

Software Installation Manual  
for Xenix, Unix and AIX-PS/2  
Interactive Unix  
With the CC Range of  
Serial Communications Cards

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Note: References to the TCL+8DB throughout the manual apply similarly to the other cards in the TCL direct and buffered range.

## Chapter 1 Introduction

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The TCL CC device driver is a set of routines which communicate with the CC/X Multiport card and provide a means by which the Operating System can control the card to perform I/O operations.

### 1.1 Precautions

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- ! Before attempting a driver installation or any operation where the operating system is to be altered in any way, it is extremely advisable to backup the working user files.*
  
- ! It is also not advisable for other users to be logged on to the system during this operation.*
  
- ! Do not hit <DEL> or <RESET>, power down the system, or in any way try to interrupt the driver installation.*
  
- ! Do not have any background processes running.*

## 1.2 General instructions

---

In order to install a CC range device driver, certain steps should be taken.

- ! A CC Multiport card must be installed in your system (See hardware installation manual).
- ! The Link Kit must be installed on the system (SCO Only).
- ! Know how to use one of the text editors (Xenix 286 only).
- ! Have the 386/ix operating system installed as a minimum requirement (Interactive Unix only).
- ! Have the Base operating system and the Extensions installed as a minimum requirement (AIX-PS/2 only).

All the operations described as part of the installation process are carried out in the system maintenance (root or super-user) mode.

References to the CC range throughout the manual apply similarly to the other cards in the TCL direct and buffered range.

TCL distributes the CC range device driver on 3½ (1.44 Mb) and 5¼ (1.2 Mb and 360 Kb) floppy disk.

## Chapter 2 Installation

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Before installing the driver it is necessary to login as the super-user.

### 2.1 Installation Guide

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For SCO Unix and Xenix the drivers are installed using the standard system utilities provided with the operating system.

#### 2.1.1 Selected IRQ

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The installation scripts will get the free IRQs from the system configuration files and requests the user intervention to select one of them when more than one IRQ is free. The chosen IRQ will be written to the driver object file in order to enable the card interrupting the CPU when enabling a port. So, you should set the hardware interrupt level to be the same as the IRQ selected during the installation time (please refer to the Hardware installation manual).

*Note: Changing the hardware interrupt level will result in a number of problems, among them: none of the ports will function. This is because of the CC range driver has not installed to look after the changed hardware interrupt level. The only way out of this problem is to re-install the driver again from the distribution disk.*

#### 2.1.2 I/O base address

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The CC range driver will search for the multiport card(s) in the I/O address space between 0x180 to 0x73f. So, you don't need to re-install the driver when changing the card address.

## **2.2 Updating the system generation link file with SCO Xenix 286**

---

To reconfigure the kernel, the system generation link file `/usr/sys/conf/link_xenix` must be edited to contain the CC range driver library name `p8dlib.a`.

The CC range driver library name must be placed in the "ld" command line prior to any of the object library references (`_libxxx.a`) and following all other object file references (i.e. it must follow: `start.o`, `c.o`, `uts.o`, `oem.o`, etc..).

Example: If the system generation file was previously:

```
start.o c.o uts.o oem.o space.o tab.o kid.o \  
../ml/libml.a ../mdep/libmdep.a ../sys/libsys.a \  
..
```

it should be changed to:

```
start.o c.o uts.o oem.o space.o tab.o kid.o \  
p8dlib.a ../ml/libml.a ../mdep/libmdep.a ../sys/libsys.a \  
..
```

## **2.3 Saving files as a recommended safeguard**

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### **2.3.1 SCO Xenix**

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using the XENIX command `mv`, save the following files by renaming them:

```
/usr/sys/conf/c.o  
/usr/sys/conf/space.o
```

### **2.3.2 AIX-PS/2**

---

The following files should be backed up:

```
master  
system
```

If system generation fails, these files can then be restored.

## 2.4 Installing the driver

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- ! The TCL system diskette must be inserted into the drive, then the driver can be installed as follows:-

### 2.4.1 SCO Xenix 286

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Type install in order to enter the install utility to extract the driver distribution files and install the driver.

### 2.4.2 SCO Xenix 386 and SCO Unix

---

The release disk for these systems contains two packages, for TCL's intelligent and direct multiport cards, for both SCO Xenix and SCO Unix. The SCO custom utility is used to install the appropriate driver.

If you are updating an earlier version of the driver you must remove the old driver before installing the new one. Follow the instructions in section 3.3.

To install the driver the following steps are required:

- ! If you are using Xenix, save the following files by renaming them with the mv command.

```
/usr/sys/conf/c.o /usr/sys/conf/space.o
```

These files can be restored if system generation fails.

- ! Insert the release diskette into the (first) drive.
- ! Type custom to run the custom utility.
- ! Select option to add a new product.
- ! Select option to list the available packages.
- ! Select option to install one or more packages.

## Software Driver Installation Manual for the CC Range

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! The installation menu will display the available packages (under the field name) on the TCL distribution diskette. To install the CC8/CC8DB driver, select TCL+8DB.

Note 1: Recommended I/Obase address is 2c0h and Interrupt level 5.

Note 2: The DEL key can be used at any stage to abort the installation gracefully.

Note 3: With SCO Unix, if you select the Entire Product option both the intelligent and the direct drivers will be installed into the kernel.

Note 4: The above procedure installs a driver from whichever diskette drive custom uses as default. To use a different drive use one of the following commands:

Drive	Size	Capacity	Command
0	5¼"	360 kb	custom -m /dev/rfd048ds9
0	5¼"	1.2 Mb	custom -m /dev/rfd096ds15
0	3½"	1.44 Mb	custom -m /dev/rfd0135ds18
1	5¼"	360 kb	custom -m /dev/rfd148ds9
1	5¼"	1.2 Mb	custom -m /dev/rfd196ds15
1	3½"	1.44 Mb	custom -m /dev/rfd1135ds18

Note: The SCO XENIX 386 driver installation is defaulted to use interrupt level 5. The card must therefore be configured for IRQ5 (see Hardware installation).

### 2.4.3 Interactive Unix

---

! Type sysadm to enter the sysadm (system administration) utility

! Select option 5 (softwaremgmt) to access the software management menu

! Select option 1 (installpkg) and follow the instructions given to install the driver.

The sysadm utility may also require details of the relevant drive specifications.

### 2.4.4 AIX-PS/2

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- ! Enter: `cpio-idm </dev/rfd0`.
- ! The driver can then be installed using the `install.tcl` installation script.
- ! During installation, a series of instructions is displayed on the screen. Error messages are also displayed, a list of which can be found in Appendix B.

The driver installation script will check on the free IRQs in the system, one of which must be chosen for the card(s). the number of terminals required must also be entered.

## Chapter 3 Driver removal

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Before removing the driver it is necessary to login as the super-user.

### 3.1 Removing the driver from the kernel with SCO Xenix 286

---

- ! The CC range driver library name p8dlib.a should be removed from the link file /usr/sys/conf/link\_xenix.
- ! Edit the following files to remove any reference to the TCL+8DB driver, look for any line starts with the string "p8d":
  - /usr/sys/conf/xenixconf
  - /usr/sys/conf/master
- ! Restore the object files saved earlier:
  - /usr/sys/conf/c.o
  - /usr/sys/conf/space.o
- ! Edit the following files to remove any reference to the TCL+8DB, look for any line starts with the string "tty??pd":
  - /etc/ttys
  - /etc/ttytype
- ! Delete the TCL+8DB driver special files by using the following command:
  - rm /dev/tty??pd
- ! The system should be regenerated by using the following commands:
  - cd /usr/sys/conf
  - ./link\_xenix

### 3.2 Ensuring the driver is installed

---

- ! Before attempting to remove driver it is necessary to ensure the driver is installed. This can be carried out as follows:-

### 3.2.1 SCO Xenix 386 and SCO Unix 386

---

- ! Run the custom utility.
- ! Select the option to list the available packages (TCL Device Drivers).

### 3.2.2 Interactive Unix

---

- ! Type displaypkg. If the driver is installed, the following message is displayed:  
TCL CC Range Device Driver - Version ???

## 3.3 Removing the driver

---

### 3.3.1 SCO Xenix 386 and SCO Unix

---

- ! Run the custom utility.
- ! Select the option to Remove one or more packages (TCL Device Drivers).
- ! Enter the string which identifies the CC range driver.
- ! Exit the custom utility.
- ! Delete the product permission list file with the command:  
rm /etc/perms/tcldrv

Note: Earlier versions of the SCO Unix driver were installed with the installpkg utility. These should be removed with removepkg.

### 3.3.2 Interactive Unix

---

- ! To remove the CC range driver, enter the following command:  
removepkg  
and select the number which corresponds to the CC range driver.

## Chapter 4 Booting the new system

---

- ! In order to boot the newly generated Operating system, the system should be halted by entering:  
shutdown
  
- ! The rebooting procedures for the various operating systems are as follows:-

### 4.1 Xenix and Unix

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Press any key then at boot prompt:

SCO Xenix 286 - enter: xenix.new

SCO Xenix 386 and Unix - enter the Xenix or Unix name chosen during driver installation.

### 4.2 Interactive Unix

---

The newly generated operating system will boot by default.

### 4.3 AIX-PS/2

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Enter: unix.std

## Chapter 5 Enabling (disabling) a terminal line

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- ! With CC Multiport cards up to 32 more users can have simultaneous access to the Operating System. Before these additional users can use the system, the terminals must be enabled.

Note: see hardware installation manual for details of connections

- ! Once the driver is installed, the terminals must be enabled for the Operating system using the file names listed in Appendix A.
- ! When disabling a terminal the power supply to that terminal must be turned off.
- ! To enable (disable) a terminal line it is necessary to login as the super-user. Terminals are enabled (disabled) for the various Operating Systems as follows:

### 5.1 SCO Unix and Xenix

---

- ! Enter enable (disable) command with the terminal file name listed in appendix A. E.g. to enable(disable) terminal 1, connected to port one of a CC Multiport card, enter:
  - enable (disable) /dev/tty01pd - SCO Xenix
  - enable (disable) /dev/ttypd01 - SCO Unix

### 5.2 Interactive Unix

---

- ! Enter sysadm utility
- ! Select option 7 (ttypgmt) to enter the TTY management menu.
- ! Select option 3 (modtty) and enter the terminal file name (see Appendix 1). Change its state to on (off), select your line setting and answer y(es) to install the new characteristics.

### 5.3 AIX-PS/2

---

- ! To enable a terminal, the AIX devices command must be run. This command, when using the change option, will create two stanzas for the selected terminal; one to reference the terminal in the system ports file, the other to reference the terminal in the system initialisation table file.

Note: Devices' delete and add options are not supported for terminals attached to the CC Multiport card.

- ! Enter: `penable (pdisable) /dev/` followed by the terminal file name (see Appendix A).
- ! When enabling a terminal it should be switched On and the <RETURN> key pressed. A 'login' message will be displayed, at which point it is possible to login and use the system.

## Chapter 6 Setting up the serial ports

---

It is possible to set up each port of the multiport card(s) individually as follows:

- ! Login as the super-user.
  
- ! Ensure that terminal line is disabled (see chapter 5)

### 6.1 SCO Unix and Xenix

---

- ! The mode field for the terminal line in the file:
  - `/etc/ttys` for SCO Xenix
  - `/etc/inittab` for SCO Unixmust be modified. The mode field is a single character or group of characters defining the line settings for the terminal and should match one of the field names in the file
  - `/etc/gettydefs`

### 6.2 Interactive Unix

---

- ! Type `sysadm` to enter the `sysadm` (system administration) utility
  
- ! Select option 7 (`tymgmt`) to access the TTY management menu
  
- ! Select option 3 (`modtty`) and enter the terminal file name (see Chapter 1). Change its state to off, select your line setting and answer y(es) to install the new characteristics.

### 6.3 AIX-PS/2

---

- ! Run the AIX's `devices` command. For more information, please refer to the AIX's commands reference manual.
  
- ! The terminal line should then be enabled (see chapter 5).

### 6.4 Flow control

---

The Flow control setting specifies the techniques which are used by the terminal (or printer, etc) to stop the computer transmitting, and by the computer to stop the terminal transmitting. This is known as a handshake. The following settings are supported by the CC range driver:

#### 6.4.1 Off

---

No flow control. May be satisfactory at low data rates.

#### 6.4.2 XON/XOFF

---

The computer and the terminal stop each other transmitting by inserting a control character (XOFF) in the data stream and cause transmission to restart by sending another character (XON). This is known as software handshake and does not require a special cable. The terminal should also be set to XON/XOFF.

#### 6.4.3 CTS

---

A low level on the CTS input of the port stops the computer transmitting. This is normally recommended with terminals. The cable should link DTR output of the terminal to the CTS input of the port (please refer to the hardware installation manual for further information). The terminal itself should be set to use DTR flow control.

Note: The TCL+8DB device driver supports the stty command to modify the line configuration.

## APPENDICES

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### Appendix A Terminal file names

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The terminal file names under the different operating systems are as follows:-

	Channel	AIX	Unix Systems	Xenix Systems
Card 1	1	pd01	ttypd01	tty01pd
	2	pd02	ttypd02	tty02pd
	3	pd03	ttypd03	tty03pd
	4	pd04	ttypd04	tty04pd
	5	pd05	ttypd05	tty05pd
	6	pd06	ttypd06	tty06pd
	7	pd07	ttypd07	tty07pd
	8	pd08	ttypd08	tty08pd
Card 2	1	pd09	ttypd09	tty09pd
	2	pd10	ttypd10	tty10pd
	3	pd11	ttypd11	tty11pd
	4	pd12	ttypd12	tty12pd
	5	pd13	ttypd13	tty13pd
	6	pd14	ttypd14	tty14pd
	7	pd15	ttypd15	tty15pd
	8	pd16	ttypd16	tty16pd

Cont . . .

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Card 3	1	pd17	ttypd17	tty17pd
	2	pd18	ttypd18	tty18pd
	3	pd19	ttypd19	tty19pd
	4	pd20	ttypd20	tty20pd
	5	pd21	ttypd21	tty21pd
	6	pd22	ttypd22	tty22pd
	7	pd23	ttypd23	tty23pd
	8	pd24	ttypd24	tty24pd
Card 4	1	pd25	ttypd25	tty25pd
	2	pd26	ttypd26	tty26pd
	3	pd27	ttypd27	tty27pd
	4	pd28	ttypd28	tty28pd
	5	pd29	ttypd29	tty29pd
	6	pd30	ttypd30	tty30pd
	7	pd31	ttypd31	tty31pd
	8	pd32	ttypd32	tty32pd

## Appendix B Troubleshooting

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### 1 Troubleshooting during Unix driver installation

---

Sometimes things can go wrong in the installation procedure. The following errors are possible during driver installation and can be rectified as follow:

Error Code 11	You are not logged in with super-user mode
	Only the super-user can install the driver. Exit, and login as root, or use su.
Error Code 12	There is no /etc/conf/sdevice.d directory
	Make sure that the directory /etc/conf/sdevice.d exists otherwise UNIX installation is not complete.
Error Code 13	There is no /etc/conf/pack.d directory.
	Make sure that the directory /etc/conf/pack.d exists otherwise UNIX installation is not complete.
Error Code 14	There is no /etc/conf/bin directory
	Make sure that the directory /etc/conf/bin exists otherwise UNIX installation is not complete.
Error Code 15	There is no /etc/conf/node.d directory.
	Make sure that the directory /etc/conf/node.d exists otherwise UNIX installation is not complete.
Error Code 16	Unable to create a system file entry for CC range driver.
	System command failure. Make sure that you have enough disk space.
Error Code 17	Unable to create a MASTER entry for CC range driver.
	System command failure. Make sure that you have enough disk space.

Error Code 18	/etc/conf/bin/idbuild failed.
	System command failure. Make sure that the CC range driver is not installed already, you have enough disk space and an uncorrupted copy of /etc/conf/bin/idbuild
Error Code 19	Unable to add the CC range device driver configuration data.
	System command failure. Make sure that the P8D/B driver is not installed already and you have an uncorrupted copy of /etc/conf/bin/idinstall

After rectifying the error, try to install the driver again.

## 2 Troubleshooting during AIX driver installation

---

Error Code 11	You are not logged in with super-user mode.
	Only the super-user can install the driver. Exit, and login as root, or use su.
Error Code 12	There is no writeable master file in /etc.
	Make sure that the file /etc/master exists
Error Code 13	There is no writeable system file in /etc..
	Make sure that the file /etc/system exists
Error Code 14	Unable to make +8D special file.
	System command failure. Make sure that you have an uncorrupted copy of mknod.
Error Code 15	Unable to add CC range port extension to /etc/master.
	System command failure in updating /etc/master. Make sure that you have an uncorrupted copy of cat.

Cont . . .

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Error Code 16	Unable to add +8D extension to /etc/system.
	System command failure in updating /etc/system. Make sure that you have an uncorrupted copy of cat.
Error Code 17	ar failed to archive /usr/sys/386/p8d16.o into /usr/sys/386/386lib.a.
	System command failure. Make sure that you have enough disk space and an uncorrupted copy of ar.
Error Code 18	Unable to change directory to /usr/sys.
	Make sure that the directory /usr/sys exists.
Error Code 19	newkernel failed.
	System script execution failure. Make sure that you have enough disk space and an uncorrupted copy of newkernel
Error Code 20	There is no /local/tmp/sysgen.386 directory.
	Make sure that the directory /local/tmp/sysgen.386 exists otherwise AIX installation is not complete.
Error Code 21	There is no /etc/ddi directory.
	Make sure that the directory /ect/ddi exists otherwise AIX installation is not complete.
Error Code 22	Failed in copying the customisation helper program.
	System command failure. Make sure that you have an uncorrupted copy of cp.
Error Code 23	Failed in copying /etc/ddi/p8d.
	System command failure. Make sure that the directory /etc/ddi exists and you have an uncorrupted copy of cp.
Error Code 24	Failed in copying /etc/ddi/p8d.kaf.
	System command failure. Make sure that the directory /etc/ddi exists and you have an uncorrupted copy of cp.

**Notes**

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