

BoardSite™ 5100

Portable In-Circuit Programmer

Developer's Guide

DATA I/O

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B. Interface Adapter Circuit Board

1 *Introduction*

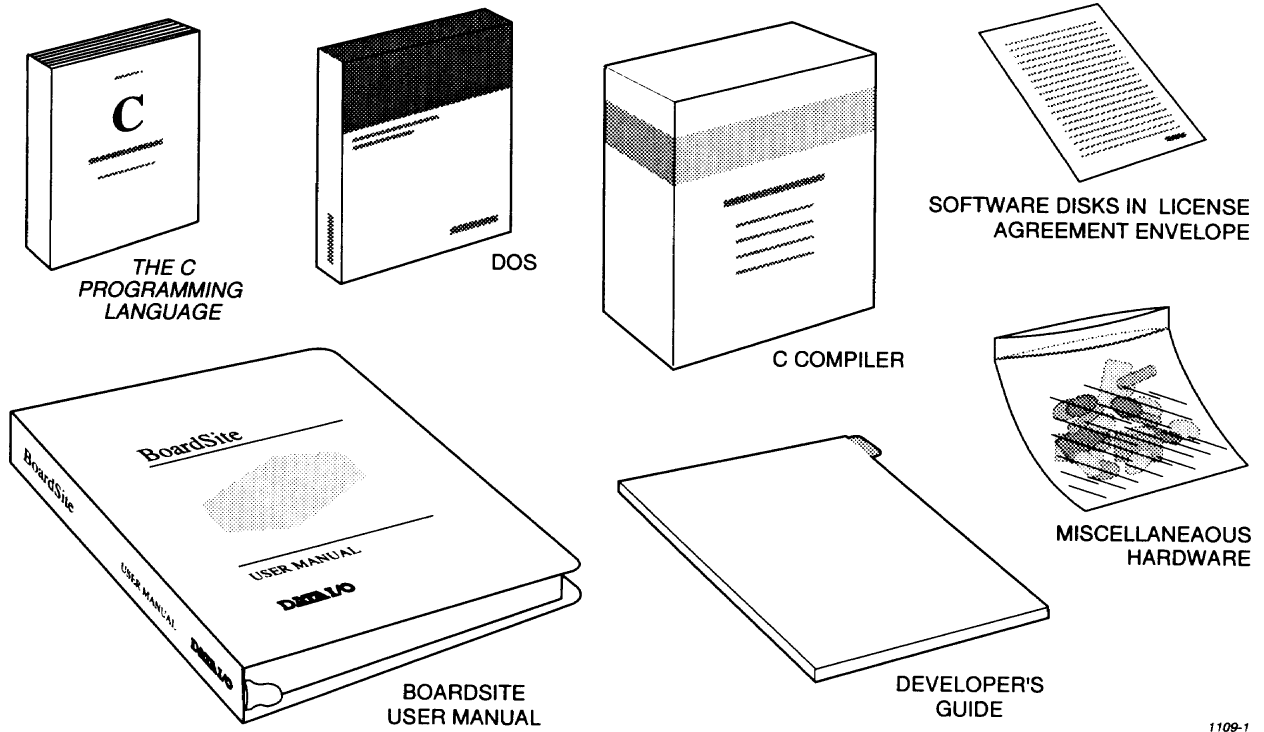
What Is BoardSite 5100?

BoardSite 5100 is a portable in-circuit programmer with which you can program memory devices that are already installed on a circuit board. BoardSite programs and tests NMOS and CMOS EPROMs, EEPROMs, and single-chip microcomputers. BoardSite 5100 can program up to eight boards simultaneously.

BoardSite 5100 programming data can be stored on the internal hard drive or floppy disk. Data RAM provides temporary storage of programming data during the programming operations. By connecting a keyboard and monitor, BoardSite 5100 becomes a programming development system. The development system includes board profile and sequence development software that you can use to create custom board profiles. It also contains the Configuration Editor, with which you customize the 5100 LCD menus and prompts.

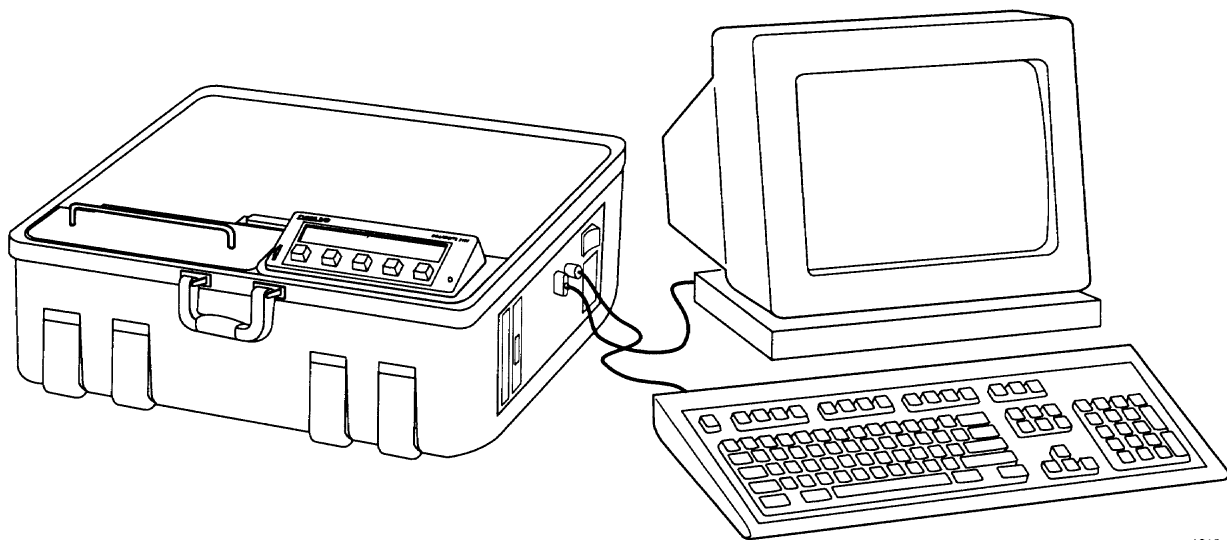
With the keyboard and monitor attached, the 5100 is a personal computer. You can run standard PC software on the 5100 in addition to using it as a 5100 development system. Figure 1-1 shows the contents of the BoardSite 5100 Developer's Kit and Figure 1-2 shows the 5100 configured for software development.

Figure 1-1
Developer's Kit Package Contents



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Figure 1-2
5100 Software Development Configuration



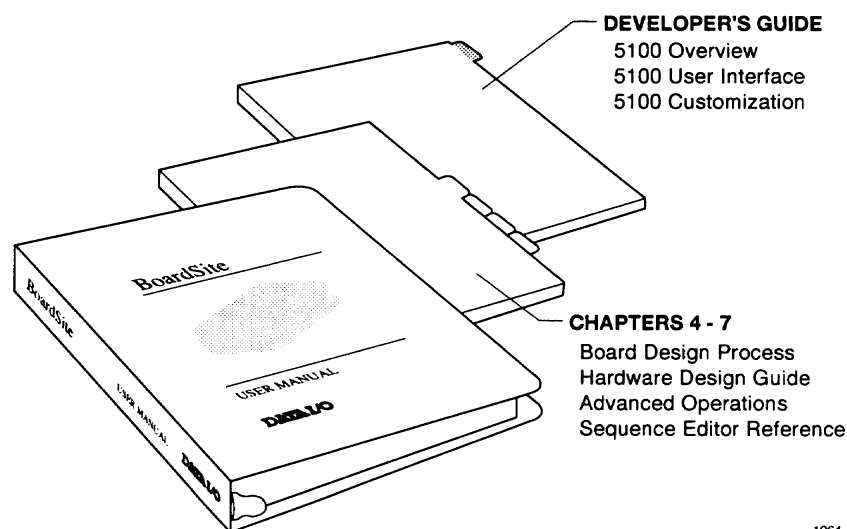
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How to Use the Developer's Guide

This manual explains how to customize the BoardSite 5100 menus, key names, prompts, and messages. You can use the 5100 Text Editor and the 5100 Configuration Editor to create a 5100 system that is optimized for your application. For example, if your system operator is highly experienced and knowledgeable, you can enable all commands and options, allowing the operator full control over 5100 operation. Or, for less experienced operators, you can assign file defaults and disable many of the 5100 commands and options. You can make the 5100 very simple to operate, which can prevent operator confusion and operator errors.

In addition to customizing the 5100 user interface, you can develop the board profile and programming sequences for your programmable circuit boards. The tools for this development are described in the preceding manual in this binder, *BoardSite In-Circuit Programmer User Manual*, Chapters 4 through 7. This manual also contains detailed information on designing the programmable board, designing the interface adapter, and designing with programmable integrated circuits.

Figure 1-3
5100 Developer Documentation



Before you begin any design tasks, be sure to read Chapter 2 of this manual, "BoardSite 5100 Overview." This chapter contains information on the 5100 development environment, file system, and user interface, and suggests a design procedure for customizing the 5100.

Chapter 3, "Editing the User Interface Text Files," contains information on the text files that define the 5100 LCD screens. It explains how to edit these files to customize the LCD screens.

Chapter 4, "Using the Configuration Editor," contains procedures for customizing the 5100 configuration file.

Setting Up the BoardSite 5100 Development System

To use the 286-based BoardSite 5100 as a development system, connect an EGA-compatible monitor to the monitor port, and connect an IBM-AT-compatible keyboard to the keyboard port. To use the 386-based 5100 as a development system, connect an EGA monitor to the appropriate monitor port, and connect a PS/2-compatible keyboard to the keyboard port. To use the Pentium-based 5100 as a development system, connect a VGA monitor to the appropriate monitor port, and connect an IBM-AT-compatible keyboard to the keyboard port. These ports are located behind the sliding door on the right-hand side of the programmer, as shown in Figure 1-4 (for 286-based 5100), Figure 1-5 (for 386-based 5100), and Figure 1-6 (for Pentium-based 5100).

Figure 1-4
286 Configuration — Monitor
and Keyboard Connections

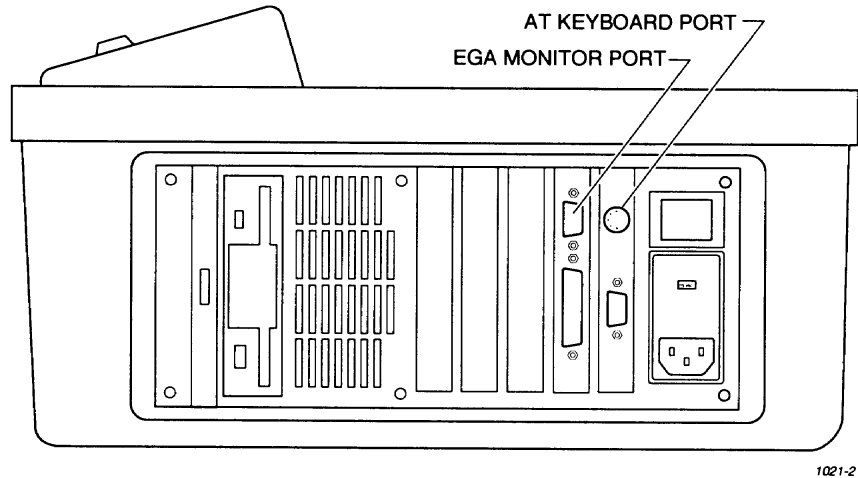


Figure 1-5
386 Configuration — Monitor
and Keyboard Connections

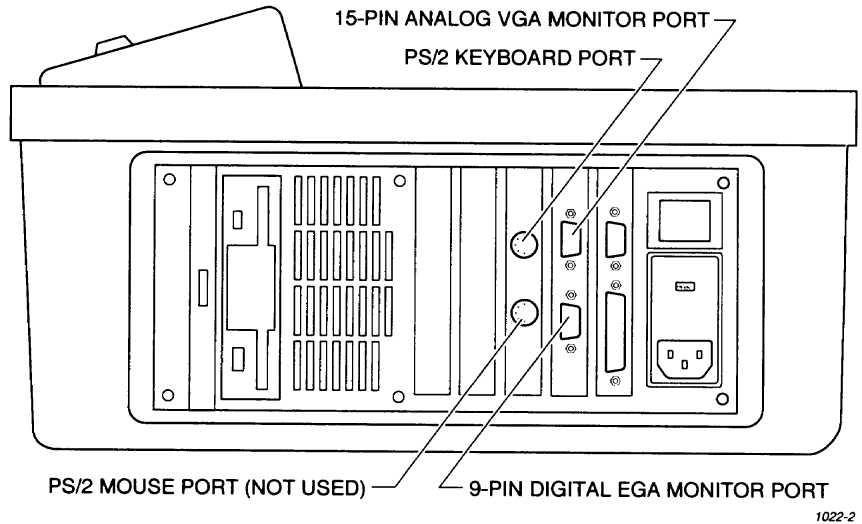
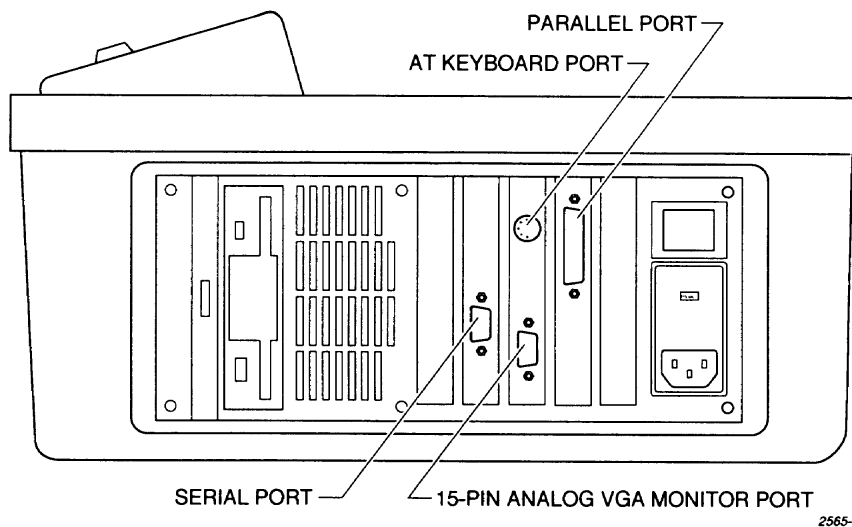


Figure 1-6
Pentium Configuration —
Monitor and Keyboard
Connections



Note: The system can be configured for monitor types other than those described in this manual. Refer to the BoardSite 5100 Maintenance Manual for more information.

Connect the monitor and keyboard with the BoardSite 5100 power turned off. When you turn the 5100 power on, the system runs a software routine that checks for the presence of the keyboard. If the keyboard is connected, the system runs the 5100 development software, during which time the LCD display and soft keys are disabled. If the keyboard is not connected, the system runs the 5100 user software, during which time the LCD display and soft keys are enabled, but the keyboard and VGA monitor are disabled.

When you are using the 5100 development configuration, with the keyboard and monitor, you can run the 5100 user software by typing **5100LCD** at the DOS prompt. This enables the LCD display and soft keys, and disables the monitor and keyboard (except for the **Esc** key, which you can press to quit the 5100 user software and return the system to the DOS prompt).

The hard disk cartridge you receive with your BoardSite 5100 contains DOS, the 5100 operating software, and the standard BoardSite development software.

2 *BoardSite 5100 Overview*

This chapter describes the 5100 development environment, file system, and user interface, and suggests a design procedure for customizing the 5100. You can use a different design process than the one described in this chapter, depending on your requirements and experience. You can also use the 5100 in its default configuration, without customizing the user interface.

Note: There are two design aids at the back of this manual: a 5100 Command Tree Worksheet and a 5100 LCD Display Worksheet. Make several copies of each of these master sheets and use the copies to help you plan your design.

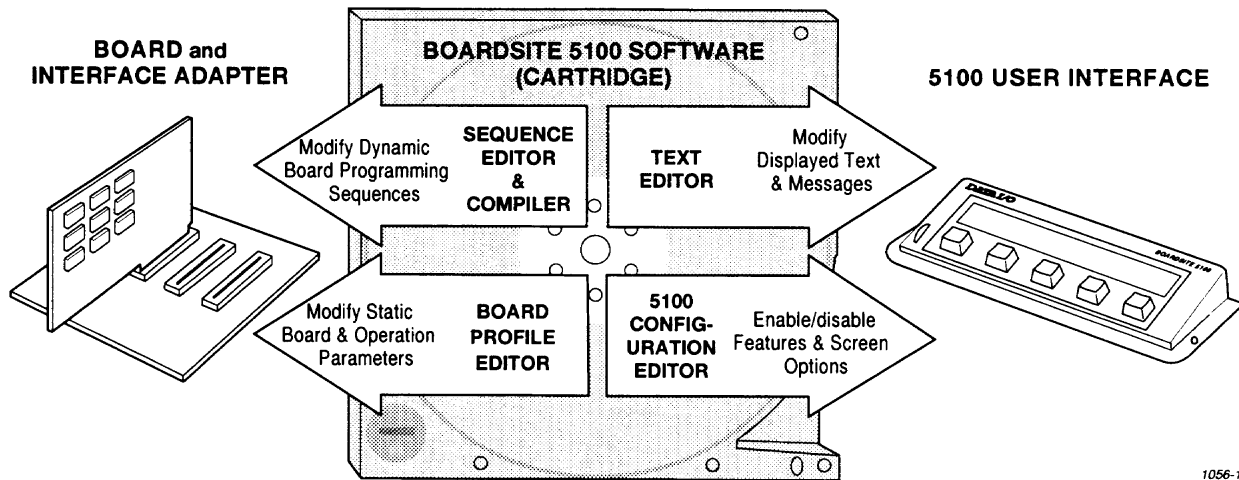
Development Environment Overview

With the 5100 development environment, you create all the software components required to interface your programmable board to the 5100. You also use the development environment to customize the 5100 user interface.

The BoardSite 5100 development environment is a superset of the BoardSite 4100/4400 development environment. You can think of the 5100 as a 4100 with the personal computer integrated into the programmer. Because the 4100 and 5100 share programming hardware and other major components, the development tools can be used for both systems, and the board profiles, sequence files, and data files are compatible with both programmers. If you are already familiar with 4100 development, you will find 5100 development almost identical.

Because the 5100 is designed to be used by inexperienced operators, the user interface consists of a 40-character by 4-line LCD display and five soft keys (the 4100 user interface is the PC keyboard and a full-screen menu system). Therefore, the 5100 operating software contains additional functions to create the LCD display screens and interpret the simplified 5100 command interface. To customize the 5100's user interface, you use two development tools normally not required in the 4100 environment: the Text Editor, with which you create custom LCD screens, and the Configuration Editor, with which you define the 5100 system configuration and command structure. Figure 2-1 shows the various components of the 5100 development environment.

Figure 2-1
Components of the 5100 Development Environment



The tools you use for 5100 development are:

- Board Profile Editor (also used for 4100 development; see *BoardSite In-Circuit Programmer User Manual, Chapter 6*)
- Sequence Editor (also used for 4100 development; see *BoardSite In-Circuit Programmer User Manual, Chapter 7*)
- Data Editor (also used for 4100 development; see *BoardSite In-Circuit Programmer User Manual, Chapter 6*)
- Configuration Editor (used for 5100 development only; see Chapter 4 of this manual)
- Text Editor (also used for 4100 development; see *BoardSite In-Circuit Programmer User Manual, Chapter 6*)

BoardSite 5100 File System Overview

This section describes the 5100 file naming convention, discusses 5100 file groups, and outlines the 5100 directory structure.

File Naming Convention

BoardSite filenames can be up to 32 characters long, so that you may use more descriptive filenames than the standard DOS filenames. To map a 32-character BoardSite filename to a DOS filename, the 5100 maintains the Catalog File. This file contains the cross-references between BoardSite filenames and the corresponding DOS filenames. Each directory that contains board profiles or data files must contain a Catalog File. The Catalog File is created or modified whenever you perform a file operation with BoardSite.

The DOS filenames contained in the Catalog File are special filenames, generated by a pseudorandom algorithm. These filenames are known only to the 5100. If you want to force the DOS filenames to be known names, then you can disable the pseudorandom filename generator, and use the same 8-character (with 3-character extension) DOS filename for both the BoardSite filename and the DOS filename. For more information, see the section, "Using DOS Filenames," in Appendix A.

File Groups

BoardSite 5100 uses a file group to provide programming information for a memory board. When you select a specific board name (Missile Nav Computer, for example) in a 5100 operation, the 5100 uses this board name to refer to a file group. Therefore, one board name may refer to five or more files.

The first file in the group is the board profile, which contains the board parameters such as address bus width, number of programmable chip enables, address increment, and so on. The board profile has a DOS filename of the form BNxxxxxx., where xxxxxx is a unique number assigned by the pseudorandom filename generator.

The next three files in the group are the sequence and algorithm files, which contain board read/write sequences and other programming information. These files all have filenames of the form A0xxxxxx.yyy, where xxxxxx is the same unique number assigned to the board profile filename. The filename extensions specify a compiled executable algorithm file (extension .EXE), an algorithm parameter file (extension .AOP), or the sequence source file (no extension).

The last file in the group is the data file, which contains the actual data that the 5100 uses when it programs and verifies the board. The data file has a filename of the form BDzzzzzz., where zzzzzz is a unique number assigned by the pseudorandom filename generator. This number is not the same number assigned to the board profile and algorithm/sequence files.

Note: If the programming files were originally developed for the BoardSite 4100/4400, the file group may contain a text file. The text file has a filename of the form TFvvvvvv, where vvvvvv is another unique number assigned by the pseudorandom filename generator. This text file may contain instructions, messages, and prompts that were designed for the 4100/4400 monitor. For more information on 4100/5100 compatibility, see the section, "BoardSite 5100 and BoardSite 4100/4400 Compatibility," in Appendix A.

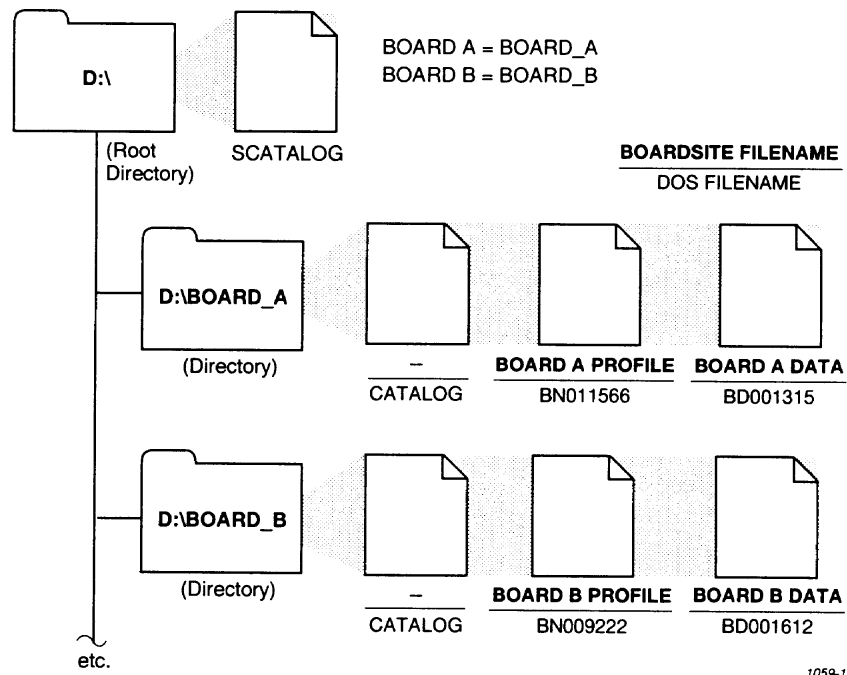
Directory Structure

BoardSite directory names can be up to 32 characters long, so that you may use more descriptive directory names than the standard DOS directory names. The 5100 maintains a Super Catalog File that maps 32-character BoardSite directory names to the corresponding DOS directory names. This is similar to the way that the Catalog File maps 32-character BoardSite filenames to DOS filenames.

Note: The Super Catalog File always resides in the root directory of the D: partition of the disk cartridge (in other words, it resides in D:\). Do not move the Super Catalog File to another directory.

You can change the Super Catalog File using the Configuration Editor, as described in Chapter 4 of this manual. Figure 2-2 shows a typical BoardSite 5100 disk cartridge directory tree.

Figure 2-2
Typical Boardsite 5100 Directory Tree



If you create file structures in the FLOPPY or RAM devices, use only a root directory. You should not use subdirectories in these devices.

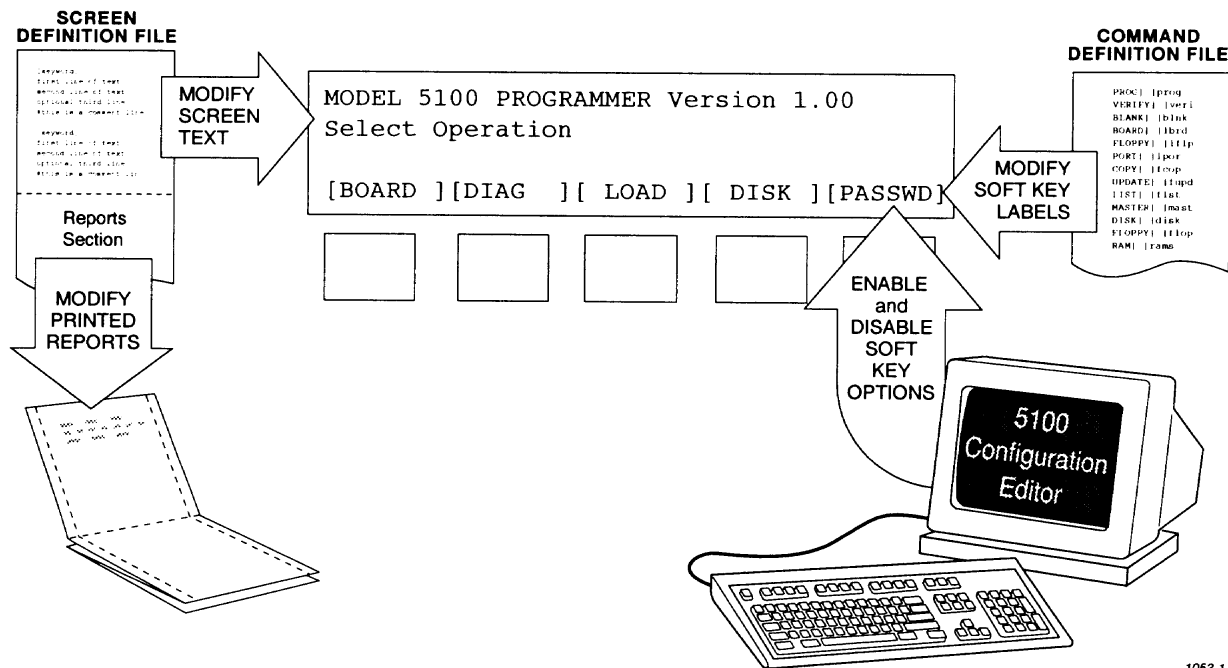
BoardSite 5100 User Interface Overview

The following figures show how the 5100 uses various files to create the LCD screens. The figures also show how you can modify the files to customize the user interface by changing the LCD screens. For more information on customizing the 5100 user interface, see Chapters 3 and 4 of this manual.

Note: You can use the 5100 in its default configuration, as shipped from Data I/O, without customizing the user interface.

Figure 2-3 shows how the 5100 creates the top level menu from the Screen Definition File and Command Definition File. Notice that you can change the screen text by editing the Screen Definition File and that you can change the soft key labels by editing the Command Definition File. You can also customize printed reports by editing the reports section of the Screen Definition File. Finally, you can enable and disable commands by running the Configuration Editor.

Figure 2-3
Screen Definition File, Command Definition File, and Configuration Editor



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Figure 2-4 shows how the error messages are created from the System Error File.

Figure 2-4
System Error File

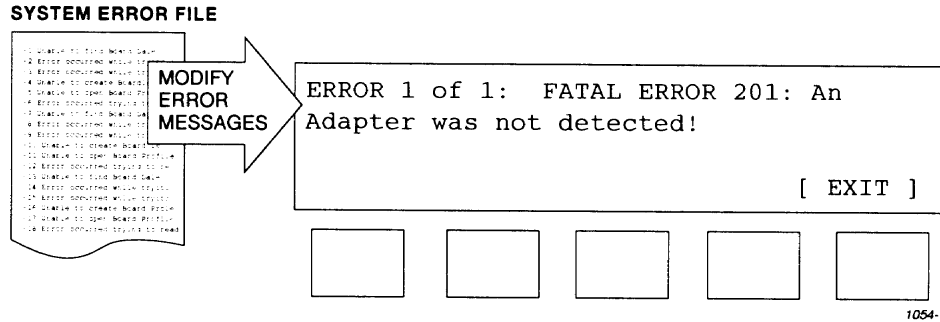
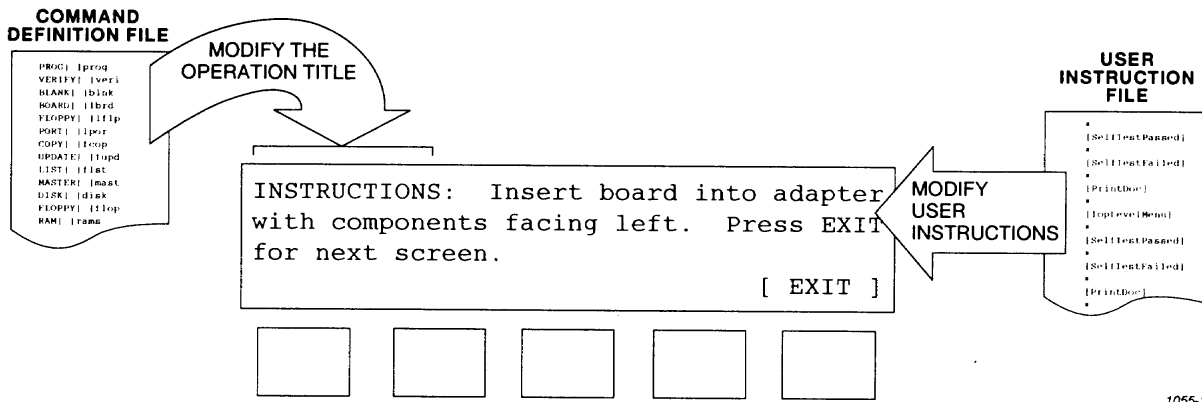


Figure 2-5 shows how the optional user instructions are created from the User Instruction File. To use these optional user instructions, you edit the User Instruction File to add the instructions and then run the Configuration Editor to enable the instruction screens.

Figure 2-5
User Instruction File



Design Procedure

The BoardSite 5100 design procedure can be divided into two parts: board interface design tasks, and user interface design tasks.

Board Interface Design Tasks

These are tasks that apply to designing the board, interface adapter, board profile, and sequence file. These tasks are essentially identical to the design tasks described in Chapter 4 of the *BoardSite In-Circuit Programmer User Manual*. To learn more about these design tasks, read Chapters 4, 5, 6, and 7 of that manual.

1. Study the *BoardSite In-Circuit Programmer User Manual*, especially Chapters 5, 6, and 7.

2. Know your board's programming requirements. Verify that your board is in-circuit programmable, or design it to be.
3. Design, build, and test the interface adapter.
4. Using the 5100 development environment, create the board profile and sequence file. Customize the BoardSite 5100 user interface (see following section).
5. Program the board, using the BoardSite 5100 BOARD command.

User Interface Design Tasks

These tasks involve the 5100 command structure and the displays and prompts that appear on the 5100's LCD display.

1. Read this manual and the *BoardSite 5100 User Manual* to become familiar with the 5100.
2. To see an example of a customized user interface, operate the 5100 using the board name Missile Nav Computer (in the EXAMPLE directory of your cartridge disk), or read Chapters 3 and 4 of the *BoardSite 5100 User Manual*.
3. Study the 5100 command tree, which is printed on the Command Tree Worksheet at the back of this manual. Use the command tree as your guide during the rest of the design.
4. Decide which top-level commands (BOARD, DIAG, and so on) you want the 5100 operator to use, and circle the commands on the Command Tree Worksheet. To minimize operator errors, restrict the command set as much as possible. For most applications, the operator will only use a subset of the BOARD command. You may want to enable the PASSWD command, so that you can use the full command set by typing a password.
5. Decide which subcommands (PROG, BLANK, VERIFY, and so on) you want the 5100 operator to use, and circle the commands on the Command Tree Worksheet.
6. Decide where you want to store the board profile, sequence file, and the data files. Your options are DISK, FLOPPY, and RAM. Circle the appropriate options on the Command Tree Worksheet. For maximum programming data file security, use either RAM or MASTER, because in both cases the data is stored in the 5100's volatile RAM. When you turn off the 5100 power, the data is erased.

Remember that you can store the board profile on one device (DISK, for example) and store the programming data files on another device (FLOPPY, for example). The files do not necessarily have to reside on the same device.
7. Run the Configuration Editor and change the configuration to correspond to the commands you circled on the Command Tree Worksheet. For more information, see Chapter 4, "Using the Configuration Editor," in this manual.
8. If you want to customize the LCD screen text, edit the Command Definition File, Screen Definition File, User Instruction File, and System Error File. For more information, see Chapter 3, "Editing the User Interface Text Files," in this manual.

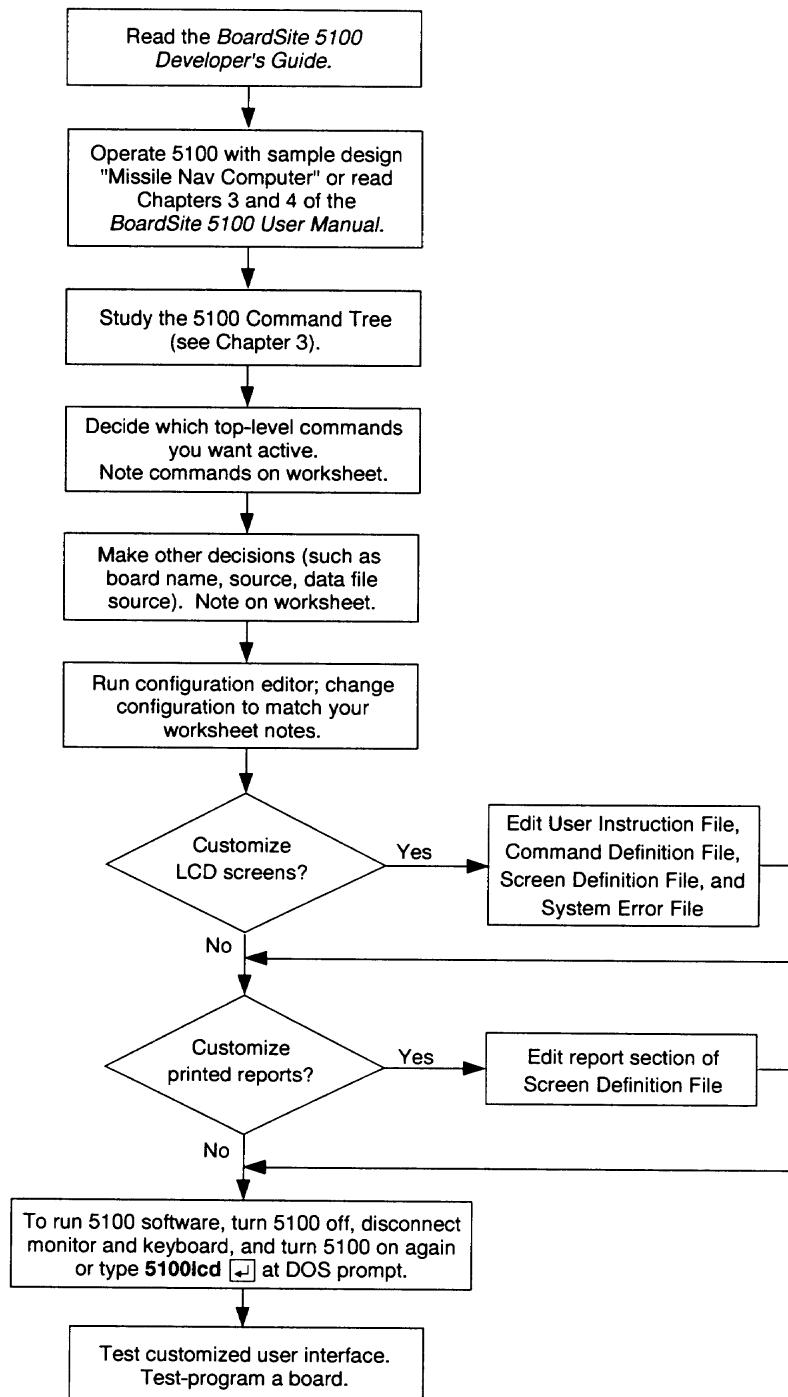
9. If you want to customize the 5100's printed reports (if your system supports a printer), edit the Screen Definition File.
10. To test your changes to the user interface, run the 5100 user software. To do this, you can exit the development software and type `5100LCD` from the DOS prompt. You can also turn the power off, disconnect the monitor and keyboard, and turn the power on again, although it's more convenient to run the software from the DOS prompt.

Test the user interface without programming any boards (you may see errors such as `Error 204-No boards were detected`). Be sure to try all the commands that the user can access. Also, try to do operations that the user is not supposed to be able to do (in other words, try to break the system). You can exit the 5100 user software and return to the DOS prompt by pressing `Esc` .

11. When you are convinced that the user interface is correct, install a board in the interface adapter and program it. Test the board in your target system.

Figure 2-6 shows the user interface design tasks in flowchart format.

Figure 2-6
BoardSite 5100 User Interface
Design Tasks



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3 *Editing the User Interface Text Files*

This chapter describes the BoardSite 5100 user interface text files: the Command Definition File, Screen Definition File, User Instruction File, and System Error File. Because the 5100 uses these files to create the LCD displays, you can customize the displays by editing the files. This chapter contains syntax rules and editing instructions for each text file.

User Interface File Descriptions

This section contains brief descriptions of the BoardSite 5100 user interface files, syntax rules, and editing instructions. This section contains descriptions of the following files:

File (file type)	Filename
Screen Definition File (text)	5100.SDF
Command Definition File (text)	5100.CDF
System Error File (text)	5100.SEF
User Instruction File (text)	5100.UIF
Configuration File (binary)	5100.CFG
Catalog File (binary)	CATALOG
Super Catalog File (binary)	SCATALOG

Making Backup Copies of the User Interface Files

Before you edit the user interface files, you should make backup copies of them. To make a backup copy of the files:

1. Power up the 5100 in the development configuration, with the keyboard and monitor attached.
2. If you aren't at the DOS prompt, quit the BoardSite development software to return there.
3. Change to the BoardSite directory (the one that contains the BoardSite executable file). Usually, the directory is C:\BRDSITE.

- Copy the original files to new filenames, assigning the extension .BAK to each one, as shown in the following table.

Original filename	Suggested Backup Filename
5100.SDF	5100SDF.BAK
5100.CDF	5100CDF.BAK
5100.SEF	5100SEF.BAK
5100.UIF	5100UIF.BAK

Later, if you find that you have edited a file incorrectly, you can easily recover a copy of the original by copying the .BAK file to the original filename. For example, to recover the Screen Definition File, type the following at the DOS prompt:

```
copy 5100sdf.bak 5100.sdf
```

Screen Definition File

This file contains the LCD screen text definitions and report form definitions.

Screen Text Definitions

The 5100 software uses the Screen Definition File to create the text that appears in lines 1, 2, and 3 of the LCD display. These lines can contain prompts, status messages, and scrolling lists. The Screen Definition File contains a series of screen definitions, delimited by keywords, as shown in the following file sample.

```
#
[BOARDBoardProfile] Pick Board Name with %^% %v%, then
SELECT
#
```

This screen definition creates the following LCD screen. Line 1 of the LCD display contains the text from the screen definition, with the special up-arrow and down-arrow characters substituted for the %^% and %v% macro fields.

Line 1 —

```
Pick Board Name with ↑ ↓ , then SELECT
↓ Missile Nav Computer
[ ↑ ] [ ↓ ] [SELECT]           [ EXIT ]
```

Syntax

All screen definitions in the Screen Definition File have the following format:

```

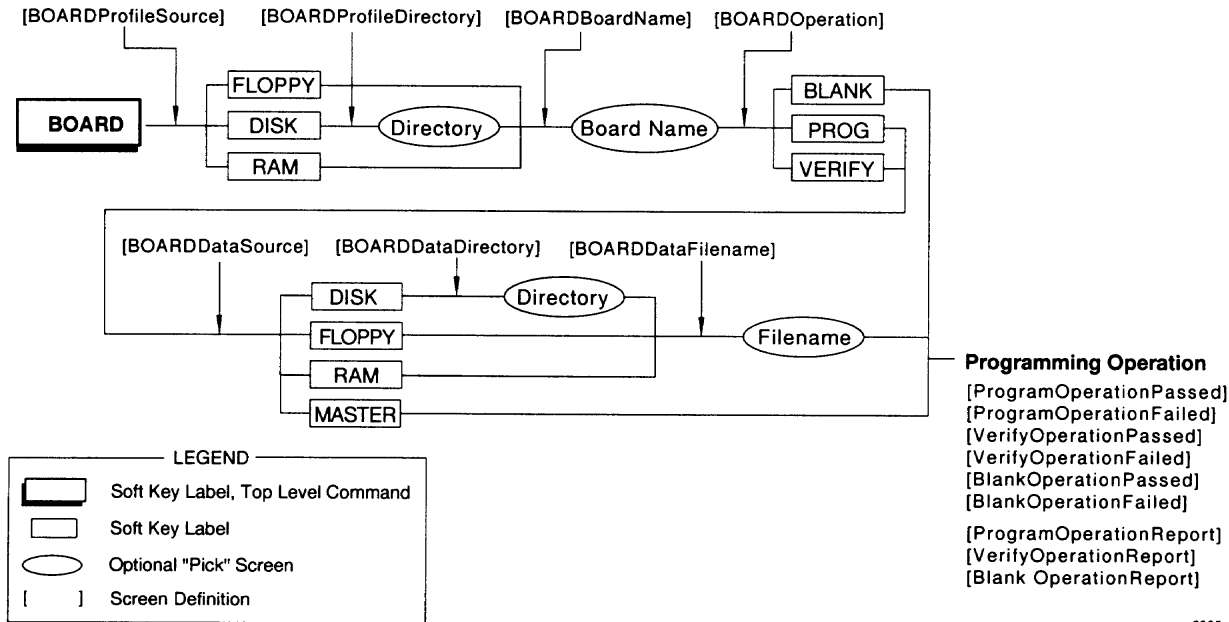
[keyword]
first line of text
second line of text
optional third line (for status screens only)
# this is a comment line

```

The keyword must be enclosed in brackets [], and must begin in the first column. Comment lines have a # in column one.

Keywords correspond to certain points, called nodes, in the 5100 command tree. A complete list of keywords appears on the Command Tree Worksheet, at the end of this manual. A portion of the command tree is shown in Figure 3-1.

Figure 3-1
5100 Command Tree with Keyword Nodes



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There are two different types of screen definitions, prompt screen definitions and status screen definitions. Prompt screen definitions correspond to the nodes in the command tree. They appear before an operation begins, when the operator is choosing options. Status screen definitions appear after the operation has finished.

Prompt screen definitions, such as [BOARDProfileSource], allow only two lines of text, so if you add a third line, it will not be displayed on the screen. Also, the software truncates any lines that have more than 40 characters.

Status screen definitions may contain three lines of text, each line having a maximum of 40 characters. All status screens contain the words "Passed" or "Failed" in the keyword. For example, the [ProgramOperationPassed] and [ProgramOperationFailed] keywords identify status screens that appear after an operation has completed.

Some screen definitions contain macro substitution fields. These macro fields allow the 5100 software to insert text into the LCD displays. In the [BOARDBoardProfile] screen definition, the macros %^% and %v% cause the up-arrow and down-arrow characters to be displayed on the LCD screen. The macro substitution fields are fully documented in the comments that appear at the beginning of Screen Definition File. Some of the more common macro fields appear in Table 3-1.

Table 3-1
Common Macro Fields

Macro	Contents
%A%	Number of memory boards detected in the adapter
%b%	File size (in bytes) after a LOAD PORT operation
%B%	Board profile name
%c%	Board CRC and/or Checksum
%C%	Current top level command (BOARD, DIAG, LOAD, DISK, or PASSWD)
%d%	Path of data file from (Super Catalog File)
%D%	Data filename
%e%	List of the last errors (report definitions only)
%E%	Last error number
%f%	Number of files copied
%F%	Boards passed/failed summary
%I%	I/O Parameters for a LOAD PORT operation
%L%	Time of operation in seconds
%O%	Current sub-command (PROG, VERIFY, BLANK, UPDATE, COPY, LIST, etc.)
%p%	Path of board profile (from Super Catalog File)
%P%	'Press PRINT for hard copy report'
%r%	Reference board CRC and/or Checksum
%R%	Last operation status (PASSED or FAILED)
%s%	Board profile source (DISK, RAM or FLOPPY)
%S%	Data source (DISK, RAM, FLOPPY or MASTER)
%T%	Time and date
%v%	Down arrow graphics character
%V%	Software version
%^%	Up arrow graphics character

Report Form Definitions

At the end of the Screen Definition File, there are report definitions that the 5100 software uses to assemble reports for the PRINT command. These reports are sent either to the printer port or to a file, not to the LCD display. The report section of the Screen Definition File begins with the reserved keyword

[REPORT_FORMS]

Following this reserved keyword, there are several report definitions, each of which begins with \$FORM. You can edit the definitions to customize the printed reports. In these report definitions, if a line begins with \$PASS then the rest of the line (after \$PASS) will be printed only if the operation passed. If a line begins with \$FAIL then the remainder of that line will be printed only if the operation failed. Also, if a line begins with \$FORM, the 5100 sends a form feed character to the printer before printing the line.

You can use macro substitution fields in printed report definitions. For example, you could use the %F% macro to insert a board passed/failed summary into a report, or you could use the %T% macro to insert the time and date into a report. The only macro fields that you should not use are the %^% and %v% fields, because these may cause unpredictable results with many printers. For a list of macro substitution fields, see Table 3-1.

To Edit the Screen Definition File

1. Make sure that the BoardSite development software is running. Select the Edit command from the menu bar.
2. In the Edit Options pop-up, select the Text File option. Press .
3. In the Edit File Name pop-up, select Screen Definition File. Press .

Note: If you don't see the Screen Definition File listed in the pop-up, it probably means that you are in the wrong directory. Use the FILE command (MOVE option) to move to the directory that contains the Screen Definition File. This is usually C:\BRDSITE.

4. After a few seconds, you should see the Screen Definition File appear in the Text Editor window.
5. Locate the screen definition text (or report definition text) you want to edit by searching for the keyword that corresponds to the LCD screen (or report) you want to customize.
6. Edit the text, remembering the following rules:
 - Do not change the keyword or delete the brackets ([]) surrounding it.
 - Prompt screens allow only two lines of text.
 - Lines containing more than 40 characters will be truncated to 40 characters.
7. Verify that the text screen definition you just edited has the following format:


```
[keyword]
first line of text
second line of text
optional third line (for status screens only; these
screens contain Passed or Failed in the keyword, and
appear after operations have completed)
```
8. Press + to exit the Text Editor and save the Screen Definition File.

User Instruction File

This file contains optional user instruction screens that can appear in addition to the standard prompt screens or status screens. The user instruction screens can be used to guide your operator through specific procedures that may be unique to your application. There is a one-to-one correspondence between Screen Definition File keywords and User Instruction File keywords, so that every keyword can refer to both a standard prompt/status screen and a user instruction screen. When you receive BoardSite 5100, the User Instruction File contains no user instructions; if you want user instructions, you must edit this file to add them, and you must enable the Display User Instructions option in the Configuration Editor. For more information on this option, see the section, "Display User Instructions," in Chapter 4.

The user instructions are the text lines between keywords. Each keyword corresponds to a node in the 5100 command tree; see the command tree worksheet or Figure 3-1. If there are no text lines between keywords, then that screen does not appear when the software encounters the corresponding node. If there are text lines in the User Instruction File, then the software displays those lines on the LCD, 3 lines at a time. The lines automatically word-wrap. If the instructions are longer than one LCD screen, the software gives the operator soft keys to scroll the instructions up or down.

Here is a brief sample of the contents of the User Instruction File:

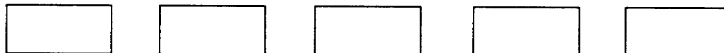
```
#
[SelfTestPassed]
#
[SelfTestFailed]
#
[PrintDoc]
#
[TopLevelMenu]
...
```

You could edit the User Instruction File to add the following user instruction:

```
[BOARDOperation]
Insert board into adapter with components facing left.
Press EXIT for next screen.
#
```

This causes the following instruction screen to appear before every board programming operation:

```
INSTRUCTIONS: Insert board into adapter
with components facing left. Press EXIT
for next screen.
[ EXIT ]
```



Syntax

All user instructions in the User Instruction File have the following syntax:

```
[Keyword]
This is the user instruction text that corresponds to the
preceding keyword. It can contain as much text as
required.
#
```

In the User Instruction File, the instructions are delimited by either the next keyword (a [character in column 1), or by a comment line beginning with the # character. To make the file more readable, you can delimit the instructions by both an empty comment line and the next keyword.

To Edit the User Instruction File

1. Make sure that the BoardSite development software is running. Select the Edit command from the menu bar.
2. In the Edit Options pop-up, select the Text File option. Press .
3. In the Edit File Name pop-up, select User Instruction File. Press .

Note: If you don't see the User Instruction File listed in the pop-up, it probably means that you are in the wrong directory. Use the FILE command (MOVE option) to move to the directory that contains the User Instruction File. This is usually C:\BRDSITE.

4. After a few seconds, you should see the User Instruction File appear in the Text Editor window.
5. Locate the user instruction text you want to edit by searching for the keyword that corresponds to the text you want to customize.
6. Edit the user instruction text, remembering the following rules:
 - Do not change the keyword or delete the brackets ([]) surrounding it.
 - The user instructions are delimited either by the next keyword or by a comment (a line with the # symbol in column 1).
 - If there is no text between delimiters, no instructions appear for that keyword.
 - Instructions automatically word-wrap, 3-lines at a time.
 - The operator can scroll up or down through the instruction.
7. Verify that the user instruction text you just edited has the following format:


```
[Keyword]
This is the user instruction text that corresponds
to the preceding keyword. It can contain
as much text as required.
#
```
8. Press + to exit the Text Editor and save the User Instruction File.

Command Definition File

This file contains the soft key labels (command names) that the 5100 software uses when it creates the LCD screens. By editing this file, you can change the 5100 soft key labels to customize the user interface. For example, you could edit the file to change the PROG soft key label to BURN. The label would be changed in every screen in which it appears.

Here is a sample of the Command Definition File:

```
PROG| |prog
VERIFY| |veri
BLANK| |blnk
BOARD| |lbrd
FLOPPY| |flfp
PORT| |lpor
COPY| |fcop
UPDATE| |fupd
LIST| |flst
MASTER| |mast
DISK| |disk
FLOPPY| |flop
RAM| |rams
```

If you wanted to change PROG to BURN in every LCD display, you would edit the first line of the file sample to be:

```
BURN| |prog
```

Syntax

Each command definition occupies one line in the Command Definition File. Each line has the following syntax:

```
NAME| |hhhh
```

where *NAME* is the command name text, and *hhhh* is the help keyword.

The placeholder is required, and is a space character surrounded by | characters.

*Note: The help keyword (**prog** in the preceding example) must not be changed. If you change a help keyword, you may cause the 5100 software to behave incorrectly.*

Because 5100 soft key labels can be no longer than 6 characters, ensure that you don't use longer names (for example, don't try to use PROGRAM for PROG).

To Edit the Command Definition File

1. Make sure that the BoardSite development software is running. Select the Edit command from the menu bar.
2. In the Edit Options pop-up, select the Text File option. Press .
3. In the Edit File Name pop-up, select Command Definition File. Press .

Note: If you don't see the Command Definition File listed in the pop-up, it probably means that you are in the wrong directory. Use the FILE command (MOVE option) to move to the directory that contains the Command Definition File. This is usually C:\BRDSITE.

4. After a few seconds, you should see the Command Definition File appear in the Text Editor window.
5. Locate the command name (soft key label) you want to change by searching for the command name.
6. Edit the command name, remembering the following rules:
 - Each command definition occupies one line in the Command Definition File. The placeholder, | |, is required, and must not be deleted or changed.
 - The help keyword, which immediately follows the | |, must not be deleted or changed.
 - Command names can be no longer than six characters. If the command name is longer than six characters in the original file, it is a prompt string, and may be up to 40 characters long.
7. Verify that the command name definition you just edited has the following format:


```
NAME| |hhhh
```

where *NAME* is the command name text, and *hhhh* is the help keyword.
8. Press **Alt** + **B** to exit the Text Editor and save the Command Definition File.

System Error File

This file contains the system error messages. You can edit this file to change the error message text that appears on the LCD display. Each error message consists of a tilde character (~) and the message number, followed by a space and then the message text. For example, error message number 256 appears in the System Error File as:

```
-256 The board does not verify.
```

If you edit this file, be sure to edit only the text that appears after the error message number; do not edit the number or the preceding tilde (~), and do not delete the space following the message number.

Here is a brief sample of the contents of the System Error File:

```
~1 Unable to find Board Data File Requested.
~2 Error occurred while trying to read Board Data File
~3 Error occurred while trying to write Board Data File
~4 Unable to create Board Profile
~5 Unable to open Board Profile
~6 Error occurred trying to read Board Profile
...
```

Syntax

All error messages have the following syntax:

```
~n error message text
```

where *n* is the error message number.

The 5100 displays the error messages in lines 1, 2, and 3 of the LCD display. The text is automatically word-wrapped. If the text is longer than 3 lines, it will be truncated. If you edit the System Error File, be sure to use short messages to prevent truncation.

To Edit the System Error File

1. Make sure that the BoardSite development software is running. Select the Edit command from the menu bar.
2. In the Edit Options pop-up, select the Text File option. Press .
3. In the Edit File Name pop-up, select System Error File. Press .

Note: If you don't see the System Error File listed in the pop-up, it probably means that you are in the wrong directory. Use the FILE command (MOVE option) to move to the directory that contains the System Error File. This is usually C:\BRDSITE.

4. After a few seconds, you should see the System Error File appear in the Text Editor window.
5. Locate the error message you want to edit by searching for the error message or error message number.
6. Edit the error message, remembering the following rules:
 - Edit only the message text that appears after the error message number.
 - Do not change or delete the error number or the preceding tilde (~) character.
 - Do not delete the space following the message number.
7. Verify that the error message you just edited has the following format:
~n error message text
8. Press + to exit the Text Editor and save the System Error File.

4 Using the Configuration Editor

This chapter shows you how to customize the BoardSite 5100 configuration file by running the 5100 Configuration Editor. The Configuration Editor makes modifications to the configuration file, 5100.CFG. This binary file contains the operator mode, command sets, communications parameters, and other system parameters.

Use the Configuration Editor to customize the following system features:

- Set default operator mode and assign passwords to modes
- Define the command set for the top level menu
- Define the command set for each top level menu command
- Enable or disable FLOPPY and RAM storage devices
- Define the sources of board profiles and data files
- Set up the communications port
- Create and change the Super Catalog File
- Set other miscellaneous system options

Note: For testing and evaluation, you can use the 5100 in its default configuration; you don't have to change the configuration file. The 5100's default operating mode is the unrestricted mode, which gives you access to all commands and options.

There are two design aids at the back of this manual: a 5100 Command Tree Worksheet and a 5100 LCD Display Worksheet. Make several copies of each of these master sheets and use the copies to help you plan your design.

To Start the Configuration Editor

1. If the BoardSite development software is not already running, start it by typing `brdsite` from the DOS command line.
2. Select the More command from the menu bar and then select the Edit command.
3. In the Edit Options pop-up, select the 5100 Configuration option. Press `↓`. After a few seconds, the Configuration Editor screen appears, as shown in Figure 4-1.

To get Configuration Editor help, press `F10` at any time.

Figure 4-1
Configuration Editor
Screen

```

BoardSite Model 5100 Configuration Editor          Tue 18-Jun-91 - 6:23:26
COMMANDS
Key          Action
↑↓          Previous, Next Option
PgUp, PgDn  Scroll Up and Down the Form
↓          Select Option
Alt-b       Save Changes and Continue
Esc        Exit this Form, Discard Changes
F10       Context Sensitive help

Model 5100 Configuration Parameters
-- Define the 5100 Default Mode and Mo
Default Mode: Restricted
Unrestricted Passwo Intermediate
Intermediate Passwo Un-Restricted

-- Define the Restricted Operator Top-Level Command Set --
Restricted Top-Level Command Set: BP

-- Define the Intermediate Operator Top-Level Command Set --
Intermediate Top-Level Command Set: GLDP

PRINT soft-key Options: PRINT to PRINTER
Use ↑ and ↓ then ↓ to select

```

The Configuration Editor screen is divided into two windows. The commands window shows the editor keys and their actions. The configuration parameters window contains the current configuration being edited.

The options in the configuration parameters window are described in the following section, "Configuration Editor Reference."

To Exit the Configuration Editor

Press `Alt - B` to save all the changes you made to the configuration file, 5100.CFG, and to exit the Configuration Editor.

If you decide that you do not want to save the changes you made to the configuration, exit the Configuration Editor by pressing `Esc`.

Configuration Editor Reference

This section describes all the options in the configuration parameters window of the configuration editor.

Define the 5100 Default Mode and Mode Passwords

BoardSite 5100 has three operating modes: restricted mode, intermediate mode, and unrestricted mode. In the default configuration, all three modes are identical. You can change the command sets for the restricted and intermediate modes to prevent the operator from accessing certain commands. Here is a typical 5100 mode set:

- **Restricted** — allows the operator to use a subset of commands, as defined by the Restricted Operator Top-level Command Set option, which is described later in this chapter.
- **Intermediate** — allows the operator access to a different subset of commands. You would typically let a technician or experienced operator enter intermediate mode, to update programming data or other files. The available commands are defined by the Intermediate Operator Top-level Command Set option, which is described later in this chapter.
- **Unrestricted** — allows you to use all commands in the system. You should reserve unrestricted mode for your exclusive use; this gives you maximum configuration control over the 5100.

To define the default operating mode, press or to highlight the desired default mode. Then press to select the default mode.

To enter either unrestricted or intermediate mode, the operator must type a password matching the password you assign in the Configuration Editor. The passwords are a five-digit combination of the numbers 1 through 4. In the default configuration, the intermediate mode has password 44444 and the unrestricted mode has password 11111.

To define the mode passwords, press or to highlight the desired mode password, and then type the password, using only the numbers 1, 2, 3, or 4. Press .

Note: If you want two modes instead of three, edit the intermediate mode and unrestricted mode command sets so that they are identical, and then assign identical passwords to these two modes. You then have two modes — unrestricted and restricted.

Define the Restricted Operator Top Level Command Set

You can enable or disable top level commands for restricted mode and intermediate mode. By enabling and disabling commands, you can customize the command set for the 5100 operator, which can help eliminate operator error.

1. Press or to highlight the restricted operator top level command set.
2. Type the letters that correspond to the commands you want to enable.

Letter	Command Enabled
B	BOARD
G	DIAG
L	LOAD
D	DISK
P	PASSWD

You can type the letters in any order—the 5100 software sorts the commands in BOARD-DIAG-LOAD-DISK-PASSWD order when it builds the LCD displays.

3. Press .

A typical restricted mode top level command set may be **BP**. This allows the operator to select only two top level commands, BOARD and PASSWD. The operator uses the BOARD command to program boards. A technician or system administrator could use the PASSWD command to switch the 5100 to the unrestricted mode, to access other commands.

Define the Intermediate Operator Top Level Command Set

To define the intermediate operator top level command set, follow the steps below.

1. Press or to highlight the intermediate operator top level command set.
2. Type the letters that correspond to the commands you want to enable.

Letter	Command Enabled
B	BOARD
G	DIAG
L	LOAD
D	DISK
P	PASSWD

Type the letters in any order—the 5100 software automatically sorts the commands in BOARD-DIAG-LOAD-DISK-PASSWD order when it builds the LCD displays.

3. Press .

A typical intermediate mode top level command set may be **BGP**. This allows a technician to select the DIAG command in addition to the BOARD and PASSWD commands.

PRINT Soft Key Options

This option enables or disables the PRINT soft key label, and therefore enables or disables the printing of reports after the end of operations. If your BoardSite 5100 does not have a printer attached, you can disable the PRINT soft key label to prevent the operator from trying to print to a non-existent printer.

You can also use this option to change the configuration so that the 5100 prints to a file instead of to the printer port. You can use this feature to save reports to a text file on disk, which you could print at the end of a work shift. The 5100 appends to the file every time it prints to the file, so the file contains a cumulative record of printed reports.

1. Press or to highlight the PRINT soft key option you want to use.
2. Press .

If you select the PRINT to FILE option, you must type the filename. The highlight is automatically positioned on the Print File Name field when you press after selecting PRINT to FILE.

1. Type the print filename. Include the full path to the file. For example, type `d:\example\print.txt`. Make sure that the directory exists on your disk cartridge.
2. Press .

Set System Time/Date

This option enables a screen that allows the operator to set the system date and time. The 5100 displays this screen only once, when power is applied to the system.

1. Press or to highlight the Set System Time/Date option.
2. Type Y to enable the screen, or type N to disable it.
3. Press .

Print Startup Documentation

This option enables the Print Startup Documentation option that appears when the operator starts the 5100 software. The documentation file is optional, and it could contain special instructions or other documents that you want the operator to read at the beginning of the programming session.

If you want the operator to print a documentation file, you should create the documentation file on the cartridge disk, using the following general procedure:

1. If you want the documentation file to be in its own directory, separate from the directory that contains your programming files, create the new directory from the DOS command line.
2. Use the BoardSite Text Editor to create a new text file that contains your startup documentation. If applicable, move to the new directory you created before you start the Text Editor. You can also create the text file using any standard text editor, and then use the BoardSite File Import command to assign a BoardSite filename to it.
3. Use the Configuration Editor to assign a Super Catalog name to the new directory.

When the 5100 powers up and loads the system software, it prompts the operator to select the appropriate documentation file. You can use this procedure to create several different documentation files, all of which will be displayed for the operator when the 5100 prompts for the documentation filename.

Note: If you set the PRINT Soft Key option to PRINT to FILE, or if you disable the PRINT Soft Key option, the Print Startup Documentation option is automatically disabled.

1. Press or to highlight the Print Startup Documentation option.
2. Type **Y** to enable the option, or type **N** to disable it.
3. Press .

If you typed **Y**, you must type the documentation file path. The highlight is automatically positioned on the Documentation File Path field when you press after typing **Y**.

1. Type the full path to the documentation files. For example, type `c:\BS5100\docs`.
2. Press .

Display User Instructions

This option enables the 5100 to display the user instructions in the User Instruction File. If the option is set to **Y**, then the user instructions are displayed. Remember, you must add user instructions to the User Instruction File by editing the file. Also, if a keyword in the file does not contain a user instruction, then the 5100 will skip the user instruction display for this keyword, even though you enabled the Display User Instructions option.

1. Press or to highlight the Display User Instructions option field.
2. Type **Y** to enable the user instructions, or type **N** to disable them.
3. Press .

Enable FLOPPY Disk Drive

This option enables the built-in floppy disk drive to be a 5100 data storage device in the restricted mode. If the option is set to **Y**, then the FLOPPY option appears in the 5100 LCD display whenever a data source is required.

Note: If you disable the FLOPPY disk drive option, then the LOAD FLOPPY and DISK UPDATE operations are also disabled.

1. Press or to highlight the Enable FLOPPY Disk Drive option field.
2. Type **Y** to enable the FLOPPY drive, or type **N** to disable it.
3. Press .

Refer to Appendix A, "Additional System Information," for important information about DOS environment variables required to support the FLOPPY and RAM options.

Note: If the 5100 is in the unrestricted operator mode, then the RAM and FLOPPY options are always enabled.

Enable RAM Memory

This option enables the built-in RAM to be a 5100 data storage device in the restricted mode. The RAM is actually organized as a RAM disk, to maintain similarity between the file structures of the RAM, FLOPPY, and DISK. If the option is set to Y, then the RAM option appears in the 5100 LCD display whenever a data source is required.

Refer to Appendix A, "Additional System Information," for important information about DOS environment variables required to support the FLOPPY and RAM options.

Note: If you disable the RAM option, then the LOAD FLOPPY to RAM operation is also disabled.

1. Press or to highlight the Enable RAM Memory option field.
2. Type Y to enable the RAM, or type N to disable it.
3. Press .

Note: If the 5100 is in the unrestricted operator mode, then the RAM and FLOPPY options are always enabled.

Let Operator Select Board Profile Source

This option enables the select board profile source option. If this option is enabled, then the operator can select the board profile source. If this option is disabled, you must specify a board profile source, as described in the next option. In this case, the operator cannot select the board profile source.

1. Press or to highlight the option field.
2. Type Y to allow the operator to select the board profile source, or type N not to allow it.
3. Press .

Specific Board Profile Source

This option specifies a board profile source, if you typed N in the Let Operator Select Board Profile Source option.

1. Press or to highlight the Specific Board Profile Source option field.
2. Press or to select FLOPPY, DISK, or RAM as the specific board profile source.
3. Press .

Note: If you select DISK as the specific board profile source, then the 5100 uses the default drive and directory in the Specify Default Initial Drive and Directory Path option in the system setup file. You can change this default by selecting the Setup command from the menu bar. For more information, see the section, "Setup," in Chapter 6 of the BoardSite In-Circuit Programmer User Manual.

Use a Specific Board Profile

This option allows you to specify a board profile name, eliminating any operator selection of board profile source or board profile. If this option is enabled, you must specify a board profile name, as described in the next option.

1. Press or to highlight the option field.
2. Type Y to use a specific board profile, or type N to allow operator selection.
3. Press .

Specific Board Profile Name

This option specifies a board profile name, if you typed Y in the Use Specific Board Profile option.

Note: The Configuration Editor does not validate the filename you type in this option field. Make sure you enter the correct filename, or the 5100 may behave incorrectly.

1. Press or to highlight the Specific Board Profile Name option field.
2. Type the board profile name exactly as it appears in the board profile source that contains it. The drive letter and path name are not required.
3. Press .

Let Operator Select Data Files Source

This option enables the select data file source option. If this option is enabled, then the operator can select the data file source. If this option is disabled, you must specify a data file source, as described in the next option. In this case, the operator cannot select the data file source.

1. Press or to highlight the option field.
2. Type Y to allow the operator to select the data files source, or type N not to allow it.
3. Press .

Specific Data Files Source

This option specifies a data files source, if you typed N in the Let Operator Select Data Files Source option.

1. Press or to highlight the Specific Data Files Source option field.
2. Press or to select FLOPPY, DISK, RAM, or MASTER as the data files source.
3. Press .

Note: If you select DISK as the specific data files source, then the 5100 uses the default drive and directory in the Specify Default Initial Drive and Directory Path option in the system setup file. You can change this default by selecting the Setup command from the menu bar. For more information, see the section, "Setup," in Chapter 6 of the BoardSite In-Circuit Programmer User Manual.

Enable Action Symbol During Programming

This option enables or disables the programming action symbol, which gives the operator a visual indication of the progress of the programming operation. Disabling the action symbol may be useful if you want to use status/debug primitives (in the sequence file) that write messages to the LCD display during programming.

1. Press or to highlight the option field.
2. Type Y to enable the action symbol, or type N to disable it.
3. Press .

BOARD Command Set

You can enable or disable the PROG, VERIFY, and BLANK commands under the BOARD top level command. By enabling and disabling commands, you can customize the command set for the 5100 operator, which can help eliminate operator error. You must enable at least one command. If you enable only one command, then the 5100 skips the prompt screen, and proceeds directly to the next option in the command tree.

1. Press or to highlight the BOARD Command Set option field.
2. Type the letters that correspond to the commands you want to enable.

Letter	Command
P	PROG
V	VERIFY
B	BLANK

You can type the letters in any order. The 5100 software automatically sorts the commands in PROG-VERIFY-BLANK order when it builds the LCD displays.

A typical command set would be PV, which enables the PROG and VERIFY commands.

3. Press .

LOAD Command Set

You can enable or disable the BOARD, PORT, and FLOPPY commands under the LOAD top level command. By enabling and disabling commands, you can customize the command set for the 5100 operator, which can help eliminate operator error. You must enable at least one command. If you enable only one command, then the 5100 skips the prompt screen, and proceeds directly to the next option in the command tree.

1. Press or to highlight the LOAD Command Set option field.

2. Type the letters that correspond to the commands you want to enable.

<u>Letter</u>	<u>Command</u>
B	BOARD
P	PORT
F	FLOPPY

You can type the letters in any order. The 5100 software automatically sorts the commands in BOARD-PORT-FLOPPY order when it builds the LCD displays.

A typical command set would be BP, which enables the BOARD and PORT commands.

3. Press .

DISK Command Set

You can enable or disable the LIST, COPY, and UPDATE commands under the DISK top level command. By enabling and disabling commands, you can customize the command set for the 5100 operator, which can help eliminate operator error. You must enable at least one command. If you enable only one command, then the 5100 skips the prompt screen, and proceeds directly to the next option in the command tree.

To set the DISK command set, follow the steps below.

1. Press or to highlight the DISK Command Set option field.
2. Type the letters that correspond to the commands you want to enable.

<u>Letter</u>	<u>Command</u>
L	LIST
C	COPY
U	UPDATE

You can type the letters in any order. The 5100 software automatically sorts the commands in LIST-COPY-UPDATE order when it builds the LCD displays.

A typical command set would be LU, which enables the LIST and UPDATE commands.

3. Press .

Edit Port Configurations

You can set up the 5100's serial port for the LOAD PORT operation by editing the port configurations. The configurations contain port hardware and software parameter settings, file transfer information, and filename. You can create up to ten different configurations, which are identified by unique names you assign. When the operator chooses the LOAD PORT commands, the 5100 displays the list of port configuration names, and then the operator can select the correct configuration by name.

To edit port configurations, follow the steps below.

1. Press or to highlight the Edit Port Configurations option field.
2. Type Y .
3. Type the number that corresponds to the port configuration you want to edit and then press . If you're creating the first new port configuration, accept the default configuration number 1.
4. Type E to edit the configuration, or type R to return all the port parameters for this configuration to default values. Press .
5. If you're creating a new port configuration, type the configuration name in the Port Configuration Name field. Press . You can press at any time to get help on any port option.
6. Set the remaining port parameters by highlighting the field you want to change, selecting the value you want, and then pressing .

RS-232 Port — Accept the default port, or change to another port.

Baud Rate — Select the baud rate that matches your host computer system. Select either 300, 1200, 2400, 4800, 9600, or 19200.

Parity — Select the parity option that matches your host computer system. Select either NONE, EVEN, ODD, MARK, or SPACE.

Stop Bits — Select the option that matches your host computer system. Select either 1 or 2.

Data Bits — Select the option that matches your host computer system. Select either 5, 6, 7, or 8.

XON/XOFF Handshake Enable — Turn software handshaking on or off. Select Y or N.

XON Character — Select the option that matches your host computer system. The XON character is usually ASCII character number 11.

XOFF Character — Select the option that matches your host computer system. The XOFF character is usually ASCII character number 13.

RTS/CTS Handshake Enable — Turn hardware handshaking on or off. Select Y or N.

I/O Timeout — Set the period of time that BoardSite 5100 waits to receive data. If no data is received within that time, the 5100 stops the operation. Type a time between 0 and 99 seconds. You can disable the I/O time-out by typing 0.

Host Command — If your computer system requires a command to begin the data transfer, you can send that command by typing it in this field.

Download Filename — Type the name of the file you are transferring. This is a BoardSite filename which may contain up to 32 characters. If the file already exists, it will be replaced automatically. If the file does not exist, it will be created.

If your 5100 is configured to use DOS 8-character filenames, then you should type the first 8 characters of the DOS filename. The 5100 automatically appends the extension .DAT to the filename. See the section "Using DOS Filenames," at the end of this chapter, for more information on using DOS filenames.

I/O Translator Format — The data translation formats allow you to send and receive files from a variety of host computers and development systems. Select the translation format that matches the one used by the host computer or development system. For more information on Translation Formats, see Chapter 9 of the *BoardSite In-Circuit Programmer User Manual*.

I/O Offset — I/O offset is the beginning address of the data. If you select the default I/O offset, then the 5100 uses the first address received from the port as the beginning address of the data.

I/O Offset Hi — This parameter sets the high-order address offset for the Extended Tektronix Hexadecimal data translation format.

Begin address — This is the first address in the file to which data is written when receiving, or from which data is read when transmitting. The default is the beginning address of the file, which is 00000000.

Block size — This is the number of bytes of data to be transferred. If you leave the block size equal to 0, it defaults to the amount of free memory. This could result in truncation of the data, depending on the amount of free memory. You should always enter the block size if you know it. If the block size is greater than the amount of free memory, then the 5100 writes directly to the DISK, RAM, or FLOPPY instead of the memory.

Fill byte — Before receiving a file, fill the BoardSite 5100 data file with a data pattern specified by this field.

7. Press **Alt** - **B** to save the parameter changes. You should see the port configuration name screen, with the port configuration name you typed in step 5.
8. Press **Alt** - **B** to save all port configuration parameter changes, or press **Esc** to exit the port configuration editor without saving changes.

Edit Super Catalog Entries

The Super Catalog File maps a BoardSite 5100 Super Catalog name (up to 32 characters long) to a DOS path name. In a Super Catalog File, you can create several Super Catalog names that correspond to several different DOS working directories. The operator can change the DOS working directory by selecting a Super Catalog name instead of a less-descriptive DOS path name.

1. Press or to highlight the Edit Super Catalog option field.
2. Type Y . You should see the following screen.

Figure 4-2
Edit Super Catalog Screen

```

Insert: OFF      Configuration  1      File: E:\scatalog
BoardSite Model 5100 Super-Catalog Editor
Name: BOARD A
Path: \BOARD_A

Name: BOARD B
Path: \BOARD_B

Name: RevB
Path: \PROJECT\REVB

Name:
Path:

Name:
Path:

Name:
Path:

Name:

```

Tab or to move to next line ↑ ↓ PgUp PgDn to Scroll
 ESCAPE to Abort Edit ALT-B Save Text F10 for Help
 Ctrl-I to Insert Entry Ctrl-D to Delete Entry

3. In the Name field, type the Super Catalog name you want to use. Press .
4. In the Path field, type the DOS path name; don't type the disk drive letter, because the Super Catalog File always defaults to the cartridge disk drive (D:). Press .
5. Repeat steps 3 and 4 for each Super Catalog name.
6. Press - to save all Super Catalog name changes.

Note: The Configuration Editor assumes that the Super Catalog File is located in the root directory of D:. If you have previously been editing system text files in C:\brdsite, use the FILE MOVE command to change to D:\.

5 *5100-specific Messages*

This chapter lists the warning and error messages specific to the BoardSite 5100. Other messages you may encounter are listed and described in Chapter 8, "Messages," in the *BoardSite In-Circuit Programmer User Manual*.

ERROR 100: Unable to open the PRINT File specified in the Configurations File.

The operation report form, sent when you pressed **PRINT**, was unable to open the print file specified in the BoardSite configuration file. Make sure your disk is not full and that the print file path and filename in the configuration file are specified correctly.

ERROR 101: Unable to open the Report Form File.

BoardSite was unable to find and open the form in the 5100.SDF file.

ERROR 102: Unable to Read from Report Form File.

BoardSite opened the form in the 5100.SDF file, but a read error occurred.

ERROR 103: A Report Form does not exist for this Operation!

The administrator deleted or changed the name of one of the report forms while modifying the 5100.SDF file.

ERROR 104: Unable to Open User Instruction File.

BoardSite is unable to open the User Instruction file, 5100.UIF, and is unable to display the user instructions text for the current menu node.

ERROR 105: Unable to Read User Instruction File.

BoardSite is unable to read the User Instruction file, 5100.UIF.

ERROR 106: Unable to allocate memory for operation.

BoardSite was unable to allocate enough memory to perform this operation. The system may have TSRs in memory or the configuration may not be making enough memory available for the software to operate correctly.

ERROR 107: Unable to Open Screen Text Definition File.

When the system initialized, it was unable to open or read the Screen Text Definition file from the 5100.SDF file. Make sure the 5100.SDF file has not been deleted or corrupted and that the BoardSite environment variable is correct.

ERROR 108: Unable to Read Screen Text Definition File.

ERROR 109: Invalid Password Entered.	BoardSite did not recognize the password you used when you tried to change modes of operation. Use the correct password.
ERROR 110: Unable to Open Super Catalog File. The system will use the current working drive and directory as default.	When you select Disk as Source or Destination for an operation, and BoardSite is configured to allow you to select the directory on disk, the system tries to open the Super Catalog file in the root directory of the disk. If it is unable to open or read this file, the system uses the current working drive and directory, specified in the 4100 system setup file, as the only accessible directory on the disk, as indicated by Errors 110, 111, and 112.
ERROR 111: The Super Catalog File is not Open. The system will use the current working drive and directory as default.	
ERROR 112: Unable to Read Super Catalog File. The system will use the current working drive and directory as default.	
ERROR 113: Unable to Update Super Catalog File.	When a Disk Update operation is unable to update the Super Catalog file from the floppy, this error appears. Make sure the Super Catalog file is not corrupted or write-protected.
ERROR 114: Unable to Open Selected Documentation File.	BoardSite was unable to read the documentation file directory and was therefore unable to display the menu allowing you to select and print the documentation files created by the administrator/developer.
ERROR 115 : An error occurred Reading Selected Documentation File.	
ERROR 116: Unable to Read Documentation File Directory.	BoardSite was unable to read the documentation file directory and therefore was unable to display the menu allowing you to select and print the documentation file path is correct.
ERROR 117 : Board Password does not match Board Profile.	The board password specified by the Board Profile is different from the one you entered. Enter the correct 5-digit password to begin the programming operation.
ERROR 118: Unable to access RAM storage.	The operation you were performing was trying to use RAM as a source or destination. If RAM is full or if no RAM disk is installed, this error appears during Load Floppy to RAM.
ERROR 119: CATALOG file does not exist on the FLOPPY disk.	BoardSite is unable to find a catalog file on the floppy disk to use as a file source to access the board profiles and data files.
ERROR 120: Unable to clear RAM storage.	If BoardSite was unable to delete all the BoardSite files from RAM when you chose to during the Load Floppy (to RAM) operation, this message appears.
ERROR 121 : LOAD FLOPPY Operation has Failed.	An error caused the operation to fail.

ERROR 122: No Catalog File on DISK COPY Source	The directory you selected on Disk, as the source of a Disk Copy operation, does not have a catalog file.
ERROR 123: No Catalog File on DISK COPY Destination	Normally the Disk Copy operation automatically creates a catalog file on the destination.
ERROR 124: DISK COPY Operation Aborted.	You pressed ABORT .
ERROR 125: DISK COPY Operation Failed.	An error caused the operation to fail.
ERROR 126: Unable to Read 5100 Configuration File.	Make sure the configuration file is valid.
ERROR 127: Unable to Allocate memory for DISK UPDATE operation.	During the Disk Update operation, BoardSite was unable to allocate internal data structures. There are TSRs in memory or the configuration of the system does not leave enough free memory.
ERROR 128: Unable to access Drive substituted for MASTER.	During initialization, if BoardSite was unable to access the drive (such as the network drive) you substituted for the Master source, the substituted drive will not be used in operations. Substitute the drive using a DOS environment variable such as set master=g:\work\data .
ERROR 129: No Sub-Directories were found on the UPDATE FLOPPY	The FLOPPY is not a valid DISK UPDATE floppy since it has no subdirectories to update onto the DISK.
ERROR 130: Unable to access UPDATE DISK	A fatal error occurred when trying to access the DISK device.

Note: Errors 140 through 152 are created when a hardware error causes a DOS operation to fail.

ERROR 140: Attempt to write to a write-protected DISK or FLOPPY.	
ERROR 141: Unknown drive.	
ERROR 142 : Drive (DISK or FLOPPY) not ready. Check cartridge DISK or FLOPPY drives.	
ERROR 143: Unknown DOS command.	
ERROR 144: Read error on DISK or FLOPPY. DISK or FLOPPY may be un-usable.	
ERROR 145: Bad drive-request structure length.	
ERROR 146: Seek error on DISK or FLOPPY. DISK or FLOPPY Hardware may be faulty.	

ERROR 147: Unknown media type on DISK or FLOPPY. DISK or FLOPPY may require formatting.

ERROR 148: Sector not found on DISK or FLOPPY. DISK or FLOPPY may require formatting or CHKDSK to be run.

ERROR 150: Write fault on DISK or FLOPPY. Possible DISK or FLOPPY hardware problem.

ERROR 151: Read fault on DISK or FLOPPY. Possible DISK or FLOPPY hardware problem.

ERROR 152: General failure on DISK or FLOPPY. Possible DISK or FLOPPY hardware problem.

ERROR 287: VCC1 current limit overflow error, ICC1 current limit has been set to the systems maximum capability.

ERROR 288: VCC2 current limit overflow error, ICC2 current limit has been set to the systems maximum capability.

ERROR 289: VPP1 current limit overflow error, IPP1 current limit has been set to the systems maximum capability.

ERROR 290: Vpp2 current limit overflow error, IPP2 current limit has been set to the systems maximum capability.

ERROR 291: VNEG current limit overflow error, INEG current limit has been set to the systems maximum capability.

A Additional System Information

This appendix contains information on using DOS filenames, BoardSite 5100 and BoardSite 4100/4400 compatibility, AUTOEXEC.BAT and CONFIG.SYS files, using BoardSite 5100 on a PC network, installing add-on communications boards, and creating an update floppy disk.

Using DOS Filenames

If you prefer, you can use standard 8-character DOS filenames (with 3-character extensions) instead of the 32-character BoardSite filenames. The 5100 development software automatically appends 3-character filename extensions to the filenames. The advantage of using DOS 8-character filenames is that the filename displayed on the LCD screen is the same as the first 8 characters of the filename you would see if you did the DOS DIR command. Using DOS filenames is desirable if you require strict traceability between the BoardSite filenames and DOS filenames.

The following extensions are appended to the BoardSite 5100 file types when you use the DOS Filenames option:

File Type	Extension
Board profiles	.PRO
Sequence files	.SEQ, .AOP, .EXE
Data files	.DAT
Text files	.TXT
BoardSite batch files	.BAT

To use DOS 8-character filenames:

1. If the BoardSite development software is not already running, start it by typing `brdsite` from the DOS command line.
2. Select the More command from the menu bar and then select the Setup command.
3. Scroll to the Use 8-Character DOS File Names field and then type Y. Press .
4. Press - to save the 8-character DOS filename option change you made to the system setup, and to exit the System Setup Editor .

If you decide that you do not want to save the change, exit the System Setup Editor by pressing .

BoardSite 5100 and BoardSite 4100/4400 Compatibility

BoardSite 4100/4400 is an in-circuit programmer that shares many components with BoardSite 5100. Because the 4100/4400 does not contain any computer hardware, it requires a separate personal computer system. The 4100/4400 does not have the 5100's LCD display, so all operator interaction occurs through the personal computer.

Because the 4100/4400 and 5100 share many hardware and software components, board profiles and sequence files are usually compatible with both systems. If you develop board profiles and sequence files for a 4100/4400, you can use them on the 5100. If you use any status/debug primitives in the 4100/4400 sequence file that display messages on the screen or accept keyboard input (specifically, `debug_get_key`, `debug_display_message`, `status_display_message`, `error_display_message`, and `move_action_symbol`), then these primitives may not work as you expect when you use the sequence file with the 5100. This is because the 5100 LCD display and soft keys behave differently than the 4100/4400 monitor and keyboard.

If you develop board profiles and sequence files for a 5100, you can use them on the 4100/4400. The 4100/4400 software ignores any 5100-specific options in the Model 5100 Features Only section of the board information form in the board profile.

AUTOEXEC.BAT and CONFIG.SYS Files

This appendix contains information on the AUTOEXEC.BAT and CONFIG.SYS files for BoardSite 5100 operating software.

AUTOEXEC.BAT

The AUTOEXEC.BAT file that you receive on the cartridge disk drive contains several DOS environment variables that BoardSite 5100 requires. You may want to change these environment variables to customize the system for your application. The environment variables as they are shipped on the cartridge disk are as follows:

- Non-Pentium systems


```
set boardsite=c:\brdsite
set floppy=a:
set disk=d:
set ram=e:
```
- Pentium systems


```
echo off
path c:\;c:\brdsite;c:\dos;c:\scsi;
mode c080
set comspec=c:\dos\command.com
set boardsite=c:\brdsite
set disk=d:
set ram=e:
set floppy=a:
set tmp=e:\
prompt $p$g
keysense
```

The SET DISK environment variable points to the D: partition of the cartridge disk. The C: partition of the cartridge disk contains the 5100 system software and DOS files, and the D: partition contains board profiles, executable algorithms, board data files, and other user files.

The SET RAM environment variable points to the RAM disk, which is a virtual disk drive located in the 5100 RAM. For operational simplicity, the 5100 RAM data storage device is always a RAM disk. This allows the operator to use the 5100 catalog-based file system for all storage devices, including DISK, RAM, and FLOPPY.

To use the 5100 RAM device, you must type Y for the Enable RAM Memory option in the Configuration Editor (see Chapter 4). You must also have the SET RAM= environment variable in AUTOEXEC.BAT. If you disable RAM in the Configuration Editor, then it will not be available in the LCD displays, even though the correct environment variable exists in AUTOEXEC.BAT. Also, if RAM is enabled in the Configuration Editor, but the SET RAM= environment variable does not exist in AUTOEXEC.BAT, then RAM won't appear in the LCD displays.

To use the FLOPPY device, type Y for the Enable FLOPPY Disk Drive option in the Configuration Editor (see Chapter 4). Unlike RAM, you don't have to have the SET FLOPPY= environment variable in AUTOEXEC.BAT, because the 5100 uses A:\ as the default for the floppy disk drive, and the environment variable is only required if you want to assign the floppy disk drive to another drive letter or path.

CONFIG.SYS

CONFIG.SYS contains several commands required by the 5100.

- Non-Pentium systems

```
device=c:\dos\smartdrv.sys 128
device=c:\dos\ramdrive.sys 3072 128 128 /e
shell=c:\dos\command.com /e:1024 /p
files=20
```

The first command installs the optional disk cache, which greatly enhances the performance of the 5100 (or any other application). The second command installs the RAM disk driver, which is required if you use the RAM option in the 5100 software. The last two commands are required for proper operation.

- Pentium systems

```
device=c:\scsi\aspi8dos.sys /d
device=sqdriver.sys
device=c:\dos\himem.sys
dos=high
files=40
buffers=40
device=c:\dos\smartdrv.exe 128
device=c:\dos\ramdrive.sys 4096 128 128 /e
shell=c:\dos\command.com /e:1024 /p
```

Using BoardSite 5100 on a PC Network

You can modify AUTOEXEC.BAT and the Command Definition File to assign one of the 5100 storage devices (RAM, for example) to be a virtual disk drive on a network file server. Assume that you have the network hardware and software installed in the 5100, and that you want to use BoardSite files in the \PROJECT\RELEASE\DATA directory of the virtual network drive H:.

Edit AUTOEXEC.BAT to change the SET RAM environment variable as follows:

```
SET RAM=H:\PROJECT\RELEASE\DATA
```

You could also edit the Command Definition File, as described in Chapter 3, to change RAM to NET, which causes the soft key label RAM to be changed to NET in the LCD screens and in report forms.

Replacing the MASTER Source Option with a Virtual Disk Drive

If you don't need MASTER as a source for memory board programming operations, you can replace MASTER with a virtual disk drive on the network, or with a directory on your cartridge disk drive.

To replace MASTER with a virtual disk drive on the network, modify your AUTOEXEC.BAT file and add a MASTER environment variable as follows:

```
SET MASTER=H:\PROJECT\RELEASE\DATA
or
SET MASTER=D:\PROJECT\RELEASE\DATA
```

You could also edit the Command Definition File, as described in Chapter 3, to change MASTER to NET, which causes the soft key label MASTER to be changed to NET in the LCD screens and in report forms. Also, NET appears as a source or destination along with DISK, FLOPPY and RAM. The 5100 disables the LOAD MASTER operation because you replaced MASTER (memory board) with a disk source/destination.

The 5100 treats the NET drive as a FLOPPY (or RAM), which means that the only directory that the 5100 uses on the NET drive is the directory defined by the SET MASTER environment variable.

Installing Add-on Communications Boards

If you want to install an add-on communications board (as COM1) in place of the standard 5100 serial port, disable COM1 on the 5100 CPU board by setting the DIP switches. Refer to the *BoardSite 5100 Maintenance Manual* for these DIP switch settings.

If you install another communications board, such as a modem, it must be compatible with the 5100's PC BIOS. In other words, it must not require any additional device drivers or TSRs to operate. A rule of thumb is that if an add-on communications board doesn't require any additional device drivers or TSRs to work with standard PC communications software, then the board should work with the 5100.

The 5100 provides a host command that can be sent to a host computer before a LOAD PORT operation begins. You can use the host command, which can be up to 72 characters long and contain special characters (carriage return, line feed, and other non-printing characters), to send command strings to the add-on communications board.

Creating an Update Floppy Disk

You can use the following procedure to create a floppy disk containing updated programming files. You could distribute this disk to several 5100 systems in the field, and the operators or technicians could use the DISK UPDATE command to update the programming files automatically.

To Create an Update Floppy Disk

The example assumes that your original programming files are in the directory \PROJECT on your cartridge disk drive. You revised the board profile and data files, and put the new files in \PROJECT\REVB.

1. If the BoardSite development software is not already running, start it by typing **brdsite** at the DOS prompt.
2. Select the More command from the menu bar, and then select the File command.
3. In the File Maintenance Options pop-up, select the DOS option. Press . You're now at the DOS command line.

4. Insert a formatted 3-1/2" floppy disk into the 5100 floppy drive. Type **A:** to switch to the A: (floppy) drive. Type **Md project** and then type **Md project\revb** . This creates the empty \PROJECT\REVB directory on the floppy drive.
5. Type **exit** to exit the DOS shell and return to the BoardSite development software.
6. In the File Maintenance Options pop-up, select the MOVE option. Press . In the New Directory pop-up, type A (no colon) in the New Drive field, and type \project\revb in the New Directory field. Press .
7. In the File Maintenance Options pop-up, select the IMPORT option. Press .
8. In the Import from DOS or BoardSite pop-up, select BoardSite. Press .
9. In the Source Directory pop-up, type D (no colon) in the Source Drive field, and type \project\revb in the Source Directory field. Press .
10. In the List Which Files pop-up, select All Files. Press .
11. In the Import Source File Name pop-up, press or to select the file you want to copy to the update floppy. Press .
12. In the Destination BoardSite File Name pop-up, press to accept the proposed filename. This will ensure that the update floppy filename is identical to the source filename.
13. Repeat steps 7 through 12 for each file you want to copy to the update floppy.
14. Press **Esc** until you are back to the menu bar. Select the Edit command.
15. In the Edit Options pop-up, select the 5100 Configuration option. Press . You should be in the 5100 Configuration Editor.
16. Move to the Edit Super Catalog Entries field and then press **Y**. You should see the Super Catalog editing screen, with the Super Catalog File, A:\scatalog, listed in the upper right-hand portion of the screen.
17. Type the name you want the 5100 operator to see when choosing the directory that contains the revised programming files. For example, type **revb** to name the directory REVB. Press .
18. Type the actual path to the revised programming files. For this example, you would type \project\revb. Press .
19. Repeat steps 17 and 18 for every directory that you want to name in the Super Catalog File. In this example, there is only one directory, \PROJECT\REVB.
20. Press **Alt** - **B** to save the Super Catalog names.

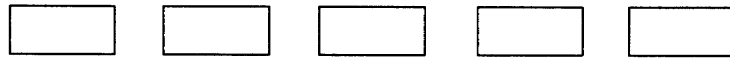
21. Remove the update floppy disk from the 5100 floppy drive. If you have a personal computer with two 3-1/2" floppy disk drives, you can use the DOS diskcopy command to make duplicates of the update floppy disk.

Using the Update Floppy Disk in the Field

To update BoardSite 5100 field units, perform the following procedure.

1. From the top level menu, press **DISK** .
2. Press **UPDATE** .
3. Put the floppy disk containing the new programming files in the floppy disk drive.
4. Press **BEGIN** to update the 5100 software.
5. The following screen appears when the operation is complete.

```
UPDATE Software
6 Files were Updated onto DISK
Press PRINT for Report
[REPEAT]                [PRINT ][ EXIT ]
```



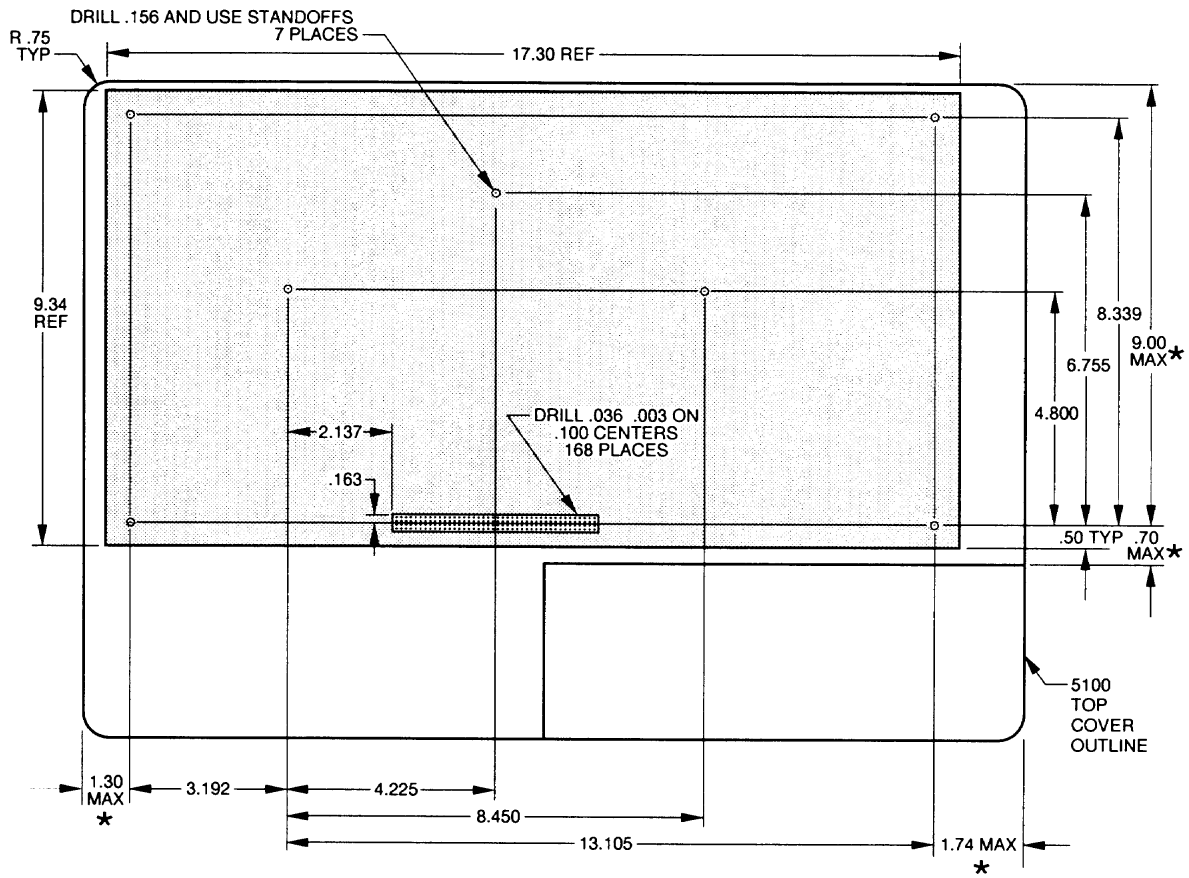
B Interface Adapter Circuit Board

The recommended mechanical design for the interface adapter circuit board is shown in Figure B-1.

Note: The dimensions marked with asterisks () in Figure B-1, represent the maximum allowable outside dimensions of any housing you design for the interface adapter circuit board. Clearance from the top cover to the inside of the lid is 2.00 inches, which allows the 5100 case top to close properly.*

To provide the correct clearance between the housing and circuit board, use seven 6-32 x 5/8", M/F, hex, stainless steel standoffs (Data I/O part number 250-0035-002) and associated 6-32 screws and lockwashers.

Figure B-1
Recommended Mechanical Design



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BoardSite 5100 Command Tree Worksheet

