation

NOTE:

When connecting a ribbon cable connector, always align the colored side of the cable to Pin 1. On most drives, Pin 1 is the pin closest to the drive's power connector.

1. Prior to installation:
   - check for conflicts with existing equipment. The DTC 2x77VL controller uses a memory segment in the Upper Memory Blocks for the on-board BIOS. In addition, it uses a range of I/O port addresses.
   - Record the drive parameters (cylinders, heads and sectors-per-track) for drive(s) installed in the system.
   - If you are adding the DTC 2x77VL to an existing system, be sure to perform a complete data backup.
   - Set the jumpers on the DTC 2x77VL as needed. Refer to the Hardware Jumpers section.
   - Install at least two SIMM modules at SIMM1 and SIMM2 locations. (See SIMM Module section for details)
2. Power down the computer, all devices connected to it, and disconnect the power cord. Remove the cover.
3. Install the DTC 2x77VL in any available 32-bit VL-BUS slot.
4. Connect the HDD LED to JP1.
5. Connect the Hard Disk Drives. The DTC 2x77VL controller differs from most other IDE cards by using separate cables to connect more than one drive.
   - **If you have only one drive**, set the jumpers on the drive as "Master". Connect the supplied 40-pin ribbon cable connector to J1. Connect the other end of the cable to the IDE/ATA drive. This drive will be recognized as drive "C".
   - **If you have two drives**, then you must decide what configuration to setup.

   Two drives installed as C: and D:, connect the first drive as described in Step 5. Set the jumpers on the second drive to "Master" mode. Connect the second drive to J2. This drive will be recognized as drive "D".

   Two drives installed as C: only, you want to link two drives into one logical drive, set the first drive as "Master" and the second drive as "Slave". Connect both drives to the same 40-pin data cable. If you connect these two drives to J1, they will be recognized as drive "C". If you connect them to J2, they will be

recognized as drive "D". Refer to Figure 2, The drives are shown as C and C', or D and D'.

6. Close the computer cover and power it on.
7. Enter the System CMOS Setup utility. Set the Hard Disk Drive type to Drive Type 1.
8. The system will boot up and display the following message:

Primary IDE Controller
Press F2 or F6 to enter advanced configuration menu
Press ESC or ENTER to bypass cache DRAM test

NOTE:
If this is the first time the DTC 2x77VL is being installed in the system, press <F2> to enter the Main Configuration Menu. Refer to the next section on "Configuration" for detailed instructions.

Configuration

During the system boot-up process, the DTC 2x77VL controller will automatically size the cache memory on board and display it on the screen. It will also determine the type of drives installed. Press <F2> to enter the "Main Configuration Menu". The screen will display the following:

IDE Cache Controller
Exit without updating EEPROM **Customized configuration** **View detailed drive information** **Jumper setting information** **Low level format utility** **Diagnostics** **Initialize hot fix area** **Update EEPROM and Exit**
Press [arrow keys] or capitalized character to select function
FIRM-VER: X.XX Date: XXXX-XXX-XX **BIOS-VER: X.XX Date: XXXX-XXX-XX**

Use the UP and DOWN arrow keys to make your selections, or enter the first letter of the desired option. Run the "Customized configuration " option to verify correct drive setup information.

Customized Configuration Menu

This option allows you to fine tune the performance of the DTC 2x77VL controller. The screen will display information similar to the following:

	Cylinders	Heads	Sectors	Attribute	Capacity
IDE BUS1 drive 0 (C)	762	8	39	Drive C	116 MB
IDE BUS1 drive 1 (C')	0	0	0	Disabled	0 MB
IDE BUS2 drive 0 (D)	0	0	0	Drive D	0 MB
IDE BUS2 drive 1 (D')	0	0	0	Disabled	0 MB

	Cylinders	Heads	Sectors	Track-remapping	Capacity
HOST DRIVE C	762	8	39	Enabled	116 MB
HOST DRIVE C	0	0	0	Enabled	0 MB

Cache line size = 16K	Write mode = Write back
Read ahead segments = 3	Write time threshold = 0.5s
Cache status = Enabled	Drive C HOT FIX = Disabled
Optimized for = DOS 33/40 MHz	Drive D HOT FIX = Disabled
Int13 BIOS = CTLR BIOS moved to RAM	

Press [arrow keys] to move between field, use [SPACE], [PGUP], [PGDN] or 0 - 9 to select or edit the field, ESC or F4 to exit.

The following fields can be set:

1. Attribute - set to drive C, C', D or D'. The default mode is 'Disable'. Select 'Link' to link two physical drives into one logical drive.
2. Track Remapping for HDDs > 528 MBytes - this is normally set to 'Enabled'.
3. Cache line size - this is normally set to 16KB.
4. Read ahead segments - this is normally set to 3.
5. Cache control - this is normally set to 'Enabled'.
6. Optimized for - this is normally set for DOS 33/40 MHz or DOS depending on the cache controller card.
7. Write Mode - this is normally set for Write back.
8. Write time threshold - this is normally set to 0.5 sec.
9. Drive C HOT FIX is disabled.
10. Drive D HOT FIX is disabled.

View Detailed Drive Information

The screen that will display information for each drive connected to the DTC 2x77VL card similar to the following.

ID BUS 1 drive 0 detailed information	
Drive's model	Conner Peripherals 120MB - CP3H104
Firmware revision #	2.55
Serial #	NBGXR1
Total physical cylinders	762
Heads per cylinder	8
Sectors per head	39
Drive's buffer type	Dual port multisector buffer & read caching
Drive's buffer size	64 sectors
PIO timing mode	Mode 0 : cycle time = 600 ns
DMA capability	Not supported
DMA timing mode	Not supported
Read write multiple capability	32832 sectors per interrupt
Doubleword I/O capability	Not supported
Format speed tolerance gap	Not required
Track offset option	Not available
Data strobe offset option	Not available
Rotational speed tolerance	> 0.5 %
Disk transfer rate	> 10 Mbps
Spindle motor control option	Not implemented
Head switch time	> 15 u sec
Encoding type	non-MFM, hard-sectored
Press UP/ DOWN key for next page, ESC or F4 to exit	

Jumper Setting Information

The screen will display information similar to the following showing jumper options and currently selected jumper positions.

JUMPER SETTING

```
        1 2 3 4 5 6                    0 : jumper installed
JP2                                    1 : jumper removed
     |  |  |  |  |  |->Reserved
     |  |  |  |  |->Hard disk I/O : 0 primary   1 secondary
     |  |  |  |->Floppy : 0 enabled   1 disabled
     |  |  |->ROM address
                 000 DC000--DFFFF    100 D0000--D3FFF
                 001 DC000--DFFFF    101 CC000-CFFFF
                 010 D8000--DBFFF    110 C8000--CBFFF
                 011 D4000--D7FFF    111 ROM disabled
```

Current Jumper Setting

```
        1 2 3 4 5 6
JP2          |->0
     |  |  |  |->0 : Hard disk I/O primary
     |  |  |->0 : Floppy enabled
     |  |->0 : ROM address at DC00:0000
```

Press ESC or F4 to exit

Low Level Format Utility

This option should be used only when bad sectors are found on the drive. Check with the drive's manufacturer before proceeding.

IDE BUS1 drive0
Cylinders = 762 Heads = 8 Sectors = 39 Interleave = 1
Format status : CYL = 0 , HEADS = 0
Press UP DOWN for next drive, ESC or F4 to exit Press F to begin low level format

Diagnostics

The screen will display information similar to the following for hardware level diagnostics.

IDE Cache Controller Diagnostic	ERROR COUNT	TEST COUNT
CPU test :	0	0
Timer test :	0	0
SRAM test :	0	0
EEPROM checksum :	0	0
EPROM checksum :	0	0
Cache DRAM test : Pattern = 5555		
Bank0 = 256 KB Status = 0 KB OK	0	0
Bank1 = 0 KB Status = 0 KB OK	0	0
Bank2 = 0 KB Status = 0 KB OK	0	0
Bank3 = 0 KB Status = 0 KB OK	0	0
IDE BUS1 drive0 connection test :	0	0
IDE BUS1 drive1 connection test :	0	0
IDE BUS2 drive0 connection test :	0	0
IDE BUS2 drive1 connection test :	0	0
Press S for one loop, I for infinite loop test. Press ESC or F4 to abort test or exit.		

Initialize HOT FIX area

This option should only be turned on when installing a new drive. It will reserve some tracks for relocation of bad sectors.

NOTE:
This should be initialized before installing DOS.

Exit the Main Menu

If any options have been changed, choose "Update EEPROM & Exit" option to update the DTC 2x77VL controller. Otherwise, choose "Exit without updating EEPROM".

Troubleshooting

This section lists some of the problems the user might encounter following installation and configuration of the DTC 2x77VL.

PROBLEM: The BIOS sign on mesage is not displayed.
SOLUTION: Verify that nothing in the system is using the same resources as the DTC 2x77VL. Check that there is no conflict with the BIOS address range. Check the VGA card, and disable Shadow RAM.

PROBLEM: DTC 2x77VL Hangs or Fails when you access the Hard Disk Drives.
SOLUTION: 1) There must be a minimum of two SIMMS installed in the DTC 2x77VL before it will operate properly. 2) Verify that the CMOS drive type has been set to "Drive Type 1". 3) Remove or disable any other IDE port that is set for I/O address range 1F0H - 1F7H. 4) Check that no other card in the system is using IRQ14. 5) Verify that the HDDs have been Partitioned and Formatted using the DOS "FDISK" & "FORMAT" commands.

PROBLEM: Installed two Hard Disk Drives, but can only access the "C:" drive.
SOLUTION: Recheck the installation. The second drive should be connected to connector J2 to be seen as the "D:" drive. Verify that the "D:" drive has been installed using the system CMOS setup.

PROBLEM: Installed two Hard Disk Drives as a single logical drive (linked), but can not access the entire logical drive capacity.
SOLUTION: Verify that the drives have been linked in the "Custom Configuration Menu". The second drive (Slave) attribute field must indicate that it is linked to the first drive (Master).

Technical Support

Phone Support **(408) 262-7700**

Technical support personnel are available Monday through Friday (excluding holidays) from 7:30 am to 5:00 PM (Pacific Time Zone).

Automated FAX **(408) 942-4005** (24 hours)
Bulletin Board System (BBS) **(408) 942-4010** (24 hours)

The **BBS** setup requires the following modem settings:

Baud Rate: 1200 - 14400 bps **Data Bits:** 8 **Stop Bit:** 1 **Parity:** None

After you have registered and created your own password, you will be brought to the Main Board Menu. To access a conference form the Main Board, use the **"J"** command to **Join** a Conference. Once you have joined the appropriate conference, type **"F"** for a list of the Files Directories. The Files Directories are divided into three (3) subdirectories: **"1"** is Install Guides and Application Notes, **"2"** is Drivers, and **"3"** is for Uploads.

Sales Support

DTC Data Technology Corporation offers a full line of AT, EISA, EISA, and PCI bus controllers for IDE/ATA and SCSI devices. For information on other products, contact the nearest distributor or contact DTC at one of the following numbers:

Phone **(408) 942-4081** (8am - 5pm PST)
Sales Support FAX **(408) 942-4027** (24 hours)

FCC Compliance

This device complies with the Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. However, there is no guarantee that interference will not occur in a particular installation. DTC Data Technology is not responsible for any television, radio or other interference caused by unauthorized modification of this product.
Modifications to this equipment that are unauthorized by the manufacturer may void the user's right to operate this device according to FCC rules.