Configuration Editor

Software Manual

Version 5 Software

Safety

Procedures in this manual may contain Warnings, Cautions, and Notes. A Warning gives the reader information which, if disregarded, could cause injury or death. A Caution provides the reader with advice which, if disregarded, could cause damage to the equipment. A Note furnishes additional information for added emphasis or clarity.

The customer is responsible for assessing his or her ability to carry out the procedures in this manual. Make sure you understand a procedure and the precautions necessary to carry it out safely *before* beginning. If you are unsure of your ability to perform a function, or have questions about the procedures listed in this manual, contact Eurotherm Drives Customer Service at (704) 588-3246.

WARNING!

This software is used specifically to configure the control of potentially dangerous motor control systems. The user assumes all liability and risk for the performance, application and reliability of all control systems configured with this software. It is the user's responsibility to understand thoroughly and to check independently all configurations *before* commissioning any equipment controlled by this software. Eurotherm Drives, Inc. accepts no liability for the application of this software.

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I. LIMITED WARRANTY. Eurotherm Drives warrants that:

a. The SOFTWARE will perform substantially in accordance with the accompanying printed materials for a period of ninety (90) days from the date of receipt; and

b. Any hardware accompanying the SOFTWARE will be free from defects in materials and workmanship under normal use and service for a period of one (1) year from the date of receipt.

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a. Return of the price paid or

b. Repair or replacement of the SOFTWARE or hardware that does not meet Eurotherm Drives' limited warranty and that is returned to Eurotherm Drives with a copy of your receipt.

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Chapter 1   INTRODUCTION

PRODUCT DESCRIPTION

The *LINK* product line is a distributed control system manufactured by Eurotherm Drives which uses fiber optic technologies in industrial control applications.. The *LINK* network connects all *LINK*-compatible motor controllers (drives) and modules using a high-speed fiber optic serial communications link. By using the *LINK* technology, customers eliminate conventional signal and control wiring required by current industrial control systems. Programming of *LINK* products is performed using the software tool Configuration Editor (ConfigEd).

Using the software tool Configuration Editor (ConfigEd), you can access, develop, install, modify, and monitor all drive and module programs for the entire first generation *LINK* and *LINK*2 product range. ConfigEd employs a graphical user interface which includes sophisticated drawing tools which allow you to create, diagram, and document your control scheme in an easy-to-understand visual format. This visual format makes commissioning and trouble-shooting of industrial control systems simpler and more intuitive for the average user.

> NOTE.
>
> 1. This manual assumes that you are proficient in using either a "mouse" or similar pointing device on a personal computer (PC) . Additionally, to fully benefit from this software package, you must be familiar with the basic concepts of, and the manipulation of data within, the Microsoft Windows™ environment.
>
> 2. ConfigEd's software blocks use standard Boolean logic symbols (e.g., AND, NAND, OR, NOR, and XOR). You must have a basic understanding of Boolean logic.
>
> 3. Before using ConfigEd, you must be familiar with the basic concepts of the *LINK* fiber optic control network as described in the **LINK Overview Manual** (HA350678).

A working knowledge of AC and DC drives is recommended. Specific training in *LINK* drives is recommended, but not immediately required.

For those using this product on a regular basis, training by Eurotherm Drives is available on both ConfigEd and *LINK* system design.

In addition to the software tool ConfigEd, this package also includes *LINK* Manager, a utility which provides you with the facilities to manage both your *LINK* database and the projects you create on your PC. Refer to the **Manager User Manual** (RG352101) for information on this product.

NEW FEATURES

For users of ConfigEd prior to Version 5, the following is a brief list of new major features:

- Support added for all new generation LINK2 products.
- New editing commands supporting copying, cutting, pasting, deleting, and moving function blocks and their associated connections within the same configuration or *between* different configurations.
- The ability to install information into *LINK* modules which supports extracting the configuration from the modules without the original project files on your PC.
- Graphical Setup and Monitor (SAM) features where data from LINK modules is displayed on your configuration as originally drawn in lieu of the text based format of previous versions.
- A new on-screen potentiometer feature for incrementing and decrementing SAM parameters while on-line with a *LINK* control system.
- Four different SAM communication profiles may be stored for future use.

Key Features

As previously supported by ConfigEd Version 4.x, you still can:

- Create and modify configurations for *LINK* drives and modules.

  NOTE. You do not need *LINK* hardware to create or modify configurations for your control system. All configurations may be generated off-line on your PC and installed later into the appropriate devices while on-line with your *LINK* system.

- Create project folders for your configurations.

- Setup and monitor the performance of installed configurations while on-line with your *LINK* system.

- Generate project documentation.

WARNING!

Errors in configurations can cause unexpected and dangerous machine operation. Do *not* install configurations, or put any *LINK* system controlling machinery into service, unless it has been first thoroughly checked and tested by a qualified engineer or technician.

WARNING!

Installing configurations will interrupt drive and module processing. It is strongly recommended configurations be installed only after the equipment controlled by the *LINK* system has been fully stopped and disabled.

Structure of This Manual

Chapters 1 through 3: These chapters give a brief overview of ConfigEd, a listing of the parts included with your ConfigEd package, and instructions on how to install and setup ConfigEd.

Chapter 4: This chapter is an in-depth reference guide to all ConfigEd functions related to creating, configuring, and installing *LINK* configurations and managing *LINK* projects.

Chapter 5: This chapter discusses ConfigEd's displaying, documenting, and printing features.

Chapter 6: This chapter gives an overview of all the functions related to the Setup and Monitor feature within ConfigEd.

Chapter 7: This chapter gives tips on troubleshooting in ConfigEd.

Appendix A: This appendix gives information on communicating to *LINK* network devices with your PC through a *LINK* module's RTNX (RS232) port.

Appendix B: This appendix is a quick reference guide to all ConfigEd functions and features. It is a condensed version of Chapters 5, 6, and 7.

Appendix C: This appendix is a tutorial instructing beginners on how to configure an elementary two node *LINK* system. It is recommended that all new ConfigEd users work through the tutorial.

Text Conventions

For clarity, all references to ConfigEd's functions, keyboard commands, or parameters appear in `courier` type in this manual.

Chapter 2   PACKAGE CONTENTS & HANDLING

PACKAGE CONTENTS

Before you install and begin using ConfigEd, first verify that your package is complete. Your ConfigEd package should include:

- 3.5" floppy diskettes (Part Number RD350672G000) containing the ConfigEd and Manager software programs and the *LINK* database files. At the time of publication of this manual, four diskettes were required with each disk containing the following files:

Disk 1:	CTL3D.DLL	DATABASE.001
	ID.DAT	INSTALL.EXE
	MANAGER.EXE	XWMBA415.DLL
	XWMHN415.DLL	XWMTE415.DLL

    Disk 2:   DATABASE.002

    Disk 3:   DATABASE.003

    Disk 4:   DATABASE.004

- **Configuration Editor Software Manual, Version 5** (Part Number RG353792)

- **Manager User Manual** (Part Number RG352101)

- *LINK* **Overview Manual** (Part Number HA350678)

- *LINK* **Hardware Manual and Application Notes** (Part Number HA352136)

- **Installation Instruction for *LINK* Software** (Part Number HG352017)

- User licenses for ConfigEd and Manager (Part Number RH352747)

- Cable assembly, DE-9 to RJ11, three-meter length, surge arrester (Part Number CM353470)

- Zipper pouch for cables and adapters (Part Number IC351351)

- Binder for storing manuals and diskettes (Part Numbers IC351284, IC351858, IA352234U000, and IA352235)

- Diskette holder to fit binder (Part Number IC351283)

If any items are missing, or if the package or any of its contents is damaged, contact the Eurotherm Drives Customer Service Department at (704) 588-3246.

Handling

Take proper care in the handling the materials used for the program. Keep the distribution disks in a dry, clean environment with a relatively constant range of temperature and humidity.

Caution

Magnetic or electrical fields may erase the information on the distribution diskettes. Keep the program diskettes far from magnetic and electrical field sources, including permanent magnet motors.

Chapter 4   CONFIGED FUNCTIONS

This chapter describes all of ConfigEd's features related to creating, editing, and installing *LINK* configurations, as well as, managing *LINK* projects (refer to *Chapter 5 Displaying, Documenting & Printing* for details on displaying and printing your *LINK* projects). For information on ConfigEd's Setup and Monitor (SAM) features, refer to *Chapter 6 SAM Functions* while a quick reference for all of ConfigEd's features appears in *Appendix B Quick Reference*.

THE SSD_*LINK* DATABASE

The ConfigEd software package includes the `SSD_LINK` database which contains all the files required to build *LINK* configurations. It occupies about 15 megabytes of hard disk space on your computer and must be accessible by the ConfigEd program for all of its features to work properly. As the number of function blocks and *LINK* module types grow, more disk space will be required. While running, ConfigEd continuously accesses the database and reports any file errors to the `Scratch Pad`. Refer to Appendix A of the `LINK Overview Manual` (HA350678) for a description of the file structure of the `SSD_LINK` database.

ORGANIZING YOUR WORK

A *LINK* project is a logical grouping of configurations for one coordinated system controlling a production line (e.g., a group of *LINK* drives supplied by Eurotherm which control the motors of a printing press). Within any *LINK* project, you may create configurations for any of the modules supported by ConfigEd (i.e., AC drives, DC drives, operator stations, processor modules, etc.). Categories, in turn, are used to keep all related *LINK* projects in some logical grouping.

As an example of project grouping, consider a printing facility which has three separate presses, each having a series of motor controllers, operator stations, tension transducers, and winders. A separate *LINK* system controls each press while a unique *LINK* project (in this case, Web 1, Web 2, Web 3) contains all the software configurations associated with the *LINK* motor control system. For each *LINK* module or drive within the system, one software configuration exists which contains the necessary function blocks to control the printing process. To further organize the work, all projects relating to particular department within the plant are grouped under the category Printing (as opposed to other plant operations, such as Laminating, Slitting or Binding). Figure 4.1 shows the hierarchical breakdown of this printing plant's *LINK* projects.
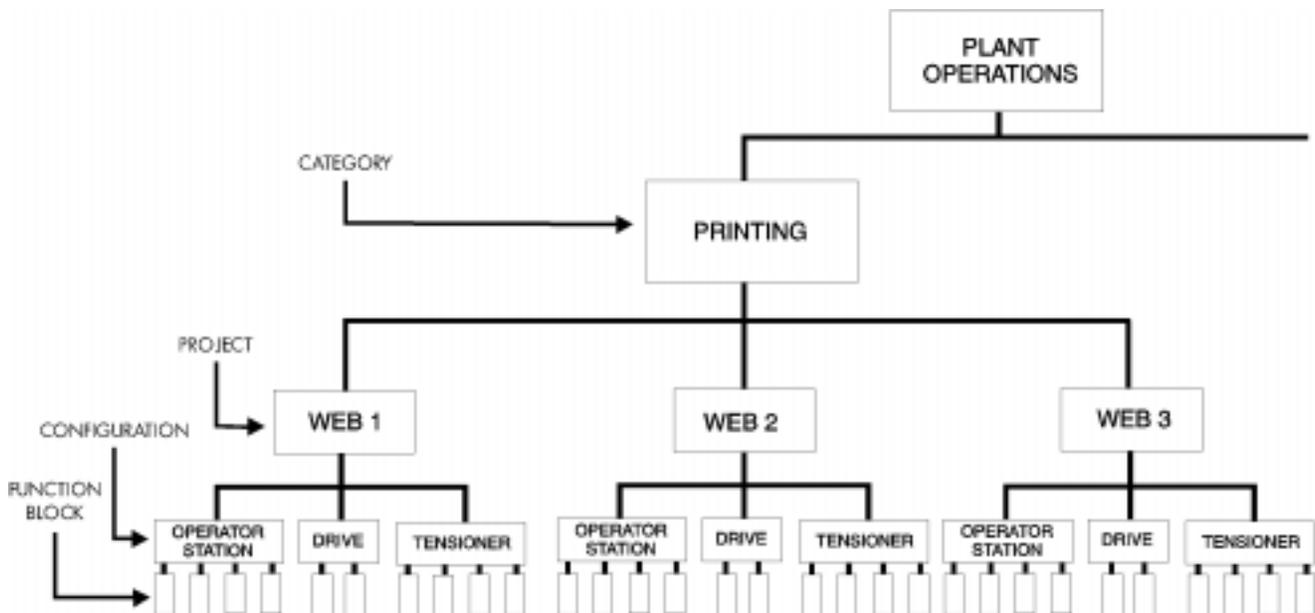

Figure 4.1 - Organization Breakdown of *LINK* System in a Printing Plant

Typically, one ConfigEd project is assigned to each separate *LINK* network while each configuration in that project is installed into only one *LINK* module on that network. However, grouping of the configurations for a *LINK* network may vary depending on whether you are using only first generation *LINK* hardware, only *LINK2* hardware, or a mixture of the two. Refer to the **LINK Overview Manual** (HA350678) for planning considerations for a *LINK* system.

THE CONFIGED MAIN MENU BAR

When you begin a new ConfigEd session, the ConfigEd workspace fills your entire screen. The main menu bar is located at the top of the screen and the ConfigEd **Scratch Pad** appears at the bottom. Each main menu heading contains commands associated with one aspect of designing configurations for a *LINK* project. Clicking on a main menu heading with your mouse opens a list of sub-menus which are commands/selections associated with the main menu picked. Figure 4.2 highlights the functions associated with each main menu heading.

Create, delete, open, close & select configurations within currently selected project; set page display & print settings.

Cut, copy & paste edit functions; change configuration network address & network topology within a single configuration.

Select & manage projects; compact, update, duplicate, document & print projects.

Select function blocks to place in a configuration.

Install configurations; access SAM functions; start, halt & poll information from a *LINK device*; change the address of a *LINK* device

Change configuration sheet; add annotation text & drawing elements; add, delete & modify configuration forms.

Open or update CE module list; switch between open windows on screen

Change text font

Change text style.

Function block data sheet information, project and `ssd_link` database revision levels and release notes.

ConfigEd Scratch Pad.

Figure 4.2 - ConfigEd Main Menu Bar

THE SCRATCH PAD

The **Scratch Pad** appears on screen during every ConfigEd session. As previously mentioned, it responds to the same commands as any other window and provides a written record of most actions you perform during your ConfigEd session, such as:

- Loading, saving, installing, and deleting configurations.

- Reporting any errors between your database and the *LINK* network.

- Recording all SAM commands, including *Get* and *Set* actions.

When you close the program for the first time, ConfigEd automatically saves the contents of the **Scratch Pad** to a file called **CONFIGED.TEX**. This **TEX** file is saved to the as specified by the ConfigEd icon (typically **C:\SSD_LINK\TOOLS\TOOLS\WIN3**). At the close of each subsequent ConfigEd session, the contents of the current **Scratch Pad** is appended to this existing file. If for some reason the **TEX** file does not exist, ConfigEd will create a new one and save the contents of the **Scratch Pad**. The **TEX** file format is standard ASCII characters and may be edited or printed using any word processing program. In most Windows installations, the accessories **NOTEPAD.EXE** (smaller files) and **WRITE.EXE** (larger files) are available to edit/print this file.

To print the **CONFIGED.TEX** file's contents using **Write**:

1. Launch **Write** from the **Accessories** program group in Windows**.**

2. Select **Open** from the **File** menu.

3. When the **Open** dialog box appears, choose *All Files (*.*)* for the *List files of Type:* selection and use the *Directories:* window to locate the **CONFIGED.TEX** file (typically in the **C:\SSD_LINK\TOOLS\WIN3** directory). Once the file is visible in the *File Name:* window, choose the **CONFIGED.TEX** file by clicking once on the filename. Finally, click on the **OK** button.

4. A **Write** window will now appear asking "Do you want to convert this file to write format?". Click on the **No Conversion** button.

5. To print the file's contents, select **Print** from the **File** menu. When the **Print** window appears, confirm your printer's settings and click on the **OK** button.

After launch, ConfigEd automatically records the tools version number, current date and time, database ID, and user name in the **Scratch Pad**. If during commissioning or startup of a *LINK* system you would like to note the current date and time in the **Scratch Pad**, you can manually insert the current date and time at any point by selecting the **Paste Time** command in the **Edit** menu.

NOTE. The title bar of **Scratch Pad** *always* displays the currently selected project's unique serial number, category, and title. If you change projects during a session, the title bar shows only the *active* project.

In addition to the information automatically recorded in the **Scratch Pad**, you can add you own comments to supplement ConfigEd's recording features. To add text, simply click in **Scratch Pad** where you want to add text and type at the blinking cursor.
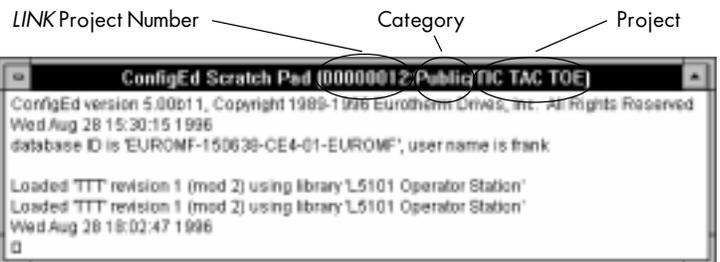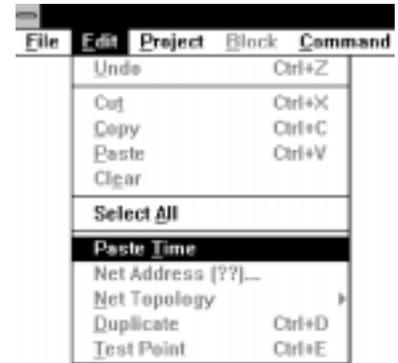
You can also clear the visible text in **Scratch Pad** by clicking on the **Scratch Pad** window and then choosing **Save** from the **File** menu. After clearing the window, ConfigEd appends all text from the **Scratch Pad** to the **CONFIGED.TEX** file.

The contents of the **TEX** file can be a valuable record of commissioning and troubleshooting activities; however, since it is continuously updated, the file can get relatively large consuming considerable hard disk space. Therefore, it is recommended this file periodically be moved (or deleted) from ConfigEd's working directory (remember, if the file does not exist, it is recreated by ConfigEd). A good time to perform maintenance of this type is immediately follow-ing the commissioning or servicing of a particular *LINK* system where all of the file's contents are associated with a specific project.

THE PROJECT MENU

The **Project** menu is used to manipulate the projects on your database. Selectable options in this menu include: **Select**, **Man-age**, **Compact**, **Duplicate**, **Update**, **Document**, and **Print**.

The Project-Select Command

The **Select** menu pick is a list of the last 50 projects accessed on your computer in prior ConfigEd sessions (the list is stored in the **CONFIGED.RCT** file). This menu pick allows you to quickly switch between frequently accessed projects and categories. To use this feature, click on on the **Select** menu pick. Categories on your database will then be displayed. An additional single click on each category lists the projects most recently accessed in that cat-egory. To select a project from the list and make it active, simply click on the project title. Note, the **Scratch Pad**'s title bar changes with the execution of the **Select** menu pick.

The Project-Manage Command

Click the **Manage** menu pick to open the **Project-Manage** dialog box. You can use the **Project-Manage** features to do the follow-ing:

1. Create new categories and projects

2. Select an existing project (not in the **Select** pick).

3. Move projects between categories.

4. Protect project categories by designating them category as *Read-Only*

5. Sort the configurations inside a project by their *LINK* network address.

6. Enter project data used by ConfigEd's documentation features.

   NOTE. The **Manage** menu pick only manages projects for the *LINK* database installed on your computer. To manage projects between multiple computers, use the separate *LINK* Tool Manager (see the **Manager User Manual** (RG352101)).

Create a New Category

To create a new category, click on the **New Category** button in the dialog box. Type in the desired name (up to 12 characters) for the category and click OK. The new category now appears in the *Destination Category* column. Projects may now be moved into the new category as described later in this chapter. Click on the **Done** button to close the dialog box.

Although you cannot directly delete a category, empty categories are automatically deleted by ConfigEd.

Create a New Project

To create a new project, select the appropriate category from the *Category* box and single click the **New Project** button. A *New Project* window will appear with data entry fields for the **New Project Name** and **Fields 1-9**.

The new project's title is entered in the **New Project Name** field (up to 20 characters) and specific project data is entered in **Field 1** through **Field 9**. The generic forms supplied with ConfigEd use the data in the **Fields** to automatically enter title block information when printing your configurations (see *Chapter 5 Documenting, Printing & Displaying Configurations* for details). Enter the appropriate project title and any desired field data then click on the **New** button to create the project.
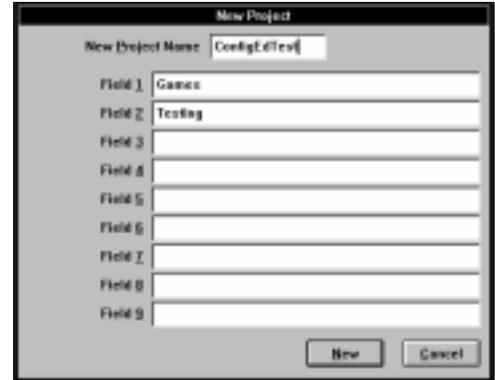
After clicking the **New** button, your project title will appear in the category you selected with both the category and project highlighted. Click **New** to close the **Manage** dialog box and create the project. At this point, ConfigEd assigns the project a unique 8-digit number corresponding to a sub-directory under the **SSD_LINK\CONFIGS** directory on your computer. All files related to the new project will be stored in this directory (see the **LINK Overview Manual** (HA350678) for an in-depth discussion of the *LINK* database directory structure).

> NOTE. ConfigEd actually uses the 8-digit project number NOT the category and project title to access the files on your database. Therefore, it is possible to have two projects within a category with the exact same title; however, it is not recommended.

8-digit *LINK* Project Number.

Date project was created.
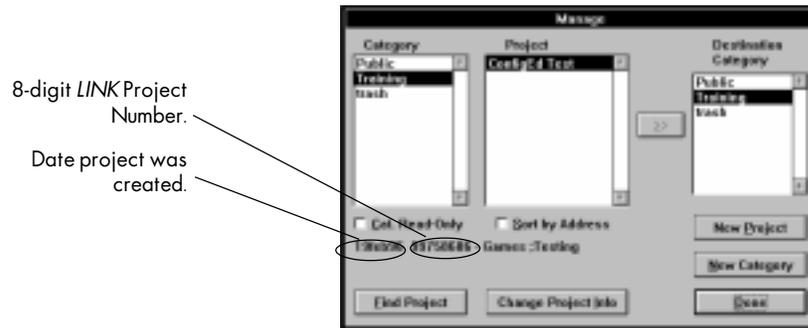
All of the **Field** data, the project's creation date, and its unique 8-digit project number now appear in the **Manage** dialog box. You may modify the project title **Field** data by click oning the **Change Project** button. The *Change Project* window (identical to *the New Project* window) will appear and the data may be modified.

> NOTE.. Project numbers are a limited resource as each new user of ConfigEd is assigned a limited range of unique 8-digit numbers. Whenever possible, you should use the **File-Delete** menu pick to empty obsolete projects of all configurations and reuse the project number in lieu of creating new projects. The **Project-Manage** menu pick may be used to move obsolete projects to an appropriate category (e.g., Spares) until required.

> NOTE. Once created, a project CANNOT be deleted directly from ConfigEd. If the project is to truly be deleted, the *LINK* Tool Manager will allow the project to be exported to floppy diskettes with its Read/Write token making the copy on your computer *Read-Only*. Once in a *Read-Only* state, the Manager will permit you to delete the project (see the **Manager User Manual** (RG352101)).

Select a Project

To select an existing project using the **Project-Manage** menu pick, click on the appropriate category and then click on the desired project. To select the project and close the **Manage** dialog box, click on the **Done** button. Note, the **Scratch Pad** 's title bar changes to the selected project with the execution of the **Done** command.

Move a Project

To move an existing project from one category to another using the **Project-Manage** menu pick, click on the project's existing category in the *Category* list then click on the appropriate project title in the *Project* list. Now, click on the desired category under *the Destination Category* list on the right. If satisfied with your selections, click on the double-arrow **(>>)** box between *Project* and *Destination Category* boxes to move the project. When executed, the project move at the right will transfer the project **junk** from the **Public** to the **Training** category.

Cat. Read-Only

To prevent modification of any projects in an entire category using the **Project-Manage** menu pick, click on the category to be protected and then click on the box labeled *Cat. Read-Only.* Each click of the mouse will toggle the state of the box. (checked is protected, blank is unprotected). For LAN installations, this lockout is private for each user and stored in the **CONFIGED.RCT** of their icon's working directory.
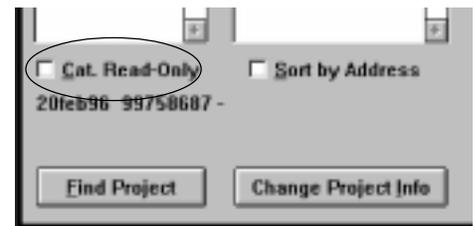
Sort by Address

To sort the configurations in a project by their *LINK* network address using the **Project-Manage** menu pick, click on the project title in the *Project* box and then click on the box labeled *Sort by Address*. Each click of the mouse will toggle the state of the box. (checked is sorted by address in ascending order, blank is sorted alphabetically by configuration name). This box affects the order in which configuration names are presented in the **File-Open** menu pick, as well as, the order in which configurations are printed in the **Project-Print** menu pick. Lastly, activating the *Sort by Address* feature properly configures your computer to use the **Index** configuration under the **File-New** menu pick (see *Chapter 5 Displaying, Documenting & Printing*).

Find Project

If you cannot recall a project's category and/or title, the **Find Project** button in the **Project-Manage** menu pick allows you to locate the project using either the project's title or its unique 8-digit project number. To find a project, click on the **Find Project** button. When the *User Input* dialog box appears, type in either the exact name or unique 8-digit project number for the missing project and click on the **OK** button (the *User Input* is not case-sensitive). If the project exists on your database, its category and project title will be highlighted in the *Category* list and *Project* list, respectively. If multiple projects have the same title, the first matching title ConfigEd encounters will be selected. If you determine the highlighted project is not the missing project, simply repeat the command.
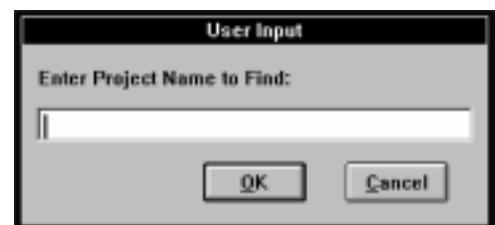
Change Project Info

To change project information using the **Project-Manage** menu pick, click on the **Change Project Info** button in the dialog box. A *Change Project* window exactly like *the New Project* window previously described will appear with data entry fields for the **Project Name** and **Fields 1-9**. Change the project information as required, then click on the **Change** button to accept the data or the **Cancel** button to leave the project information unchanged.

> NOTE. It is possible to have the labels in the *Change Project* window for **Fields 1-9** display meaningful descriptions of how the data in these boxes are actually used in your forms by creating a file called **FIELDS.TXT** in working directory for the ConfigEd icon (see the section on *Creating Forms* in *Chapter 5* for more details.)

The Upgrade Command

Since the first generation *LINK* products were released, Eurotherm Drives has continued to develop newer, more powerful versions of our function blocks, as well as, create new function blocks. Accordingly, the programming code associated with these function blocks has grown on the **SSD_LINK** database. Since all *LINK* modules have a finite amount of memory, if a user built a configuration years ago which barely fit inside the module, without any protections, the same configuration may not fit with current versions of the function blocks.

ConfigEd protects you from this growing project dilemma by freezing the database at the level at which it was created. When you create a new project, ConfigEd records the level of the current **SSD_LINK** database in the project directory. To the project, the database never looks as if it has been updated. No new are revised function blocks (or *LINK* module types) will be accessible from the *frozen* project.

An upgrade will bring a project up to the current database levels making all current revisions of function blocks and *LINK* modules available. In effect, it is like the project was created on the day of the upgrade.

Caution

Do not use the **Upgrade** command unless you are certain that you need to replace existing function blocks with a newer revision or you need access to previously unreleased function blocks. You cannot undo an **Upgrade** once it has been performed.

> NOTE. Prior to upgrading, you should export to floppy a *Read-Only* copy of any project with Manager. This copy will retain all the original project's properties and, with direction from Eurotherm Drives, may be restored to your *LINK* database.

To upgrade a project, select the project you want to upgrade from the **Project-Manage** menu pick's window and then click on the **Change Project Info** button. When the *Change Project* window appears, click on the **Upgrade** button to upgrade the project. Prior to actually performing the upgrade, a *ConfigEd* confirmation window will appear providing you the last opportunity to cancel the upgrade.

After upgrade, you will immediately have access to any new function blocks currently available on your database; however, obsolete function blocks will have to be replaced using the following procedure:

1. Delete the original function block.
2. Place a new copy from the **Block** menu.
3. Reconnect all the inputs and outputs of the function block.
4. Set all the function block's parameters appropriately.
5. Reinstall the revised configuration into the *LINK* module.

Obsolete function blocks in your configurations will be highlighted by a number of asterisks (*) adjacent to their name (e.g., CPW *) indicating the original function block has been replaced by another function block with a different part number (i.e., one asterisk indicates the block has been replaced once, two asterisks indicates the block has been replaced twice, etc.).
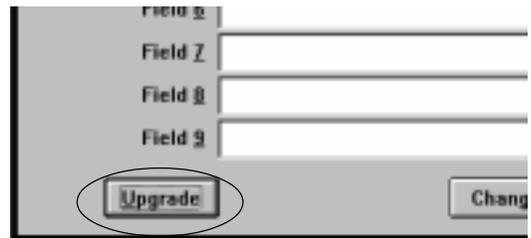
The Project-Duplicate... Command

The **Project-Duplicate...** menu pick allows you to copy the currently selected project (see the **Scratch Pad** title bar) to a new unique 8-digit number within the same category. All configuration names in the duplicate project will match the original, but will have their revision numbers reset to .001. Also note, the duplicate project's database level will remain at that of the original unless an **Upgrade** is performed. The **Duplicate** command can be a valuable time saver on *LINK* systems which are identical (or similar).

> NOTE. The **Duplicate** command is for entire projects **only**. To copy individual configurations, use the **File-Save** menu pick.

To duplicate a project, click on on the **Project-Duplicate...** menu pick. A *New Project* window identical to the window displayed when creating a new project appears.

A *New Project* window will appear with data entry fields for the **New Project Name** and **Fields 1-9**.

Fill in the **New Project Name** and **Fields 1-9**, then click on on the **New** button. Your new project title will now be listed in both the **Project-Select** and **Project-Manage** menu picks. The duplicate project resides in the same project category as the original. Use the move feature in **Project-Manage** to move the duplicated project to a different category.

> NOTE. Do not use **Project-Duplicate** to back up your project. In the background, ConfigEd *only* recognizes projects by their unique 8-digit number see the duplicate project as a completely separate entity.. Use the export feature of Manager to make copies/backups of your work (see the Manager User Manual (RG352101)).

The Project-Update... Command

Once you have used the SAM functions to fine tune function block and system parameters for a ConfigEd project installed in a *LINK* network, you can use **Update** to automatically revise the parameter settings in the project's configuration files to match the real world SAM settings. This is a convenient feature, since you can often only approximate many parameter settings when you originally set them in ConfigEd and arrive at optimum values through trial and error when you performance tune the control system. This also puts field tuned parameter values into the source configuration file so that future installations will not overwrite the field tuned parameter values in the *LINK* network modules.

> NOTE. You must have access to the project's configuration files to perform an **Update** on a *LINK* network using first generation *LINK* modules. This means that either:
>
> • The configuration files for the project must be resident on your PC hard drive or local network, or
> • You must be able to use the **Extract Selected** command and reconstruct the original configuration source files from the first generation *LINK* modules. To do this, the configuration must have been installed with the **Install Source** option selected under the **File-Open-Open** command in the **File** menu (see the discussion on **Install Source** later in this chapter).

Update overwrites all the parameter values in a project's configuration files with those of the *LINK* modules, even values changed during normally system processing. These include all setpoint and feedback values of function blocks and drives, regardless of data type. In effect, **Update** takes a snapshot of all values and parameters of all modules at the moment you execute the **Update**.

To **Update** your configuration, you must first close all open configurations; ConfigEd prevents you from updating configurations unless all configurations are closed. Then click on **Update** in the **Project** menu. From the selection box that appears, select those configurations
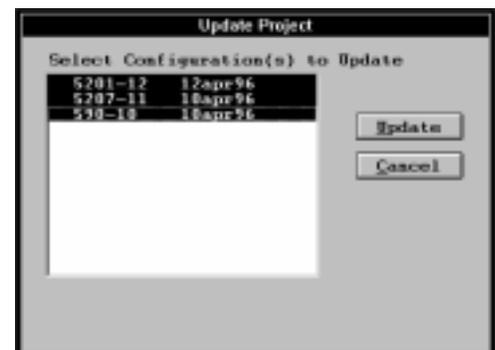
you wish to update. Use the Shift-click or Ctrl-click combination to select multiple modules. Once you have selected the configurations, click the **Update** button.

> NOTE. ConfigEd cannot update modified configuration files, or those configurations to which you have made functional modifications, but have not installed. ConfigEd marks these files in the Update configuration selection box with an asterisk (*).

ConfigEd then automatically refreshes or opens a **CE Module List** and overwrites the parameters and value settings of configuration files on your PC with those from the configurations installed within the *LINK* modules. The configurations update in the order in which they are arranged in the project. A status bar monitors and the **Scratch Pad** records the progress of your **Update** and any errors (such as a communications error or missing/revised configuration files). Configurations on which errors are reported are not updated.

> NOTE. Performing an **Update** does not change the modification level of a configuration since it only changes the parameter values, not the functionality of a configuration. However, an **Update** does change the revision level of the updated configurations (see page 4-14 for a discussion on Modification versus Revision level).

Caution

Executing **Update** adds extra communications loading on *LINK* network modules, particularly the one to which the PC is connected, creating a slight chance that a *LINK* module may halt on a L-Error processing fault (or Low-Level Error). It is therefore recommended to stop all machinery the *LINK* network controls before executing the **Update** command.

The Project–Compact Command

Compact removes all configuration revisions of a project, except the currently installed revision and the highest (i.e. latest) revision. This saves disk space on your PC.

Caution

Compact deletes early configuration file revisions. Do not compact a project until you have completed installing and commissioning your *LINK* system and you are certain that all parameters are optimally set and no more configuration changes are required.

To compact an installed and fully commissioned project, close all open configurations and select **Compact** from the **Project** menu. A dialog box first warns you that ConfigEd will delete early configuration revisions. Click **Compact** to proceed.

A status bar reports and the **Scratch Pad** records the progress of the **Compact**. When completed, select **Open History** from the **File** menu to view the remaining file revision. Only the currently installed version and its last revision of each configuration should remain, leaving at most two files per configuration. These are the most current configurations.
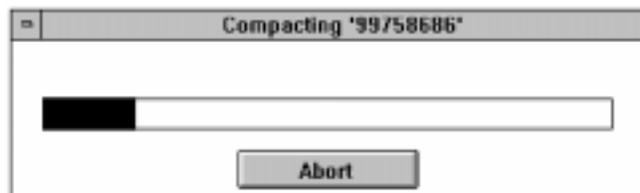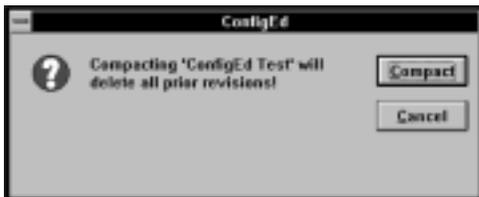
The Project–Document... & Project–Print... Commands

These features are discussed in *Chapter 5 Displaying, Documenting & Printing Configurations.*


THE FILE MENU

The **File** menu manages the configuration files of a ConfigEd project.

> NOTE. Although you may have multiple configurations from different projects open on you monitor screen, ConfigEd allows you to work on only one configuration within one project at a time. The title bar of the **Scratch Pad** window always indicates the active project.

Use the commands in the **File** menu to:

- Create, save and copy configurations.

- Open, close, and delete current (or past) revision configurations.

- Print open configurations and adjust your printout parameters.

- Exit ConfigEd.
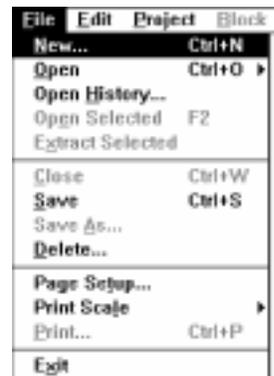
The File–New... (Ctrl+N) Command

This command creates a new configuration file within the ConfigEd project you have selected. The title bar of **Scratch Pad** indicates the currently selected ConfigEd project. To create a configuration, click **New...** in the **File** menu, or use the keyboard combination **Ctrl+N**, then select the type of configuration you want to create from the listing that appears. *The Select New Configuration* window lists all available types of first generation *LINK* and *LINK2* modules by model number. The table also lists the date the module type was entered into the ConfigEd database. All begin with the letter L, which is the Eurotherm Drives model number designation for a *LINK* module.

> NOTE. The type of configuration you create must match the first generation *LINK* or *LINK2* module in which you will install the configuration. Generally, you cannot install a configuration designed for one type of module into another type of module.

For example, if you have a three-node *LINK* system which includes a 590SPL DC drive, a L5207 processor module, and a L5201 analog module, you must create a L590SP configuration for the 590SPL DC drive, a L5207 configuration for the processor module, and a L5201 configuration for the analog module.

> NOTE. The exception to the rule are cases where new *LINK* modules have been released to replace older *LINK* hardware. For example, you can install the configuration for a first generation L5101/L5102 LINK operator station into a L5390/L5391 *LINK2* operator station.

The *Select New Configuration* window lists different versions of some configuration types (usually drive configurations). Select the version that matches the firmware of the module or drive within your *LINK* system. For example, select L590v2 when creating the configuration for a 590 *LINK* DC drive with Version 2.x firmware and L590v3 for a 590 *LINK* DC drive with Version 3 firmware.

Once you have selected the correct configuration type for your *LINK* module, click the New button. ConfigEd creates the configuration then prompts you to assign the configuration an address between 1 and 3000, inclusive. This address is the node address for the module within your *LINK* system.

> NOTE. You can assign the same address to different configurations within the same project. However, each *LINK* module or drive within the same fiber optic network **must** have a unique address.
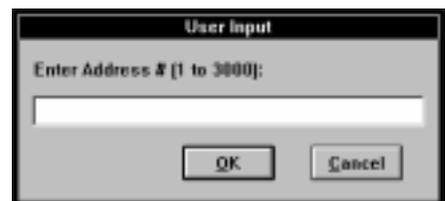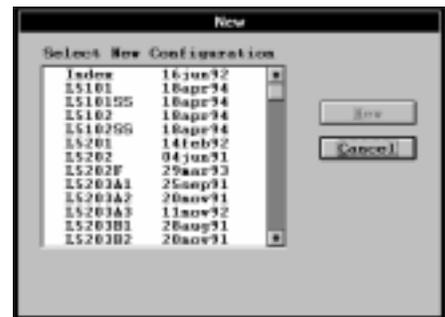
ConfigEd then prompts you to name the configuration. This name appears on the title bar of the configuration when opened in ConfigEd. It also serves as the MS-DOS file name for the configuration, which is stored under the 8-digit project subdirectory in **SSD_LINK/CONFIGS** directory on you hard disk. For a discussion on the complete file structure of the ConfigEd database, refer to the *LINK* Overview Manual.

> NOTE. As restricted by the MS-DOS, configuration names are limited to 8-character file names. The 3-character MS-DOS file extension is reserved for revision numbers (001 through 999).

The File-Open (Ctrl+O) Command

Use **File-Open** to open the latest revision of a configuration within a project. When you choose **File-Open**, highlight the configuration file from the menu that appears and click on it to open it. Picking the **Open...** selection at the top of the box allows you to set display and installation options for each individual configuration.

> NOTE. A check mark (Ö) indicates that the configuration is not write-protected (in the Read-Only status), as set through the **File-Open-Open** command.

The File-Open-Open Command

If you choose the second **Open** command at the top of the **File-Open** selection box (or **File-Open-Open**) a second selection box appears which gives you more control options for your configurations. You can open configurations from the same list **File-Open** offers (the latest revision of the project's configuration files) but you can also individually change a configuration's Read-Only status, designate a file's source information be installed into the *LINK* module when loading, and select a graphical format.

To open a configuration from the **File-Open-Open** dialog box, highlight the configuration, then click **Select**. An asterisk (*) next to the file name in the **File-Open-Open** selection box indicates that the configuration functionality has been modified since last installed.
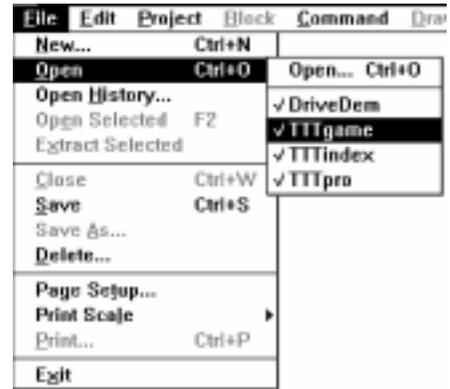
Configuration Read-Only Mode

The **File-Open-Open** dialog box gives you the option to designate a configuration as Read-Only protecting it from inadvertent or accidental modification. This selection only provides limited protection as any user may change the Read-Only designation (assuming they have Guest Rights to the project). Those configurations you designate as read/write (or not Read-Only) are marked with a check (Ö) in the **File-Open** command list.
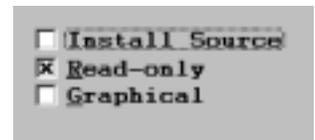
Graphical Mode

This selection determines how your computer displays configurations on your screen. Checking the box sets the display to a graphical format; unchecking the box sets the display to the earlier text-based format of ConfigEd.

> NOTE. Graphical mode is recommended for all projects created with ConfigEd Versions 3.x and higher.
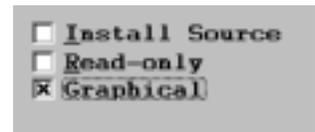
Install Source

Checking the **Install Source** box prior to installing configurations will cause ConfigEd to load information into the *LINK* module which will enable the software tool to extract the configuration from the module's memory (i.e., without the project files on your computer). In order to use the **Extract Selected** function on first generation
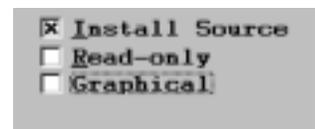
LINK modules, the option must be enabled. For *LINK2* modules, ConfigEd installs the configuration's source file information regardless of the status of this box.

> NOTE. The source file information for a configuration consumes processor memory and limits the amount of free memory usually reserved for configuration data in first generation *LINK* modules. To avoid running out of configuration memory, it is recommended to enable the **Install Source** option only when installing small sized configurations into first generation *LINK* modules.

Configuration Description Fields

The **File-Open-Open** dialog box also gives you access to separate data entry fields for each configuration within a project. These fields provide standard information about the configuration that often appears on engineering drawings such as the configuration name, the type of module, as well as, the project designer. The data from these fields can be included in your forms (see the sections on *Forms and Automatic Data Entry* in *Chapter 5*).

To enter or change configuration description information, highlight the configuration in the list, then click **Fields**. When the *Fields* dialog box appears, scroll through the different fields using the mouse or the **Tab** key. Enter the required information, then click the **Change** button. Click on **Cancel** button, if you decide not to make any changes.

The default names for these data entry fields are **Field 1** through **Field 6**. You may change the names of these fields to more relevant names by creating a **FIELDS.TXT** file in ConfigEd's working directory using a Windows text editor such as **NOTEPAD.EXE**. Prior to using the fields, it is a good idea to determine a standard format for this information to allow you to enter the information for each configuration consistently (e.g., assign **Field 1** to the configuration name, **Field 2** to the *LINK* module type, etc.).

> NOTE. The **FIELDS.TXT** file also contains the names for the descriptive fields found in the *Change Project Info* dialog in the **Manage-Project** menu pick.
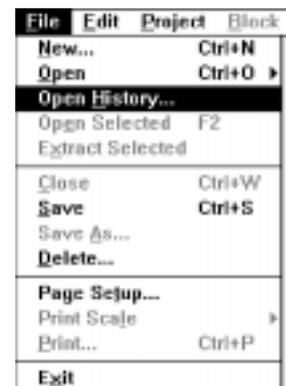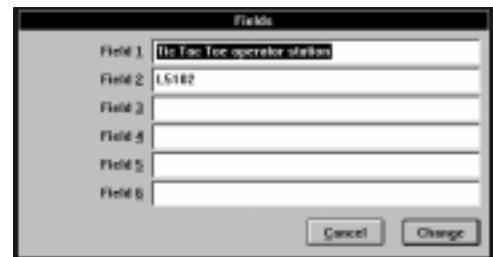
The File-Open History... Command

ConfigEd sequentially saves each configuration revision to a new file whenever a save is executed. This occurs regardless of whether you save manually using the **Save** (**Ctrl+S**) command in the **File** menu or whether ConfigEd performs the save automatically (e.g., during either the execution of an install command or when you close the configuration window).

When you select **File-Open History...**, a dialog box listing all of the saved revisions of each configuration in the active project appears. From this list, you may open an earlier revision of a configuration.   The suffix number appended to the configuration file name indicates the revision level. The highest revision number corresponds to the latest revision and matches the revision level of the configuration listed in the in the **File-Open** dialog box. You can set the number of revisions ConfigEd will save under **Revisions (#)...** in the **Command** menu.

ConfigEd allows you to open only one revision of a configuration at a time. When you open a configuration, the **Scratch Pad** indicates the revision level which was opened.

> NOTE. A file revision differs from a file modification. The distinction is discussed in the *Modification Level vs. Revision Level* portion of the **File-Save** section.
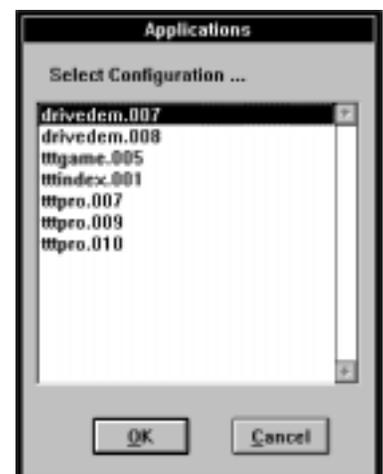
The File-Open Selected Command (F2)

The **Open Selected** command opens the configuration file for the *LINK* module selected in the **CE Module List**. Since this is usually the same revision of the configuration you installed in the module, it is a quick, convenient way of opening a configuration for making modifications while commissioning a *LINK* system.

> NOTE. You must have the *LINK* project and the *LINK* module's configuration files on your database in order to use **Open Selected**.

To use **Open Selected**, open or update the **CE Module List** and select the *LINK* module whose configuration file you want open. Then, click on **Open Selected** in the **File** menu (or press the function key **F2**).

In some cases, the modification level of the configuration file downloaded into a *LINK* module may not match the latest modification level of the configuration file within the *LINK* project on your database. This often happens when you make a functional modification to a configuration and close it, thus saving it, before downloading the modified file into the *LINK* module. When this file mismatch occurs, a dialog box asks you which revision of the configuration you wish to open: the modification in the module, or the latest modification on your database. ConfigEd allows the user to select the appropriate revision.

Caution

Be careful when modifying earlier revisions of configurations as ConfigEd skips all used revision numbers when saving. If you open earlier revisions and make any changes, any work done in intermediate revisions be lost.
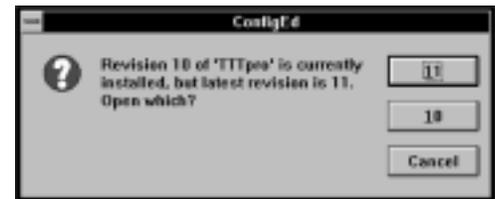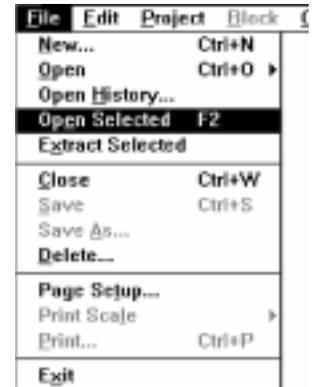
The File-Extract Selected Command

Use the **Extract Selected** command to reconstruct the original configuration file from the configuration installed in a *LINK* module. Unlike the **Open Selected** command, you do not need the original project and configuration files on your hard disk to reconstruct the file. However, the configuration must have been installed with the **Install Source** option selected in the **File-Open-Open** dialog box (done by default for *LINK2* modules).

This command is often used when you need to make modifications to a *LINK* configuration which are outside the parameter change capability allowed by the SAM features, such as adding function blocks to a configuration, or sending/receiving signals to/from other modules on the *LINK* network. After extracting, you can use ConfigEd to modify and reinstall the reconstructed configuration file, just as with the original configuration file.

Using **Extract Selected** is similar to using **Open Selected**: select the *LINK* module whose configuration file you want to reconstruct from the **CE Module List** and click **Extract Selected** from the **File** menu. If the module does not contain source information, ConfigEd reverts to performing an **Open Selected** on the *LINK* module assuming the project and configuration files reside on you database. If the project does not exist on your database, ConfigEd cannot reconstruct the original files and will generate the error message noted below.
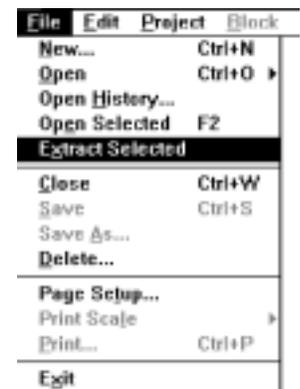
Caution

Once you have used **Extract Selected** and then modified and reinstalled the configuration(s), it is still recommended you transfer a copy of the reconstructed and revised configuration file(s) to the hub managing the *LINK* project. Otherwise, you can risk losing configuration data since the hub does not have the modified configuration file(s) as stored in the *LINK* module(s).

---

The File–Close Command (Ctrl+W)

The **Close** command closes the active configuration window. Prior to closing the window, ConfigEd saves any changes to the configuration to a new revision number on your database.

The File–Save Command (Ctrl+S)

If there are any changes to a configuration, the **Save** command immediately writes the active configuration window to your database. Configuration changes may be functional in nature (e.g., adding/deleting *LINK* input/output slots, function blocks, or connections) or merely appearance related (e.g., rearranging function blocks, adding/deleting text, or adding/deleting drawing elements).

ConfigEd automatically saves modified configurations in the following situations:

- Upon exit, using the **Exit** command in the **File** menu.

- On closing the configuration, using the **File** menu **Close** command (**Ctrl+W**).

- On installing the configuration, using any of the install options in the **Command** menu.
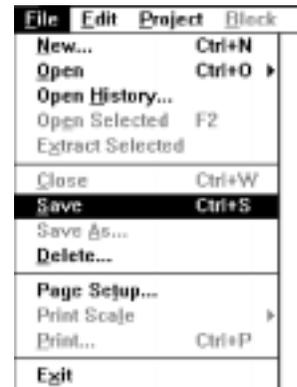
Caution

ConfigEd has no autosave feature. It is recommended to periodically save while you are designing configurations to avoid losing data in case of a power failure.

Modification Level vs. Revision Level

ConfigEd keeps track of both the quantities and types of change. Changes that alter the appearance of a configuration, in any way, are revision changes. Revision changes involve any of the following:

- Moving functions blocks and connections.

- Drawing or removing shapes using the **Draw** menu.

- Placing or deleting annotation text using the **Text** tool.

- Changing function block parameter values manually through ConfigEd.

- Updating function block parameters via the **Update** command.

- Adding/deleting function blocks or function block connections.

- Adding/deleting *LINK* input and outputs.

Any and all changes made to a configuration since a previous revision (either automatic or through the **File–Save** command) causes ConfigEd to save the configuration in a new file on the next save. For each file save, the configuration's 3-digit **MS–DOS** file extension is incremented indicating the configuration's revision level. You can set the number of configuration file revisions ConfigEd keeps through the **Revisions (#)...** in the **Command** menu.

Modification changes are concerned with functional changes within a *LINK* configuration. ConfigEd increases the modification level of a configuration on the next save (if you make functional changes) not when just the appearance of the configuration is changed. Functional changes to configurations include:

- Adding and deleting function blocks or function block connections.

- Adding and deleting *LINK* input and outputs.

The modification level of a configuration is stored in each configuration file revision. This means that two revision levels of a configuration are functionally identical if they have the same modification number.

> NOTE. Making a functional change to a configuration increments its modification level while creating a new revision file. Executing a save after adding or deleting annotation text and drawing objects, executing an **Update** or moving function blocks and connections also creates a new revision file, but leaves its modification level unchanged.

ConfigEd uses the modification number to perform operations between the source configuration and the configuration installed in a *LINK* module. In general, any operation that uses both the source configuration and the configuration installed in a *LINK* module requires both to have the same modification number to prevent data corruption. The two features most affected by the modification issue are the SAM and the **Update** functions.

If you create an index using the **File New** menu pick (see *Chapter 5*), the index lists both the revision and the modification level of each configuration in a project. Additionally, when you open a configuration, the **Scratch Pad** indicates both the revision and modification level. You can use the **Get Info** command in the **Command** menu to find out the modification level of a configuration previously installed into a *LINK* module.

Saving Scratch Pad Text

You can also use the **Save** command to save the text within the **Scratch Pad**. To save the text, make the **Scratch Pad** window active by clicking on it with your mouse, then execute a **Save**. This appends the **CONFIGED.TEX** file with all information currently displayed in the **Scratch Pad** window and clears the window. After the save, the **Scratch Pad**. window will continue to record commands/actions during the current ConfigEd session.

The File-Save As Command

The **Save As** command is used to copy a configuration from one project to another, or to make a copy of a configuration within the same project.
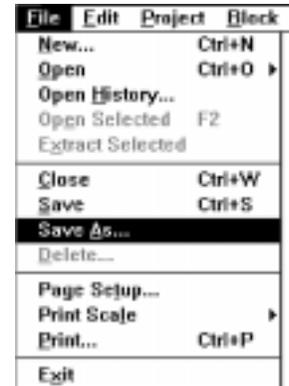
NOTE. Use the **Duplicate...** command in the **Project** menu to copy entire projects. Use **Duplicate** in the **Edit** menu to copy individual function blocks within a configuration.

Open the configuration you wish to copy, then click on **Save As** in the **File** menu. A dialog box will appear asking you for the new configuration name and the category and project in which you want to save it. If you are saving the copy of a configuration to a new project or category, you must have first created the new project or category through the **Manage** dialog under the **Project** menu. Give your configuration a name and then select the project and category in which you want to save it. Then click **OK**.

NOTE. The **Save As** command copies all aspects of a configuration, including its address. If you copy a configuration into the same project (a feature typically used when configuring a similar section for a *LINK* system controlling many drive sections) remember to change the address of the new configuration using the **Net Address...** function in the **Edit** menu before installing.
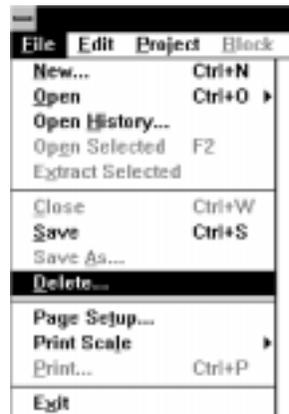
The File-Delete Command

To delete a configuration, select **Delete** from the **File** menu, highlight the configurations you wish to delete from the list in the dialog box that appears.

ConfigEd will warn you that a delete will permanently remove all revisions of that configuration. Click **Delete** to erase all revisions of that configuration from your PC's hard disk.
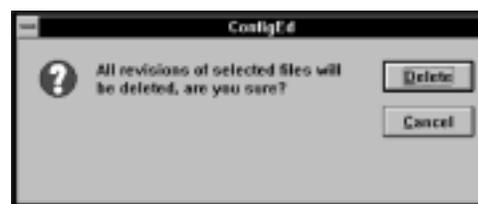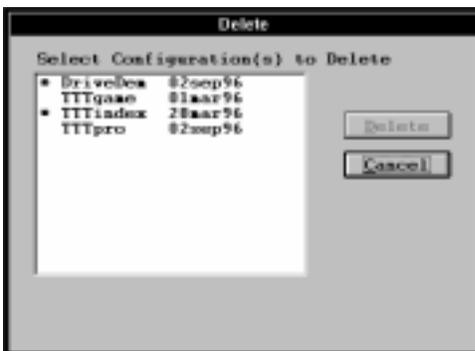
Caution

You should delete configurations if they become obsolete or if you wish to make major changes and begin a new configuration from scratch.

The File–Page Setup…, File–Print Scale, and File–Print… Commands

These commands are covered in *Chapter 5 Displaying, Documenting & Printing Configurations.*

The File–Exit Command

The **Exit** command ends your current ConfigEd session. All open configurations that you have altered since you began the ConfigEd session are closed and saved on exiting and the **Scratch Pad** text is appended to the **CONFIGED.TEX** file in the ConfigEd icon's working directory.

Caution

Do not turn power off to your PC until ConfigEd has completely closed and you have returned to the Windows Program Manager. Turning the power-off while ConfigEd is closing could cause an irrecoverable loss of data.
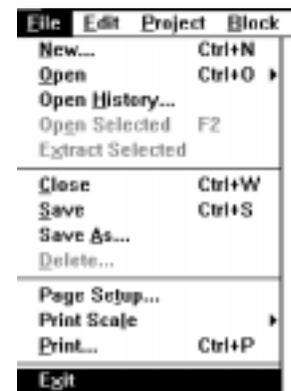
THE EDIT MENU

The commands in the ConfigEd Edit menu pertains only configuration files and the **Scratch Pad**. Those commands that apply to configurations are only active when a configuration window is open and active. Similarly, those commands relevant to the **Scratch Pad** are active only when the **Scratch Pad** is active.

Use commands in the Edit menu to:

- Duplicate and move function blocks.

- Change the address and topology of a configuration.

- Select and time-stamp information in the **Scratch Pad**.

- Create SAM test points.

The Edit–Cut, Edit–Copy, Edit–Paste & Edit–Clear Commands

Use these **Edit** menu commands to duplicate or move a single function block or a group of function blocks. The commands operate identically to the **Cut**, **Copy**, and **Paste** of many Windows software applications. Highlight the item you wish to copy (or move) and click on **Copy** (or **Cut**). If you wish to move or copy a group of items, hold down the **Shift** key and click and drag the mouse cursor over an area that includes all the items. Or, select multiple items individually by highlighting them while holding down the **Shift** key.

Copy writes a duplicate of the element(s) into the Windows clipboard buffer. **Cut** removes the selected item(s) and writes it to the same buffer. Prior to executing a **Cut** command, a ConfigEd dialog box warns that you are deleting the selected elements. Use the **Paste** command to retrieve items from the clipboard. An outline of the elements to be pasted is attached to your cursor allowing you to place the blocks appropriately. To drop the blocks in the configuration, click on white space within the configuration window's borders.
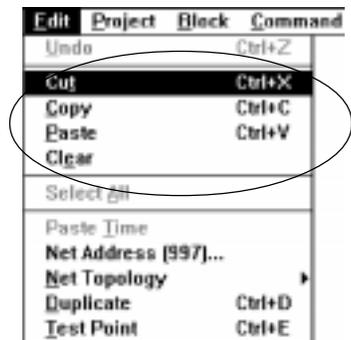
> NOTE. You can also move groups of items by selecting them and dragging them to a new location directly with the mouse (see *Chapter 6*).

You can use **Copy**/**Cut** and **Paste** to move a group of function blocks with connections (or text) to another sheet of the same configuration (for details on sheet selection, see the discussion on the **Sheet** commands in *Chapter 6 Displaying, Documenting & Printing* section). Or, you may use these commands to move an group of function blocks with connections to other configurations of the same project (or a different project).

> NOTE. Only function blocks supported by the module for which they are destined will be pasted when performing the **Cut** or **Copy** command (e.g., the Display Handler is only supported by *LINK* Operator Stations and is peculiar for each type of operator station (i.e., L5101, L5102, L5390, or L5391) while the System Control block is unique for every *LINK* module).

ConfigEd increments the suffix number of duplicated items, just as with the **Duplicate** command (see below). Rename duplicated items by double clicking on the item while holding down the **Ctrl** key.


Caution

The **Cut**/**Copy** buffer handles elements from only one action at a time. Be careful not to overwrite elements stored in the buffer from a prior action when initiating a **Cut**/**Copy** .

The **Clear** command deletes all selected function blocks, annotation text, and drawing entities. It mimics the functions of the **Delete** and **Backspace** keys for a group of items.

The Edit–Select All and Edit–Paste Time Commands

These commands are associated with the **Scratch Pad**. **Select All** selects the entire contents of the **Scratch Pad**. Use this command in conjunction with the **Backspace** key to delete the contents of the **Scratch Pad** (see **Scratch Pad** below).

The **Paste Time** command records the current date and time in the **Scratch Pad** window. This command is useful to record actions when troubleshooting a *LINK* system.
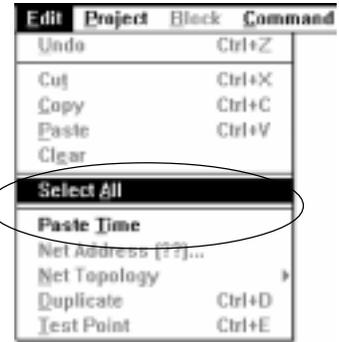
The Edit–Net Address(##)... Command

Net Address... allows you change the address of the active configuration. Its current address, usually assigned to the configuration when it was created, is shown in the parentheses.

To reassign a configuration's address, click on **Net Address(##)...** in the **Edit** menu When the *User Input* dialog box appears, type in the new address and click on the **OK** button.

> NOTE. The range of permissible *LINK* addresses is currently restricted to the range from 1 to 3000, inclusive.
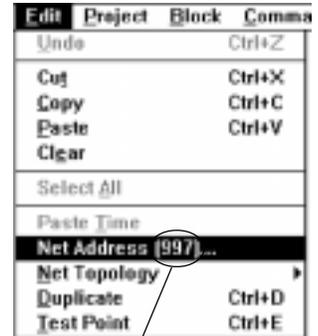
Current Network Node Address of Selected Configuration

The Edit–Net Topology Command

You can change the network topology of a configuration by selecting the **Net Topology** command in the **Edit** menu and click oning on the desired network topology (either Simple, Tapped, Redundant, or Auxiliary Tapped). The currently selected topology of the configuration is marked with a check mark (Ö) while the default setting is a Simple topology.

For an explanation of *LINK* network topologies, refer to the *LINK* Overview Manual.
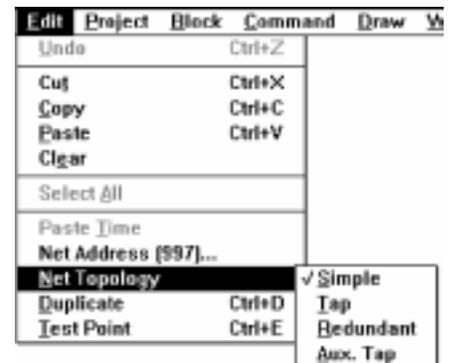
The Duplicate (Ctrl+D) Function Block Command

The **Duplicate** command copies selected function blocks and *LINK* inputs/outputs within a configuration. This feature only copies individual function blocks or *LINK* inputs/outputs within the same configuration and not to/from other configurations. The **Duplicate** command will not copy annotation text or drawing shapes.

> NOTE. To duplicate entire configurations, use the **Save As** command in the **File** menu. To duplicate entire projects, use the **Duplicate...** command in the **Manage** menu.

To use **Duplicate**, first highlight the original function block or *LINK* input/output within your configuration, then click on on **Duplicate** in the **Edit** menu. When duplicated, the highlighted item should change to a reverse video image on your monitor and be attached to your cursor. If you select **Duplicate** before selecting a function block, ConfigEd generates an error dialog box.

An outline of the duplicate item will follow your cursor around the screen until you click on your mouse at the location where you would like to place the item. If the selected item was a function block, ConfigEd gives the new function block a name identical to the block's original name, except for adding a suffix number. The suffix number increments for each duplicated function block. You can rename the block by using the **Ctrl** double-click feature of ConfigEd.

You can duplicate a function block quickly by highlighting the item simply hitting the **Ctrl** and **D** keys simultaneously.

The Edit-Test Point Command

This command is related to the SAM features of ConfigEd. Refer to *Chapter 6 SAM Functions*.

THE BLOCK MENU

You can access the *LINK* software function blocks in the **SSD_LINK** database through the **Block** menu. Function blocks are pre-configured software elements used for designing custom configurations for your *LINK* control application. Once you place the function blocks you need in your configuration, you can change the blocks' parameter values and connect them to other function blocks within the same configuration or to function blocks in other network locations.

Placing Function Blocks

The **Block** menu lists the **SSD_LINK** database categories used to store the function blocks. A distinct category exists for each type of function block. Among the function blocks categories are: **Logic** and **Logic Gate** (which store all logic-type function blocks), **Ordinal** (which store all ordinal data-type function blocks), **SignalP** (which stores all value data-type function blocks), and **OpStn** (which stores all *LINK* operator station blocks).

> NOTE. The **Help** menu lists a data sheet for each function block. Refer to it for a functional description, technical information, and data types required for the particular *LINK* function block. You can also quickly access the on-line data sheet for a function block by holding down the **Shift** key before selecting it from the **Block** menu.

To place a function block into your configuration, select it with you mouse from the category listed in the **Block** menu. Once selected, an outline of the function block will be attached to your cursor. Click on the mouse in the area where you wish to place the block. The picture to the right shows the placement of a two input OR gate (**Logic Gate/OR-2**).

Renaming Function Blocks

ConfigEd gives the block a standard, default name. You can rename the block by double-clicking on the block while holding down the **Ctrl** key. The dialog box that appears shows the original name and prompts you for a new name.

Deleting Function Blocks

To delete a function block from your configuration, simply highlight the function block, and then press the **Backspace** or the **Delete** key (or click on **Clear** from the **Edit** menu).

Configuring *LINK* Inputs and *LINK* Outputs

To configure a *LINK* input, click on the *LINK* Input selection at the top of the **Block** menu. An outline of *LINK* input slot appears and follows your mouse cursor. Click in your configuration in the area you wish to place the input. ConfigEd automatically assigns the input slot a number, beginning at one. The slot numbers increment for each new input slot. To change the slot number or to add annotation text, double click on the slot after placing it. A dialog box appears asking you to define the input's slot number, source address, and description.
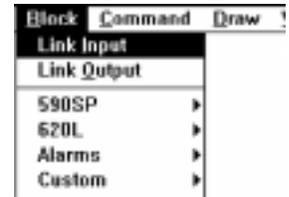
> NOTE. You must assign a unique slot number between 1 and 4095, inclusive. Duplicates are not allowed within a configuration; however, you may use the same slots numbers in another configuration within the same project. Descriptions and source addresses are optional.

The *LINK* output from the source configuration sending the signal defines the receiving *LINK* input source address. ConfigEd automatically fills in the source address when you execute the **Project-Document...** or **Project-Print...** commands with the **Save Sources** option toggled on (see *Chapter 5*).
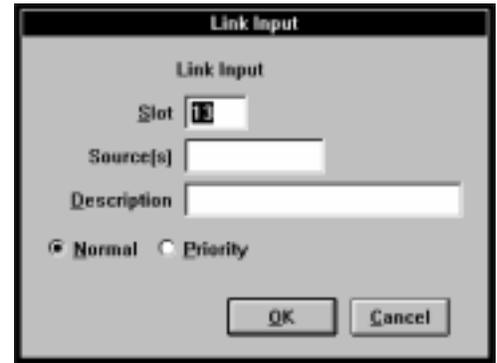
Caution

ConfigEd automatically saves your configuration whenever you close it or exit ConfigEd. It will not save inputs unless they are connected to function blocks or *LINK* outputs within the configuration. Do not close or save your drawing until you have made at least one connection for each *LINK* input; otherwise, you will have to recreate these inputs after reopening the file.

To configure a *LINK* output, open the **Block** menu and select *LINK* Output and click the area within your configuration window where you wish to place the output. Fill in the information in the dialog box that appears. ConfigEd automatically assigns a destination address and slot number, beginning at one. To change the destination address, slot number, or description, double-click on the *LINK* output.
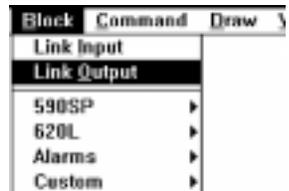
> NOTE. You must assign the output slot a destination slot number in the range 1 to 4095 (inclusive) and an address in the range 1 to 3000 (inclusive). Descriptions are optional.

WARNING!

Assigning *LINK* outputs to non-existent slots in valid destination addresses will cause problems if those slots are subsequently defined by changes to your *LINK* system. Additionally, assigning *LINK* outputs to slots in non-existent destination addresses will cause unnecessary network traffic (Address Matches) and may cause the destination module to halt processing and enter the **L-Error** state.

WARNING!

ConfigEd allows you to assign the same slot and address to different *LINK* outputs. This acts as a "wired-or" at the destination *LINK* module slot, and can cause the *LINK* module to behave in unexpected ways. Although this may be desirable in certain circumstances, be sure you understand fully the implications of assigning duplicate slots and addresses.

Once you have created the *LINK* input or outputs you need, connect them to the function block inputs and outputs you wish to send messages to or from other *LINK* modules over the *LINK* fiber optic network.

Source addresses for *LINK* inputs are shown on the left of the input. Input slots numbers are shown on the right. For *LINK* outputs, destination addresses are shown on the left of the output and destination slot numbers are shown on the right, as indicated in the graphic to the right.
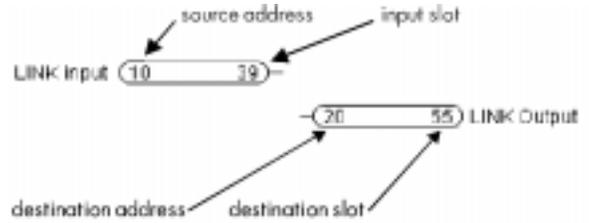
Notice that *LINK* outputs and function block inputs have left handed connection points. You will also notice that *LINK* inputs and function block outputs have right handed connection points. This suggests a general left to right data flow within configuration drawings. It is therefore recommended to align *LINK* inputs on the left side of configuration drawings and *LINK* outputs on the right. This makes your configuration drawings easy to read and gives them a neat, professional appearance.

Normal & Priority Inputs

Once you have placed *LINK* inputs in a configuration, you can set how the *LINK* module will handle the incoming message using the Normal/ Priority settings located in the *LINK* input's dialog box. Double-click on the *LINK* input to open its dialog box.

A module processes a Normal *LINK* inputs at the same priority as other module processing- first in, first out. Priority *LINK* inputs are processed immediately upon receipt, jumping ahead of previously scheduled module processing already in the *LINK* module's event processing queue.
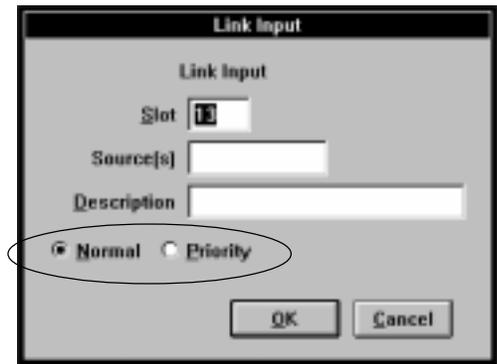
> NOTE. Leave the majority of *LINK* inputs set to `Normal`, the default setting, and use `Priority` only for time-critical parameters (e.g., feedback trigger inputs for winder blocks or when control processing is distributed between two or more *LINK* modules, but must act as a single function block). Refer to the `LINK Overview Manual` for additional details concerning Normal and Priority inputs.

Working With DC *LINK Drive*

The configurations for 570 *LINK*, 590 *LINK* and 590SP *LINK* DC drives are created and configured in much the same way as other modules in a *LINK* system. You create a *LINK* DC drive configuration just as you would for any other *LINK* module: by executing the New command from the File menu, selecting the type of *LINK* DC drive configuration and giving it a name and an address (Drive Dem, a L590v3 — or 590 version 3 software *LINK* drive with an address of 999, in our example here). However, there are a few important differences in working with DC drive configurations:

1. All DC drive configuration function blocks are predefined and fixed — you cannot delete or modify existing DC drive function blocks.
2. You cannot add function blocks to a DC drive configuration. When a *LINK* DC drive configuration window is active, ConfigEd disables all function block categories in the Block menu, except *LINK* Input and *LINK* Output.
3. All the input slots of each DC drive configuration function block are prearranged, so configuring inputs slots is unnecessary.
4. *LINK* DC drives do not have a RTNX serial communications port. Consequently, you cannot directly communicate to a *LINK* DC drive with your PC using ConfigEd. You must communicate to a module with a RTNX port that is connected to the same *LINK* fiber optic network as the DC drive, then select the *LINK* DC drive from the **CE Module List**.
5. All DC drive configurations span more than one sheet. If you cannot see a function block on your monitor, use the Sheet commands at the top of the Draw menu to page through the configuration and locate the function block. (Refer to Chapter 5 Displaying, Documenting & Printing for instruction on the Sheet commands.)

Configuring DC *LINK* Drive Outputs

To configure drive outputs for DC *LINK* drives (L570, L590 or L590SP), open a *LINK* drive configuration you have created, select *LINK* Output from the Block menu and move it to the right of the drive function block which contains the output you wish to transmit to another *LINK* module in your *LINK* project. As with configuring any other *LINK* output, a dialog box then appears prompting you for the destination Address and Slot. The same slot and address range restrictions apply and the description field is optional. Once you fill in the information, click OK to place the *LINK* output slot.
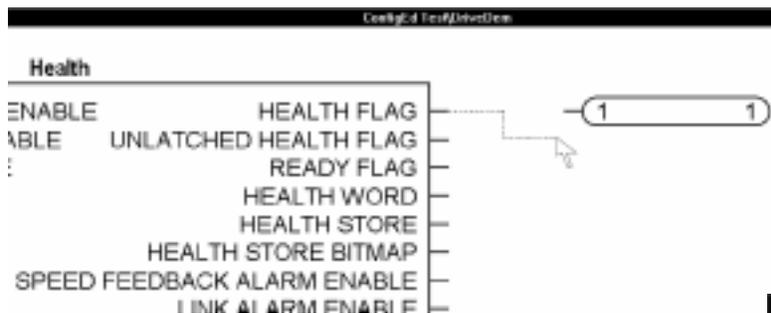
You must now connect the DC drive function block output to the *LINK* output slot, just as you would with any other configuration. (In the screen shot above, the Health Flag output of the *LINK* 590SP drive configuration DriveDem is being transmitted to slot one of a *LINK* module whose address is one.) Once you make this connection, a dialog box appears prompting you to designate the connection type — Fast, Medium, Slow, or Special. This sets the speed of the output signal over the *LINK* fiber optic network.

You should send most drive output signals at a medium or slow speed. Reserve the Fast setting for critical signals, such as Health Flag and Composite Program Stop. Sending too many signals at a fast rate to the same destination address can overload the processor event queue of the destination *LINK* module. This can cause the *LINK* module to crash, or stop processing.

Caution

The Special setting is used to identify messages that need to be sent at extremely high speeds, generally between DC drives. Do not use the Special setting without consulting Eurotherm Drives.

The speed settings for Fast, Medium, Slow and Special are set in the Parameters function block of the DC drive configuration. To change these rates, locate the function block (you may need to page to other sheets within the drive configuration) and double click on it. The Parameters function block dialog box gives you access to sub-menus controlling various aspects of the drive's performance. The Update Rates category contains the speed settings for Fast, Medium and Slow. The units for these settings are in ticks, a unit of processing time related to how frequently the drive's microprocessor executes its current control loop. This varies from model to model and depends on the processor's computation loading. Refer to the appropriate drive manual for more information on drive processing speed and the **LINK Overview Manual**.
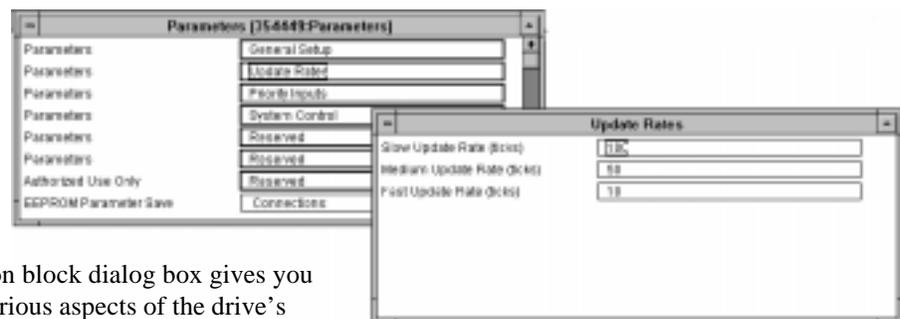
NOTE. It is recommended to leave the Update Rates settings at their default values.

Working With L620 Vector *LINK Drives*

The L620 Vector *LINK* drive has features which make configuration and design with the drive different than its DC *LINK* drive counterpart.

First, the L620 Vector *LINK* drive has more available memory than the DC *LINK* drives. This allows you to place function blocks for processing the drive start/stop logic and speed and current inputs and outputs directly in the drive configuration rather than elsewhere in the ConfigEd project in which the drive operates.

When you first create and open a L620 Vector *LINK* drive, notice that the first configuration sheet is empty and that the drive function blocks initially exist on sheets two and three. This is done to reserve the first sheet for function blocks related to processing the drive's input and output signals.

> NOTE. At the very least, the L620 Vector *LINK* drive — and, in general, all *LINK* drives — should have a Drive Start Logic block (located in the Logic Block category of the Block menu) to properly control the drive's start/stop sequencing.

Second, the L620 has digital and analog input and output terminals as well as *LINK* capability. This allows you to control the drive externally by applying voltage signals to the input terminals, or to configure the drive with ConfigEd and control it through the *LINK* fiber optic network.

> NOTE. To keep system design consistent, it is recommended to always control the L620 Vector *LINK* drive through the *LINK* network if you are using the drive in a project with other *LINK* modules

You create a L620 Vector *LINK* drive as you would any other new configuration: by executing New from the File menu and selecting L620 from the list of *LINK* modules that appears in the pop-up window list, then assigning it a name and node address.

Configuring L620 Vector *LINK* Drive Inputs & Outputs

Unlike DC *LINK* drives, L620 Vector *LINK* drives do not have preassigned *LINK* inputs. To configure an input, you must place an *LINK* input in the L620 configuration and connect it to the desired input function block. Use the sheet feature to connect the input to the drive input block if you placed the *LINK* input on the first sheet of the configuration drawing.

L620 *LINK* Vector drive outputs are configured in much the same way as DC *LINK* drive outputs: place a *LINK* output in the L620 configuration and connect the desired drive output to the *LINK* output. Once you make this connection, a dialog box appears prompting you to specify the update rate, in milliseconds. Enter the update rate as an integer, using the recommended settings listed below:

Recommended Analog Outputs Update Rate	30 mS
Recommended Digital Outputs Update Rate	200 mS
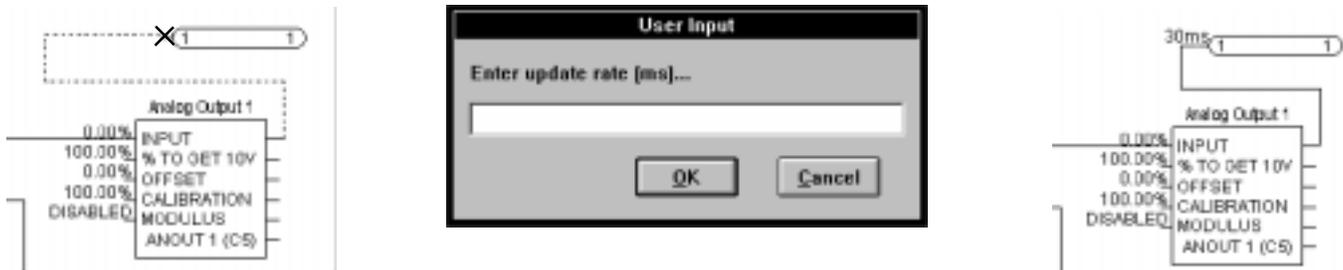
THE COMMAND MENU

The ConfigEd Command menu allows you to:

- Install a configuration.
- Halt, restart and poll information from a *LINK* module.
- Gain access to the ConfigEd SAM functions.
- Set the communication settings between your PC and a *LINK* module.
- Change the number of revisions ConfigEd automatically saves.
- Change the address of *LINK* modules.
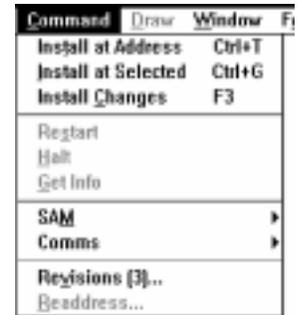
Except for `Revisions (#)...` and `Comms`, all these commands require communication between your PC and the *LINK* network. Before you install a configuration into a first generation *LINK* or *LINK2* module, you must first open a `CE Module List`. Refer to Appendix A, Communications and the section Opening a `CE Module List` in this chapter.

WARNING!

Do not install a configuration to a *LINK* network module unless all equipment controlled by the network is in a stopped and safe condition. Configuration errors may cause an unexpected or dangerous system response. Have a qualified engineer check or test all configurations before installing them and putting the *LINK* network into service.

The Command–Install at Selected Command (Ctrl+G)

This command installs the configuration you have selected in ConfigEd (the active window) into the *LINK* module you have highlighted in the `CE Module List`. The new address of the configuration file you install overwrites the existing address of the *LINK* network module.

NOTE. ConfigEd does not allow you to download the configuration designed for one type of *LINK* module into a different type of *LINK* module. In general, the *LINK* hardware and configuration type must be compatible. (However, you can install the configuration for one type of *LINK* module into a newer model *LINK* module designed to replaced discontinued hardware.)

To use Install at Selected, you must first open a `CE Module List`. If none is currently open, run either Update Partial or Update Full to open a `CE Module List` window, then select the destination *LINK* module from the `CE Module List`.

Make sure the configuration you are installing is open and that it is the active window, then choose Install at Selected from the Command menu.

A status dialog monitors the progress of the installation. The upper left corner of the status dialog shows the elements being installed as they are loaded. A bar chart graphically represents the progress of ConfigEd as it loads the various blocks and other elements of the configuration into the module. All ConfigEd status dialog boxes include an Abort button. Click Abort to cancel an action and return to the previous running status any time during the execution of that action.
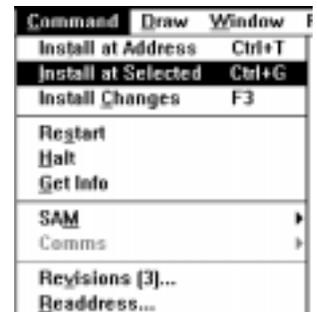
NOTE. Pressing Abort during installation may result in a "no configuration" status for the module. When this occurs, a No Config message appears in the `Scratch Pad` and you will need to reinstall the configuration or install a different configuration if the original configuration again fails to install.

The **Scratch Pad** records all actions you perform with ConfigEd and confirms the installation of the configuration in the *LINK* network module you have selected.

> NOTE. When designing a configuration, keep in mind the of amount of module memory the configuration requires. For first generation *LINK* modules, it is recommended to reserve at least two free pages of memory. This memory overhead may be necessary for installing larger revision configurations in the future or to accommodate an increase in function block size in case you upgrade the project with the Upgrade function at a later date.

ConfigEd will generate the warning message to the right in case the configuration size exceeds the minimum two page memory reserve. To check the amount of configuration space available in a *LINK* module, highlight the module in the **CE Module List** and select Get Info from the Command menu. The **Scratch Pad** will report the amount of free space remaining in the module.
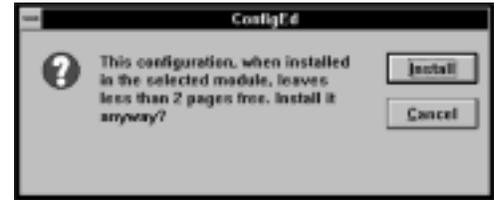
The Command-Install at Address Command (Ctrl+T)

You can install the currently selected configuration (active window) at a matching *LINK* network module address by choosing Install at Address from the Command menu. The *LINK* network module type must be compatible with the configuration module type, unless you are installing a configuration into a module designed to replace discontinued *LINK* hardware. Install at Address attempts to install your selected configuration (the active configuration window on your screen) to the *LINK* module on the network having a matching node address.

Install at Address is convenient when you want to quickly install revised or replacement configurations to *LINK* modules containing the same network address in an established network. You do not need to first open the **CE Module List** — ConfigEd automatically generates a new list if it is initially closed.

If the selected configuration does not have a matching network address, ConfigEd will ask you to specify where to install the configuration. If this occurs, either:

- Use Install At Selected (see above) to install the configuration.

- Open or select a configuration with an address that is present on the ring and try executing Install At Address again.

- Change the address of the active configuration using Net Address in the Edit menu.

- Change the address of the *LINK* module to match the configuration files address using the Readdress... command (see below).
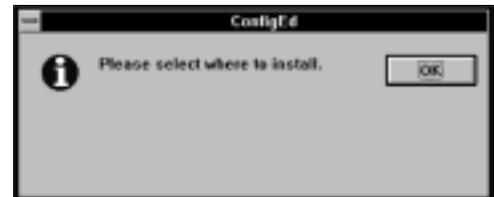
The Command-Install Changes Command (F3)

A third way of installing configurations is by using **Install Changes**. This automatically polls the network and performs an **Install at Address** for all *LINK* network modules whose configurations have been revised, but not yet installed in the currently selected project. Configurations that are revised but not yet installed are marked with an asterisk (*) in the **File-Open-Open** dialog box.

> NOTE. You must first close all open configuration windows before using Install Changes.

When using Install Changes, ConfigEd recognizes which *LINK* network modules it needs to install a changed configuration to by its address only, not its ConfigEd project number.

Caution

Because ConfigEd allows configuration addresses to be the same from project to project, you can potentially download the wrong configurations to a network using Install Changes, which can have catastrophic results. Be certain you have the correct project selected before using Install Changes.
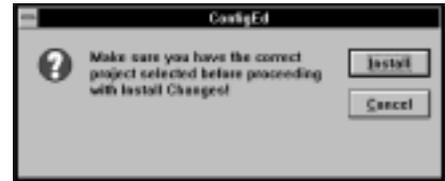
The program generates the message shown at the right warning you to double check the *LINK* project before proceeding. If you are using this feature to install configurations for a project into its *LINK* network modules for the first time, use the **Readdress...** command (see below) to correctly preset all node address in the network before using Install Changes. Used together, these features can cut down on the installation time for a *LINK* project, especially for large *LINK* networks.

The Command–Halt, Command–Restart, and Command–Get Info Commands

These commands operate on any *LINK* module you select from an open **CE Module List**.

The Command–Halt Command

Halt stops the *LINK* module you select from running its configuration. Executing Halt switches the *LINK* module from the "run" or OK state to the "halted" state. The way other *LINK* modules will react to a halted module on the same network depends on their setting of Restart on reconfiguration in the System Control block. If Restart on reconfiguration is enabled (the default setting), the *LINK* module reacts by switching from the **OK** state to the **Peer Halted** state; if it is disabled, the module ignores the event.

Caution

Any *LINK* module in the Halted or Peer Halted state cannot run its installed configuration and, consequently, ceases to control any drives or equipment connect to it.

The Command–Restart Command

Use the Restart command to request a restart of a *LINK* module in the halted state. The module may have entered the halted state due to a processing fault or because of a previous halt command. To restart a *LINK* module, first select it in **CE Module List**, then click on Restart in the Command menu.

NOTE. You must restart only the *LINK* module in the halted state to bring a halted *LINK* network back on line and processing data over its fiber optic network. The network returns to its "run" or OK state if all other peer halted *LINK* modules are healthy. Executing Restart on a peer halted *LINK* module will not restart *LINK* network processing; the *LINK* module will remain peer halted until the original halted *LINK* module any other modules on the network in the halted state are restarted.

When you restart a *LINK* module, persistent parameters within your configurations return to their saved values, sending an initializing signal to other modules on the *LINK* network. This can change the state of *LINK* operations and function blocks which, consequently, can cause unexpected motor motion and alter the state of *LINK* system outputs. As a caution, ConfigEd prompts you to confirm the restart whenever you execute the Restart command on a halted module.

WARNING!

Unexpected motion and injury could result when restarting *LINK* modules. Make certain no possibility of damage or injury can result before confirming a **Restart** command. Be certain that you interlock critical signals such the start input to the drive configurations with physical, external operator controls.

The Command-Get Info Command

Use Get Info to acquire detailed information about a *LINK* module on a *LINK* network. The command is useful in troubleshooting (see Chapter 8 Troubleshooting and Section 8 of the *LINK* Overview Manual). To use Get Info, highlight the *LINK* module from the **CE Module List**, then click Get Info in the Command menu. The **Scratch Pad** then lists information about the module.

The two screen shots below shows the module information reported to the **Scratch Pad** after executing Get Info on a first generation *LINK* module (shown below left) and a *LINK*2 module (shown below right). The list below the screen shots explains this information.
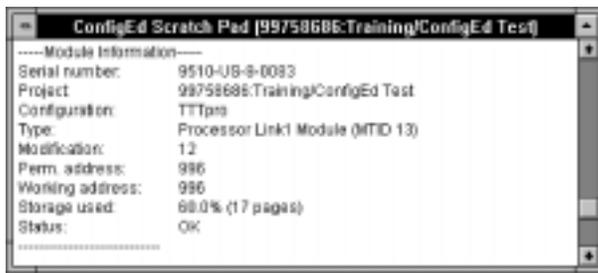
Serial Number: This number is assigned to each *LINK* module during manufacturing. The serial number shown in **Scratch Pad** should match the number on the module label (for example, 9145-US-C-0022 for a first generation *LINK* L5207 processor module).

Project: Gives the *LINK* project number, its category and project name to which the configuration is associated.


```
99758686:Training/ConfigEd Test
```
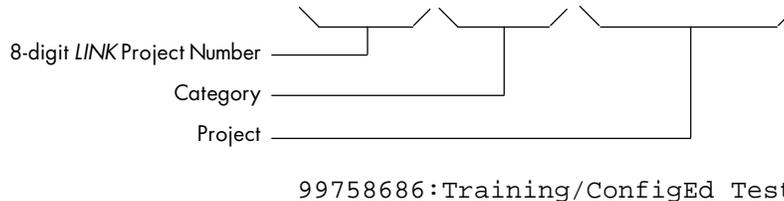
Configuration: The name of the configuration currently installed in the *LINK* module.

Type: The type of *LINK* module — for example, processor, Analog I/O, Digital I/O or operator station, and whether it is a LINK or *LINK*2 module — as well as its microprocessor type (for example, the LINK processor module has a type MTID 13 microprocessor; the *LINK*2 operator station has a type MTID 2305).

Modification: The modification level of the installed configuration. The modification number increments each time a configuration is functionally changed (see Modification Level vs. Revision Level under the section on The Save Command in this chapter).

Perm. Address: The permanent network address assigned to the *LINK* module (996 for the LINK processor, 3 for the *LINK*2 operator station).

Working Address: The current network address of the module. Normally, it matches the permanent address. They will differ only when you install two or more configurations with the same address into *LINK* modules connected in the same *LINK* network. When this occurs, ConfigEd assigns a temporary address to the first module whose permanent address duplicates a permanent address already encountered on the network during a **CE Module List** update. This allows you to open full module list and communicate to all *LINK* modules on the *LINK* network even though the network contains duplicate addresses.

Persistents used: (*LINK*2 modules only.) Indicates the amount of persistent memory space the installed configuration uses, as well as the number of persistents used in the configuration.

Storage used: Indicates the amount of the *LINK* module's processor memory space the installed configuration file uses. In the above examples, the configuration TTTpro uses 60% (17 pages) of memory space; the *LINK*2 operator station uses 13.4% (103 pages). If you later increase the size of TTTpro by adding additional function blocks, 40% of the module's memory space for the LINK processor is free to accommodate the larger configuration. 86.6% of the *LINK*2 operator station's memory is free for configuration storage.

NOTE. It is recommended to leave at least 2 pages of spare memory for LINK modules to accommodate future configuration modifications or upgraded function blocks.

Status: The operating condition of the module (OK) on the *LINK* network. The most common status codes are listed in the section Get Info Status Messages in Chapter 7 Troubleshooting. Each module status state corresponds to the LED blink codes on first generation *LINK* modules and to the seven segment LED character display on the back of *LINK*2 modules. Refer to the **LINK Overview Manual** for more information on the LED blink and seven segment status codes.

Executing Get Info on a *LINK*2 module that is in a running state (OK, Net warning or Net fail) generates two extra lines of dynamic information in the **Scratch Pad**. This information is described as follows:

CPU used: Recent indicates to amount of CPU activity, or how busy the microprocessor was, during the last 2.5 seconds of operation. Peak refers to the peak amount of CPU activity since the previous Get Info execution.

Heap used: Shows how much heap, or static RAM (SRAM), the module's CPU is using. Static refers to the amount of SRAM the CPU uses to hold the installed configuration and Peak refers to the amount of SRAM used since the module last entered the OK state and began executing the installed configuration.

These four figures give the project designer a general sense as to whether the installed configuration is overloading the module. If any of these four percentages exceeds 95%, you should redesign the configuration to reduce its size and

perhaps its execution load. However, because system operation is dynamic, values below 95% do not ensure that a module will not crash with an out of heap error.

The Command-SAM Functions

A sub-menu with all the Setup and Monitor (SAM) functions are located under this menu item. The functions are only active when you connect your PC to a *LINK* network and after you have generated a **CE Module List**. The SAM functions are covered separately in Chapter 6 SAM Functions.

The Command-Comms... Function

You set the communications settings between your PC and a *LINK* network or between your PC and a telephone modem through this menu selection. The settings in this menu and communications between your PC and *LINK* networks in general are discussed in *Appendix A Communications*.

The Command-Revisions (#)... Command

Any time ConfigEd executes a save, it creates a new revision file for any configuration you have functionally modified or whose appearance you have altered. This allows you to recall early revisions of the same configuration (see **File-Open History** above). **Revisions(#)...** sets the quantity of revisions of a configuration ConfigEd saves in from the current to the oldest. The larger the number, the more current the revision.

To change the number of revisions ConfigEd saves, go to the Command menu and select Revisions (#).... A dialog box will ask you to set the desired number of revisions. Enter a number and click OK. The parentheses shows current set number of revisions. The default number is three. If you save more than the set number of revisions, the oldest existing revisions are deleted. For instance, if you set your number of revisions for
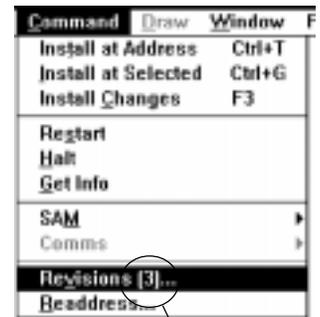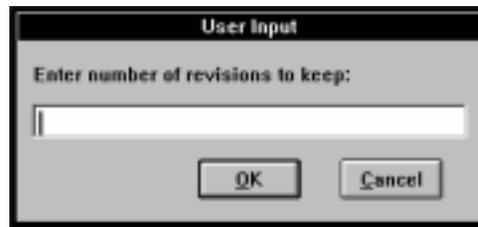
TTTpro to three and then open, modify and close the configuration four times, the Applications that appears when you click on Open History... will make only the last three revisions available.
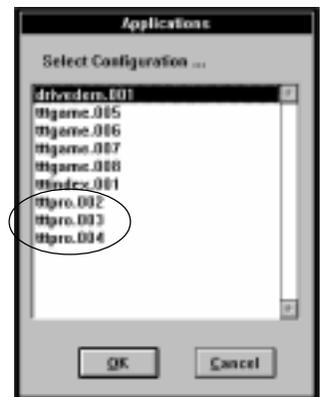
NOTE. The exception to this rule of saved revisions is a configuration that has been installed in a module. The latest configuration that has been installed will remain in the **File-Open History** menu list, even if more than the set number of revisions are subsequently saved.

The Command-Readdress... Command

The Readdress feature allows you to change the permanent address of modules on a *LINK* network.
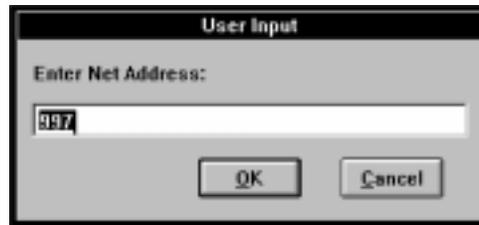
To use this feature, first open or refresh the **CE Module List**, then click on the *LINK* module whose address you wish to change. Click Readdress in the in the Command menu.   A User Input pop-up box prompts you for the module's new address. Enter the new address (between 1 and 3000, inclusive) then click **OK**. The selected *LINK* module is now assigned to the new address.

If a **CE Module List** is open, it will immediately update the node address.

Use Readdress when preparing to install the configurations of a project to *LINK* network modules in a new network, or to new modules added to an existing *LINK* network.   In both these situations, the new modules have some other configuration and address installed in them, usually a default test configuration and test address.

When used with the Install Changes command, you can use Readdress to quickly download all configurations for an entire project into a *LINK* network. First, wire up the *LINK* modules in your network, then use Readdress to change the addresses of the new modules to match those in your project. Then use Install Changes to automatically download all project configurations.

THE WINDOW MENU

The Window menu is divided into four parts, each dealing with a specific aspect of windows used by ConfigEd.

- The four commands in the top section of the menu are concerned solely with opening or updating the **CE Module List**

- The Connections command in the second section opens a window which lists all existing connections within the active configuration, including inter-sheet connections. SAM Test Points is related to the SAM functions within ConfigEd (refer to *Chapter 6 SAM Functions*). It opens a window which list all SAM Test Points for the current configuration.

- Commands in the third section of this menu allow you to quickly switch between open windows in the ConfigEd program

- The bottom section lists the windows currently open in ConfigEd. The checked (✓) box indicates the active window

  NOTE. Holding down the **Shift** key while selecting a window from the bottom section of this menu re-sizes its default size and location. This is useful when the window does not display properly when you first open it.
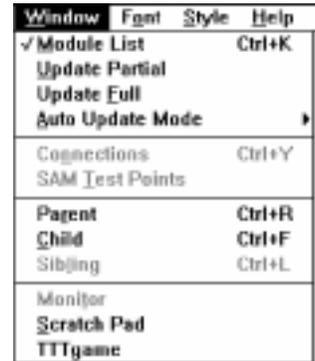
Opening a CE Module List

You will need to successfully open a **CE Module List** to communicate with ConfigEd to any first generation *LINK* or *LINK*2 module. Valid communication between your PC and a *LINK* module through a the **CE Module List** is required to perform any of the following functions:

- Installing configurations.
- Using the SAM features.
- Using the **Halt**, **Restart** and **Get Info** commands.
- Updating configurations using the **Update** command.
- Changing the node address of a *LINK* module using the **Readdress...** command.

  NOTE. ConfigEd functions on *LINK*2 modules are very restricted if you access the *LINK*2 module through a **CE Module List** generated through a first generation LINK RTNX. To gain full ConfigEd functionality for *LINK*2 modules, including installing configurations and all available SAM features, it is recommended to open the **CE Module List** through a *LINK*2 RTNX connection.

To open a **CE Module List**, you must first establish a valid communications setup between your PC serial port and the *LINK* module. Refer to Appendix A Communications for information on setting up communications to a *LINK* network.
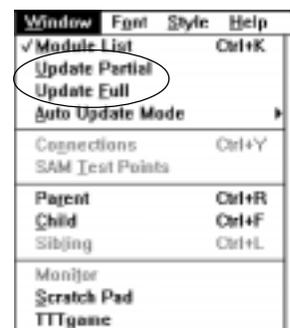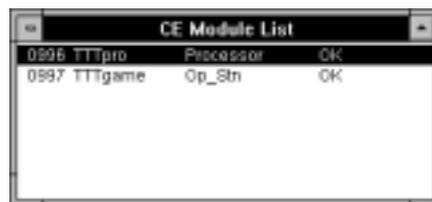
NOTE. You must connect the serial communications port on your computer to a module within a functional *LINK* network. You cannot open a complete **CE Module List** for a *LINK* network whose fiber optic ring is either broken or improperly connected . The *LINK* network module to which you connect your PC through its RS232 port also must be powered up.

To open the **CE Module List**, open the Window menu and click on either Update Partial or Update Full. ConfigEd quickly scans the *LINK* network and generates a **CE Module List** that displays all *LINK* modules on the network. Executing either command updates the list if it has been previously generated.

The **Scratch Pad** reports all communication activity between your PC and the *LINK* network. If you cannot generate a module list using either command, refer to Chapter 8 Troubleshooting and the troubleshooting section in the *LINK* Overview Manual.

NOTE. Keep in mind that opening a **CE Module List** polls the network only once and displays the results in the **CE Module List** window. You may have to periodically update the **CE Module List** to check whether the status of a *LINK* module has changed while you are commissioning or troubleshooting a *LINK* system.

Duplicate & Temporary Addresses

Each type of first generation *LINK* and *LINK*2 module is shipped pre-configured with a test configuration which has a specific address. This address differs for each type of module. Since most *LINK* networks use several of the same types of *LINK* modules, they can have duplicate addresses when power is initially applied. This creates a communications initialization problem, since a *LINK* network cannot successfully transmit and receive data over its fiber optic ring unless each node address is unique.

To circumvent this problem, the software within the *LINK* modules immediately resets to zero the address of those modules it encounters that have a duplicate address when initializing fiber optic communications at power up. It then identifies the modules on the ring by its unique serial number, allowing you to open a **CE Module List**. When you open the list, ConfigEd assigns a temporary address to those modules it encounters with an address of zero. Temporary addresses range from 3001 to 4095. These modules revert to the Halted state and do not run their configurations, although they can still transmit message packets around the fiber optic ring.

Until you download a new configuration with a unique, permanent address (within the range of 1 to 3000), the module retains this temporary address and uses it as its working address. The **CE Module List** indicates that a working address is temporary by bracketing it in parentheses. After downloading a configuration to the module, the permanent address replaces the module's temporary address as the working address. ConfigEd then refreshes the **CE Module List** which displays the permanent configuration address — or the address you last assigned to the configuration file before the download — without the parentheses.

Device Type   Status

Working Address (permanent)

Working Address (permanent or temporary)

Configuration name

*LINK*1 or *LINK2* device
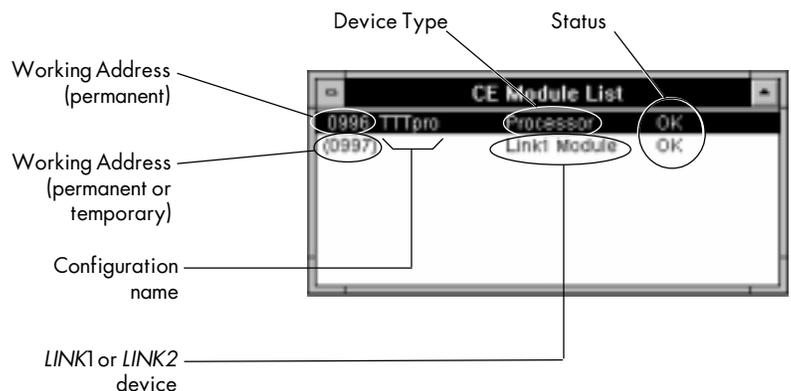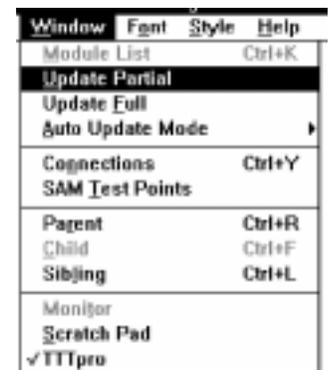
The Window–Update Partial Command

When you execute Update Partial, ConfigEd scans the ring and lists the modules connected on the *LINK* network in the direction of data flow around the fiber optic ring. A status dialog box indicates the progress of the update and allows you to abort before it completes and opens the **CE Module List** window. Once the update is complete, each line in the **CE Module List** window corresponds to a *LINK* module, or node on the *LINK* network. Nodes are displayed in the order they appear on the network, beginning at the point where the serial connection is made and proceeding around the fiber optic ring in the sequence in which the fiber optic cable physically connects them together.

The **CE Module List** gives all information about the first *LINK* module on the *LINK* network, or the module connected to your PC through its RTNX RS232 port. This information includes: the node's working address, its configuration name, the type of *LINK* module and it status. For the remaining modules on the network, the **CE Module List** reports only the module's working address, whether the module is a first generation *LINK* or *LINK2* module and its status.

> NOTE. Because this command provides a low level update for quickly opening the **CE Module List**, executing an Update Partial cannot determine whether the working address of a node other than the first is permanent or temporary. ConfigEd therefore assumes that the working address of these nodes are temporary and encloses them in parentheses.

Update Partial provides a quick update of the *LINK* network, since it only fully polls the first module on the network for all its identification information. It is useful for large *LINK* networks having many network nodes. Use this update method if you are comfortable navigating through your *LINK* network through ConfigEd by address rather than by configuration name.

Once the **CE Module List** is opened and updated, the first node — the one connected to your PC — is automatically highlighted. Select other modules or drives by either highlighting them with the mouse pointer or by scrolling through the list using the arrow keys.

The Window–Update Full Command

Executing the Update Full command generates a **CE Module List** that displays all information — its working node address, the configuration name, the module type and operating status — for all nodes in a *LINK* network. Working addresses displayed in parentheses are temporary; those not enclosed in parentheses are permanent.

If you execute an Update Full after an Update Partial, ConfigEd polls the *LINK* network and, for each node on the network, fills in the configuration name and changes the module version (LINK or *LINK2* module) to module type (processor, op station, drive etc.). Working addresses that are temporary remain enclosed in parentheses; the parentheses are dropped from permanent addresses.

The Window-Auto Update Mode

You can set ConfigEd to automatically update the **CE Module List** at the end of a configuration installation. ConfigEd updates the list according to the option selected in the Auto Update Mode sub-menu: Full (the default setting) gives a complete module list update, Partial gives a quick update and None disables the auto update feature altogether.

> NOTE. Because parameter changes to a *LINK* module frequently affect its performance and therefore the module's status, it is recommended to leave the Auto Update Mode setting to Full or Partial. A Partial setting is preferable to quicken the update time, especially when working with large *LINK* networks.

The Window-Module List Command

If a **CE Module List** has been created using either the **Update Partial** or **Update Full** commands, the **Module List** command activates the window and moves it to the front of your screen. Performing this command does not refresh the **CE Module List**. You can refresh the list using a partial or full update.

Chapter 5   DISPLAYING, DOCUMENTING & PRINTING

DISPLAYING CONFIGURATIONS

ConfigEd offers many features for enhancing your screen display and for documenting and printing your configurations. The screen display features provide an easy, quick way of moving about your configuration drawing and make configuration design a simple process. The documentation and printing features give your configuration printouts a neat, professional appearance which simplifies troubleshooting and makes them easy to work with. Most of the functions used for displaying and documenting configurations are under the `Draw` and `Edit` menus. Printing functions and features are under the `File` and `Project` menus.

Display Options

"Screen Zooms" & The Scale Function

The `Scale` function in the `Draw` menu adjusts the scale of the active configuration window to preset "screen zooms". A scale of 1.00 sizes all text within the configuration to a 6 point font. Zooming in or out magnifying or reduces the drawing and changes the font size linearly: a scale of 2.00 changes the font to 12 point and a scale of 0.50 changes the font to 3 point. The variable menu pick allows you to customize the scaling of the window to within the limits specified in the pop-up window.

You can also change magnification with the "+" and "-" keys. These keys are located on the upper right of the keypad portion and to the right of the numbered key of standard PC keyboards. Each execution scales the configuration display by ±1.33 of the current setting. Press a numbered key to zoom to a specific preset scaling. The table in Figure 6.1 lists the preset scaling factor that corresponds to each number. The table also shows keystrokes which are convenient for moving to different areas of your screen display without changing the scaling. Hitting these keys have the same affect as adjusting the horizontal and vertical slide bars to the right and at the bottom of your display window.

Keystroke	Result	Keystroke	Result
0	Scales to 10pt. font (1.67x drawing)	Home	Sets origin of view to upper left corner
1	Scales to 11pt. font (1.83x drawing)	Page Up	Moves view of drawing up by 7/8 of current size
2	Scales to 12pt. font (2.00x drawing)	Page Down	Moves view of drawing down by 7/8 of current size
3	Scales to 3pt. font (0.50x drawing); Homes drawing to upper left corner	Up arrow	Nudges view of drawing up
		Down arrow	Nudges view of drawing down
4	Scales to 4pt. font (0.67x drawing); Homes drawing to upper left corner	Left arrow	Nudges view of drawing to the left
		Right arrow	Nudges view of drawing to the right
5	Scales to 5pt. font (0.83x drawing)	Shift Page Up	Moves view of drawing to previous sheet
6	Scales to 6pt. font (1.00x drawing)	Shift Page Down	Moves view of drawing to next sheet
7	Scales to 7pt. font (1.17x drawing)	Backspace	Deletes currently-selected item
8	Scales to 8pt. font (1.33x drawing)		
9	Scales to 9pt. font (1.50x drawing)		
+	Increases scaling by factor of 1.33		
-	Decreases scaling by factor of 1.33		

Figure 5.1 - Screen Scaling & Display Keystrokes

To zoom in on a specific area of a drawing, click and drag the mouse over the area that you wish to magnify then release the mouse button. ConfigEd scales the configuration display to the scale which best fits your selected area. This technique does not operate on shapes or annotation text created using the drawing tools in ConfigEd's Draw menu. To zoom in on a drawing object or text, you must include a portion of a function block within your selected zoom area.

> NOTE.   Changing the scale of a drawing using the Scale function in the Draw menu or the "+" and "-" keys only changes the appearance of the configuration on your screen, not the scaling when you print out the configuration.
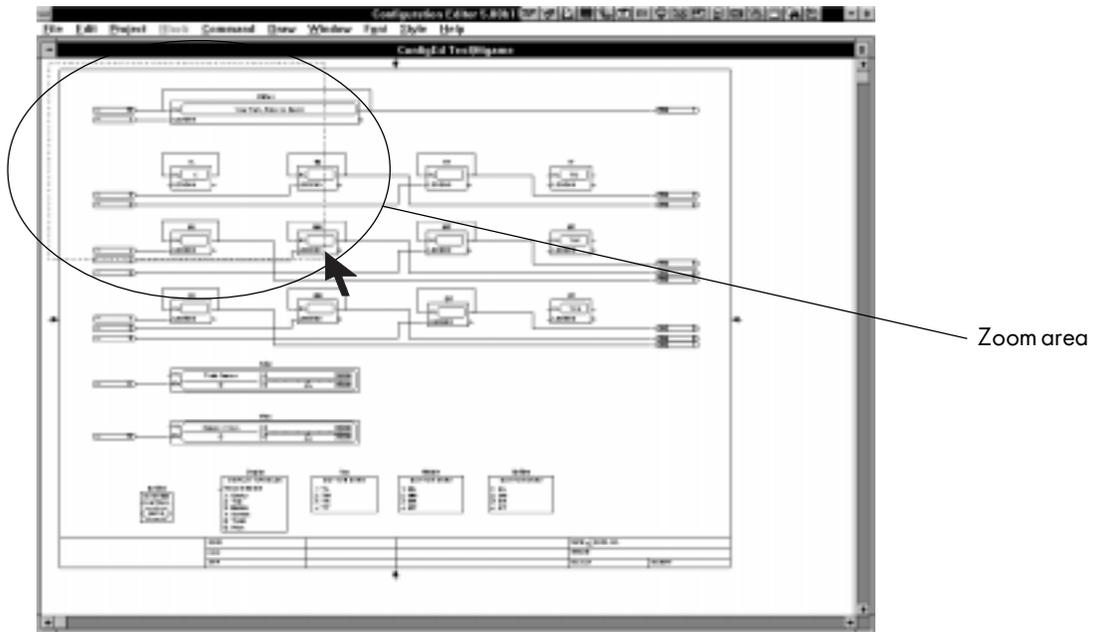
Before zoom
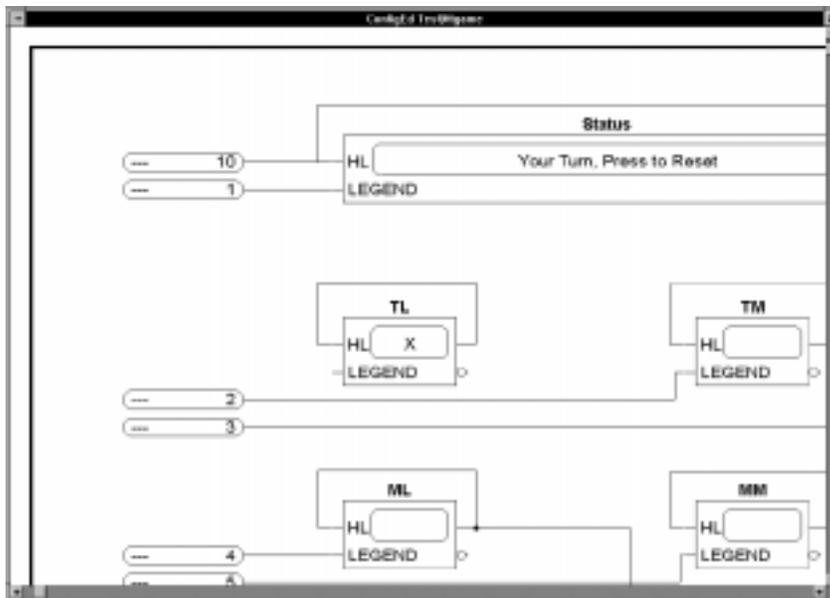
After zoom

Moving Function Blocks and Drawing Elements

You can move functions blocks or drawing elements within a configuration by selecting the item with your mouse, holding down the mouse button and dragging the item to a new location. When you select and move a block or element, an outline of the entity follows your cursor around the screen. Let go of the mouse button to place the entity in its new location.
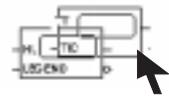
You can also select and move groups of objects, a convenient feature for arranging elements within large configurations. To move a group of objects, hold down the `Shift` key and the mouse button and drag your mouse to create a selection area. A dashed border marks the selected area. When you let go of the mouse and `Shift` buttons, ConfigEd highlights all entities— including block-to-block connections and drawing elements— that fall into the selected area or cross the area's border. Click the mouse on any highlighted function block, hold down the mouse button, drag the group to a new location in the configuration and release the mouse button to place the group. *All* elements within or crossing the selected area are moved, including connection lines, text and drawing elements.

NOTE.   You can also use the copy buffer and the `Cut`, `Copy` and `Paste` commands in the `Edit` menu to move and copy function blocks and *LINK* inputs and outputs (see *Chapter 4*).

Arranging Elements Within a Configuration

To keep your configuration drawings neat, keep in mind the general direction of data flow when designing configurations. Note that input connection points are on the left and output connection points are on the right of *all* function blocks, giving the control process a general left to right data flow. The *LINK* inputs and outputs also reinforce this convention: connection points for *LINK* inputs are on the right— a natural location for connections to function block input. *LINK* output connections are left positioned— making them convenient for connections from function block outputs.
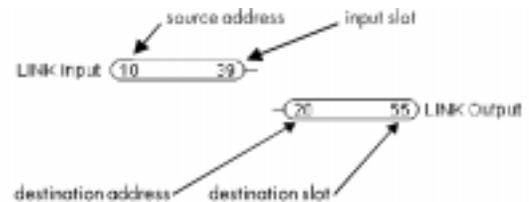
For clarity and neatness, use the Align function (described below) to keep all *LINK* inputs in an even column on the left side and all *LINK* outputs in a column on the right side of your drawing page.

LINK2 modules have a large storage capacity— up to 10 drive sections can be stored in a L5391 or L5300 processor module.

Therefore, for clarity, limit all function blocks and software configurations associated with one drive section to one sheet or two sheets using the `Sheet` feature (see below). It is also a good idea to organize the sections in sequence.

The Align Function

The graphical interface feature of ConfigEd allows you to easily align function blocks and elements within your configuration drawing. To align a series of function blocks either vertically or horizontally, highlight a function block or element, then select Align from the Draw menu, or press Ctrl+A. This specifies the position of the selected function block as a reference for aligning other function blocks. Any function block you place near the reference element automatically snaps itself into either vertical or horizontal alignment with the reference element. This applies to newly created blocks, duplicated blocks or existing elements that are placed within the alignment "sense" range of the reference element. ConfigEd determines whether the most appropriate alignment is in the vertical or horizontal plane and aligns the element accordingly. The Align feature remains active until you cancel it by clicking on an empty section of the drawing (so that no function block is selected) and pressing Ctrl+A. You can also toggle the feature off while clicking Align in the Draw menu when no function block or *LINK* input or output in the configuration is highlighted.

> NOTE. The alignment spacing and "sensing" distances are fixed and non-configurable.

The Sheet Feature

When placing function blocks in your configuration, you can spread your configuration over several sheets if you run out of space. The sheet commands are located in the top section of the Draw menu. These commands allow you to change the view of your drawing to the next sheet, the previous sheet or to a specific sheet. Up to 126 sheets per configuration are permitted. The Sheet features are described below:

- Prev Sheet - switches the page view to the previous sheet.

- Next Sheet - switches the page view to the next sheet.

- Sheet (x of y)... - switches page view to the specified sheet. The letter x designates the *current* sheet; y designates the *last* sheet in the configuration that contains a function block or graphical drawing element.

To move function blocks to other sheets, click and drag the function block or group of function blocks to the Draw menu, then select the sheet on which you wish to place the blocks from Sheet. When ConfigEd changes the screen view to the selected sheet, hold down the mouse button and drag and drop the entities to the area you wish to place them.
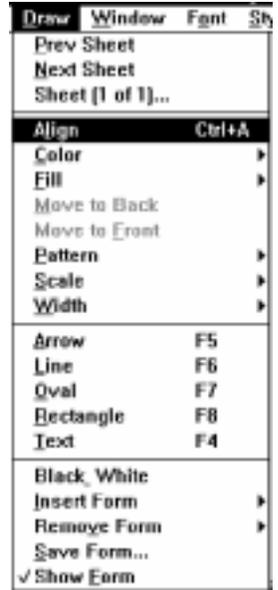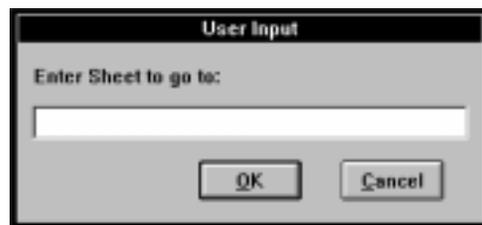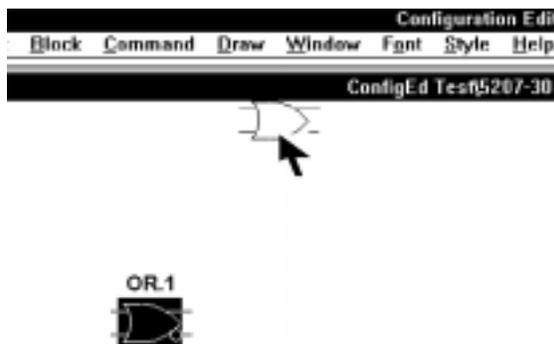
> NOTE. Moving a block or *LINK* input or outputs connected to another entities to another sheet is unsupported. You must use the Cut and Paste commands in the Edit menu (see *Chapter 4*). Otherwise, first break *all* connections, move or group move the function blocks to the desired sheet, then use inter-sheet connections (see below) to reconnect the blocks.

You can also use the Edit menu commands Cut and Paste in conjunction with the Sheet command to move function blocks from sheet to sheet.

Inter-Sheet Connections

ConfigEd allows you to make connections from blocks on one sheet of a configuration to blocks on another sheet of the same configuration. This is useful if your configuration covers more than one sheet. To use this feature, first place the function blocks you want to connect on any two different sheets of the same configuration. Begin drawing the connection normally from the output terminal of the function block on one sheet, then move the mouse pointer to the `Draw` menu and select `Next Sheet`. When the screen displays the sheet you choose, a dashed line indicating the connection will follow your mouse pointer.

Connect the dashed line/connection to an input terminal on your second function block. When the connection is complete, the dashed line changes to a solid arrowhead line with text identifying the sheet number of the connection source (SHT 1). The sheet containing the starting point of the connection will have a corresponding arrowhead line and text indicating the sheet number of the destination point of the connection (SHT 2).
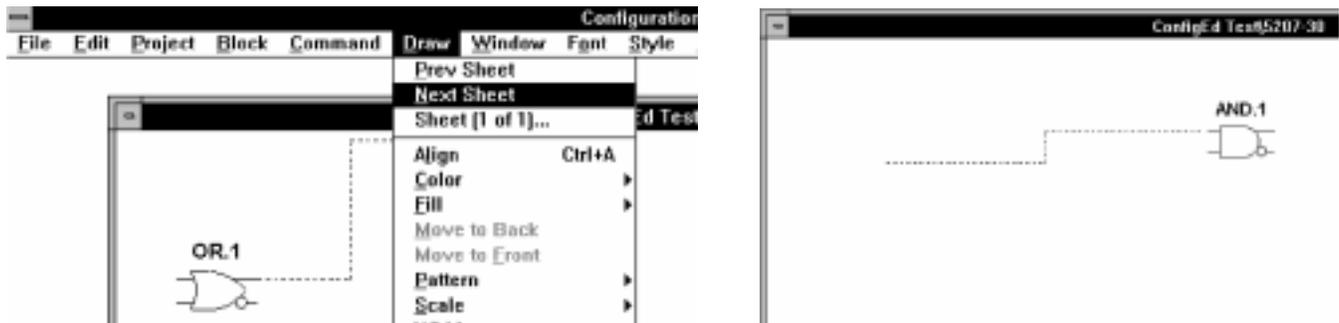
Change the inter-sheet connection text by double-clicking on the arrowhead or the descriptive text. This brings up a dialog box for you to enter your text. The new information appears on both sheets. The `Connections` list in the `Window` menu lists *all* existing connections within the active configuration, including inter-sheet connections.

Split Connections

Split connections function like inter-sheet connections, except that they connect function blocks existing on the same configuration drawing sheet. They include labels identifying their source and destination and keep complex configurations from being cluttered with cross-connecting lines. Changing connections to split-connections does not add or delete the connection— only the on-screen appearance is modified.

> NOTE. You can convert ordinary block-to-block connections on the same configuration drawing sheet into split connection in read-only configurations, since the connection itself remains unchanged.

To draw a split connection, double-click an existing connection or click on the connection to select it, then press the `Enter` key. A dialog box appears prompting you to name the connection. Enter a name and click `OK`. If you leave the split connection unnamed, ConfigEd assigns a name.
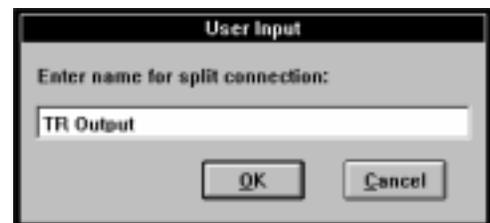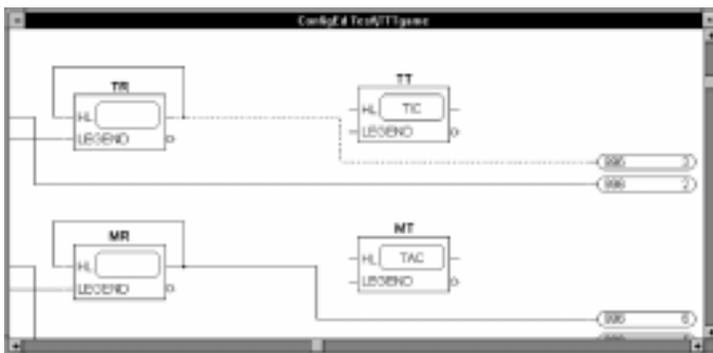
The connection splits and the assigned or default name appears on the source and destination end of the connection. You can change the connection name by double-clicking either the source or destination arrow end of the connection. Check the `Connections` list in the `Window` menu to view *all* existing connections within an active configuration, including split connections.
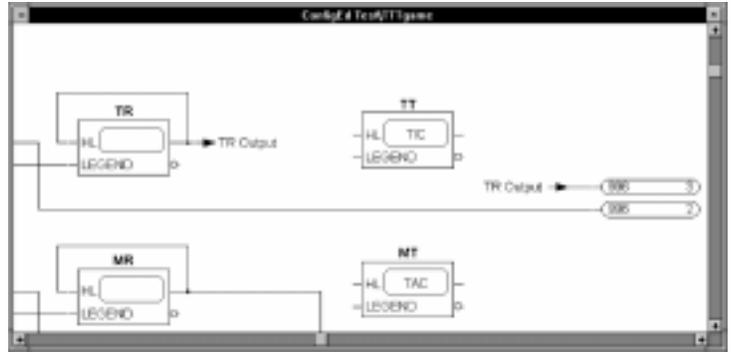
DOCUMENTING CONFIGURATIONS & PROJECTS

ConfigEd provides many features for documenting individual configurations and entire projects. Thoroughly documenting ConfigEd projects allows end users to relate the software representation in a *LINK* control system to the actual motors and machinery. A fully documented project— complete with an index and annotations, where needed— is also essential for commissioning and troubleshooting *LINK* systems.

To this end, ConfigEd provides the following documentation tools:

- the drawing and text functions in the `Draw` menu, which are used for annotating configuration drawings. Use these features to incorporate calibration data, set up information and truth tables into configuration drawings.

- the `Project Document...` and `Project Print...` commands, which create a cross reference of connections between configurations.

- the SAM `Document Module` and `Update` commands, which record on line parameter settings and values.

- an indexing feature, which can automatically generate an index giving users a convenient way of locating a particular configuration in a large ConfigEd project.

- a means of creating forms for each of your configurations. Incorporating forms into your configurations gives your *LINK* configuration drawings a neat, professional look.

Annotating Drawings

The drawing and text functions— the tools used to annotate drawings— are located in the second and third sections of `Draw` menu.

ConfigEd handles drawing elements and annotation text differently from *LINK* inputs, outputs and function blocks. Although they are part of a configuration drawing, they alter the appearance of the configuration *only*, and do *not* affect the functionality or operation of the configuration.

> NOTE.   You can add annotation text and drawing objects to configurations without changing the modification level of a configuration. You can even insert text or drawing shapes into a read-only configuration without removing the read-only restriction.

For quick access, a specific function key (`F4` through `F8`) corresponds to each of the five drawing tools in the `Draw` menu.

> NOTE. Pressing the `Ctrl` key after using any drawing tool causes ConfigEd to revert control to the *last immediate* drawing action you performed— whether it be text, line, arrow or shapes. The `Backspace` and `Delete` keys removes selected text or shapes from your configuration drawing.
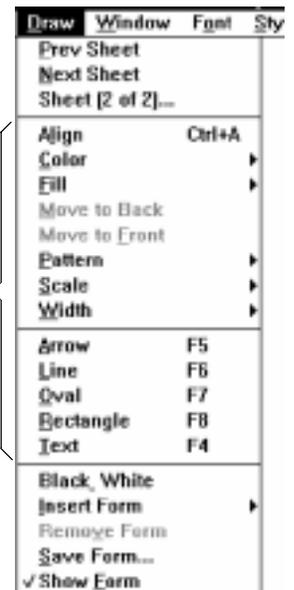
The Text & Drawing Tools

Text (F4)

To create and place annotation text in your configuration drawing, click on `Text` in the `Draw` menu. Your mouse cursor will then change to a text marker common to most Windows word processing applications. Click the cursor in the area where you wish to place your text. The cursor will change again to a flashing marker (|). Type in your desired text.

To change the appearance of the type, click on the text with the mouse pointer. Selected text is marked by a dashed box around the type. Select a different font size and type from the `Font` and `Style` menus in the menu bar (see *Text Attributes* below).

To edit text you have previously placed, select the text block with your mouse, highlight the text and type in the new text.

Rectangle (F8)

To draw a rectangle, select `Rectangle` from the `Draw` menu. Your mouse cursor will then change to a cross hair symbol (X) showing that it is now a drawing tool. Move the crosshairs to the area where you wish to place the top left point of your rectangle, push and hold down the mouse button and drag-draw your rectangle. The dotted outline formed shows the outline of the rectangle. Stretch the outline to the desired size, then release the mouse button to place the rectangle.

Holding down the `Shift` key while drawing the rectangle constrains its shape to equilateral sides. Use this feature to quickly draw squares.

Oval (F7)

The feature adds ovals or circles to your drawing and operates like the `Rectangle` tool. Select `Oval` from the `Draw` menu and click the crosshair in the area of the drawing that you wish to place the oval. As you hold down the mouse button and drag the mouse, a dotted outline shows the size of the oval. The midpoints of the top and bottom edges indicate the top and bottom points of the oval, and the sides of the outline indicate the oval's sides. Size the oval as desired and release the mouse button to place it. The oval appears only after you release the mouse button.

To draw a circle, use the `Oval` tool while holding down the `Shift` key.

Line (F6)

The `Line` command allows you to draw straight lines anywhere in your drawing. Use this feature to create form outlines and text boxes and to add highlighting to drawings. When you select `Line` from the `Draw` menu, your mouse pointer turns into crosshairs (X). Place the crosshairs where you want to begin your line, press and hold the mouse key down, and drag a line to the desired end point. Release the mouse key when to complete the line.

To draw a series of connected lines, hold down the `Ctrl` key when you click the mouse the second time. A new line will begin where the first one finished, which you can then drag to a new end point with the mouse.

Arrow (F5)

The `Arrow` command works identically to `Line` except that an arrowhead (➔) appends to the endpoint of each line. You can draw multiple, connected arrows by holding down the `<CTRL>` key when you click the endpoint of the first arrow you create.
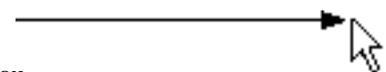
Moving & Re-sizing Drawing Elements

You can move any of the drawing items above by highlighting the item then clicking and dragging it to a new location with the mouse. For rectangles, ovals, lines and arrows, the outline shows the boundaries of the drawing element.

> NOTE. The group move feature (holding down the `Shift` key while selecting items with your mouse, then moving them as a group) applies only to function blocks and *LINK* inputs and outputs, not to drawing shapes and annotation text.

To re-size a drawing shape, highlight the element and click and drag on the corner or the element's outline. Change an arrow or line's length by clicking and dragging the beginning or end of the line or arrow.

Move to Front & Move to Back

These commands overlay drawing text, lines, arrows and shapes. Executing a `Move to Front` or a `Move to Back` moves the selected text or drawing shape to above or below *all* drawing and text elements within the configuration drawing.

> NOTE. These features apply to drawing shapes, lines, arrows and text *only*, not to function blocks.
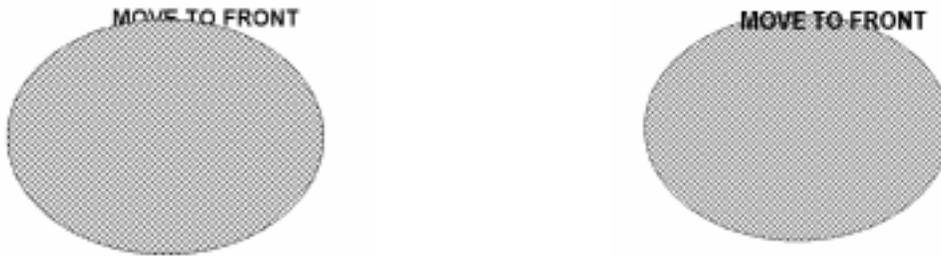
You can use these features to highlight drawing shapes: copy the original shape using the `Copy` command in the `Edit` menu, use the `Paste` command to place the duplicate slightly offset from the original, then place the duplicate behind its original using `Move to Back`. Use `Pattern` and `Fill` to darken the block color and give the original a "shadowed" appearance.

Draw & size `Rectangle`;
Change `Fill` to `Solid`;
`Copy` then `Paste` Original

Select a Shading of Duplicate with
`Pattern`; then `Send to Back`
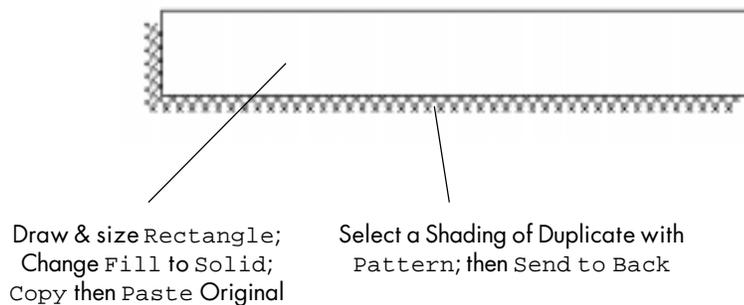
Creating a "Shadowed" Box

Drawing Attribute Functions

ConfigEd includes features you can use to enhance the lines, arrows and shapes you have drawn in your configuration. These features are `Color`, `Fill`, `Pattern` and `Width` in the `Draw` menu.

> NOTE. The drawing attribute features apply to the drawing elements *only*, *not* to function blocks you have placed in your configuration. You cannot re-size or modify ConfigEd function blocks as to color, fill or line width.

To apply these commands to an existing drawing element, first select the object with the mouse pointer.

Color

The `Color` command specifies the display *outline* color for rectangles and ovals and the display color for lines, arrows and text you have added to your drawing.

To change the color outline of an object or text, either select a line, arrow, shape or text you have placed in your drawing, then select the new color from the `Color` menu. The default setting is `Black`.
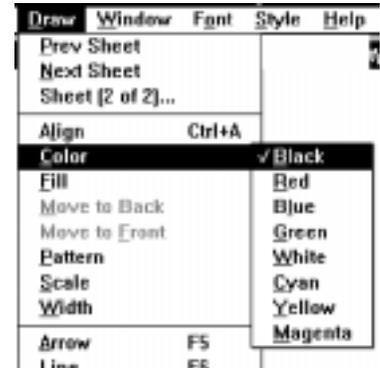
Fill

`Fill` applies only to ovals and rectangle elements in your configuration drawing. Use this feature to color the contents of a drawing shape as a solid block of color. The default `Fill` setting is `White`.

> NOTE. You must first change an object's `Pattern` attribute to `Solid` to fill it with a color or a pattern.

Pattern

Use `Pattern` to fill a drawing shape with a textured fill pattern. Eight selections are available, including Hollow and `Solid`. `Hollow`, the default, changes the shape to its outline and Solid fills the shape with the color selected from the `Color` menu selection.
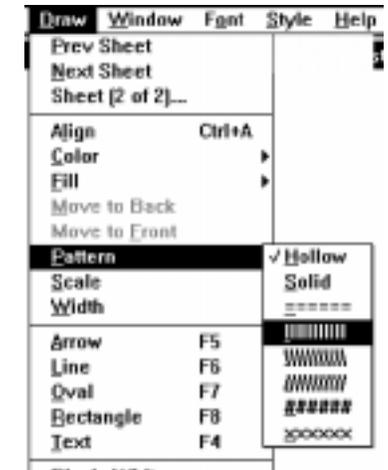
Width

The `Width` command specifies the thickness of lines created with the `Arrow` and `Line` commands and the *outlines* of shapes created using the `Oval` and `Rect-angle` commands. These widths range from 0.5 to 16.0 points, where one point equals 1/72 of an inch (.014"or 0.55 mm). The default line width is 0.5 points.

> NOTE. The `Width` command does *not* apply to text or to function block outlines.

Draw	Window	Font	Style	Help

Prev Sheet
Next Sheet
Sheet [2 of 1]...

Align Ctrl+A
Color ▶
Fill ▶
Move to Back
Move to Front
Pattern ▶
Scale ▶
Width

Arrow F5
Line F6
Oval F7
Rectangle F8
Text F4

Black_White
Insert Form
Remove Form
Save Form...
√ Show Form

√ 0.5 pt
1.0 pt
1.5 pt
2.0 pt
2.5 pt
3.0 pt
4.0 pt
5.0 pt
6.0 pt
7.0 pt
8.0 pt
9.0 pt
10.0 pt
12.0 pt
14.0 pt
16.0 pt
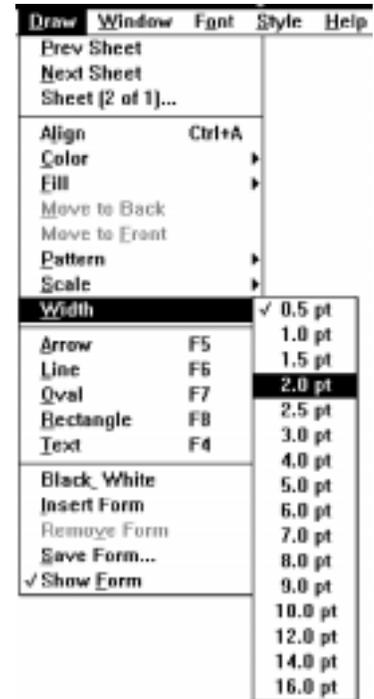
Black White

The `Black White` command in the `Draw` menu is used to change the display of your configuration from color to black and white mode. This is useful when viewing a drawing on a black and white monitor that was created on a color monitor. It is also useful when printing a configuration with color drawing elements on a black and white printer.

> NOTE. `Black White` differs from the `Black & White` option that appears in dialog box associated with `Project Print...`. (See `Project Print...` below.) The `Black White` command under `Draw` affects the way the configuration is displayed on the screen and how it is printed. Its setting is also saved when the configuration is saved. The `Black & White` option in the `Project Print...` dialog only effects how the configurations are printed. Its setting is not saved when you save the configuration.

Draw	Window	Font	Styl

Prev Sheet
Next Sheet
Sheet [2 of 1]...

Align Ctrl+A
Color ▶
Fill ▶
Move to Back
Move to Front
Pattern ▶
Scale ▶
Width ▶

Arrow F5
Line F6
Oval F7
Rectangle F8
Text F4

√ Black_White
Insert Form ▶
Remove Form
Save Form...
√ Show Form
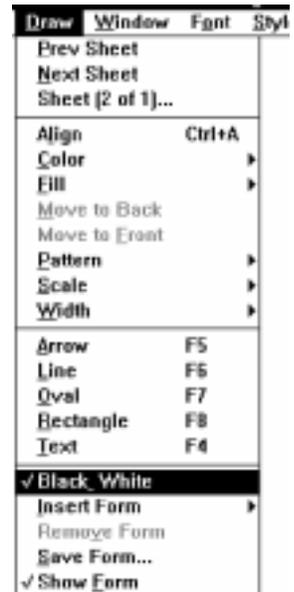
Text Attribute Functions

Font & Style Menus

The pull down menus `Font` and `Style` change the monitor screen appearance of text in ConfigEd.

The number of font selections available in the `Font` menu depends on the active window open on your monitor. If a configuration window is active, only four font selections are available, as shown in the figure to the right. These four fonts are part of the ConfigEd database and *only* apply to annotation text you have added to your configuration using the `Text` function. To change the appearance of annotation text in configuration windows, mark the text with your mouse cursor, then make your selection from the `Font` and `Style` menus.
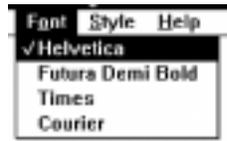
Available *only* to annotation text within configuration windows

You can also change the appearance of text in any *dynamic* window in ConfigEd. A dynamic ConfigEd window is any window which displays data that changes due to *LINK* network processing. The `Scratch Pad`, `CE Monitor List`, `SAM Monitor List` and any SAM monitor window are considered dynamic windows since they display information which changes as the *LINK* control network processes data. You can select fonts for dynamic ConfigEd windows from the entire list of fonts installed on your Windows system. The number of fonts available for dynamic ConfigEd windows depends on the number you have loaded on your PC. Consult your Windows manual for information on installing fonts.

> NOTE. The appearance of text within ConfigEd software blocks appearing in configuration windows is fixed and *cannot* be changed through these menus.

To alter text within dynamic windows, click on a dynamic window (such as `Scratch Pad`) to make it active and make your selection from the menus. The font and style you select changes *all* the text within *all* dynamic windows— you cannot change the font and style for dynamic windows independently. ConfigEd retains the font and style settings for use in your next ConfigEd session.

The `Style` menu offers a list of text sizes in point size from 3 to 72 point and allows you to underline, italicize text and set text in boldface.

Available to *dynamic* ConfigEd windows

> NOTE. The default text font and style settings are 14 point, non-boldfaced, non-italicized and non-underlined Helvetica font, which is easily viewed on most laptop and PC monitors. This type selection and setting matches the function block text typeface. A sans serif typeface, such as Helvetica which is clear and easy to read, is recommended.

Changing your text to a larger font size is particularly useful when monitoring dynamically changing values on the `SAM Monitor List` from a distance while tuning or troubleshooting a *LINK* system.

The printed text size and font may differ from the font and style you select using these menus. Refer to Printing Configurations below to change the printing font selection.

Forms

ConfigEd provides you with the capability to place forms— such as outline borders and index tables— in your configuration drawings. A drawing form presents your configurations in a uniform, professional format while providing important standardized and unique documentation information— such as company name, project title and drawing number. This information is useful for identifying and servicing your *LINK* application.

You can insert a standard form stored within the `ssd_link` database. You can also modify a standard form to create a custom form or build a custom form from scratch. Regardless of how you acquire forms, form files become part of each configuration file once you have inserted them into configuration drawings. This means that another user can still view the forms so long as the user has access to the projects configuration files. The standard ConfigEd forms are stored as `.frm` files on your hard disk under `ssd_link\tools\win3`.

ConfigEd allows you to place multiple forms in each project. This is very useful for displaying information from the same project in different configurations. This is also a convenient feature for automatic data entry (see below).

> NOTE. Like all other graphical images in ConfigEd, the form you insert into a configuration drawing *must* reside within the gray border that appears on your computer screen in order to be printed. This applies to the standard available forms that are part of ConfigEd and forms that you create.

The forms functions within ConfigEd are located in the last section of the `Draw` menu.

Inserting and Removing Forms

To insert a form, click `Insert Forms` in the `Draw` menu and choose the form you want from the roll-down list that appears. Three standard forms are available:

· **generic6** - a border form to frame your configuration drawings
· **titleb6** - a key code form, used for automatically inserting documentation information into the fields of border forms (see *Automatic Data Entry* below)
· **index_6** - a *single* column table used to tabulate index information for index configurations *only* (see *Creating an Index* below).
· **index1_6** - a *double* column table used to tabulate index information for index configurations *only* (see *Creating an Index* below).
> NOTE. The four forms listed above are standard to the ConfigEd software package. If you are granted a *LINK* Manager account through a *LINK* Manager Hub, the Hub may include extra forms when it grants you user rights.

You can insert or remove a standard form or a form that you have created on any sheet of a configuration drawing. Border and key code forms appear on *all* sheets so long as the `Show Forms` option is toggled *on*. Index forms appear on the first sheet of a configuration drawing *only*, again if the `Show Forms` option is toggled *on*. Because ConfigEd prints *exactly* what your screen monitor displays, the `Show Forms` setting also applies to printed configurations. `Show Forms` *must* be toggled ON for the form to appear on print outs. ConfigEd does *not* allow you to specify different forms for different sheets in a multiple-sheet configuration.

> NOTE. *All* standard forms in ConfigEd assume a landscape (horizontal) page orientation and are designed to fit an 8½" x 11" page size. Set the `Page Setup` orientation to `landscape` and `Print Scale` to `1.00x` to match the screen print area to the form size.

If you wish to have ConfigEd automatically enter data on your form (see *Automatic Data Entry* below), insert both the key code form `titleb6` as well as the border form `generic6`. The key codes positions on this form line up with the correct fields positions on the border form for automatically entering documentation information about your configuration into the fields of the border form `generic6`.
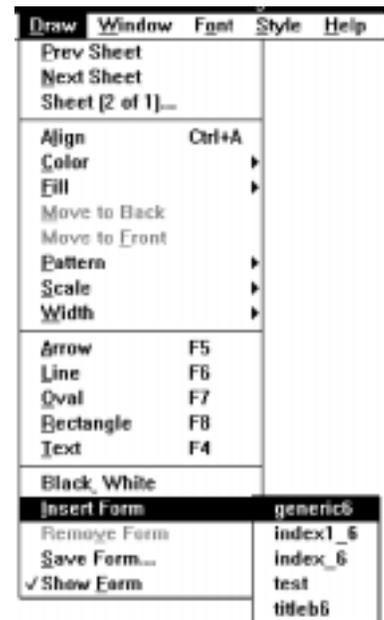
Once you have inserted a form into your configuration drawing, the Remove Forms menu option becomes active. Clicking this option displays a roll-down list of the forms inserted in your configuration drawing. Clicking on the form name from this list removes the form from your configuration drawing.

Creating Forms

Modifying an Existing Form

You can create a custom border form by modifying a standard form and saving it under a new name, or you can design an original form. Modifying an existing

form is easier, since the forms available in ConfigEd already have field blocks drawn to accommodate drawing, project, application and engineering approval information.

To modify a standard border form into a custom form, open or click on the open configuration in which you wish to create your form and insert

the standard border form you wish to modify on any sheet in your configuration.
Create the new form file by executing the `Save Form` command. This saves the form on your hard disk under the directory `ssd_link\tools\win3`. The dialog box that appears asks you to name the new form. This form name will then appear in the roll-down list under the `Insert Forms` option and will be available for insertion into all configurations.
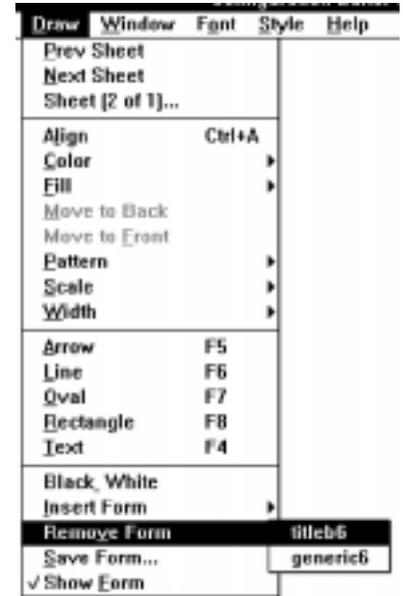
Caution

If you modify a standard form into a custom form, it is recommended to create your new form file *immediately* after inserting the standard form into your configuration drawing to avoid overwriting and permanently altering the original standard form.

Next, switch the screen view to `Sheet 0` using the `Sheet` commands at the top of the `Draw` menu. A dialog box asks you whether you wish to edit your inserted forms. Click on `Edit` to enter `Sheet 0`.
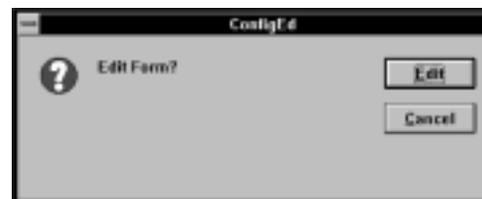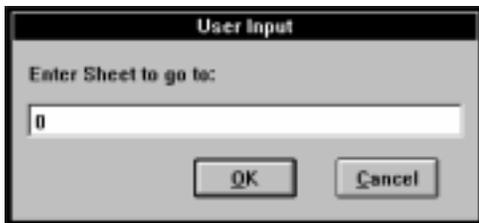
NOTE. `Sheet 0` is reserved for global graphic images *only*: *any* graphical images you place on `Sheet 0` appear on *all* subsequent sheets of that configuration . `Sheet 0` should *not* contain any function blocks. You can edit forms only on this sheet.

Once you have entered `Sheet 0`, use the drawing and text tools (see above) to modify the standard drawing to suit your documentation requirements.

Creating a New Form

To create a form from scratch, open or click to the open configuration in which you wish to create the form, then switch the screen view to `Sheet 0`. Use the drawing tools in the `Draw` menu— particularly the `Rectangle`, `Line` and `Text` commands— to create your form.

In `Sheet 0`, the gray border around your page— indicating the printable area of your screen— is the only visible element. Make sure you are in a view scale that allows you to see the gray borders at the bottom and right side of your window. If the gray border is not visible, go to the `Draw Scale` menu and select a different magnification size. Or, hit the – and + keys to quickly change the drawing view. Set the page orientation under `Page Setup` in the `File` menu so that the form's orientation aligns with your desired drawing orientation.

The first element to add when creating a form is the border surrounding your configuration drawing. This border the orients the edges of your drawing and defines the space available for placing configuration elements. While you can create the border using the `Rectangle` tool, it is more practical to use the `Line` tool, since it is easier to perform editing on lines rather than on rectangle shapes.

When creating the border, hold down the `Ctrl` key while using the `Line` function (`F6`) to draw a successive series of connected lines to form your border. A new line will begin where the first one finished, which you can then drag with the mouse to define the next corner. Make the border close to— but not extending over— the grayline defined print area to ensure as much graphical information lies within the configuration print area as possible.
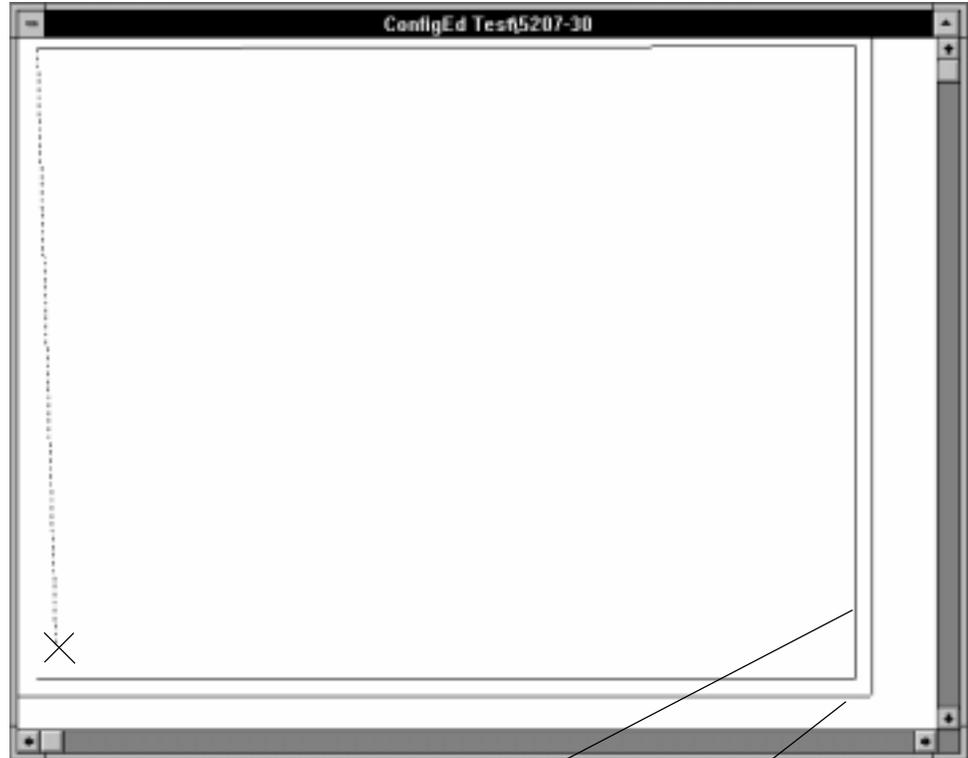
Form border using the `Line` tool   Print area border
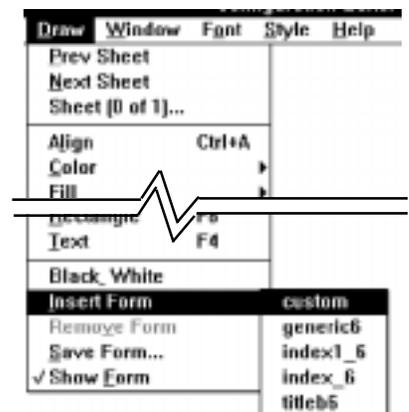
Use the `Width` feature to change the border thickness, if desired. Use the `Rectangle` command to add information blocks to your drawing and the `Text` command to add in company names and standard information headings. Change the text appearance using the selections under the `Style` and `Font` menus.

Once you have created your form, either by modifying a standard form or creating one from scratch, save the form using the `Save Forms` command.
Click `Save` only if you a certain you have typed in the correct file name. The form you have created will then appear in the pull down menu under the `Insert Forms` menu and you can install it into any configuration.

Automatic Data Entry

Configuration 0

You can have ConfigEd automatically insert information that you specify in your configuration into designated fields on your forms. To do this, switch to `Sheet 0` and use the `Text` command to key in codes on your form that tell ConfigEd to import specific configuration documentation information. This information can include the configuration name, project name and the number of sheets in the configuration.

Figure 5.2 describes the key codes. The upper-case letter codes in the left hand column refer to the current or *selected* configuration in which you have entered the form.

Configuration 7

The # symbol following lower-case letter code in the right hand column refers to the nth configuration in the current project starting at 0, as enumerated from top to bottom in the `File Open Open` dialog box under the `File` menu. This is emphasized in the figure to the right. These codes can be used for index forms.

> NOTE. All the upper-case letter codes and lower-case letter codes ^c* and ^p* are normally used for creating a title sheet. Many codes, such as those for revision and modification number, will not provide accurate information unless the project has been processed first using the `Project Print` or `Project Document` commands.

Many of these codes refer to the information you entered in `Fields` under the `File Open Open` dialog box and the `Change Project Info` dialog box under the `Project Manage` menu selection (see *Chapter 4*).

At a minimum, your form should include:

- the project name (code ^P)
- the configuration name (code ^C).
- the number of sheets in the drawing (code ^N).
- the current sheet number (code ^S).

The standard form `titleb6` available in the `Insert Forms` roll-down menu already most of the information codes you will need to create a title block form. Note that if you insert the border form `generic6` and the key code form `titleb6`, the key codes in `titleb6` line up with the information field boxes in the border form `generic6`. As a general rule, the border drawing should contain the field heading information.

As an example, the figures below show the lower portion of `sheet 0` and `sheet 1` for the configuration 5207-30 in the project ConfigEd Test. The forms `generic6` and `titleb6` are inserted into the configuration. The `File Open Open` and `Change Project` dialog windows are shown at the right for the configuration and its project to give you an idea on how information is automatically placed using the generic forms.
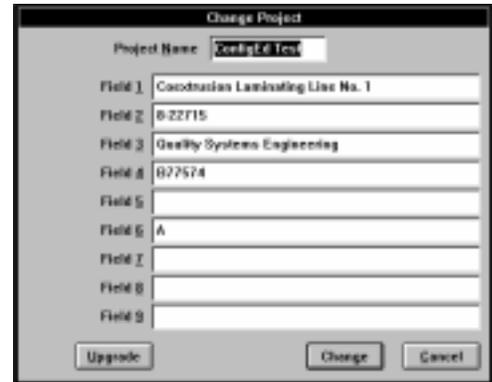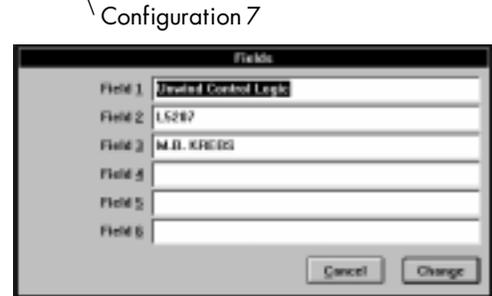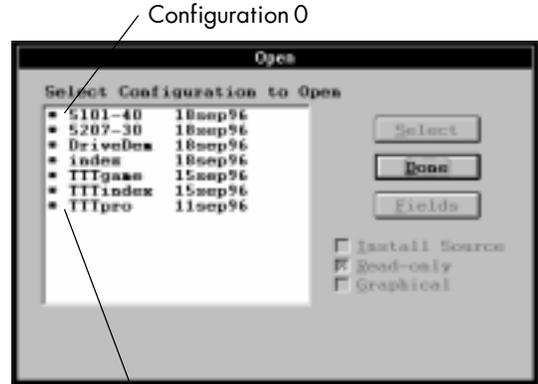
`sheet 0` of configuration 5207-30

`sheet 1` of configuration 5207-30

Code	Configuration or Project Information	Code	Configuration or Project Information
ˆA	Network address of current configuration.	ˆa#	Network address of nth configuration #
ˆC	Name of current configuration.	ˆc*	Descriptive information entered for the current configuration in `Fields` under the `File Open Open` window. The asterisk (*) specifies the field number (`Field 1` through `Field 6`). This code is identical to ˆF*.
ˆD	Date of current configuration's last modification.	ˆd#	Last modification number of nth configuration #
ˆF*	Descriptive information entered for the current configuration in `Fields` under the `File Open Open` window (see Chapter 4). The asterisk (*) specifies the field number (`Field 1` through `Field 6`).	ˆf#	`Field 1` in `Fields` under the `File Open Open` window of nth configuration #
ˆG*	Descriptive information of project where current configuration resides. This information is entered in the fields appearing in the `Change Project Info` under the `Project Manage` menu selection. The asterisk (*) specifies the field number (`Field 1` through `Field 9`).	ˆg#	`Field 2` in `Fields` under the `File Open Open` window of nth configuration #
ˆH	Project category holding the *LINK* project where current configuration resides.	ˆh#	`Field 3` in `Fields` under the `File Open Open` window of nth configuration #
ˆI	Eight digit *LINK* project number where current configuration resides. Displayed in the `Scratch Pad` title bar.	ˆi#	`Field 4` in `Fields` under the `File Open Open` window of nth configuration #
		ˆj#	`Field 5` in `Fields` under the `File Open Open` window of nth configuration #
		ˆk#	`Field 6` in `Fields` under the `File Open Open` window of nth configuration #

Code	Configuration or Project Information	Code	Configuration or Project Information
ˆM	Last modification number of current configuration.	ˆm#	Configuration modification number of nth configuration #
ˆN	Number of sheets in current configuration.	ˆn#	Configuration name of nth configuration #
ˆP	Project name where current configuration resides.	ˆp*	Descriptive information of project where current configuration resides. This information is entered in the fields appearing in the `Change Project Info` under the `Project Manage` menu selection. The asterisk (*) specifies the field number (`Field 1` through `Field 9`). This code is identical to ˆF*.
ˆR	Revision number of current configuration.	ˆr#	Revision number of nth configuration #
ˆS	Sheet number of current configuration.	ˆs#	Sheet number of nth configuration #
ˆT	Topology of current configuration.	ˆt#	Topology of nth configuration #
ˆX	Topology of current configuration (single letter) T=Tapped, R = Redundant, S = Simple, A = Auxiliary Tapped	ˆx#	Topology of nth configuration # (single letter) T=Tapped, R = Redundant, S = Simple, A = Auxiliary Tapped

Figure 5.2 - Format Codes for Automatic Data Entry

NOTE. The ^ symbol refers to the caret key (shift+6) *not* the Ctrl key.

Creating an Index

ConfigEd has an automatic indexing feature that produces a list of a project's configurations, their descriptions and the sheet on which each configuration appears in the project drawing print out.

To create a project index, you should first sort the configurations within the project by address. To do this, select the project you wish to index from the `Project Manage` menu and toggle `Sort by Address` option ON. Once this feature is toggled on, the configurations in that project appear in ascending address order in the `File Open` and `File Open Open` configuration lists. The configurations are otherwise sorted alphabetically by configuration name.

Next, close the `Project Manage` window by clicking the `Done` button and click `New` in the `File` menu. Select `Index`, then name the index file and click `OK` when the dialog box appears. ConfigEd automatically places the form `index_6` in this configuration, indexes all the configurations that belong to the project and assigns the index configuration the address -1.

> NOTE. Although an index configuration can accept configuration data, the software of first generation *LINK* and *LINK2* devices will *not* accept an index configuration file. The index configuration is reserved for documentation only. Do *not* place function blocks or configure signals to and from an index configuration.

The form ConfigEd places, `index_6`, is a two-by-two list. If you want to reduce the configuration index to a one up list, use the form commands in the Draw menu to remove the form and then insert the form `index1_6`.

If not all of your configurations appear in the list, return to the `Project Manage` dialog box and make sure `Sort by Address` is toggled on.

The index sheet that ConfigEd creates lists the following information for each configuration in the project: network address (ADR), configuration name (CONFIG), revision number (REV), modification number (MOD), description (DESCRIPTION), and sheet number (SHEET). ConfigEd updates the index automatically whenever you add or delete configurations to you project or when you change configuration information. The DESCRIPTION field fills in the information entered in `Field 1` (configuration title) of `Fields`, which appears in the dialog box when you execute the `File Open Open` command.

> NOTE. The MOD and SHEET fields show correct values only *after* the index configuration is printed using the `Project Print...` function. The defaults values in these fields may not be correct on your monitor screen and on print outs created with the `File Print...` command.

It is recommended that you insert the same border and key code forms to the index file as you placed in all other configurations.
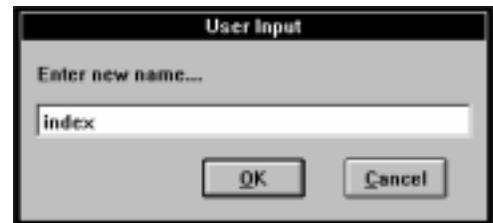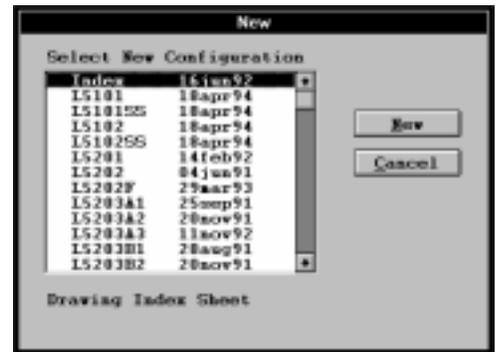
The Document... Command

Document... creates an ASCII text file on your PC hard disk which records all connections and parameter values of any selected configuration files in a *LINK* project. The file is called xxxxxxxx.doc, where xxxxxxxx indicates the project number, and is located under the project number under the ConfigEd root directory ssd_link\configs. You can print out the file or review and edit it with a standard word processing application— such as Word for Windows — or text editing application. It is useful as a permanent record for troubleshooting.

The Document... command operates only on the *last* saved configuration file and may not reflect the configuration downloaded in a *LINK* drive or module. A configuration file saved on your hard disk may *not* be the actual configuration installed. Look for the asterisk (*) in the Document pop-up window indicating that a configuration has been changed and saved, but not installed. In addition, SAM changes to a module will make an installed configuration differ from the disk stored configuration files.

> NOTE. Be sure to Update the configurations *before* executing Document... to make certain you record all SAM parameter settings in your text file.

To Document... a project, you must first close all configurations within the project. You do not need to open the CE Module List to execute Document..., since ConfigEd builds the text file directly from the configuration files stored on disk.

Select Document... from the Manage menu, then highlight the configurations you wish to document from the Document Project selection window that appears. Use the Ctrl-click or the Shift-click combination to quickly mark several configurations. Scratch Pad will report the progress or any errors in building the file.

> NOTE. Document... differs from the SAM function Document Module (see *Chapter 6*). Document... creates a text file of the configuration, whereas Document Module writes the SAM accessible parameter settings and dynamically changing parameter values of a *working* module to the ConfigEd Scratch Pad.

Date configuration was created.
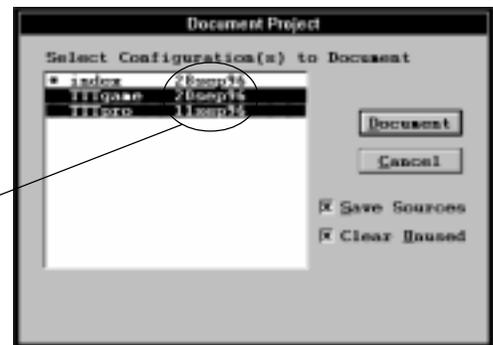
Save Sources & Clear Unused

These two features in the Document... command automatically cross reference *LINK* outputs to *LINK* inputs and reconcile *LINK* output destination addresses with *LINK* input source addresses.

- **Save Sources** - This command fills in blank source addresses and replaces incorrect source addresses in *LINK* input slots. If you leave this option toggled on when you execute the Document... command, ConfigEd automatically scans the selected configurations and supplies source addresses for *LINK* inputs you left blank or entered incorrectly.

- **Clear Unused** - This command changes the source field of *LINK* inputs to a dash if they are *not* referenced as a destination address by a *LINK* output in another configuration in the project.

Both of these features can help you find mismatched *LINK* inputs and outputs. After documenting a project with these options selected, the configuration drawing will show the true source address values of *LINK* inputs the next time it is displayed on screen.

> NOTE. It is recommended to execute the Document... command only *after* you have fully completed the design of *all* configurations in your project, and after you have performed an Update on all installed configurations in the project.

PRINTING

The horizontal and vertical gray borders within configuration window bound the print area on your screen monitor. Your printer will print whatever lies within the borders as it appears on you screen monitor and will *not* print any graphics or any portions of graphics lying outside the borders.

Use the `Print Scale` and the `Page Setup` features in the `File` menu to adjust the print output on your screen.

Print Scale & Page Setup

`Print Scale` adjusts the gray border to scale the configuration drawing to fit your printer sheet size. The scaling point is referenced to the upper left corner of the drawing. Adjusting `Print Scale` changes the size of your print area, not the size of any graphics on your screen. For example, changing `Print Scale` to `2.00 x` doubles the size of the elements within the print area when they are printed but reduces the print area to a quarter of its original size.

The `Page Setup` command opens a dialog box called `Print Setup` which contains your printer setting parameters. `Default Printer` and `Specific Printer` settings determine your print driver selection. The selection `Default Printer` is set through the `Printer` settings under the `Control Panel` icon for Windows.

You can route the printing of your configuration to another printer through the `Specific Printer` print driver selection. The printer driver you select determines the `Paper Size`, `Paper Source` and `Options` selections.

Normally, you should leave the `Print Scale` set to its default setting of `1.00x` and the page orientation set to `landscape`. This scales and orients the ConfigEd drawing to match the default forms that ship with ConfigEd. It also is the correct scale for standard 8½"x11" printer paper.

> NOTE. `Print Scale` does *not* scale any forms in your configuration drawings.

The File Print... (Ctrl+P) Command

`File Print` prints only the *active* configuration on your monitor screen. Use this option when you want a quick print out of a configuration you are currently modifying. Executing this command prints the entire configuration your have selected, not just the current sheet view.
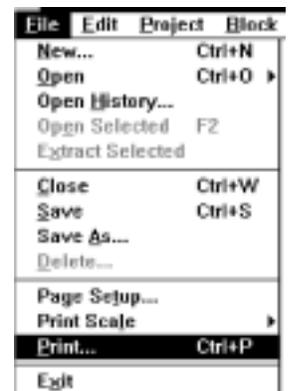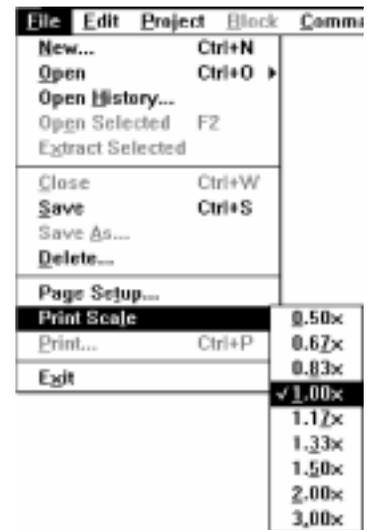
The Project Print... Command

Use `Project Print...` to print a complete set of configuration drawings for a project, including the project's index.

To `Print...` an entire project, you must first close all configurations within the project. From the `Project` menu, select `Print...`. A dialog box appears prompting you to select the configuration(s) you want to print. You can select an individual configuration, a group or all the configurations in that project.
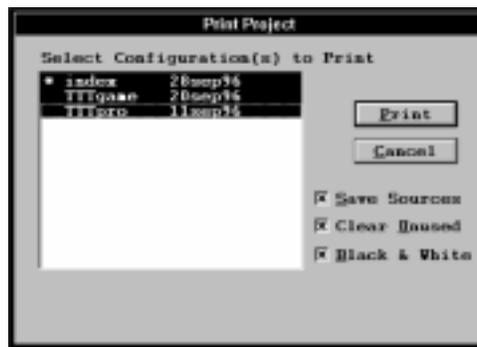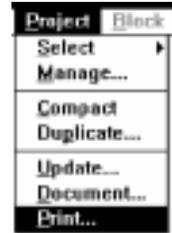
Use the mouse to select the configurations. Hold down the `Control` key to select multiple individual items, or hold down the `Shift` key to select a list of items. Once you have selected the configurations to print, click `Print...`.

The `Project Print...` dialog box contains three options:

- **Black & White** - This option changes color images to black and white when printed. Many printers cannot print in color and automatically change color attributes to grayscale. This can degrade the printed appearance of a configuration drawing. To avoid the printer grayscale conversion, check this option to convert all color graphics you placed in your configurations to black and white.

    NOTE. This option differs from the `Black White` drawing attribute selection in the `Draw` menu. The `Black & White` setting under `Project Print...` changes color graphics to black and white only when they are printed. The `Black White` setting under `Draw` applies both to the screen and printed appearance color graphics drawn in your configurations.

- **Save Sources** - This command fills in blank source addresses and replaces incorrect source addresses in *LINK* input slots. If you leave this option toggled on when you execute the `Project Print...` command, ConfigEd automatically scans the selected configurations and supplies source addresses for *LINK* inputs you left blank or entered incorrectly.

- **Clear Unused** - This command changes the source field of *LINK* inputs to a dash if they are *not* referenced as a destination address by a *LINK* output in another configuration in the project.

Both the `Save Sources` and `Clear Unused` operate identically to the same options offered under the `Docu-ment...` command and can save valuable troubleshooting time spent tracking down mismatched or mis-addressed *LINK* inputs and outputs. It is recommended to always print a project with these options selected.

Chapter 6   SAM FUNCTIONS

The SAM (Setup And Monitor) functions of ConfigEd allow you to do the following:

1. make on-line changes and monitor system parameters of *LINK* control systems during commissioning and troubleshooting
2. backup and restore installed configuration files
3. document the parameter values of a *LINK* control system

> NOTE. You *cannot* use the SAM functions to make configuration changes to the configuration file installed in a *LINK* device. To do this, you must have access to the original configuration file installed in the *LINK* device, modify it using other ConfigEd features, and then reinstall the file. If you do not have access to the original configuration file, you may be able to reconstruct it using the `Extract` function (refer to *Chapter 4*).

SAM was previously offered as a separate software package. ConfigEd 5.0 now incorporates all of the original SAM functionality and includes additional features.

ACCESSING THE SAM FUNCTIONS

The SAM functions are located in the `Command` menu. Click on `SAM` and a pull-down menu appears showing all SAM related functions.

To use the SAM functions you must open a `CE Module List` and communicate through your PC's RS232 serial connection with a *LINK* module that is connected to a functioning *LINK* network. The SAM functions are inaccessible until you successfully open a `CE Module List`. Refer to *Opening a* `CE Module List` in *The Window Menu* section of *Chapter 4* if you are unsure how to do this. Refer to *Appendix A* for information about setting up the communications between your PC and the *LINK* network.

Execute either `Update Full` or `Update Partial` from the `Window` menu to open the `CE Module List` or to update the list if it is already open. The `Scratch Pad` will display a series of error and diagnostic messages if the communications settings under `Comms` in the `Command` menu are set incorrectly. If you cannot generate or update the `CE Module List`, refer to the *Comms Problems* section of *Chapter 7 Troubleshooting*.

> NOTE. The `CE Module List` does not dynamically update. If the *LINK* network stops processing due to an event outside of ConfigEd — for instance, a module has failed, changed state or the *LINK* fiber optic network has been severed— the `CE Module List` will not reflect the change until you again update it.

Each line in `CE Module List` corresponds to a node on the *LINK* network. Nodes are displayed in the order they appear on the network, beginning at the point where the serial connection is made and proceeding around the fiber optic ring in the sequence in which the fiber optic network physically connects them.
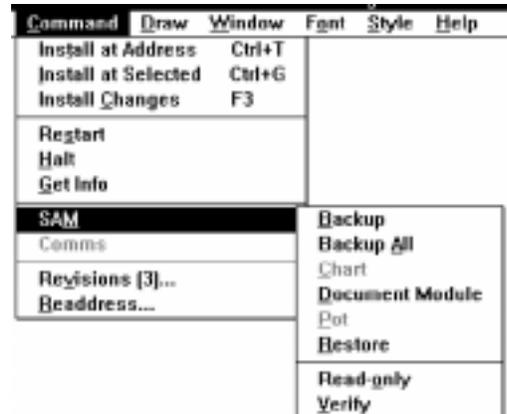
OPENING GRAPHICAL SAM WINDOWS

Once the CE Module List is opened and updated, the first node (the one connected to your PC) is automatically high-lighted. Select other modules or drives by either highlighting them with the mouse pointer or by scrolling through the list using the arrow keys. To open a SAM window, double click on the *LINK* device node with your mouse or press Enter after highlighting the device in the list to open its SAM window. An Open Selected status bar displays the progress of opening a SAM window.

Notice that the graphical SAM window of the configuration file installed in a *LINK* device looks the same as its configuration file window; only the title bar distinguishes it from its configuration window. The function blocks in both are oriented and laid out identical to the revision of the installed configuration.

Double-click to open Graphical
SAM window of 5207-30

Graphical SAM
window of 5207-30

Configuation
window of 5207-30
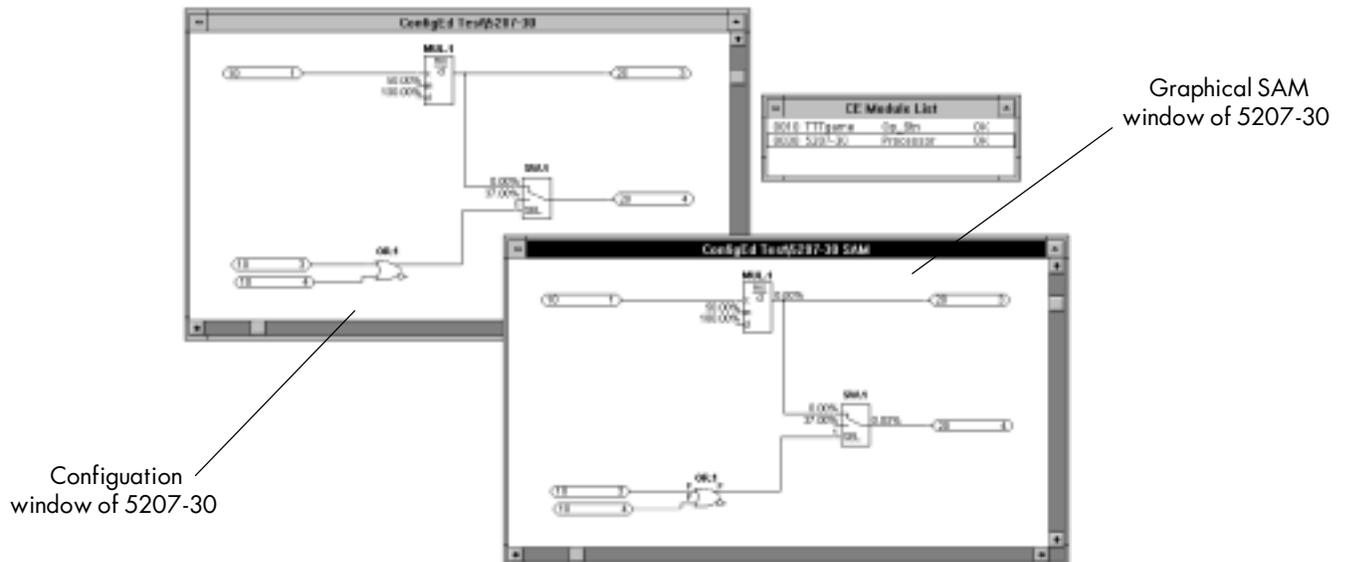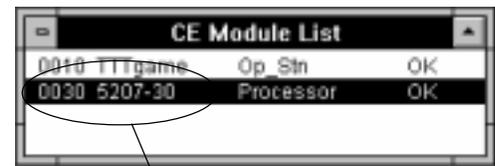
Notice also that the parameters for most function blocks in the SAM window appear adjacent to the inputs of the function blocks, just as they do in the configuration's ConfigEd window.

Upon opening the SAM window for a *LINK* module, these parameters show the values contained in the configuration file. With new *LINK2* modules, the SAM window displays the values contained in the modules, not the configuration.

When you initially open the SAM window immediately after installing its configuration file, these parameters show the value to which you *last* set them in ConfigEd before installing the configuration. If you open the SAM window of a *LINK* node subsequent to making SAM parameter changes in a previous SAM session, these parameters reflect the values to which you set them in your *last* SAM session.

MONITORING AND SETTING PARAMETERS

There are three ways to monitor and change *LINK* parameters in SAM:

1. Monitoring and setting them discretely using the predefined SAM `Get` and `Set` operation for various parameters in each configuration function block
2. Monitoring and setting them continuously using the `Chart`, `Monitor List` and `Pot` functions
3. Changing and reading the parameters directly in the graphical SAM display window of the installed configuration

Opening SAM Get & Set Parameter Windows

To monitor or set a SAM parameter, double-click in the SAM parameter window on the function block containing the parameter you wish to monitor or set. You can also highlight the function block in the SAM window and press `Enter`. A window appears listing all the available SAM `Get` and `Set` operations associated with that function block. This window is called the SAM parameter list window, and a list exists for every installed function block. The title bar gives the name assigned to the function block when it was placed in the configuration and also gives its type.
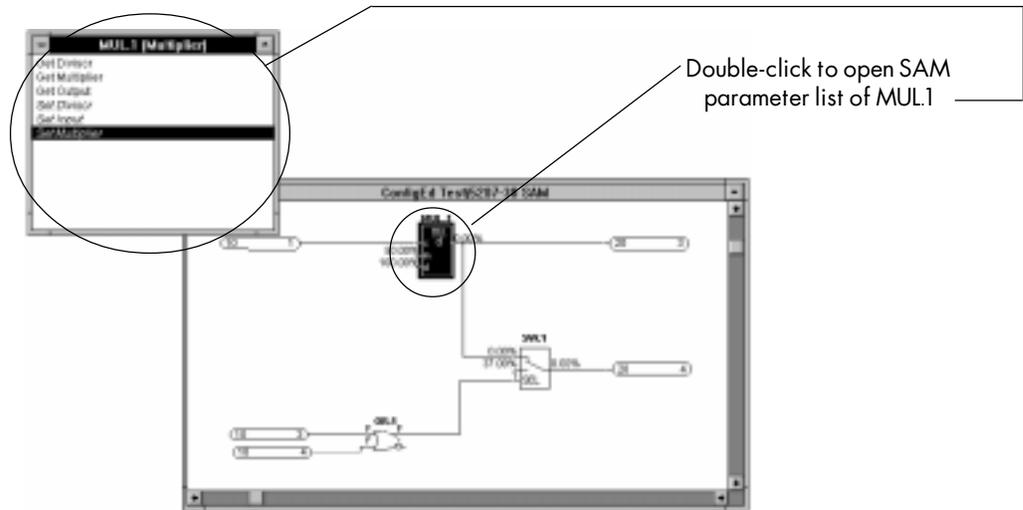
All `Get` functions associated with that function block are listed and alphabetically sorted first; all `Set` parameters are listed and alphabetically sorted last.

> NOTE. Not all function block parameters have an assigned SAM `Get` or `Set` operation. The function block's data sheet in the `Help` menu lists whether each function block input, output and parameter variable is available as a `Get` or `Set` SAM parameter.

Monitoring Parameters

The Get Operation

To monitor a parameter, highlight and double-click its `Get` operation in its SAM parameter list window. You can also select a `Get` operation using the arrow keys and pressing the `Enter` key. ConfigEd then polls the *LINK* device for the `Get` parameter you have selected and displays its value in the `Scratch Pad`. The `Scratch Pad` displays the value of the parameter *only once* for each `Get` execution.

Although most function block parameters have an associated Get and Set operation, the function blocks and parameters listed below do *not*:

- · *LINK* inputs and outputs
- · most inputs to `Signal P` (signal processing) ConfigEd blocks

However, you can still monitor the parameter by:

1. monitoring the signal source or destination block connected to the function block input or *LINK* input, or output.
2. placing a `Persistent` block or `Value Sampler` in the signal path between the signal source or destination and the block input or *LINK* input or output, then reinstalling the configuration. You can then can monitor the `Persistent` block or `Value Sampler` output— and thereby the block input — in SAM.

Double-clicking or pressing Enter on any
`Get` operation….
…displays its current value only once in
the `Scratch Pad`.
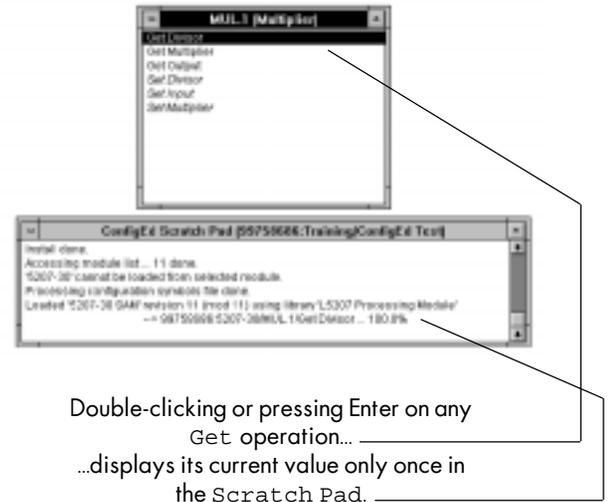
> NOTE.   If you place a `Value Sampler` in line with a block input or *LINK* input or output for monitoring purposes, be certain to set its sample rate *faster* than the update time of the signal to avoid inadvertently slowing down the signal.

The Monitor List

You can also continuously monitor a SAM `Get` parameter. To do this, either highlight the `Get` operation in a SAM parameter window and press `Shift + Enter`, or hold down the `Shift` key while double-clicking on the `Get` operation. This opens a new window called `Monitor List`. ConfigEd samples the selected parameter and reports its value in the `Monitor List` window. This is useful during commissioning when you need to dynamically monitor a parameter value such as speed or tension feedback. The `Scratch Pad` also displays the first sampled value.

Shift+double-click
or Shift+enter on
this `Get` operation
displays its value ….

…continuously in the
`Monitor List`….

…and only once in the
`Scratch Pad`.

You can add or delete parameters from the `Monitor List` as needed. To add a parameter, hold down the `Shift` key while double-clicking on the parameter you wish to add. To delete a parameter from `Monitor List`, select the parameter in the window and press the `Backspace` key. When you delete the last parameter displayed in the window, the window automatically closes.

ConfigEd samples a single parameter in the list each 0.1 second. If there are more than one parameter in the list, ConfigEd samples them consecutively and updates them in the order they appear in the list, from top to bottom. Therefore, the more parameters you add to the list, the longer the update time for each parameter.

SAM continues updating the parameters in the `Monitor List` until you either close it, break communication with the *LINK* network by closing the `CE Monitor List` window, delete all the items in `Monitor List`, switch to another program, or quit ConfigEd altogether. You may perform other SAM functions, such as `Set` operations, while continuously monitoring parameters; `Monitor List` continues updating in the background.

The Chart Function

You can display graphically the value of a parameter as it changes by using the SAM `Chart` function. First highlight the `Get` parameter, then selecting `Chart` from the `Command SAM` sub-menu.

ConfigEd then prompts you to specify an update rate, in seconds. Enter the update rate (the default is 0.1 seconds) and click on `OK`. configEd will open a new window and chart the parameter.

> NOTE. It is possible to designate an update rate that is faster than the transmission rate of the RS232 connection. In this case, the update rate will be limited by the speed of the serial communications between the computer and the *LINK* module.
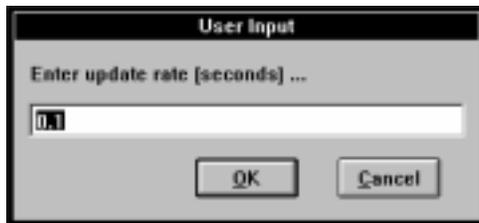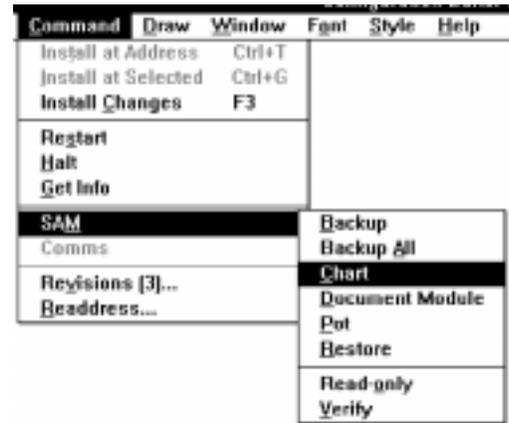
Setting Parameters

The Set Operation & the Read–Only Mode

You can modify parameter values by double-clicking on the desired `Set` operation in the SAM parameter window. If the `Read-Only` option in the `Command` SAM sub-menu is checked, all `Set` functions are disabled and you can only monitor, or `Get` SAM parameters. Toggle `Read-Only` on and off by clicking the mouse on the `Read-Only` option

When `Read-Only` is active, the SAM `Set` parameters appear in *italics* in the SAM parameter window. The program defaults to the `Read-Only` mode when you begin a new ConfigEd session. A warning window will inform you whether the `Read-Only` option is enabled. The SAM `Read-Only` option applies to all open SAM parameter windows.

These parameters are Read-only protected
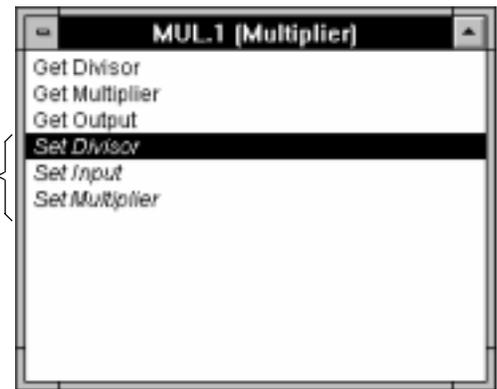
If `Read-Only` is disabled and you double-click on a `Set` parameter in the SAM parameter window, a pop-up dialog box will prompt you to enter or select a new parameter value. Make your change and click on `OK`. ConfigEd downloads the change over the RS232 connection to the module and the `Scratch Pad` reports the new setting.

You can also directly set parameter values in a SAM window. Move the cursor over the parameter until cross-hair appears. Hold the `<CTRL>` key down and double-click. This opens an Enter Data window to enter the new parameter value.

Read-only protection toggled off

Double-click on a `Set` operation....

ConfigEd generates an error message if you attempt to enter a value beyond its predefined range.
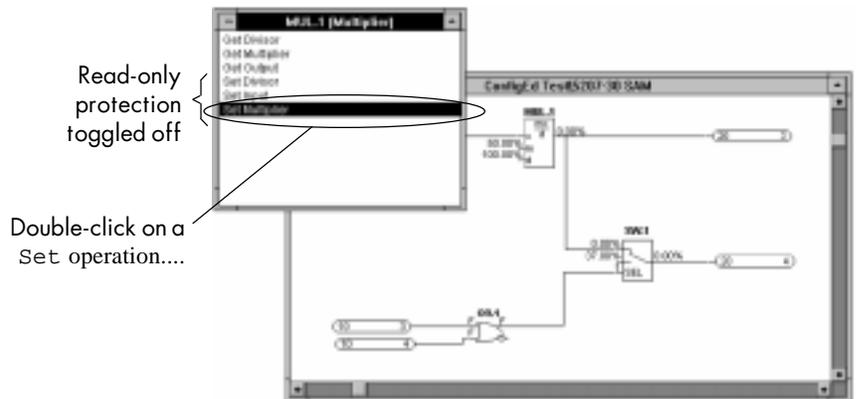
... to open its dialog box and change its value.

You must enter a value within its accepted range.
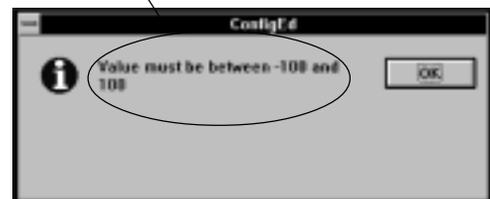
Verify Mode

In order to prevent accidental modifications of configuration param-
eter values, SAM functions have a `Verify` mode, as indicated by a
check mark in the `Command` menu opposite `Verify`. If `Verify`
mode is on, ConfigEd asks you to confirm every attempted `Set`
operation before changing a parameter value. This confirmation
window does not appear when `Verify` is disabled.
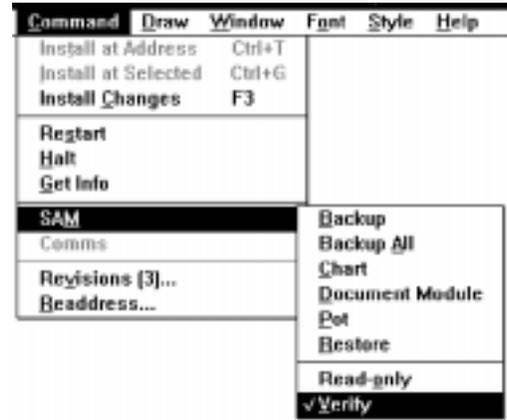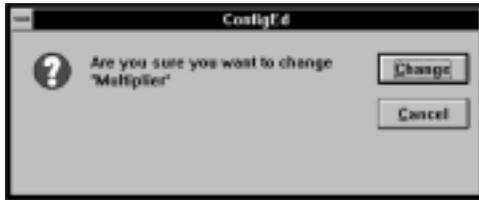
Toggle the `Verify` mode on or off by clicking on `Verify` under the `Command` SAM sub-menu. When you begin a
ConfigEd session, it is initially disabled.

The Pot Function

You can also change parameters continuously by using the `Pot` function in
the `SAM` menu. This feature in useful when tuning a parameter, such as the
speed calibration of a *LINK* drive, during commissioning.

To use the `Pot` function, remove the `Read-only` restriction in the `SAM`
sub-menu and highlight the `Set` operation for the parameter you wish to
change from its SAM parameter list. Then select `Pot` in the SAM sub-menu.

A window prompts you for the parameter setting rate. Set this setting to
change the update speed of the potentiometer, in seconds, or leave the
setting at its default rate of 0.1 seconds. After you click `Ok`, a potentiometer graphic appears which
looks similar to the graphic for the `Pot` function block used in configurations designed for L5102
(*LINK1*) or L539x (*LINK2*) operator stations. Click on the fast buttons (<< and >>) to change the
parameter value in 1% increments. For finer adjustment, click the slow buttons (< and >). This changes the parameter value
in 0.1% increments. The `Scratch Pad` records all changes you make to the parameter value.

> NOTE. You can use the Pot function *only* for **Value** parameter Set operations (Signal P type function
> blocks). You can *not* use it for **Ordinal** or **Logic** type Set operations.

Double-click on the upper left bar in the `Pot` window heading to close the window.
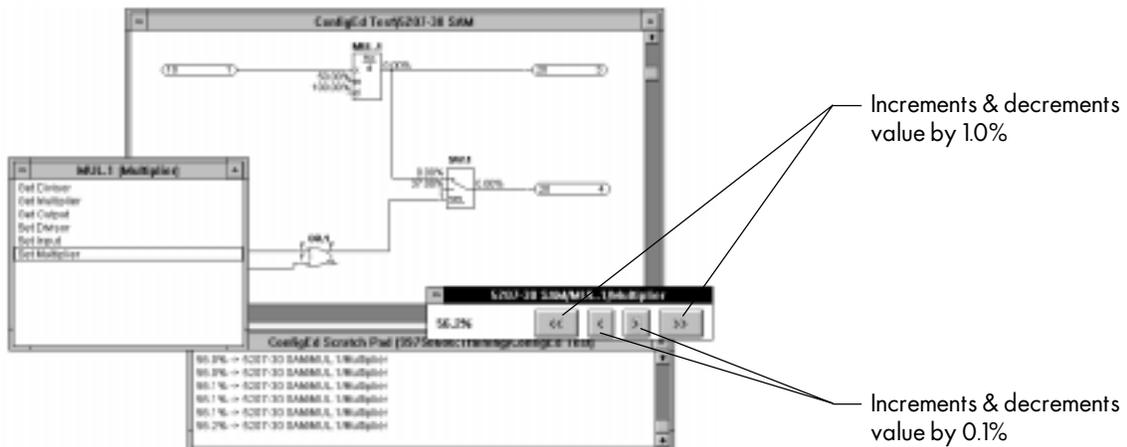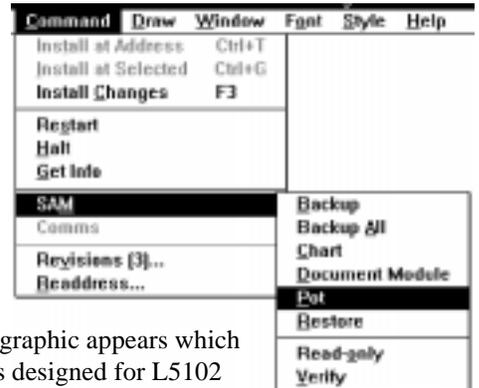
Monitoring & Setting Parameters Through the Graphical SAM Window

For many function blocks, you can graphically read a newly updated parameter value directly in the graphical SAM window without having to open the function block's SAM list and execute a Get or Set operation. To monitor a parameter graphically, bring your mouse cursor near the parameter you wish to graphically monitor. The cursor changes to crosshairs (X) when you approach the vicinity of the parameter, indicating that you can update its value graphically. Click the crosshairs on the parameter to update its value in the graphical SAM window. The Scratch Pad also records the change.

Double-click on the crosshair-marked parameter to update its value graphically…

… and to display the updated value in the Scratch Pad.
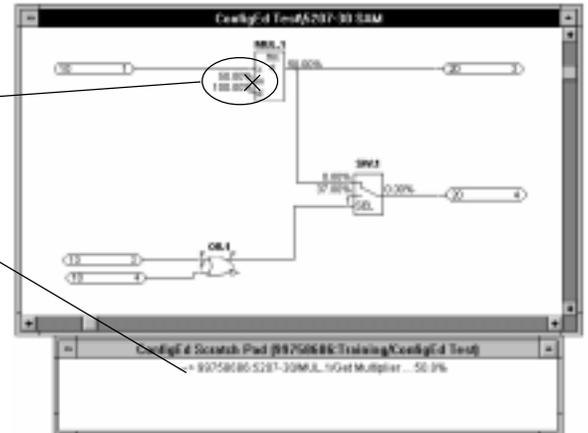
> NOTE. You can set or monitor the parameter graphically only if your mouse cursor changes to a crosshairs symbol (X) as you drag the cursor over the parameter.

You can also open the Monitor List through the graphical SAM window and dynamically update all block parameters that have an associated Get operation. To do this, hold down the <SHIFT> key while clicking on the crosshair-marked parameter. The parameter appears in a monitor window having the same title as the function block. (This window, in fact, *is* the Monitor List window, only with a different name in the title bar.) You can add to the list as many of the block's parameters that have an associated Get operation, or add parameters from other function blocks.

Shift+double-click on these crosshair-marked parameters …

… to dynmaically display their values in this (Monitor List) window…

… and to diplay their intial values in the Scratch Pad.
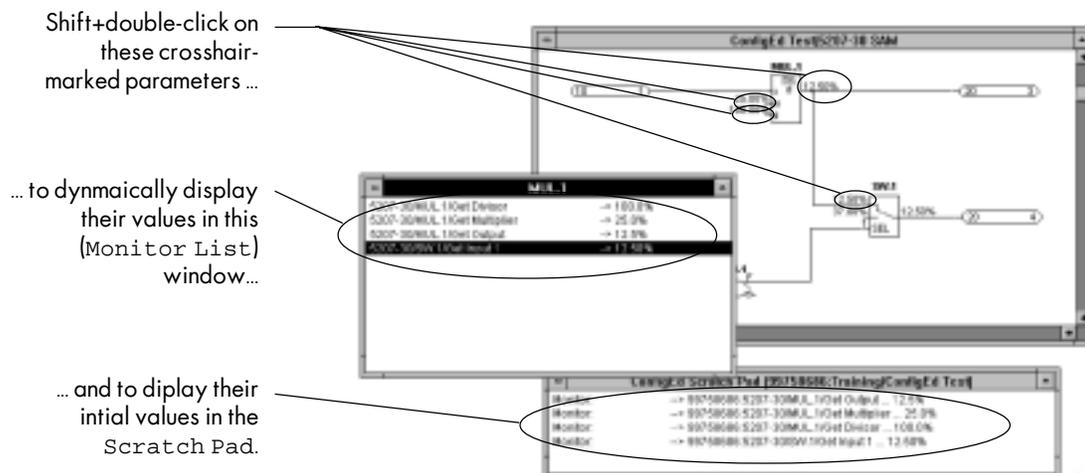
ConfigEd samples a parameter every 0.1 second and dynamically updates each parameter in the list. This is useful when you need to compare different parameters while you are troubleshooting a problem.

To change a parameter value graphically, bring your mouse cursor near the parameter you wish to change. If the cursor changes to crosshairs (X), telling you that you can change its value graphically, click the crosshairs on the parameter while holding down the <CTRL> key.

This calls up a window which will allow you to change the parameter value. (This window is identical to the dialog box that appears when you perform a Set operation.) The value changes in the graphical SAM window and the Scratch Pad records the change.

Ctrl+double-click on
this crosshair-marked
parameter…

ConfigEd graphically
updates parameter to
new value …

…to bring up this dialog window.
Enter in new parameter value.

…and displays the new parameter
value in the Scratch Pad.
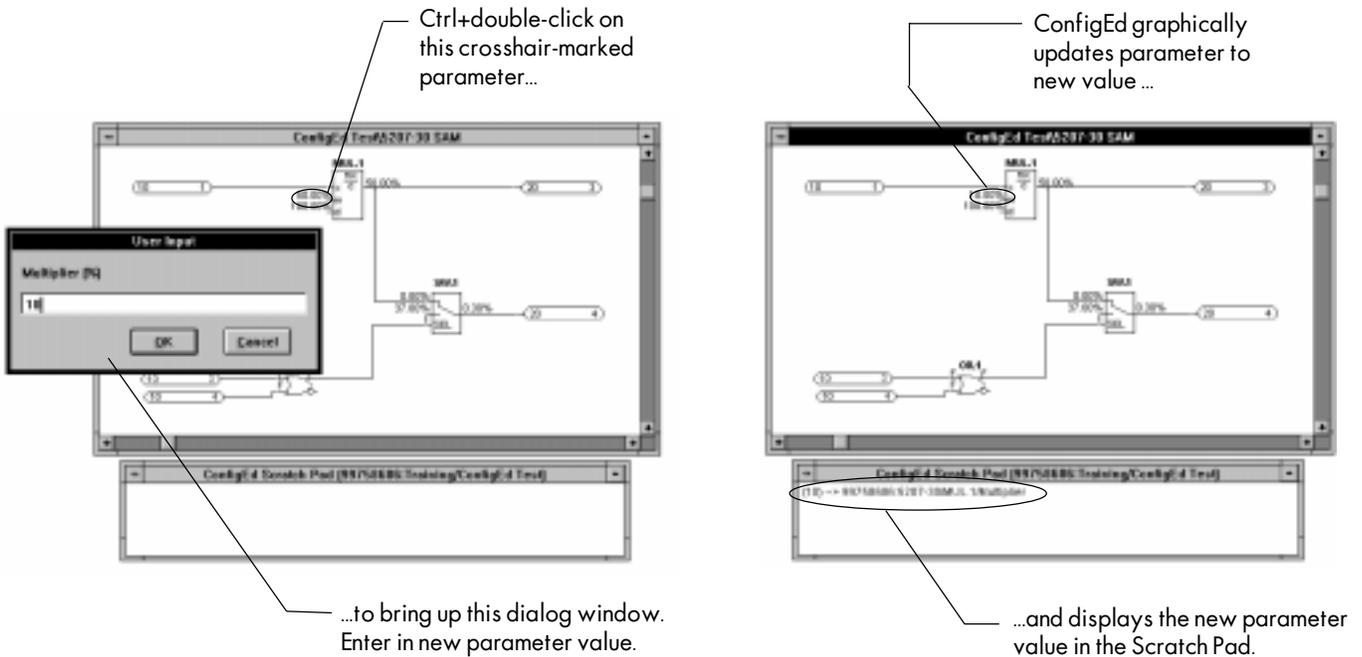
Graphical SAM windows also display the output of most function blocks. These outputs update on screen as their inputs are changed, which makes the SAM graphical display window a convenient troubleshooting feature, allowing you to track independently the effect of signal changes. You can also use this feature to test a configuration design before putting a *LINK* system into service.

> NOTE. Keep in mind that the graphical SAM window does not dynamically update its displayed parameters values to new settings. The parameter only updates to a new value when you perform a graphical Get (or double-click on the parameter), or after you perform a Get operation in the block's SAM parameter list window. Similarly, block outputs do *not* automatically update on screen, even though they may have actually changed in value due to the changing of a block input parameter value.

For example, if the 2-input OR gate shown in the screen shot below initially has a False value for both its inputs, setting Input 1 to True will *not* change the value displayed on screen, even though its output has actually changed from False to True. You must graphically Get the parameter (click on it) to update its value in the graphical SAM window.

Setting this parameter to a
different state…

…does not update these parameter values on screen
until you graphically Get (double-click) them.
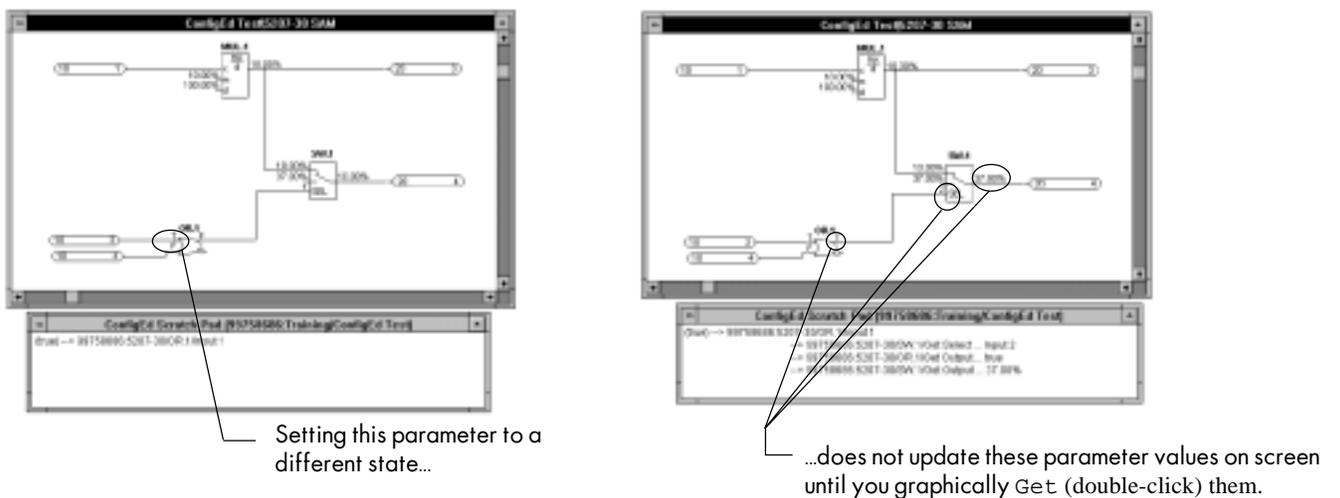
SAM TEST POINTS

SAM Test Points is a ConfigEd feature for creating a unique set of SAM accessible `Get` and `Set` operations. You can access them just as any other SAM `Get` or `Set` operation; however because they are installed with the configuration file into the *LINK* device, you do not need to have the original configuration files resident on your PC to monitor or change a SAM test point.

You should create SAM test points for a configuration in the following two situations:

1. if you are certain that the user commissioning and servicing the *LINK* system has an early version of ConfigEd (version 4.0 or lower) or the independent SAM software package, and the user does *not* have access to the original *LINK* project configuration files. These files are required to use the independent SAM software package or the SAM features incorporated in ConfigEd version 4.0 and 5.0.

    NOTE. Creating SAM test points for ConfigEd version 5.0 is usually unnecessary. Because you can recreate the original project configuration files using the `Extract` function (see *Chapter 4*), you can still change and monitor parameter values using the normal SAM features.

2. if you want to create a separate subset of SAM `Get` and `Set` points with unique names

Creating SAM Test Points

To create a SAM Test Point, first select and open a configuration from the `File` menu and highlight the function block containing the parameter of which you wish to assign a test point. Select `Test Point` from the `Edit` menu, or type `Ctrl+E`. A list of available test points for that function block only appears in a `Test Point` dialog box. Select a test point by highlighting it. The default name appears in the field at the bottom of the box. You can keep the default name or rename the test point then click `Add` to add the test point to the list of test points for that configuration. Click `Cancel` or `Ok` after you have added any or all test points you need for that function block.

Selecting `Test Point` for this highlighted function block...

...opens a dialog box displaying all avialable `Get` and `Set` operations for that function block.

New assigned name for test point `Get Multiplier`.
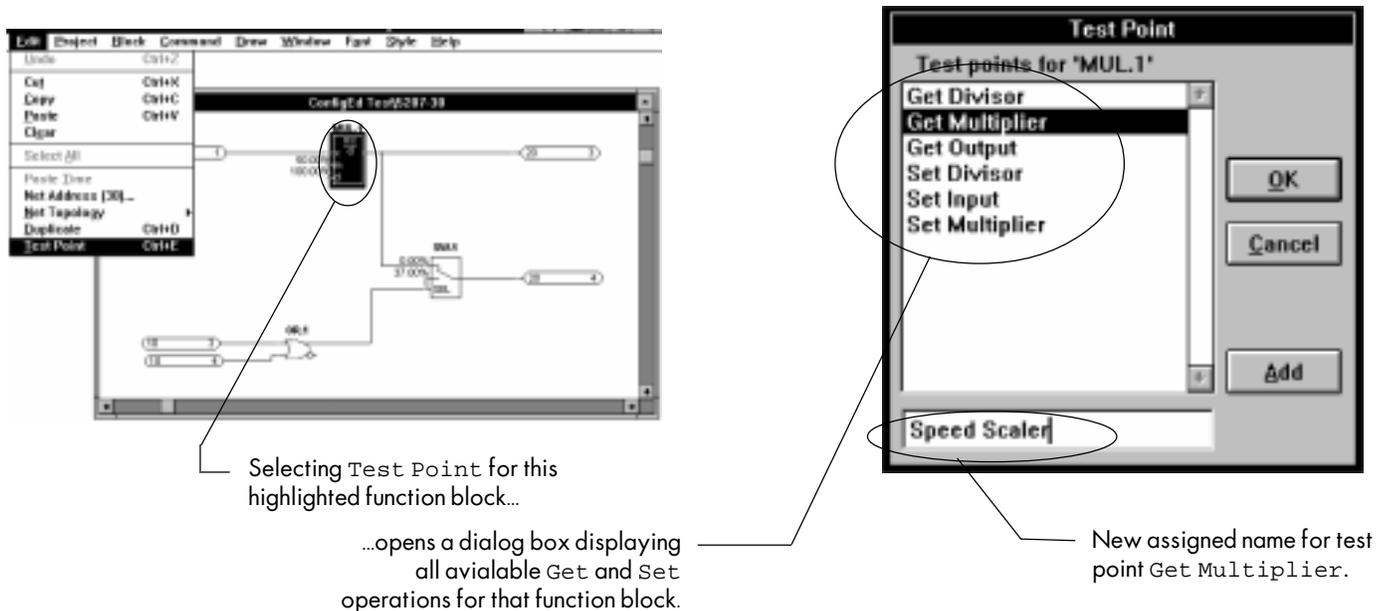
NOTE. The available SAM `Get` or `Set` parameters are predefined for each function block— you can only create a SAM Test Point from the parameters available in a function block's `Test Point` dialog box. (For instance, you cannot create a `Get` SAM Test Point for the input to a `Multiplier` function block.)

You can create a set of SAM Test Points for each configuration you design. However, be aware that creating and installing SAM Test Points consumes memory space within *LINK* devices usually reserved for function blocks and connections.

> NOTE. ConfigEd prevents you from installing a configuration file that is larger than the available storage space in a *LINK* device. Adding too many SAM Test Points can swell a configuration file beyond the available memory capacity of *LINK* devices, especially first generation *LINK* modules.

You can view the entire list of test points you have created for a configuration by opening the SAM Test Points window under the `Window` menu. Remove any test from the list by highlighting it and pressing the `Delete` key. A pop-up window prompts you to confirm the delete.

`Get` and `Set` operations.

Assigned `Test Point` names.
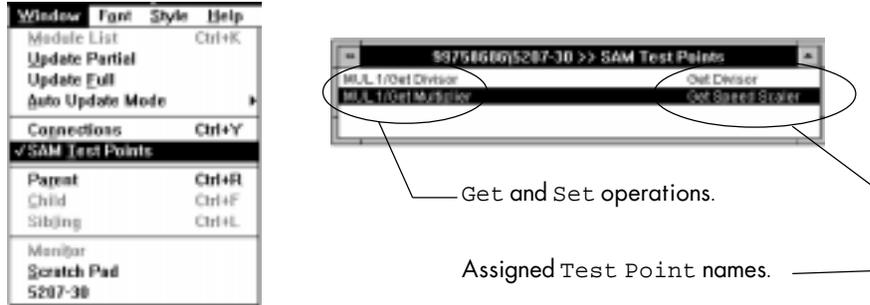
Setting and Monitoring SAM Test Points

Like any other SAM function, you must open a `CE Module List` and communicate with a *LINK* device to set or monitor its SAM test point values. To display the *LINK* device's installed SAM test points, highlight the device in the `CE Module List` and double click the mouse while holding down the `Shift` key. Or, you can select the module and press `Shift + Enter`. All test points configured for that module will appear in a window with the menu bar of the form:

> configuration Test Pts. (project name)

You may set, get, chart or monitor any *configured* test points, just as with any parameter in a SAM parameter window list. However, unlike normal SAM `Get` or `Set` parameters, you do not need to have the module's configuration files on your PC hard drive to access its test points.

Shift+Enter or Shift+double-click on this *LINK* node…

…opens a list displaying all aviable test points installed in that *LINK* device.
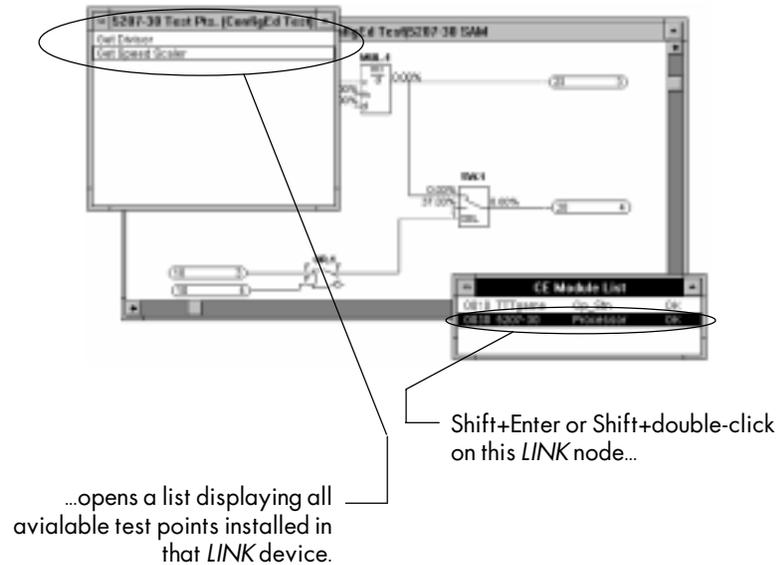
BACKING UP

After you have made final parameter value changes to the configuration installed in a *LINK* device using the Get or Pot functions, you can record these final values in a backup file. This is done through the SAM Backup function. Backup uploads the memory of the *LINK* module or drive into a separate file on your PC hard disk.

ConfigEd immediately creates a backup file for each configuration as you install it into a *LINK* device and stores the file as [configuration name].BKU in the 8-digit *LINK* project directory associated with that configuration. ConfigEd overwrites the file each time you install the configuration, and each time you execute the Backup command.

If your PC contains the project and configuration files for the *LINK* system on which you are working, ConfigEd will store .BKU files there. If not, ConfigEd will create on your PC hard drive a directory with an 8-digit name that matches the 8-digit *LINK* project number associated with the configuration file installed in the *LINK* device on which you are executing a backup. ConfigEd also creates a Public category and stores the directory holding the .BKU files there.

> NOTE. The .BKU file of a *LINK* device is used to record final parameter changes in case of a *LINK* device failure. You should back up a *LINK* device *only* after you are certain you have completed all final parameter changes necessary for commissioning and troubleshooting the *LINK* control system.

The Backup function differs from the Update function (see *Chapter 4*). The Update function updates all parameter values in the original configuration file with the current on-line values at the instant the you execute Update. These parameter values may have been changed through a SAM Get action or through normal *LINK* network control processing, such as control process changes in motor speed feedback or tension feedback. Backup records these same settings and values in a separate file, but does *not* refresh the parameter settings of the original configuration file installed in the *LINK* device.

> NOTE. You should *never* use the Backup function with ConfigEd version 5.0. A new feature, the Extract command, allows you to recreate the original project configuration files directly from the modules. If you must create a backup file, be sure the end user will *never* have access to the original project configuration files.

To Backup a drive or module, first select the *LINK* device node you want to back up from the CE Module List and then select Backup from the Command SAM sub-menu. The Scratch Pad provides a record of the backup procedure.

If you have made changes to parameter values in more than one *LINK* device in your control network, you can use the Backup All command to create or overwrite backup files for *all LINK* devices on the network. A pop-up window shows the progress of the back up. The Scratch Pad makes a record of the backup and reports whether any errors were detected.
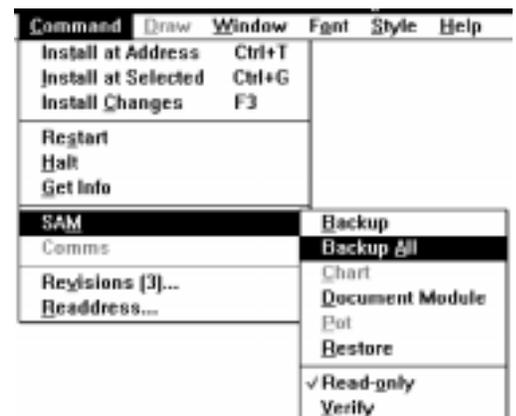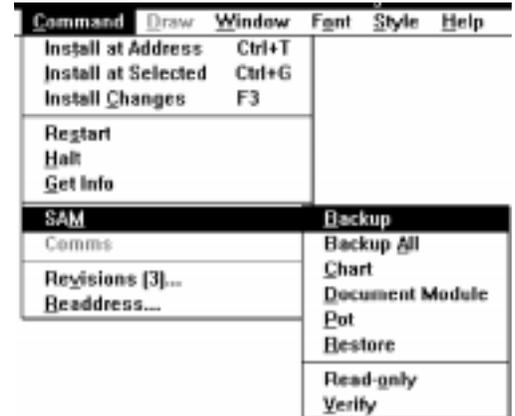
RESTORING

`Restore` downloads the `.BKU` file for the configuration installed into the *LINK* device you highlight in the `CE Module List`. Because the `.BKU` file should hold the final SAM parameter changes made to an installed configuration, you should use `Restore` to install a configuration into a spare used to replace a defective *LINK* device.
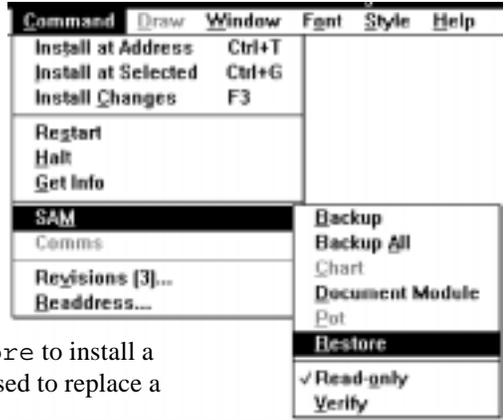
To execute a `Restore`, first select from the `CE Module List` the *LINK* device to which you wish to restore a configuration, then select `Restore` from the `Command SAM` sub-menu.

A dialog window prompts you to select the backup file from a category and project. Select the appropriate `.BKU` file, then click on `Restore` to replace the module's current configuration with the backup file.

> NOTE. If you have access to the *LINK* devices' configuration files, it is recommended to use `Update` and `Install` rather than `Backup` and `Restore` to keep your software files up to date. Use `Backup` and `Restore`, only if you are using earlier versions of ConfigEd (version 4.0 or lower) *and* if you are certain the end user will not have access to the original configuration files for the project installed in the *LINK* network.

SAM DOCUMENT MODULE COMMAND

This SAM feature creates a text file listing the values of all SAM access points at the moment the module is documented. It effectively takes a snapshot of all SAM accessible software block parameter settings, inputs and outputs values. It is useful in troubleshooting programming problems and recording final system tuning adjustments. You can access this text file— called [configuration name].DOC, located in the working directory for ConfigEd (usually c:\ssd_link\tools\win3)— through most word processor applications, text editing and text viewing utilities. You can view the file immediately in the `Scratch Pad`.

The software will perform a `Document Module` only if the configuration files are resident on your PC; if your PC does not have access to the configuration files, `Document Module` will capture only SAM test points installed in the *LINK* device, if any.
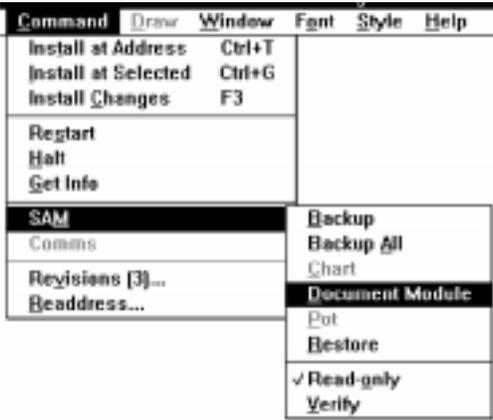
> NOTE. The SAM `Document Module` feature differs from the ConfigEd function `Document...` located under the `Project` pull down menu. `Document Module` operates on configurations installed in on-line *LINK* devices and captures only parameters values available as SAM `Get` or `Set` operations. `Document...` records *all* parameters settings of *all* function blocks within the off-line configuration file, as well as signal connection information. Although `Document...` is more comprehensive, it does not capture the immediate values of dynamically changing parameters, such as `Speed Feedback` or `Tension Feedback`.

To document a module, go to the `Command SAM` sub-menu and select `Document Module`. The `Scratch Pad` displays the values of all the SAM available parameters in all the function blocks of the selected module.

Chapter 7   TROUBLESHOOTING

Many problems you may encounter when using ConfigEd involve either communications errors with *LINK* devices, or difficulty in accessing configuration files. Other problems are caused by configuration design errors, which can cause modules to fail (crash), meaning that the device halts executing its installed configuration. RS232 serial communications and file access problems are covered in this chapter. Refer to *Section 8* of the *ConfigEd Overview Manual* to troubleshoot problems related to a crashed module, or to problems related to overall *LINK* network fiber optic communication.

PC SERIAL PORT COMMUNICATIONS PROBLEMS

The most common problem involving serial communications is attempting to communicate at a baud rate exceeding the capability of your PC. Many PCs have difficulty communicating at 57600 baud or even 19200 baud through their serial port. If you are experiencing difficulties transmitting information or commands from your computer to your installed modules, try lowering the baud rate under Comms in the Command menu (see *Appendix A*). If the problem persists, consider upgrading your PC's serial port driver. Eurotherm Drives offers an *Enhanced Windows Communications Kit* which can eliminate the delays caused by the low speed of the standard Windows™ serial port driver.

Another common communications error is specifying a comms port that is already being used by another peripheral device connected to your PC, such as a mouse. If this problem occurs, check the settings in your currently selected communications profile in the Comms menu and make certain your selected profile is using the correct port.

When you open a CE Module List, the Scratch Pad reports the success or failure you may have in your request to open the list. And, each time you update the list, install a configuration or perform any other function in the Command and Window menus, the Scratch Pad records the result of your attempt to communicate with the *LINK* network through the serial connection.

The table below lists the error message which the Scratch Pad displays if you cannot open a CE Module List or otherwise have trouble communicating with the *LINK* network. The table also suggests ways to solve the problem.

If the Scratch Pad displays this message...	**...try the following:**
Accessing module list … Cannot establish network connection. Cannot refresh immediate module info. Cannot complete exploration.	1. check for faulty serial cable or unconnected serial cable 2. check supply power to LINK module
No valid echo received	baud rate set too fast; try a lower baud rate
Module not responding as expected...	1. baud rate set too fast; try a lower baud rate 2. module may be crashed; restart module
error code -10	check comms port selection for currently selected comms profile
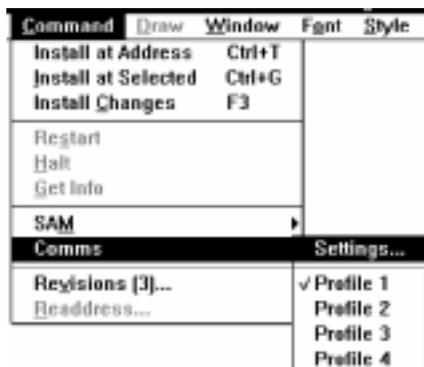
ERROR DIALOGS

ConfigEd displays a variety of error messages if it has trouble accessing a configuration file or if it cannot not perform a requested operation. Other error dialogs warn you to be aware that executing a requested operation, under certain circumstances, could cause the *LINK* system to control machinery in a hazardous manner. Some of the common error dialogs you may encounter are explained below.

Can't Access Configuration This dialog box appears when multiple users accessing the same ConfigEd project database on a local area network (LAN) computer system attempt to open the same configuration file at the same time. ConfigEd restricts project data file access in this instance because ConfigEd projects are single user tasked— only one user can access a configuration file at any given time.

Guest Rights This dialog indicates that you do not have guest rights, or write access ability, to the selected project and therefore are restricted to a read only version of the project. ConfigEd grants only one user the right to modify any project at any one time. This right is called the "write token". If you feel that you need to make configuration modifications to a project, coordinate with the Hub administrating the project for write token access. Consult the *LINK Manager Manual* for further information.

> NOTE. If you do not have the write token for a project, you can still use ConfigEd's SAM features to monitor and change parameters through `Set` or `Get` operations.

Read-Only ConfigEd have several levels of read-only and therefore several read-only dialog boxes.

This dialog box indicates that the category in which the project resides has been designated Read-only through the `Project Manage` dialog. To make configuration modifications, toggle off the Read-only box in `Project Manage`.

This dialog box indicates that the configuration has been designated as Read-only through the `File Open Open` dialog. Toggle the Read-only box off for that configuration in the File Open Open dialog box to make configuration modifications.

This dialog box appears when you are in a Read-only configuration and try to change the position of an element or the information in an element's description box.
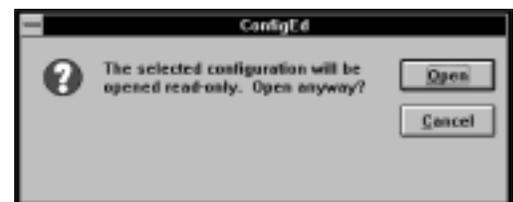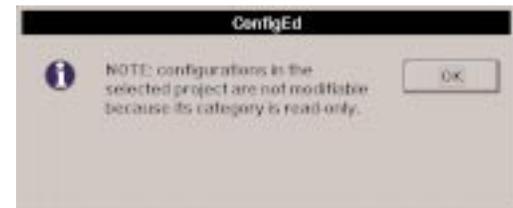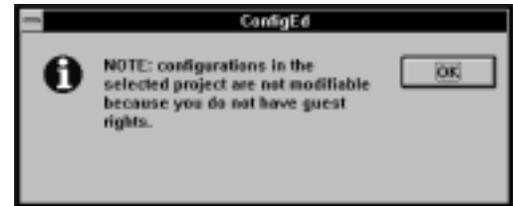
Can't Change Text This dialog box appears when you try to specify the values of an element's description improperly. It commonly occurs when configuring text information for a display handler or button band placed in an operator station configuration. This error message prevents you from specifying incorrectly formatted information for these elements.

Not Enough Memory All *LINK* and *LINK2* devices have a finite amount of memory reserved to store configurations. If the configuration you are installing into a module exceeds this amount, ConfigEd aborts the installation the dialog box to the right appears.
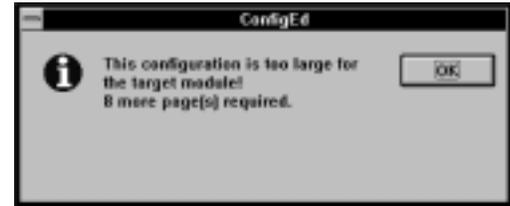
You cannot install the configuration until you reduce its size to the number of pages mentioned in the dialog box (in the above example, eight). To free up software space, you must condense the configuration design through tighter written logic or shift function blocks and signal processing to other configurations within the project. In many cases, especially with projects that use *LINK* modules exclusively, it may be simpler to add another *LINK* module and create a new configuration for it. You can then move the excess configuration design there rather than distribute it to already existing configurations.

>   NOTE. For *LINK* devices, leave at least two free pages of memory in the module to accommodate future configuration changes or `ssd_link` function block changes which may occur when you perform an `Upgrade`.

Error #6405: Could not access configuration This error occurs when you:

1. Try to open the SAM graphical window of a configuration installed in a *LINK* device, and

2. You do not have access to the original source configuration files for that project, and

3. The configuration has been installed *without* the Save Source option checked in the File Open Open window.
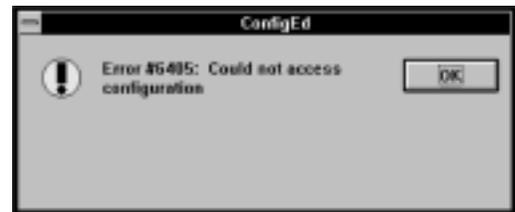
When this error occurs, you can only access SAM Test Points (if any were designed into the installed configuration). Contact your Hub administrator to gain access to the project's source configuration files.

DISPLAY PROBLEMS

You can occasionally have problems properly displaying configurations for a project originally designed on another computer. For example, you may have designed configurations for a project on a PC equipped with a large monitor and later open the same configuration files using ConfigEd running on a small laptop computer. The display size difference between the two machines can cause the laptop to distort the display, or can prevent the laptop from displaying the configurations entirely.

To resolve this conflict, use the File Open History or `File Open Open` commands to select and view the configuration. These commands trigger a default viewing size for the equipment currently in use. If you already have the configuration open, hold down the shift key and re-select that configuration from the `Window` menu. This redraws the window to within the size of the display of the machine currently being used.

GET INFO STATUS MESSAGES

These messages appear in the `Scratch Pad` under `Status` when you execute the `Get Info` command on a *LINK* device.

Checking Network The module is ready to start but is unable to send a message to itself around the fiber optic network to ensure that the ring is complete. Check for unconnected modules, loose connections, broken or damaged fiber optic cable and non-powered modules.

Duplicate Address The module has discovered a duplicate address number on the network and stopped running its installed configuration. If a *LINK* network has two or more nodes with the same address, it cannot run. Correct the problem by re-configuring one of the modules and assigning it a unique address.

Halted The module has been halted by a ConfigEd tool and not restarted. For example, when you install a configuration, the target module or drive may revert automatically to the halted state. Once you have determined why the module or drive has stopped, select Restart from the Command menu to restart.

L Error The module has detected a low-level internal error and has stopped executing its installed configuration. This error code often accompanies an Out of Heap message in the Scratch Pad and occurs when data messages overloads the module's microprocessor. The module attempts to process the high data overhead by storing the excess input events in memory. Eventually, the module runs out of memory and crashes. (L error also will appear in the CE Module List next to crashed module when you update the list.)

The first step in correcting this error is to isolate the problem. If nothing has been re-configured recently, create an L5203log configuration, install it into an L5203 serial module, and connect the module to your *LINK* network. Connect a printer to the module, repeat the activity that generated the error message and check the printout for the cause of the problem. If a configuration *has* been changed recently, try installing a previous configuration that works and making configuration revisions in small steps to isolate the cause of the error.

Once you feel that you have resolved the problem, use the `Restart` command in the `Command` menu to restart the device.

No Config The module is unable to run because it has no configuration. Install a configuration.

OK The module is running it installed configuration with no errors.

Peer Halted The module is ready to start but is waiting for other modules on the network to be ready. The *LINK* network will not run until all modules are ready. Check for other *LINK* devices in the that may be Halted or in an error state.

Self-Test Failure The module failed its start up self-test due to an error in a memory component and has stopped. Replace the malfunctioning module and retry.

LED & SEVEN–SEGMENT STATUS DISPLAY CODES

All *LINK* modules have a status LED and all *LINK2* devices have a single character, seven-segment LED status display. Each LED blink sequence and LED display code indicates the operating status, or operating state, of the *LINK* device. Refer to the *LINK Overview Manual* for a complete listing of all status LED blink sequences and LED codes.

THE HELP MENU & FUNCTION BLOCK INFORMATION

The `Help` menu provides general information on the currently active ConfigEd project and gives you application information about each function block available in the *LINK* data base under the `Block` menu.
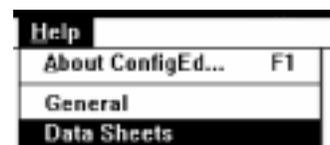
Click on `About ConfigEd...` or type `F1` to open the ConfigEd database information window. This window gives you information on the revision of the platform, library, instruction and class directories of the currently installed `ssd_link` database and the database for the currently selected project (ConfigEd Test in the screen shot shown at the right). Whether they match depends on whether the `ssd_link` database has changed and whether you have upgraded the project's database (refer to the *Upgrade Command* in *Chapter 4* for information on upgrading project databases).

> NOTE. You must use Manager to upgrade your `ssd_link` database. Refer to the *Manager Manual* and contact your Hub administrator for `ssd_link` database upgrades.
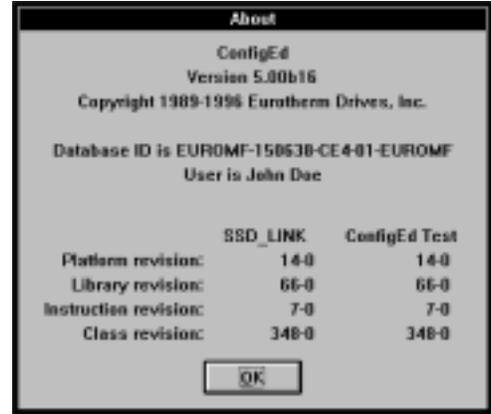
To get information on a function block, select `Data Sheets` from the `Help` menu then select the function block from the category list that appears. The categories match those listed in the `Block` menu. You can also quickly open

Appendix A   COMMUNICATIONS

COMMUNICATING WITH *LINK* NETWORKS

You can communicate with a Windows compatible PC running ConfigEd to first generation *LINK* or *LINK2* devices connected in a *LINK* network either directly through the PC's RS232 serial communications port, or remotely through a modem. Once you have established communications between the PC and a *LINK* control network, you should have access to all devices in the *LINK* network through the `CE Module List`.

> NOTE. All first generation *LINK* I/O modules and operator stations and all *LINK2* devices and AC *LINK* drives have a built-in RTNX serial port socket, similar to a telephone handset jack, for PC and PC/modem communications. These ports, however, are unavailable on *LINK* Gateway modules and DC *LINK* drives. You therefore must access these devices through a `CE Module List` generated through a RTNX equipped device.

DIRECT COMMUNICATIONS HARDWARE SETUP

You can communicate directly to a *LINK* network with a Windows compatible PC running ConfigEd. Communications is established over a serial RS232 protocol hookup between a PC serial port, usually located on the back panel of your PC, and the RTNX port of a *LINK* device.

> NOTE. ConfigEd functions on *LINK2* devices are very restricted if you access the *LINK2* device through a first generation *LINK* module. To gain full ConfigEd functionality for *LINK2* devices, including installing configurations and all available SAM features, you must connect to a *LINK2* RTNX port.

Make this connection using the three meter RJ11 connector cable (LA350475U003) and the DE-9 to RJ11 adaptor (LA350481), included with your ConfigEd package. The adaptor converts the cable from an RJ11 connection to a female DE-9, making it compatible with the standard male, 9-pin serial port (PORT1 or PORT2) connection on your PC.

Connect the smaller end of the RJ11 cable directly to the RTNX connection of a *LINK* device and the larger end to the adaptor. Most PCs have at least two 9-pin serial ports and use PORT 1 for its mouse connection leaving PORT2 for serial communications with an external device. Connect the DE-9 end of the adaptor to either PORT1 or PORT2 or your PC, whichever is available. The adaptor and the connection set up are shown below.
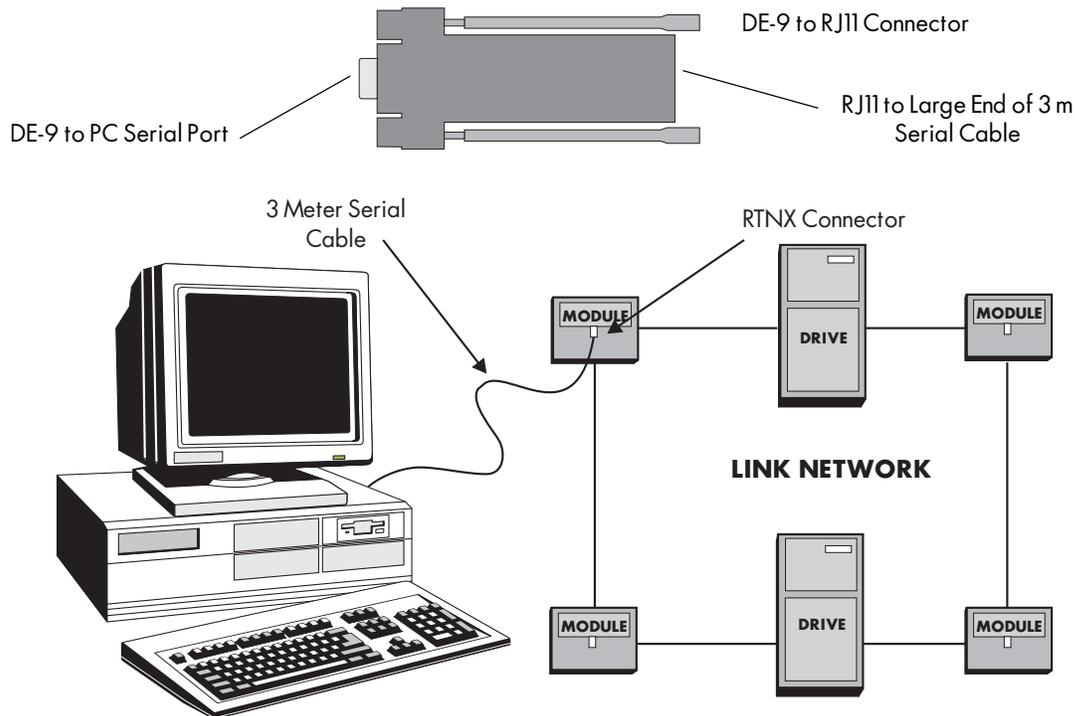
Figure A.1 - DE-9 to RJ11 Adaptor & Direct PC to *LINK* Network Communications Set Up

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Caution

Only use the connection cable and adaptor included with your ConfigEd package. Using any other cable or connector can damage your PC and the *LINK* device or otherwise degrade performance. Using any other cable or connector will void the Eurotherm Drives warranty.

Once you have correctly set up the PC to *LINK* network RS232 connection, refer to *Communications Settings* below to specify your port and baud rate setting.

MODEM COMMUNICATIONS HARDWARE SETUP

You can communicate with a *LINK* network over a telephone line using a modem and a Windows™ compatible PC running ConfigEd. This allows you to use *all* ConfigEd features— including installing configurations and setting and monitoring parameters using the SAM tools— on *LINK* devices in a *LINK* network from a remote location. You will require a modem at either end of the phone line.

> NOTE. If the remote *LINK* network does not contain *LINK2* devices— it consists *entirely* of drives and *LINK* modules— you *must* use the Eurotherm Drives L5214 Modem Package at the remote *LINK* network end of your modem communications setup. The L5214 is a complete modem package consisting of a high speed 28,800 baud modem and a first generation *LINK* serial module which communicates between the package's modem and the *LINK* network. The serial module automatically downloads the correct initialization command string to the modem and simplifies the setup.

> It is *not* recommended to use the L5214 to for modem communication with *LINK* networks containing *LINK2* devices. In such cases where the remote *LINK* network contains a mixture of drives, *LINK* and *LINK2* devices or *all* drives and *LINK2* devices, connect a different remote modem kit directly to the RTNX port of a *LINK2* device.

An example of a modem communications set up using the L5214 and a network with only *LINK* modules and drives at the remote end is shown in Figure A.2. Figure A.3 shows the set up with a remote modem connected to a hybrid network, or a network with drives, *LINK* and *LINK2* devices.
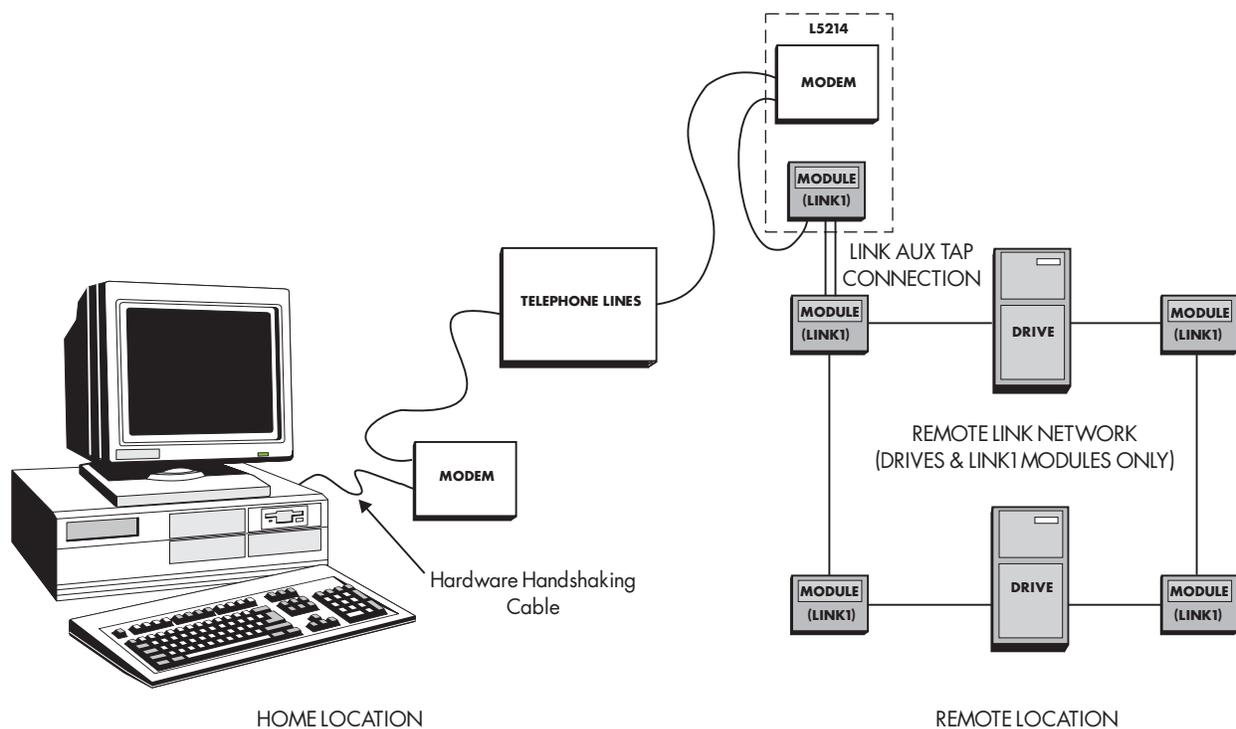
Figure A.2 - Modem Communications Set Up for *LINK* Interface

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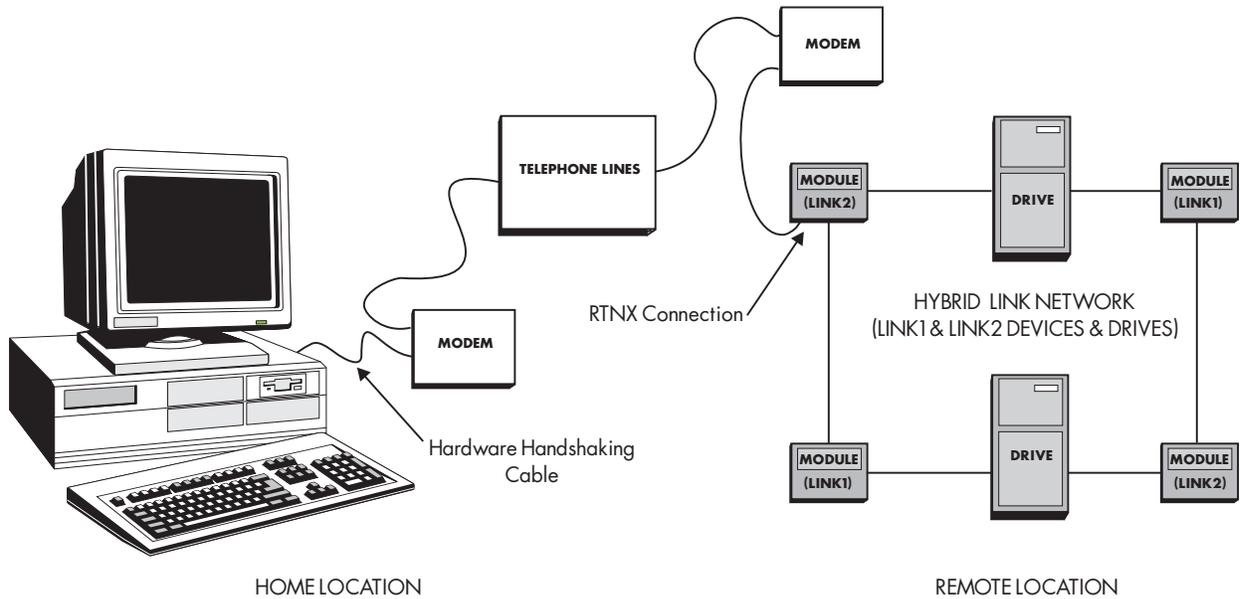
Figure A.3 - Modem Communications Set Up for *LINK2* Interface

Consult the documentation that ships with your modem manual for setting up and connecting the modem at the home location. You should use a hardware "handshaking" communications cable between the your PC and the modem at the home location. The cable should have a DE-9 female connector at one end for the PC interface an another pin connector (usually a DB-25) at the other. Most modem kits include such a cable.

For *LINK* remote networks, consult the L5214 manual for connection information and hardware set up. For *LINK2* or hybrid remote *LINK* networks (those containing *LINK and LINK2* devices), refer to the manual for the remote modem for connection and set up information. Note that as with *LINK* modules, the RTNX port of *LINK2* devices accommodates a standard RJ11 phone jack connector.

COMMUNICATIONS SETTINGS

The communications settings for home modem communications are located in the `Comms...` sub-menu under ConfigEd's `Command` menu.

> NOTE. You can only access the Comms.. menu when the `CE Module List` is closed.

You can choose and set independently four communication scenarios, or profiles, through this menu. Click once on Profile 1 through Profile 4 to select a scenario. A check mark (✓) indicates the currently selected communications profile.

To change the settings of any the four profiles, double-click on Settings... This opens the `Link Comms Settings` dialog window. To select the profile you wish to change, click on the arrow next to the upper left field of the window and select the profile from the pull-down list.

Select the port for a profile by clicking on the arrow next to the field marked `Port:` and highlighting the desired port. The column of three selection buttons allows you to select the type of communications between your PC and the *LINK* network for that profile.

There are three selections available for each profile select:

1. `Direct` for direct communications (PC serial port to *LINK* RTNX port)

2. `Slow Modem` if you are using a 2400 baud modems at both ends

3. `Fast Modem` if you are using a 9600 baud or faster modem at both ends

> NOTE. Due to incompatibilities between slow (2400 baud V.22bis) modems and modern faster modems, you must use the same modem protocol at both ends.

Once you have selected the type of communications, select your baud rate for the port.

You can set up each profile independently. This allows you to specify a unique PC communications baud rate or modem string for each profile. For instance, if you use your ConfigEd loaded PC mainly in your office to configure and test *LINK* systems , but occasionally use the same PC to remotely monitor or tune field installed *LINK* systems, you can set up `Profile 1` for direct communications and `Profile 2` for modem access. ConfigEd retains these settings and the profile you have selected for use in your next ConfigEd session.

Baud Rate Settings: Direct Communications

Four standard baud rates are available. Set the baud rate for the highest rate your PC can support. The default for each profile is 57600 baud. However, some IBM-compatible machines using 386 processors may experience comms errors at 57600 baud and even 19200 baud when using the standard Windows driver. PCs using 486 or better processors should handle the faster baud rates.

Eurotherm Drives offers an Enhanced Windows Communications Kit (Eurotherm Drives part number LA351199), which includes a high speed serial card, to replace the standard Windows driver and improve performance.

Baud Rate Settings: Modem Communications

The Slow or Fast Modem selection and their baud rate settings depend on the type of modem you are using at your home location. Select the appropriate baud rate as follows if you have selected:

1. `Slow Modem`, recommended for 2400 baud (or V.22bis) modem communications, the baud rate is locked at 2400 baud.

2. `Fast Modem`, recommended for 28,800 baud (V.32bis) or V.28bis or V.34 modems, select the fastest baud rate the PC can handle. The field disallows baud rates settings *below* 9600. If the `Scratch Pad` keeps reporting communications errors, lower the baud rate for that profile.
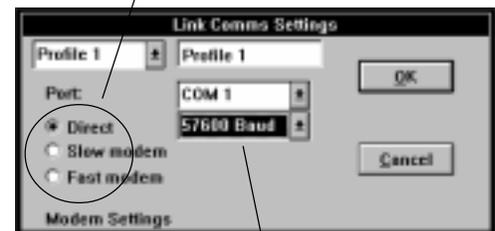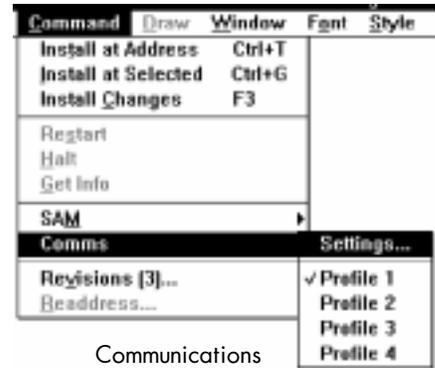
Modem Command String Settings

Selecting `Slow` or `Fast Modem` displays the modem commands, or `Modem Settings`, you need to specify for your home location modem. The default modem strings, which are the same for the fast and slow modem selections, are compatible with most available modems. Consult your modem user manual for the appropriate initialization string for each command field.

The command fields are explained below.

ATTENTION:	+++	Attention command string.
INITIALIZATION:	AT	Standard modem command prefix indicating attention.
	H	Hang-up if busy or no answer.
	&F	Factory default setting for hardware handshaking.
	E	Turn off the local echo when in command mode.
DIAL:	AT DT	D = dial, T = dial using tones.

[NOTE. If you are not using tone dialing, delete the second T. Enter the remote phone number in this field after the DT setting. Include all numbers necessary for dialing (e.g., "9" for and outside line, "1" for long distance or *70 to disable a "call waiting" interrupt feature).]

'YES' RESPONSE: OK

'NO' RESPONSE: NO, BUSY, ERROR

CONNECT: CONNECT

The final three fields enable ConfigEd to interpret the modem commands. Once you have correctly set the modem settings for that profile, click `OK` to confirm. ConfigEd saves the settings and uses them for all projects. Click `Cancel` to retrieve your last confirmed settings.

The initialization strings for other modems are listed in the table below.

MODEM INITIALIZATION STRINGS

Model	Initialization String
US Robotics Sportster 14.4 (Internal) (for use with `Fast Modem` selection only)	AT H &F1 E &K M1
Xircom Credit Car/Ethernet CEM-10 (for use with `Fast Modem` selection only)	AT H &F E0 &K3 W2

Appendix B QUICK REFERENCE

CONFIGED MENU REFERENCE

File Menu

New Begins the process of drawing a new configuration by prompting the user to choose a type of configuration.

Open Opens a selected source configuration and, by the use of the `File Open Open` string, allows the user to specify configuration description fields, assign `Read-Only` protection, and display a source configuration in either graphical or text format.

Open History Opens a selected revision of a source configuration.

Open Selected Opens the source configuration installed in the *LINK* device selected in a `CE Module List` window.

Extract Selected Rebuilds the source configuration file from the configuration installed in the *LINK* device selected in a `CE Module List` window. Source configuration file must have been installed in the *LINK* device with the `Save Source` option selected in the `File Open Open` window.

Close Closes the currently active source configuration.

Save Saves the currently active source configuration.

Save As Saves the currently active source configuration by a name and to a destination specified by the user.

Delete Deletes the currently open and active source configuration.

Page Setup Opens a standard printer setup dialog box. Select your printer driver, page orientation and print paper size through this window.

Print Scale Allows the user to designate the size of the printed version of the currently open and active configuration.

Print Prints the currently open and active configuration.

Exit Closes the open configurations and quits the ConfigEd program.

Edit Menu

Undo Unsupported.

Cut, Copy, Paste Allows the user to transfer, duplicate and retrieve function blocks or groups of function blocks to a memory buffer for placement elsewhere in a configuration, or for placement in another configuration.

Clear Removes contents of `Scratch Pad`.

Select All Selects all text in the `Scratch Pad` when it is the active window..

Paste Time Pastes the current time to the `Scratch Pad`.

Net Address Allows the user to designate the network address of the currently-selected configuration.

Net Topology Allows the user to designate the network topology of the configuration.

Duplicate Duplicates a selected function block or *LINK* input or output. Non-applicable to annotation text or drawing elements.

Test Point Selects a function block for adding a test point for monitoring with SAM functions.

Project Menu

Select Permits user to select a particular project.

Manage... Permits user to designate a new project or new category, Upgrade a project, change project description information, assign `Read-Only` status to a project, sort configurations within a project by network address, and move projects from one category to another.

Duplicate... Duplicates the currently selected project and places the duplicate in the original's project category.

Compact Allows user to remove all configurations in a project, except the last revision and the last-installed versions of each configuration.

Update SAM parameter changes are generally done to fine tune a system during test or commissioning. After the parameters are tuned to their final operating values, this function updates the parameter values in the module's configuration files to match the changes made with SAM.

Document... Creates an ASCII text file <project number>.doc containing all configuration information of all configuration files within a project.

Print... Prints all configurations within a project and automatically assigns correct addresses to inputs.
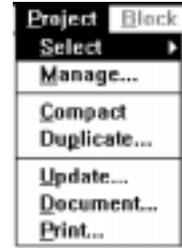
Block Menu

Presents a listing of all available function blocks, categorized by function.

Command Menu

Install at Address Installs the active configuration into the module with the matching network address.

Install at Selected Installs the active configuration into the module selected in the module list.

Install Changes Installs revised configurations into modules to which configurations have previously been installed.

Restart Restarts a selected halted module.

Halt Halts a selected module.

Get Info Prints to the `Scratch Pad` technical information about a selected module.

SAM Allows access to SAM functions.

Comms Allows user to select comms port and baud setting, as well as modem use for remote equipment.

Modem Brings up modem dialog in which settings for modem initialization and use are made.

Revisions [3] Allows the user to specify the number of configuration revisions saved.

Readdress Allows the user to check module configurations to determine which ones need to be replaced by newer configurations. Most often used to replace default shipping configurations with user-specific ones.
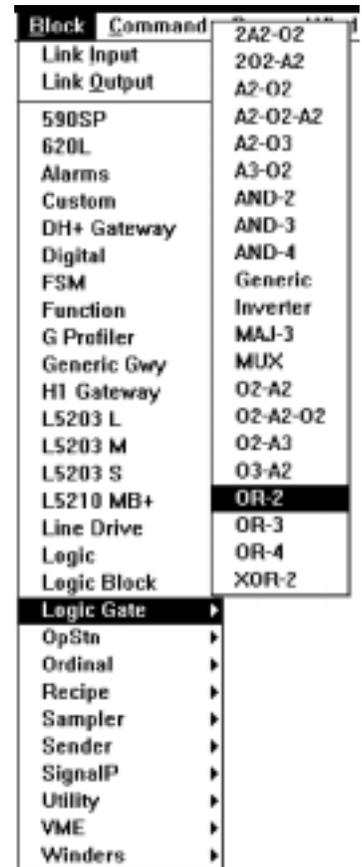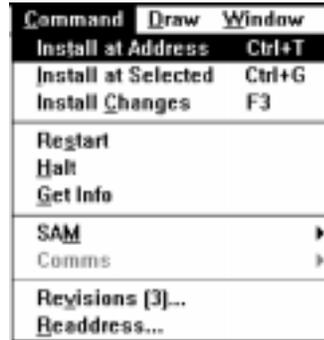
SAM Sub-menu

Backup Creates backup file of configuration installed in the *LINK* device highlighted in the CE Module List.

Backup All Creates backup files of all configurations installed in all *LINK* devices in CE Module List.

Chart Graphically displays a SAM Get operation.

Document Module Creates an ASCII text file documenting all SAM Get operations of the *LINK* device highlighted in the CE Module List.

Pot Allows you to continuously change a SAM Set operation.

Restore Downloads a backup file to a *LINK* device selected in the CE Module List.

Read-only Restricts you from changing SAM Set operations.

Verify Prompts you to confirm independently each SAM Set operation change.

Draw Menu

Previous Sheet Moves to the previous sheet in a multi-sheet configuration.

Next Sheet Moves to the next sheet in a multi-sheet configuration.

Sheet [ ] Moves to the specified sheet.

Align Allows user to align function blocks.

Color Allows user to assign colors to elements.

Fill Allows user to fill drawn objects with colors or patterns.

Move to Back Moves selected item to bottom layer of drawing.

Move to Front Moves selected item to top layer of drawing.

Pattern Allows selection of fill or line pattern.

Scale Allows selection of viewing scale for configuration.

Width Allows selection of line width.

Arrow Selects arrow drawing tool.

Line Selects line drawing tool.

Oval Selects oval drawing tool.

Rectangle Selects rectangle drawing tool.

Text Selects text insertion tool.

Black & White Selects black and white viewing and printing of configuration.

Insert Form Allows insertion of selected form.

Remove Form Allows removal of selected form.

Save Form Saves user-drawn form.

Show Form Displays selected forms in configuration drawings.

Window Menu

Module List Makes the CE Module List the front most, active window.

Update Partial Conducts a partial update of the network modules.

Update Full Conducts a full update of the network modules.

Auto Update Mode Allows selection of method followed by ConfigEd when it updates the module list automatically.

Connections Presents in text form a list of all connections in the currently open configuration.

SAM Test Points Opens test point window in which are displayed the SAM test points for a selected configuration.

Parent Brings the parent, or higher level, window to the front.

Child Brings the child, or lower level, window to the front.

Sibling Brings the sibling, or equal level, window to the front.

Monitor Allows the user to observe the performance of a selected module's test points.

Scratch Pad Makes the Scratch Pad front most, active window.

Font Menu

Changes the font of text in ConfigEd program windows. Four fonts are available for annotation text added to configuration drawings. For the display of text within the Scratch Pad, the CE Module List and any other dynamic ConfigEd or SAM windows, you can select from the list of fonts installed on your PC.

Fonts avialable to text in dynamic ConfigEd windows.

Fonts avialable for annotation text.

Style Menu

Allows the selection of type style (Bold, Italic, Underline) as well as type size for text displayed in dynamic ConfigEd windows such as Scratch Pad, as well as for annotation text added to configuration drawings.
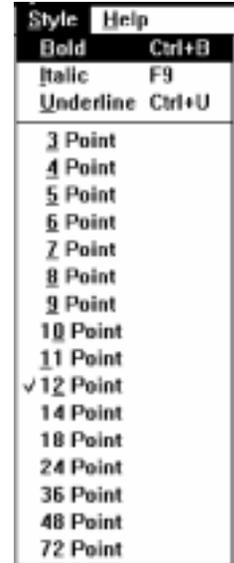
Help Menu

About ConfigEd Gives the ConfigEd software version, assigned user identification number and name, the database revision level for the selected configuration and the your current revision level of ConfigEd's ssd_link software tools installed on your PC.
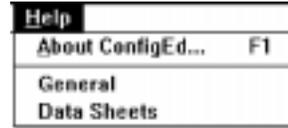
General Gives contact information if you need customer service to help resolve a ConfigEd or *LINK* system problem.

Data Sheets Gives information on all the function blocks within ConfigEd's Block menu.

KEYBOARD DISPLAY COMMANDS

A variety of keyboard commands are available to manipulate the display size and placement of your configuration drawing on you monitor screen.

Keystroke	Result	Keystroke	Result
0	Scales to 10pt. font (1.67x drawing)	Home	Sets origin of view to upper left corner
1	Scales to 11pt. font (1.83x drawing)	Page Up	Moves view of drawing up by 7/8 of current size
2	Scales to 12pt. font (2.00x drawing)	Page Down	Moves view of drawing down by 7/8 of current size
3	Scales to 3pt. font (0.50x drawing); Homes drawing to upper left corner	Up arrow	Nudges view of drawing up
		Down arrow	Nudges view of drawing down
4	Scales to 4pt. font (0.67x drawing); Homes drawing to upper left corner	Left arrow	Nudges view of drawing to the left
		Right arrow	Nudges view of drawing to the right
5	Scales to 5pt. font (0.83x drawing)	Shift Page Up	Moves view of drawing to previous sheet
6	Scales to 6pt. font (1.00x drawing)	Shift Page Down	Moves view of drawing to next sheet
7	Scales to 7pt. font (1.17x drawing)	Backspace	Deletes currently-selected item
8	Scales to 8pt. font (1.33x drawing)		
9	Scales to 9pt. font (1.50x drawing)		
+	Increases scaling by factor of 1.33		
-	Decreases scaling by factor of 1.33		

Appendix C DESIGNING A PROJECT— A TUTORIAL

This chapter instructs a beginner on how to build a simple *LINK* demonstration project step-by-step. The result is a functional configuration for a game of `Tic Tac Toe` played on a first generation L5101, L5102 or *LINK2* operator station (model L5391). By creating this demonstration configuration, you should become familiar with the ConfigEd tools without risking equipment damage or injury to personnel. The project consists of two configurations, one for a *LINK* operator station to display the Tic Tac Toe game board and first generation *LINK* processor module (L5207) to hold the game's control configuration.

The configurations you will create using this tutorial are actually recreations of the two existing configurations under the project `TIC TAC TOE` in the `Public` category.

> NOTE. For reference, the finished configurations you will build is shown in Figure C.2 and C.3 at the end of this appendix.

The tutorial in this chapter provides a cursory introduction to using basic functions— such as creating projects and configurations, configuring a *LINK* project and installing *LINK* configurations into *LINK* network devices— to give the user a feel for how to use the product. All the software functions and features of ConfigEd are discussed more fully in Chapters 4, 5 and 6.

GETTING TO WORK

If you have followed the setup instructions in Chapter 3, you will have already selected the `id.dat` file and set your communications parameters. From the Windows™ 3.1 Program Manager, double-click on the `ConfigEd` icon in the `Link Tools` window to launch the program.

If you are running the Windows 95™ operating system, click the `Start` icon on the menu bar at the bottom of your screen and click on the `Link Tools` selection in the roll-down menu. Click on the `ConfigEd` selection.

To begin, you must first create a new configuration management structure of `Project` and `Category` for the configurations you will design. Each *LINK* project is a set of software configurations designed to control one *LINK* control network. Generally, each *LINK* configuration is dedicated for one *LINK* network device whose node address matches the configuration file address. A category is a grouping of one or more projects that are related in some way. Refer to *Organizing Your Work* in *Chapter 4 ConfigEd Functions* for a description of ConfigEd's category/project hierarchy.

To create a category and project, go to the `Project` menu and select `Manage`.

A dialog box will appear with lists for `Category`, `Project`, and `Destination Category`. In this dialog box, you can create new categories and projects, move projects from one category to another, enter or change project information, or use the `Find Project` feature to locate a particular project.
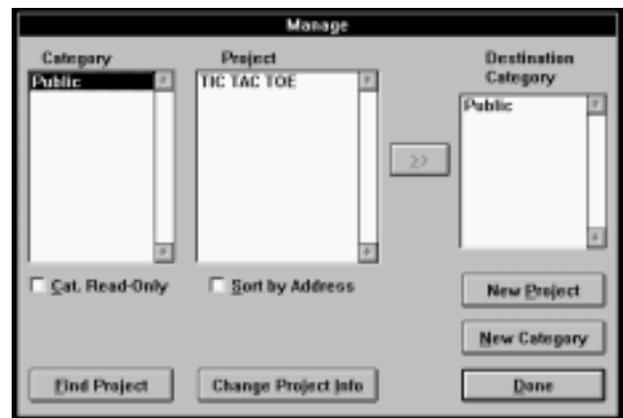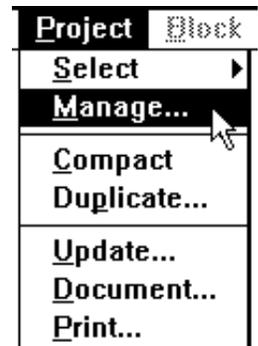
NOTE. The `Manage` function under the `Project` menu allows you to handle projects and configurations for one ConfigEd user account only. To administrate projects between multiple accounts, use the separate software application Manager (see *Chapter 7*).

Click on `New Category`, give it an appropriate name (for example, `Training`) and click `OK`. `Training` will now appear in both the `Category` and `Destination Category` columns.

Whenever you add new projects to your database, you must first put them in the appropriate category. To do this, highlight the category where you want your new project to reside. Any project you created will immediately reside in the highlighted category. (For our exercise, highlight the only category now available, `Training`.)

Next, click on `New Project` and give it a name (for example, `ConfigEd Test`). A dialog box then presents a series of nine description field boxes in which you can enter additional data to help identify and describe your project.

NOTE. These fields correspond to the ^F# codes described in the section *Automatic Data Entry* (see *Chapter 5 Displaying, Documenting & Printing*) and is used for creating forms.

The fields are marked for standard information which often appears on most engineering documentation. In the field marked `System title`, enter `Games`. Enter `Testing` in the field marked `S.O. Number` and click the `New` button. `ConfigEd Test` will now appear in the `Project` column in the `Manage` window. You have now set up a system which organizes your projects by category.

If `Read-only` is toggled on in the `Project Manage` dialog box, click on the box to remove this restriction. This allows you to create new configurations. Click on the `Done` button to close the `Project Manage` window.

After creating a project, you can then design configurations within that project. Select a project by choosing it from the `Project Select` menu tree once it has been created.

NOTE. The title bar of `Scratch Pad` always shows the name of the current project. When you open or change projects, or if several ConfigEd projects windows are open on your screen, the title bar of the `Scratch Pad` indicates the *active* window, or the current project selected. Any ConfigEd function you perform affects that project only.
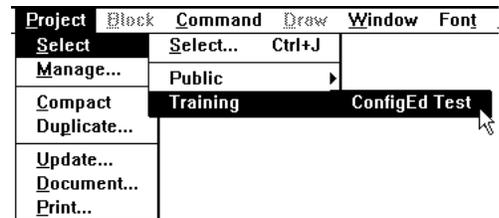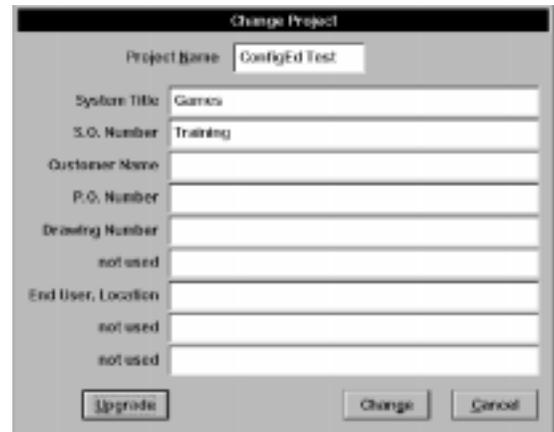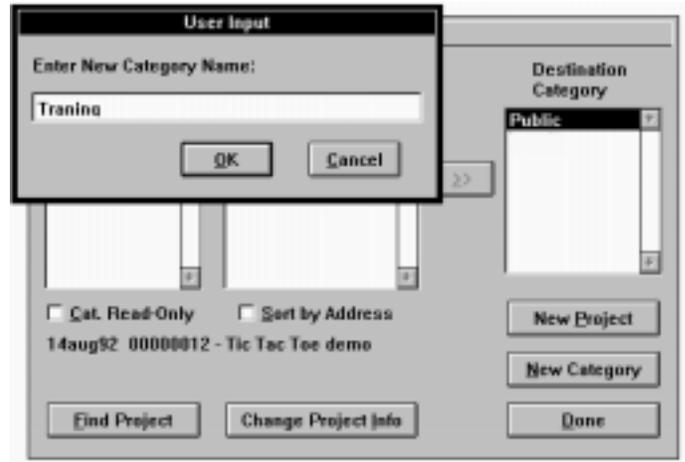
CREATING & SAVING CONFIGURATIONS

Creating a New Configuration

Once you have created a project, the next step is to create new configurations for the *LINK* network devices in your project. You can then place function blocks within them and make connections between configurations to design a control scheme for your *LINK* network.

> NOTE. ConfigEd saves your drawing automatically whenever you close the drawing or exit the program. The program, however, does *not* automatically save while you are working. It is therefore good practice to save your configuration periodically to prevent the loss of work in case of an unexpected power loss. Save your configuration manually by going to the File menu and selecting Save or using the keyboard shortcut Ctrl+S.

To begin, you must first create all the configurations your *LINK* network requires. Select New from the File menu. A dialog box will provide a list of the base modules in the *LINK* database included in your ConfigEd package. This list includes all first generation *LINK* and *LINK2* devices.

Select L5101 (Operator Station) and click on the New button. Note that as you select a *LINK* device in the list, a brief description of it appears in the dialog box.
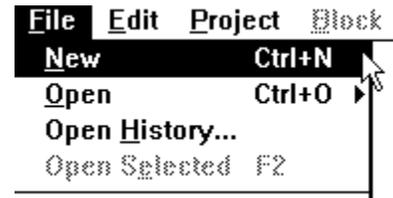
A second dialog box will appear asking you to designate the network address (node number on the *LINK* network) for the configuration you are creating. For our example, enter 997 for the address, and click on the OK button.

Once you enter an address, the files needed to configure the module are loaded and, as the graphical image appears on screen, you are prompted to name the module.
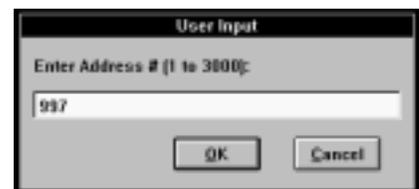
> NOTE. Configuration names must be legitimate 8-character DOS file names with no extension.

It is best to keep a consistent naming convention for your configurations. The Eurotherm Drives convention is to specify the type of module first, followed by a dash and the address of the configuration (e.g., 5101-997). For this training example, we have named the operator station TTTgame. Type in that name and click OK.
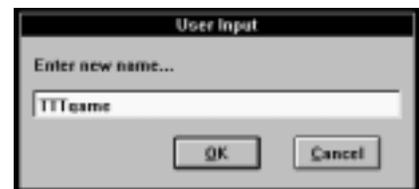
Configuration Display

On screen, you will now see a graphical representation of a `System Control` block and a `Display Handler` block. The `System Control` block provides system and network management functions. `Display Handler` associates function blocks in the operator station configuration with actual bands used on the touch screen display. There must be a unique function block associated with each of the six bands available (annunciators, meters, etc.).

> NOTE. For more information on `System Control`, `Display Handler` and all other function blocks, click on the `Help` selection on the menu bar.

There are a variety of ConfigEd controls available to change the way configurations are displayed on your screen. To enlarge the ConfigEd window to fill your monitor screen, click on the screen "sizing" box in the upper right corner of the window. Clicking again on the box will return the window to its previous size.
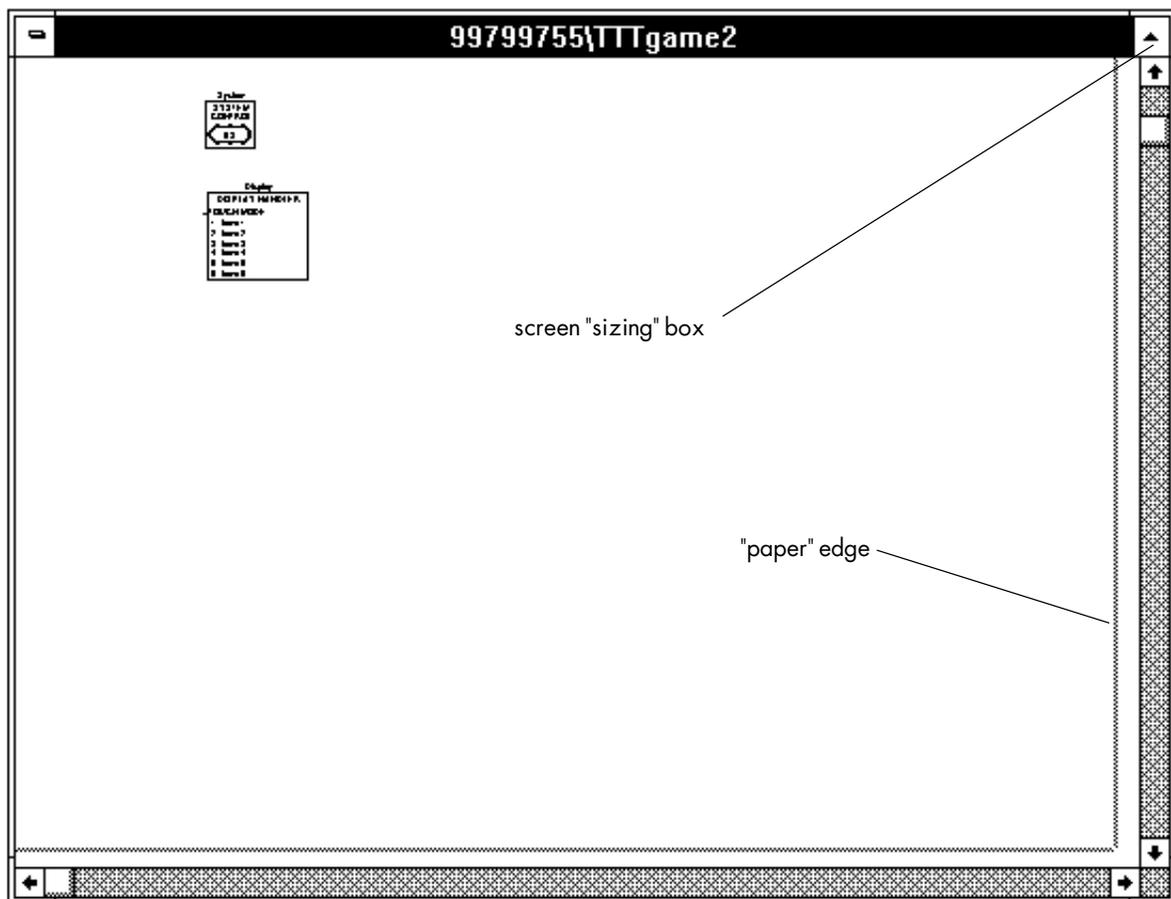
Notice the gray outline frame near the bottom and right side of your ConfigEd window (if the gray outline is not visible, scroll down or to the right until it appears). This outline marks the "paper" edge or the limits of your configuration drawing. When you print your configurations, leave an extra margin inside the paper outline. Items that touch or extend beyond the paper outline will not be printed. You can reorient the paper to a "landscape" sizing through the `Page Setup` command in the `File` menu.

ConfigEd has internally set "screen zooms" which enlarge or reduce the view inside an active configuration window. You can switch to these preset screen zooms using the number keypad at the right or with the number keys at the top of a standard PC keyboard. Each number zooms the view to a different preset scale. The + or - keys, increments or decrements the view to the next preset zoom. The arrow keys and the `Page Up` and `Page Down` keys moves the

entire selected window on the screen without zooming. Other commands switch the display to the next or previous configuration page.

You can also zoom in and out of a configuration window using the `Scale` function in the `Draw` menu or enlarge an area of a drawing by holding down the mouse button and dragging over the an area you want to enlarge.

> NOTE. Refer to the table 5.1 in *Chapter 5* for a full list of all the ConfigEd keyboard display commands.

To enlarge the area of a drawing, hold down the mouse button and drag the mouse over the area of the drawing you want to enlarge. A dashed-line box will enclose the area. When you release the mouse key, the area you have selected will fill the window.

Adding & Naming Function Blocks

Now you will begin adding function blocks and elements to your configuration to represent the software required to configure your Tic Tac Toe game. Screen snapshots in the manual show your progress to the final drawing, shown at the end of the appendix.

> NOTE. Study the function block data sheets before placing the function blocks in a configuration. The data sheets, located in the `Help` menu, provide in-depth information on the blocks and data on the block's parameters.

First, use the mouse pointer to move the `System Control` and the `Display Handler` to the bottom of your drawing. To move an element, place the mouse pointer on the element to be moved, then press the mouse key and hold it down while you drag the element to its new location. (An outline of the element appears while you are moving it.) Release the mouse button when you have placed it where you want it.
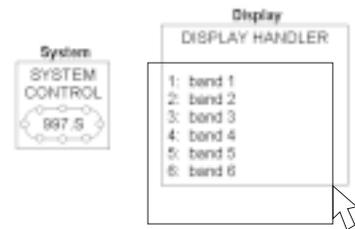
Next, go to the `Block` menu, click on the `OpStn` sub-menu and select `Annunciator`. An outline of annunciator function block will follow your mouse pointer around the screen.
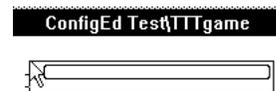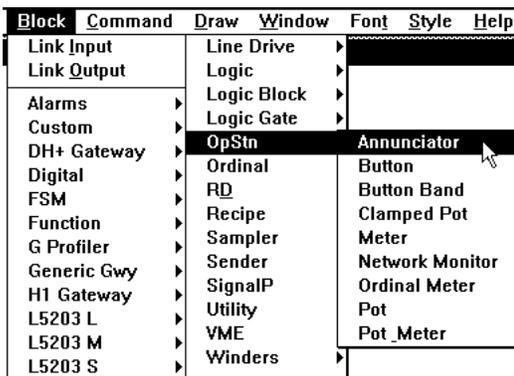
Move the pointer to where you want to place the annunciator (for this example, center it just below the top edge of your drawing area) and click the mouse key. ConfigEd places the software element and assigns it a default name. You can rename the software element by double-clicking on the block while holding down the `Ctrl` key and typing in the new name in the dialog box that appears. Rename the block `Status` and click `OK`.
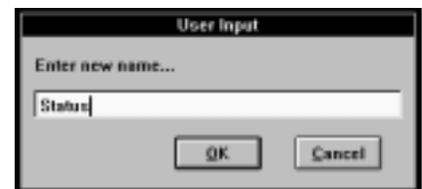
Double-clicking on a function block opens its parameter window. For example, double-clicking on the annunciator `Status` opens a parameter window showing `New Legend`, `Legend 1` and connections for its `Non-Inverted Output` and `Inverted Output`.

Status [350765:Annunciator]	
New Legend	New ...
Legend 1	Your Turn, Press to Reset
Legend	TIC-TAC-TOE...I Win, Press to Reset
Legend	Tie Game, Press to Reset
Non-inverted Output	Connections:
Inverted Output	Connections:
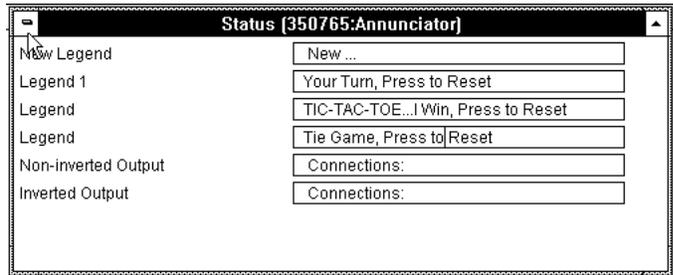
> NOTE. Since all connections with ConfigEd 5.0 are made graphically on screen, these fields are for information only. You can *not* set connections in this window.

Open the `Status` annunciator, click on `Legend 1` and type `Your Turn, Press to Reset`. Then, double-click on `New Legend`. This creates an additional legend field that is now highlighted. Type in `TIC-TAC-TOE...I Win, Press to Reset`. Double-click again on `New Legend` and type `Tie Game, Press to Reset`. Close the parameter window. Your monitor screen should now display the annunciator with legend 1 (`Your Turn, Press to Reset`) shown.

ConfigEd Test\TTTgame

Status

HL [Your Turn, Press to Reset]
LEGEND
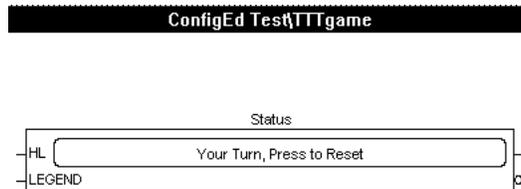
Next, you will add a series of push buttons that will let you "play" interactive games of Tic Tac Toe with the processor. Buttons must be used in sets of four because the function block used to display them (`Button Band`) holds four buttons. For this configuration, you will need four button bands since nine are required to play the game. The first three buttons in each band will hold the X's and O's required to play Tic Tac Toe; the remaining button will display text and will have no switching capability.

L5210 MB+
Line Drive
Logic
Logic Block
Logic Gate
OpStn   Annunciator
Ordinal   Button
Recipe   Button Band
Sampler   Clamped Pot
Sender   Meter
SignalP   Meter & SP Monitor
Utility   Network Monitor
VME   Ordinal Meter
Winders   Ordinal Pot
               Pot
               Pot & Meter
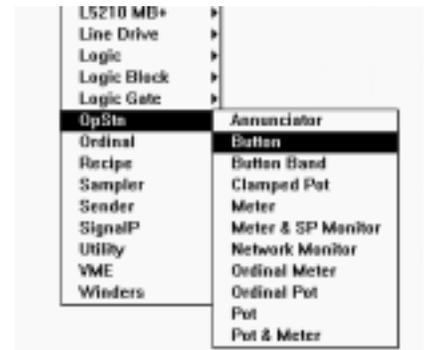
To create a button, go to the `Opstn` sub-menu in `Draw` and select `Button`.
Place the first button below and left of the annunciator. For clarity, we will lay the configuration out in the same manner the display will appear on the operator station screen. This will be the top left button, so rename the block `TL`.

TL

HL [.]
LEGEND
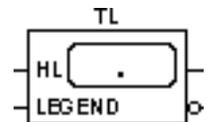
Duplicating Function Blocks

To create the additional buttons, you can either repeatedly return to `OpStn` under the `Block` menu and select `Button`, or you can duplicate the block with a keyboard shortcut. To duplicate the block, select the button by placing the mouse pointer on it and clicking once; the button reverses its display image to white on black. Press the `Ctrl` and `D` keys simultaneously, or select `Duplicate` from the `Edit` menu. ConfigEd creates a duplicate button and assigns a default name which is identical to the original default name, except for a suffix number which increments for each duplicate created. Drag the duplicate block to another location on your screen and click the mouse button to place it in your configuration.

File Edit Project Block Command
       Undo   Ctrl+Z
       Cut   Ctrl+X
       Copy   Ctrl+C
       Paste   Ctrl+V
       Clear
       Select All
       Paste Time
       Net Address [12]...
       Net Topology
       Duplicate   Ctrl+D
       Test Point   Ctrl+E

TL

HL [.]
LEGEND
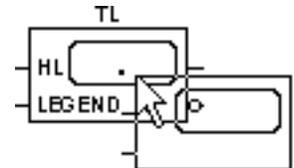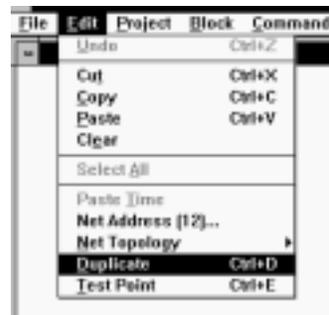
Rename this second button `TM` (top middle), place it to the right of the first button, then create two additional buttons and name them `TR` (top right) and `TT` (top text). Arrange the button below the `Status` annunciator. Your drawing should appear as below.

Double-click on the first button (`TL`) to open its parameter window. This button will be the starting point for the game. Double-click on the `Legend 1` field and type an X, the close the window. This will be the game's first move and will display X in the top left button.
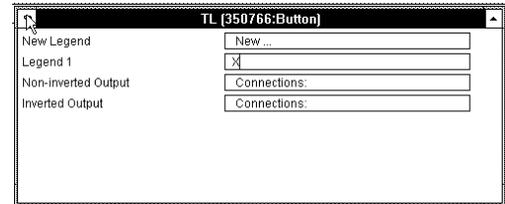
Double-click on the `TM` button. Because it contains no information at the start of a game, leave `Legend 1` blank by pressing the space bar once. Double-click on `New` to create additional legends. For the first, type X and for the second, type O. This supplies the three displays for the buttons: blank at the start of a game, and either X or O as the player selects each button. Repeat these actions for the `TR` button.
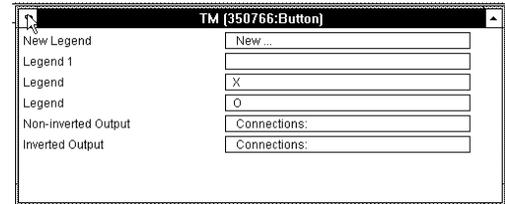
The `TT` button will display the word `TIC`. Open the parameter window of that button, double-click on `Legend 1` and type `TIC`. The button will now display the word `TIC` at the beginning of the game and, since you will not enter any additional legends, the L5101 will display that message throughout the game.
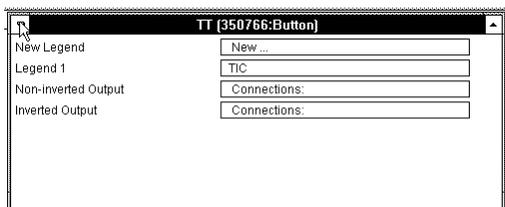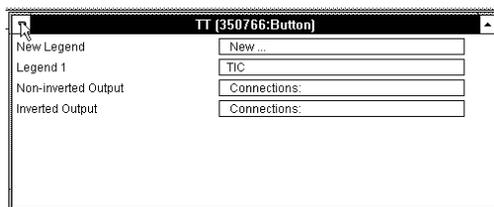
Repeat your actions to create a second row of buttons. Make your duplicate buttons from either the `TM` or `TR` buttons using the `Ctrl+D` key combination. This way, you will not have to type in the X and O legends— they will be duplicated along with the button. Name your next three buttons `ML` (middle left), `MM` (middle), and `MR` (middle right). For the MT button, duplicate the `TT` button, double-click on Legend 1 and change it to `TAC`.

Now, create a third row of buttons in the same manner. Name them `BL` (bottom left), `BM` (bottom middle), `BR` (bottom right), and `BT` (bottom text). Change the legend in the `BT` button to `TOE`. When finished, arrange your buttons on screen, as shown in the screen shot on the next page.
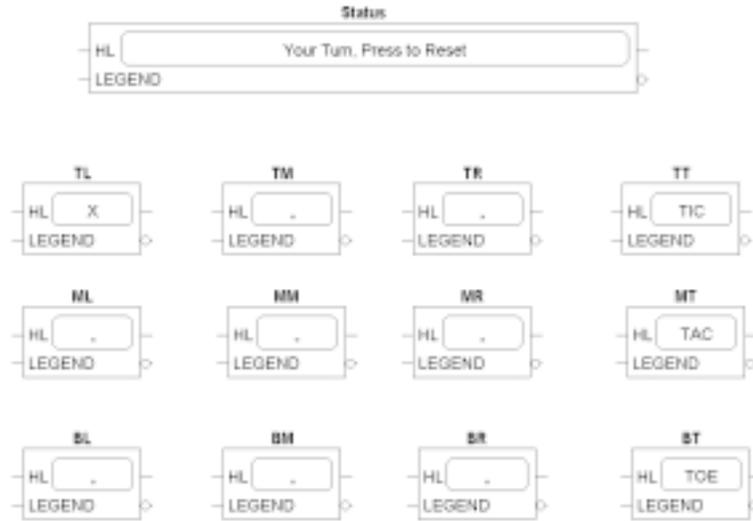
Button Bands

A L5101, L5102 or L5391 operator station will display push buttons only if the push-button entities are specified in an operator station button band function block. This function block organizes them on screen and displays them in the order you specify.

Go to the `Block OpStn` menu and select `Button Band`. Place the first one near the bottom of your configuration and name it `Top`. Duplicate it and name the second one `Middle`. Duplicate it once again and name it `Bottom`. Position the button bands in a single row across the screen.

You must specify the physical order of appearance of the pushbuttons in order to line them up correctly on the operator station screen. Double-click on the top button band to bring up its parameter window. Double-click on the `Button 1` line to bring up a list of all the push buttons in your configuration. Since this is the top button band, we will be placing the push buttons labeled Top Left, `Top Middle`, and so on. For `Button 1`, select `TL`; for `Button 2`, `TM`; for `Button 3`, `TR`; and for `Button 4`, `TT`.
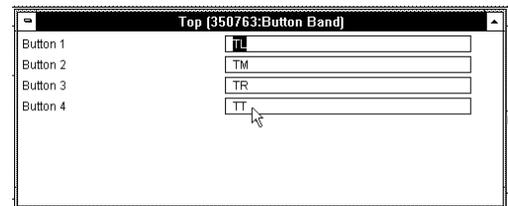
Close the window and verify that you have entered the data correctly. Repeat the process for the other two button bands. When finished, your button bands should look like this:
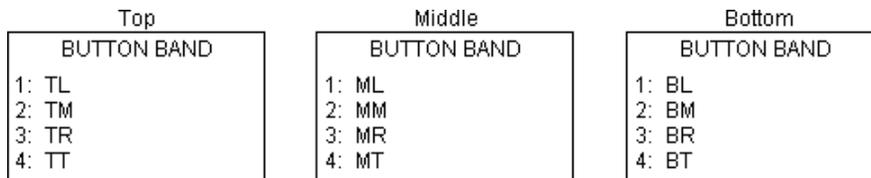
Adding Meters

You now need to add two ordinal meters to your configuration, one to record the total number of games played and another to log the number of games won. To create the `Total Games` meter, go to `Block OpStn` and select `Ordinal Meter`. Place it in your drawing, centered under the bottom row of buttons (`BL`, `BM`, `BR`, and `BT`), and name it `Total`.
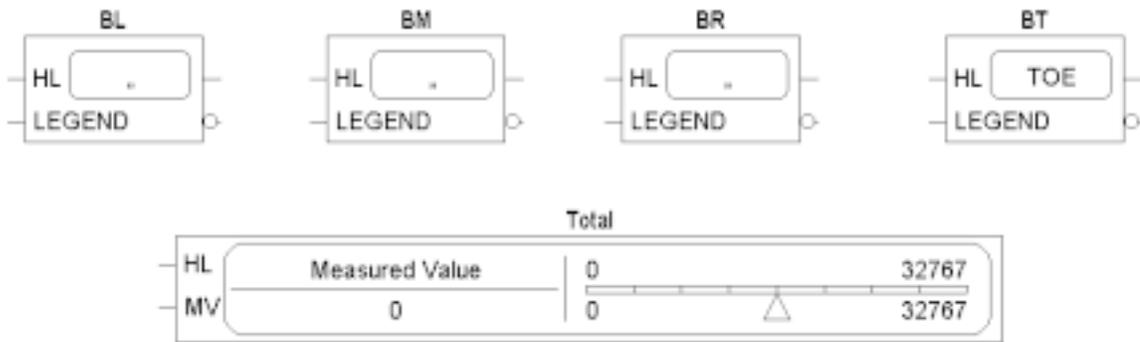
Double-click on the meter to bring up its window. For the Legend, type `Total Games` and leave Format at its default setting of `#####`. Set `Display Max` and `High Redline` values to 20 and close the window.
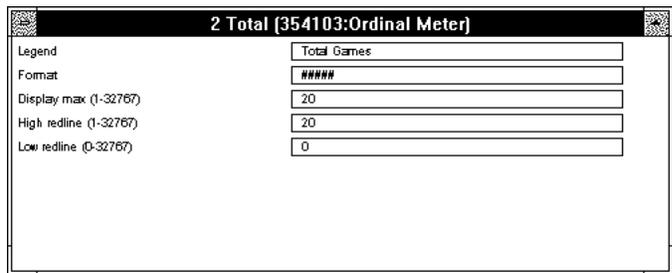
Next, add an ordinal meter to log the number of games won by the processor. You can either return to the `OpStn` in the `Block` menu and repeat the process used for the `Total Games` ordinal meter, or you can simply duplicate the meter already present in your drawing. Use the `Ctrl+D` key sequence to duplicate the previous meter. A new ordinal meter, identical to the first will appear adjacent to your mouse pointer. Place it in your drawing and name it `Won`.

Notice that the settings of your second meter are identical to the first— the duplicate feature also duplicates a software function block's attributes as well as the function block. You must change these to reflect the new meter's functions. Double-click on `Won` to open its window. It will display the settings you entered for `Total`. Since you only need to change the legend, click on it and change it to `Games I Won`.

Close the window and check your work. Your ordinal meters should appear as in the screen shot below.

Adding & Connecting Inputs & Outputs

Now you will add inputs and outputs and connect them to and from the function blocks in your configuration. These *LINK* inputs and outputs will send and receive data to and from the L5207 processor which will hold the control configuration for the Tic Tac Toe game. Connections to these inputs and outputs are analogous to wires in a hard-wired system: the *address* is the device to which the "wire" is connected; the *slot* is the "terminal" on the device. Inside the device, the input and output slots connect to and from function blocks.

When creating inputs, you must define *only* the incoming slots numbers. Naming the source address is optional and is used only to document the source signal. The number on the left end of an input slot is the source address; the receiving slot number of the configuration is on the right. For an output slot, the number on the left end is the destination address and its destination slot number is on the right. For now, you will name only the incoming slot.

NOTE. When configurations are documented or printed (using the `Document...` or `Print...` commands in the `Project` menu), ConfigEd automatically fills in the source addresses of *LINK* input slots.

For clarity and consistency, keep *LINK* inputs on the left side and *LINK* outputs on the right side of configuration drawings to maintain a left-to-right flow of data.
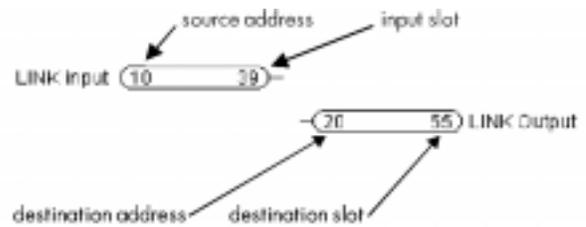
Creating and Connecting *LINK* Inputs

Go to `Block` and select `Link Input`. Place the input to the left of the `Status` annunciator. Once you place the block, its parameter window appears. Notice that ConfigEd automatically assigns an input slot number, beginning at one. The default input slot number increments for each successive slot you create.   For this example, change the input slot number to 10.
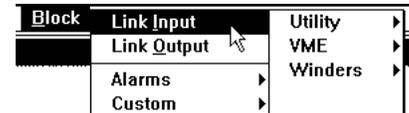
You can double click on a placed LINK input (or output) and change its parameters just as with any other function block. Leave the `Source` blank; ConfigEd automatically fills in this field when you execute the `Document...` or `Print...` commands. You can also leave the `Description` box blank. Adding annotation text to inputs (or outputs) is optional. For now, leave the `Normal` and `Priority` option set to the default (`Normal`) selection. The *Normal & Priority Inputs* section of *Chapter 4 ConfigEd Functions* explains the meaning of these settings.
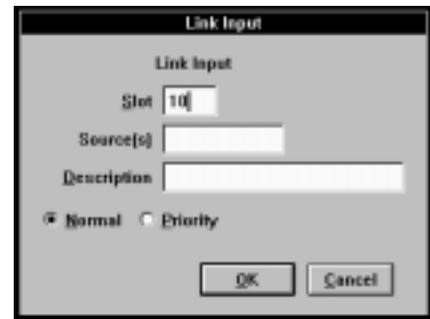
Click `OK`, and your input will appear as the screen shot below.
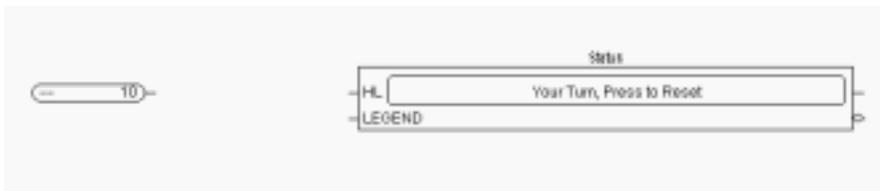
You will now draw connections between *LINK* inputs and function blocks.

NOTE. You may only make connections from the *output* of a function block or LINK input to the *input* of the same function block, or to the *input* of another function block or LINK output.

First, connect the *LINK* input you have just placed to the `Highlight` (`HL`) connection on the annunciator. Place the mouse pointer near the terminal line extending from the right (output) side of the input. As you cross that line, the pointer changes into cross hairs indicating that you can begin drawing the connecting line.

With the cross hairs showing, click and hold down the mouse key, then drag the mouse to the left side of the annunciator. As you move away from the starting point, the cross hairs revert to a pointer and a line will extend from the start of the connection to the pointer. Once the pointer icon appears, you no longer need to hold down the mouse button. When the pointer once again turns into cross hairs near the `HL` input terminal of the annunciator, complete the connection by again clicking the mouse key.
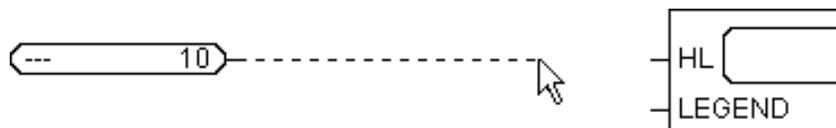
The *LINK* input to slot 10 is now connected to the `Highlight` terminal of the annunciator. If you accidentally draw a line to the wrong point, remove it by clicking once on the line with the mouse pointer. This changes the connection to a dashed line indicating that you have selected it. Press the `Backspace` or `Delete` key to remove it.

Caution

ConfigEd automatically saves your configuration whenever you close it or exit ConfigEd. ConfigEd will *not* save LINK inputs or outputs you have created unless they are connected to function blocks inputs within the same configuration. Do *not* close your drawing until you have made these connections; otherwise, you will have to recreate these inputs upon reopening the file.

Create additional LINK inputs or use the duplicate feature to add all the LINK inputs your configuration will require using the drawing at the end of this appendix as a guide. Assign these new inputs slot numbers 1 through 12, as required.

You can move function blocks in your drawing to straighten out and tidy up the appearance of your configuration even after they are connected. Place the mouse pointer on the object you wish to move, hold down the mouse key and drag it to its new location. When you are satisfied with its position, release the mouse key. You can also align a group of function blocks or *LINK* inputs or output either vertically or horizontally using the `Align` function in the `Draw` menu. Refer to *Chapter 5 Displaying, Documenting & Printing* for information on this feature.

When you have added and connected all LINK input slots, your drawing should appear as the screen shot below.
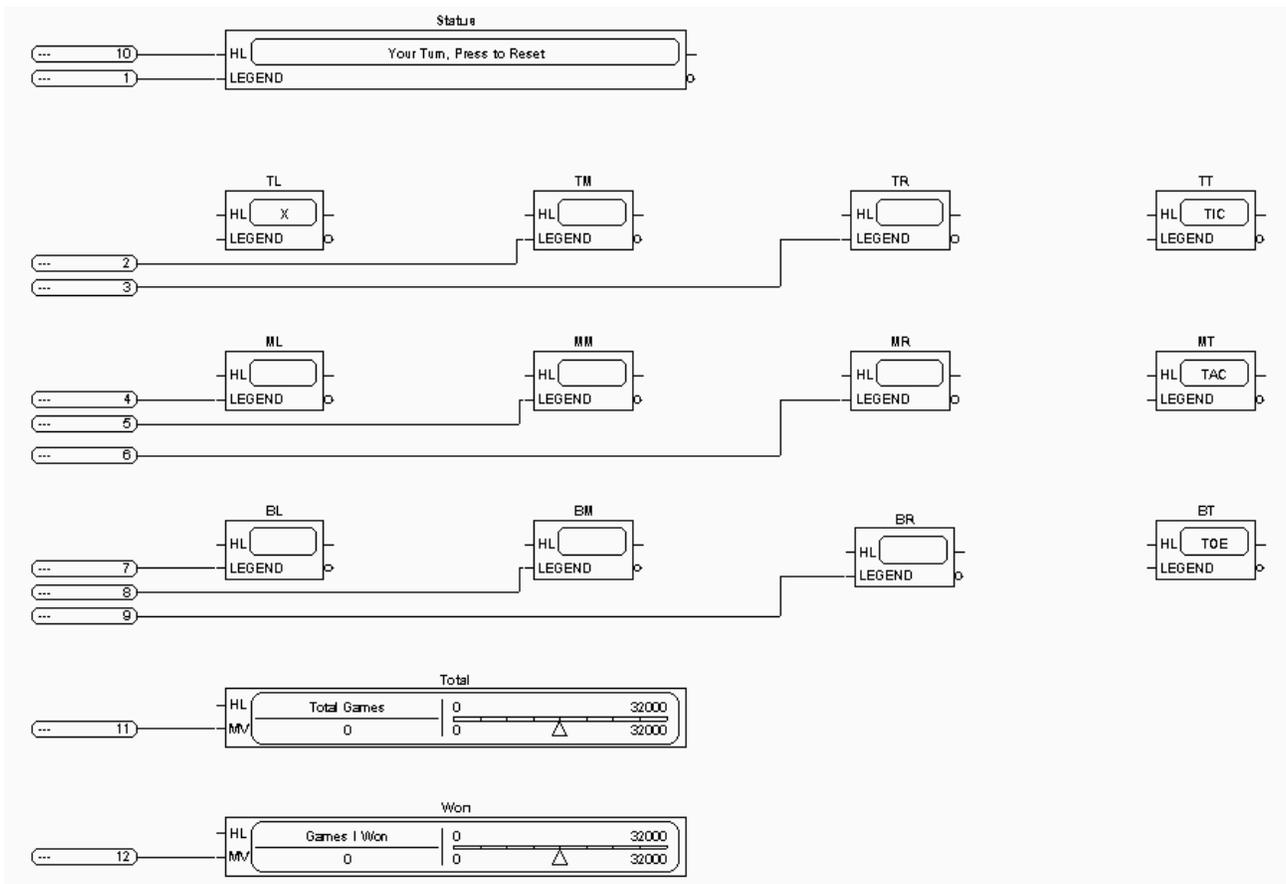
Creating and Connecting *LINK* Outputs

Your configuration also needs a series of nine outputs placed along the right side of the drawing. To create an output, select `Link Output` from the `Block` menu.

Block	Link Input	Utility ▶
	Link Output	VME ▶
	Alarms ▶	Winders ▶
	Custom ▶	
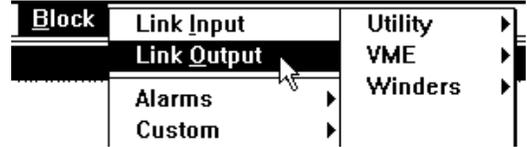
Place this first output to the right of your annunciator. ConfigEd automatically opens the LINK output's parameter window when you place it in your configuration. It assigns it a default destination address and slot number, beginning at one, and increments the default destination slot number for each successively placed LINK output. As with LINK inputs, you can open a LINK output's parameter window and change the destination address and slot after you have placed the block.

> NOTE. You *must* assign a destination slot *and* destination address for each output. ConfigEd prevents you from assigning duplicate destination slot numbers for the same destination address (a warning/ dialog box appears when this occurs). Descriptive information is optional.

Click on the output and give it a destination address of 996 and set the destination slot number to one. Continue adding additional outputs as shown in the sample drawing at the end of this appendix, giving each a destination address of 996. (If you use the duplicate function, ConfigEd copies the destination address of the original LINK output and increments the default address.) Use the `Align` function to keep your work orderly.

When all are placed, your configuration should appear as the screen shot below.
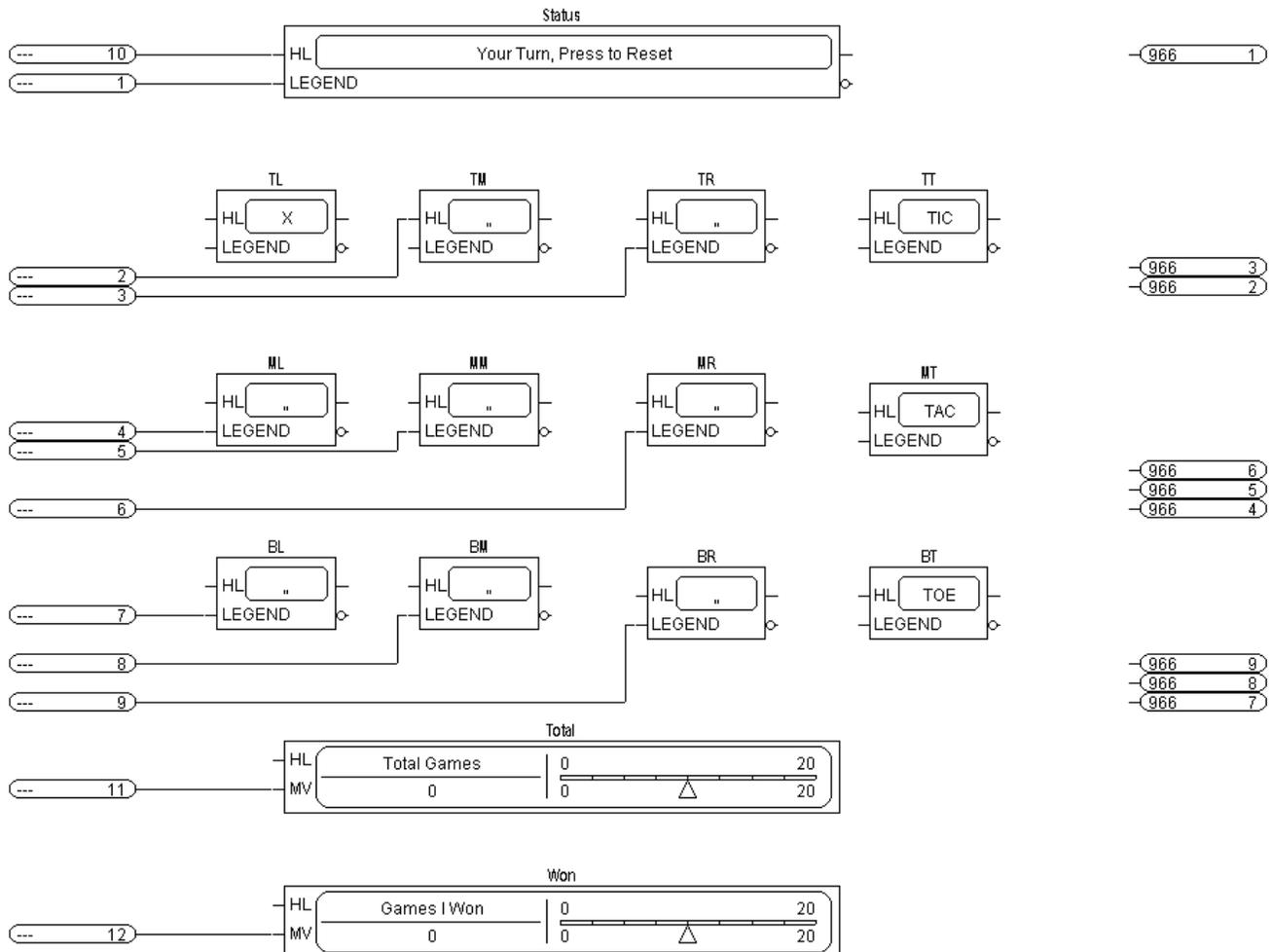
Next, connect these outputs with their source elements. You will again select and draw the line connection with your mouse. Remember, you can only connect an element's output to another element's input, so you will have to start at the annunciator or a push button output, then draw the connection to a *LINK* output.
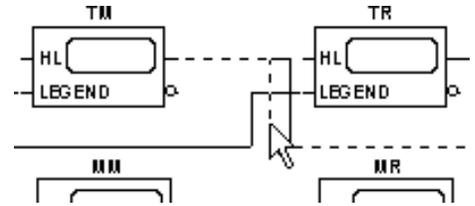
As you draw connection lines from one object to another, notice that ConfigEd prevents you from placing connections over function blocks and will automatically reroute the line away from a function block.   When this occurs, ConfigEd may place these connections much closer to objects than you would prefer. To rearrange the look of your configuration, you can move and adjust a line by selecting it with the mouse pointer and dragging it to a more suitable location.

After adding this second series of connections (from the function blocks to their *LINK* outputs), your configuration should appear as the screen shot below.
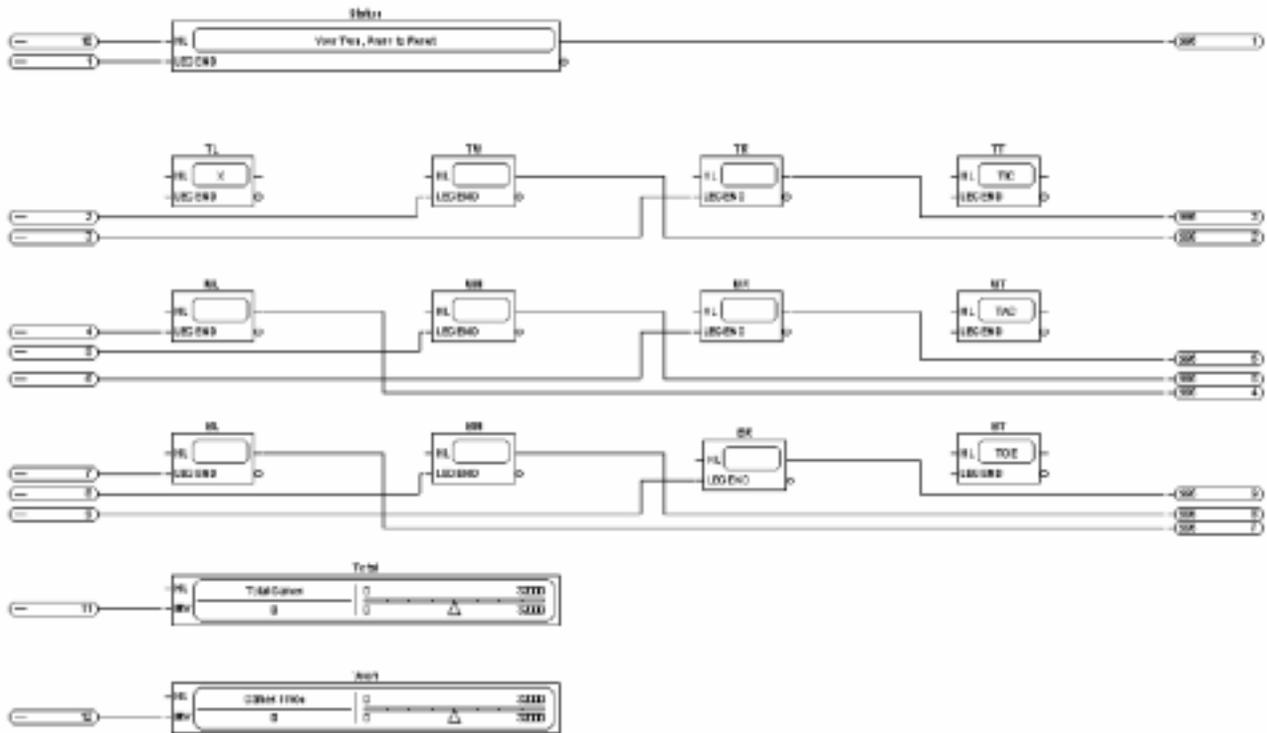
Button Highlights

The final set of connections are those connecting the output of a function block to an input of the same block. These connections are needed for the status annunciator and the nine Tic Tac Toe "squares" to change the display of elements in the operator station during the course of a game. You must draw these lines from the output side to the input side of an element.
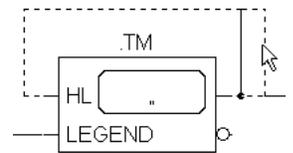
Go to the TL push button and click on the non-inverted output terminal to begin drawing the connection. Bring the line over the top of the push button until you can reconnect it to the HL (Highlight) terminal.
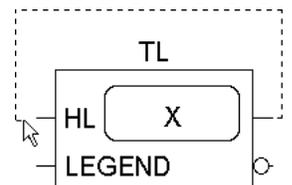
Using the completed configuration drawing at the end of this appendix as a guide, create the remainder of your connections. When adding a connection to a function block input that already has a connection, ConfigEd uses a black dot to indicate its junction with the previous connection at the point at which the two diverge. This distinguishes it from intersecting

connections, which merely cross and do *not* connect to the same input. You can move the first or second line— or its divergent point (black dot)— to tidy up the configuration.

Continue adding connections as on the sample sheet until you are finished with your drawing. Once you have finished, your configuration appear as the screen shot below.
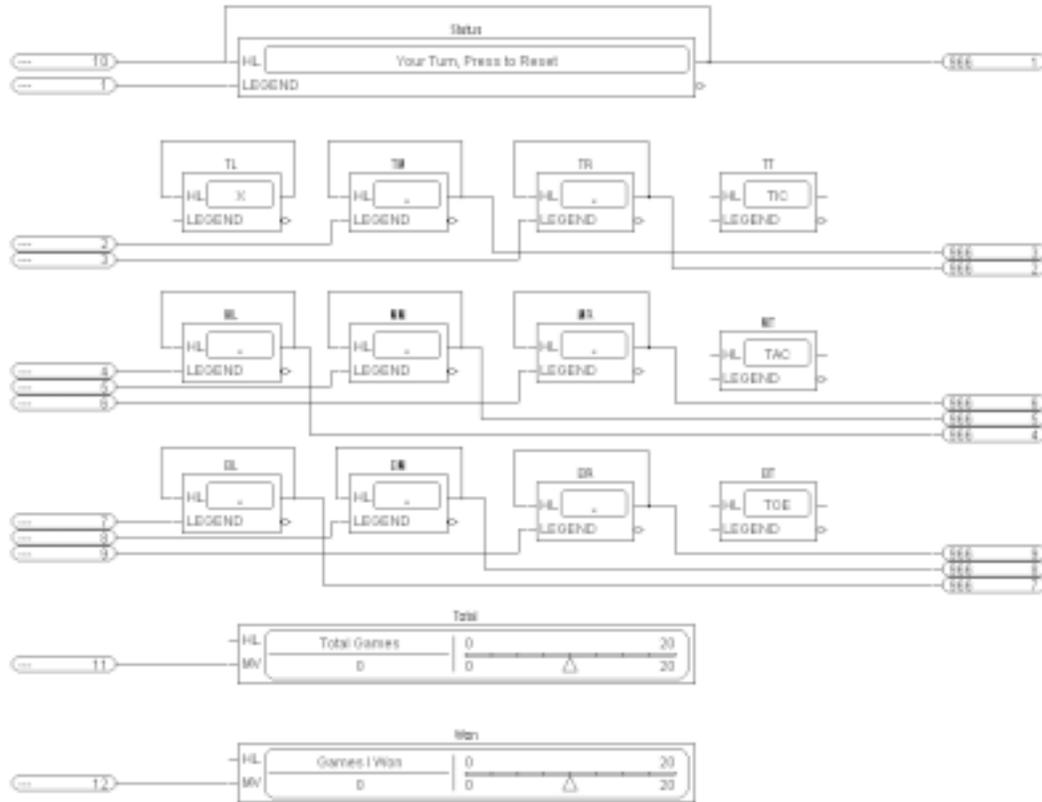
Organizing Your Display

When you have finished placing items within your configuration and making the connections linking them together, you need to organize how the display will appear on the L5101 touch screen. To do this, use the `Display Handler`, which assigns the configuration function blocks to each of the six bands on the *LINK* operator station.

To organize your display, double-click on the display handler to open its window.

As with the button band function blocks, double-click on each text box to bring up a list of the items you can place in the bands. Select items you wish to place in the fields by double-clicking on them. In `Band 1`, place `Status`; place `Top` in Band 2; `Middle` in Band 3;

Bottom in Band 4; Total in Band 5; and Won Band 6. Close the window and observe the completed display handler block. The order in which the function blocks appear on your operator station follows the sequence— from top to bottom— in which you listed them in the Display Handler.
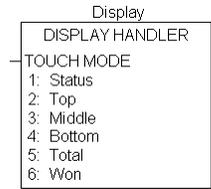
Your configuration should now be complete. Compare it to the sample configuration at the end of this appendix. Close your configuration drawing by double clicking on the box under the word File in the upper left corner of the window. ConfigEd automatically saves the configuration on exit.

Copying an Existing Configuration

Now that you have completed the configuration for your Tic Tac Toe L5101 operator station, you need an L5107 processor configuration to make it work. Rather than repeat the same procedures to create the configuration, copy one from the demonstration project TIC TAC TOE into your ConfigEd Test project. This configuration is included in the Public category of the ssd_ *LINK* database.

Return to the Project Select menu structure, choose Public and then pick the project named TIC TAC TOE. Click Open in the File menu and select TTTp.
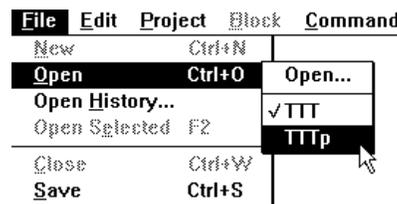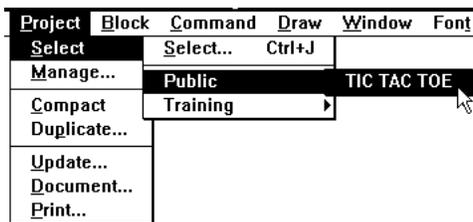
A dialog box will warn you that ConfigEd will only open the file in read-only mode. Click Open to acknowledge the clear the dialog and open the configuration.
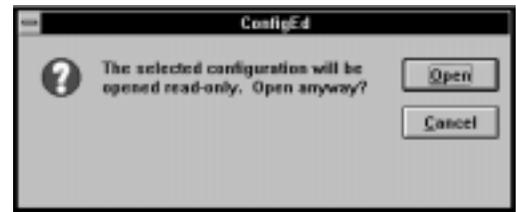
When the file opens, you will see a completed configuration for the processor. You will need this configuration to run the Tic Tac Toe game. Return to the File menu and select Save As.

This brings up a dialog box asking you the new name of the configuration and the project and category in which you wish to save it. Choose the category and project you have set up for your training activities (Training), give the processor a name (TTTpro) and click OK.

This saves the configuration to your ConfigEd Test project. It also gives you read/write access to your copy of the configuration in case you need to modify it for a particular application. This is an important, time saving skill to learn— you will find it quicker and easier to reuse configurations from other projects rather than redesigning new ones from scratch, especially when configuring similar series of control sections.
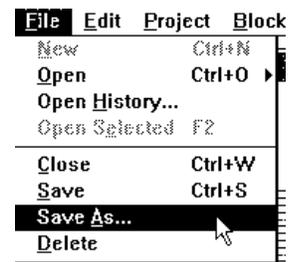
INSTALLING A CONFIGURATION

Before you install a configuration into a first generation *LINK* or *LINK2* device, you must establish a valid communications setup between your PC serial port and the *LINK* device and open a `CE Module List` window. Refer to *Appendix A Communications* for information on communicating to a *LINK* network. Also, you must connect your computer to a functional *LINK* network.

The *LINK* network for our Tic Tac Toe game is a simple topology ring consisting of only two *LINK* "nodes"— a L5101 operator station and a L5207 processor module, both first generation *LINK* devices. Figure C.1 shows how this *LINK* network should be connected.
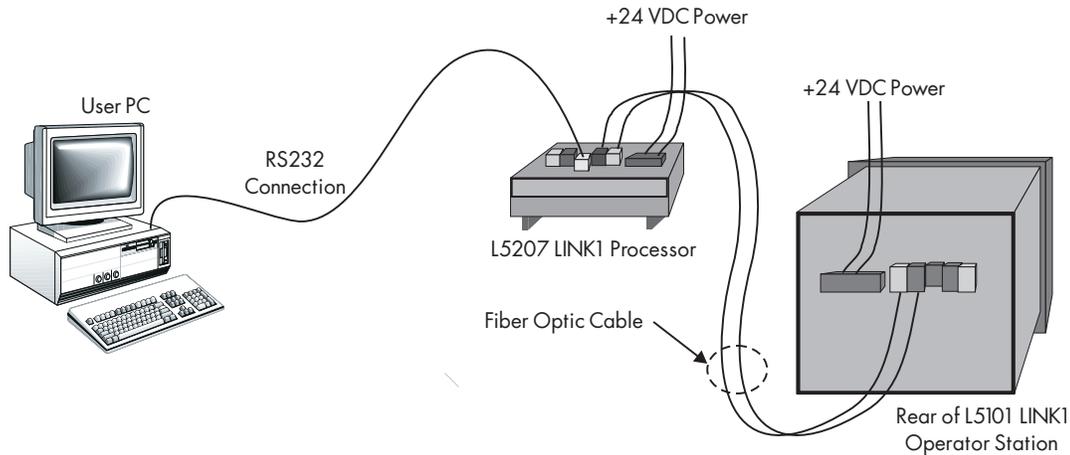
Figure C.1 - Two node *LINK* System for TIC TAC TOE

WARNING!

Do *not* install a configuration to a *LINK* network device unless *all* equipment controlled by the network is in a stopped and safe condition. Configuration errors may cause an unexpected or dangerous system response. Have a qualified engineer check or test all configurations *before* installing them and putting the *LINK* network into service.

To open a `CE Module List`, click `Update Full` in the `Window` menu. If the communications setup between your PC and the *LINK* device is correct and the fiber optic *LINK* network between the modules is communicating properly, the `CE Module List` should open and appear as the screen shot below.

NOTE. The "as shipped" test addresses may differ from those shown in the screen shot.
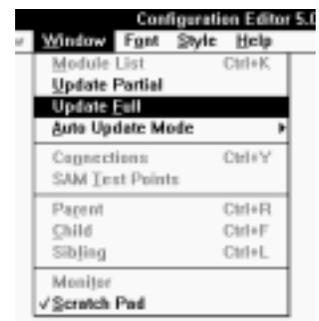
The `Scratch Pad` records the information as you update your `CE Module List` and as you download configu-

```
ConfigEd Scratch Pad (99758686:Tranining/ConfigEd Test)
ConfigEd version 5.00b4, Copyright 1989-1996 Eurotherm Drives, Inc.  All Rights Reserved
Mon Mar 04 10.12.27 1996
database ID is 'EUROMF-150638-CE4-01-EUROMF', user name is engineer

Loaded 'DriveDem' revision 6 (mod 6) using library 'L590v3 Drive Module'
Accessing module list ... 1D done.
```

rations to *LINK* devices. It also reports any problems or failures related to generating the list and installing configurations.

Installation options are located in the `Command` menu and are discussed in detail *in Chapter 4 ConfigEd Functions*. For now, use the `Install at Selected` option to download the two configurations.

To use the `Install at Selected` command, select the L5207 processor module from the `CE Module List`, then open the configuration `TTTpro`, or select it by clicking its window if it is already opened. Choose `Install at Selected` from the `Command` menu. This installs the *active* configuration into the LINK device you select in the `CE Module List`, *regardless* of whether the source configuration and destination module addresses match— in this instance, the configuration file `TTTpro` will install into the L5207 processor module.
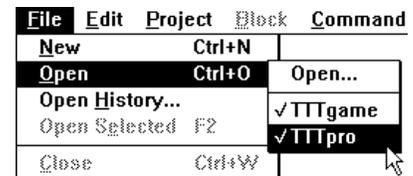
ConfigEd reassigns the original (test) address to the permanent address of 996. A status dialog logs the progress of the installation. The upper left corner of the status dialog shows the software elements as they are loaded. A bar chart shows the installation of the various blocks and other elements of the configuration into the module. All ConfigEd status dialog boxes include an `Abort` button. Click `Abort` to cancel an action and return to the previous running status any time during the execution of that action.

```
Installing 'TTTgame' at Selection
Downloading Block 128
[====================          ]
           Abort
```
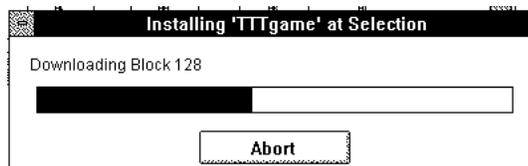
After you have installed `TTTpro`, chose the L5101 operator station in the `CE Module List` and install `TTTgame`. During this installation, ConfigEd automatically checks to verify that all function blocks in the configuration are defined and that all their attributes are specified properly. If an undefined function block is found or if an attribute within a function block is improperly specified, the error message `Undefined Symbol ' in [`name of function block`]` appears in `Scratch Pad`. ConfigEd will then halt the installation procedure and the *LINK* device will continue to operate using the currently installed configuration— or its pre-shipped configuration. To correct this error, make certain that each of the six bands in the operator station `Display Handler contain` a function block that exists within the configuration, then try another installation.

Once you have installed the project `Tic Tac Toe`'s operator station and processor configurations into your two-node *LINK* network, you can play an interactive game of Tic Tac Toe. If you have a problem with installing either configuration or with playing the game, see *Installing Configurations* and *Interrogating a Module* in *Chapter 6 SAM Functions* for more information.

PRINTING A CONFIGURATION

If you have set up your page properly, printing your configurations is simply a matter of sending the configuration files to a printer connected to your computer. You can select `Print...` from the `File` menu to print only the active configuration open on your monitor. Make sure that the configuration you want to print is the active window and that the page orientation in `Page Setup` under the `File` menu is set for landscape format. Refer to your Windows™ and printer manual for further assistance.

You may want to include information about your configuration— the project's name, the creator's name and date drawn, for example— at the bottom of your drawing. You can create a customized form to organize your information and present it in a functional, attractive format. See *Chapter 5* for more information. *Chapter 5* also shows you how to create and print an index of your ConfigEd project.

To print an entire project, a project index or multiple configurations within a project, use the `Print...` command in the `Project` menu. The `Project Print...` command automatically cross references and enters certain data from your configuration (network address, revision number, modification number, and sheet number) on the index sheet (see *Chapter 5*).

Figure C.2 - Completed Configuration TIC TAC TOE\TTT

TTT
TIC TAC TOE

STATE
TL
TR
ML
MR
BL
BR
BLINK
PLAYED
WON

BL
BR
BR
ML
MR
RESET
TM
TR

SYSTEM
CONTROL
NO.

Figure C.3 - Completed Configuration TIC TAC TOE\TTTp

Contents

Contents (Continued)

Contents (Continued)

Contents (Continued)

Contents (Continued)

NOTES

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NOTES

Eurotherm Drives Companies

Product Sales

9225 Forsyth Park Drive
Charlotte, NC 28273
Tel: (704) 588-3246 Fax: (704) 588-3249

REGIONAL SALES

Carolinas
9225 Forsyth Park Drive
Charlotte, NC 28273
Tel: 704-588-3246
Fax: 704-588-3249

Central
50 East RiverCenter Blvd.
Suite 400
Covington, KY 41011
Tel: 606-292-2519
Fax: 606-292-2518

Mid-Atlantic
849 Quince Blvd., Suite J
Gaithersburg, MD 20878
Tel: 301-258-1941
Fax: 301-330-5211

Southeast
3651 Canton Hwy, Ste 100
Marietta, GA 30066-7603
Tel: 404-924-1532
Fax: 404-924-0296

Northeast
1644 Washington Valley Road
Martinsville, NJ 08836-2005
Tel: 908-271-1504
Fax: 908-271-1053

West Coast
11161 Shadyridge Drive
Moorpark, CA 93021
Tel: 805-529-9074
Fax: 805-529-9076

WORLDWIDE SALES AND SERVICE

Australia
Eurotherm Pty., Ltd.
Unit 3, 6 - 18 Bridge Road
Hornsby
New South Wales 2077
Tel: 011-61-2-477-7022
Fax: 011-61-2-477-7756

Austria
Eurotherm GmbH
Geiereckstrasse 18/1
A-1110
Vienna
Tel: 011-43-1-798-76-01
Fax: 011-43-1-798-76-05

Belgium
Eurotherm BV
Herentalsebaan 71-75
B-2100 Deurne
Antwerpen
Tel: 011-32-3-322-3870
Fax: 011-32-3-321-7363

Canada
Eurotherm Drives Inc.
530 Seaman Street
Unit No. 3
Stoney Creek
Ontario L8E 3X7
Tel: 905-664-8911
Fax: 905-664-5869

China
Eurotherm Drives, Ltd.
Rm 5488 Bldg. 4
Xi Yuan Hotel
Er Li Gou, Beijing
Tel: 011-86-3388-5488
Fax: 011-86-3388-8954

Denmark
Eurotherm Danmark A/S
Finsensvej 86
DK-2000
Frederiksberg
Tel: 011-45-31-871-622
Fax: 011-45-31-872-124

England
Eurotherm Drives Ltd.
New Courtwick Lane
Littlehampton
West Sussex, BN17 7PD
Tel: 011-44-1-903-721-311
Fax: 011-44-1-903-723-938

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Eurotherm Vitesse Variable SA
27 Avenue du Québec
Z.A. de Courtaboeuf
91951 Les Ulis Cedex
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Fax: 011-331-6918-5159

Germany
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Birkenweg 8
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Alsbach-Hähnlein
Tel: 011-49-6257-3005
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Fax: 011-852-870-0148

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IDA Industrial Estate
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County Kildare
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Marushima Building
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Tel: 011-31-71-411-841
Fax: 011-31-71-414-526

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Postboks 199
N-1412
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Tel: 011-47-66-803330
Fax: 011-47-66-803331

Scotland
Eurotherm Drives Ltd.
Unit 59
Stirling Enterprise Park
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Stirling FK7 7RP
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Poligono Industrial de Alcobendas
28100 Alcobendas
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Lundavägen 143
S-212 24 Malmö
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CH-8152
Glattbrugg
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Fax: 011-41-1-810-8920