UNIQUE MICRO DESIGN

Model S143
UMD ProtoLink Programming Utility

Technologists and suppliers to professional systems integrators.

Unique Micro Design

Model S143

UMD ProtoLink Programming Utility

Program Version 1.4

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S143 UMD ProtoLink Programming Utility

The S143 *UMD ProtoLink Programming Utility* is used to program the Unique Micro Design family of *UMD ProtoLink Products*. This family includes the *UMD Model 264 Custom Keyboard, UMD Model 211 Custom LCD Terminal* and others.

UMD ProtoLink Products contain non-volatile memory which holds configuration parameters and keypad definitions. The S143 program allows you to easily view and edit this memory to configure the UMD ProtoLink Product to suit your application. It also provides keypad testing and serial terminal facilities.

In the past, to program a UMD ProtoLink Product, an ASCII text editor was required to create a "script file" which conformed to the UMD ProtoLink command set and configuration parameters. The S141 or S142 Download Utility software would be used to program the UMD ProtoLink Products using the script file. Refer to figure 1.

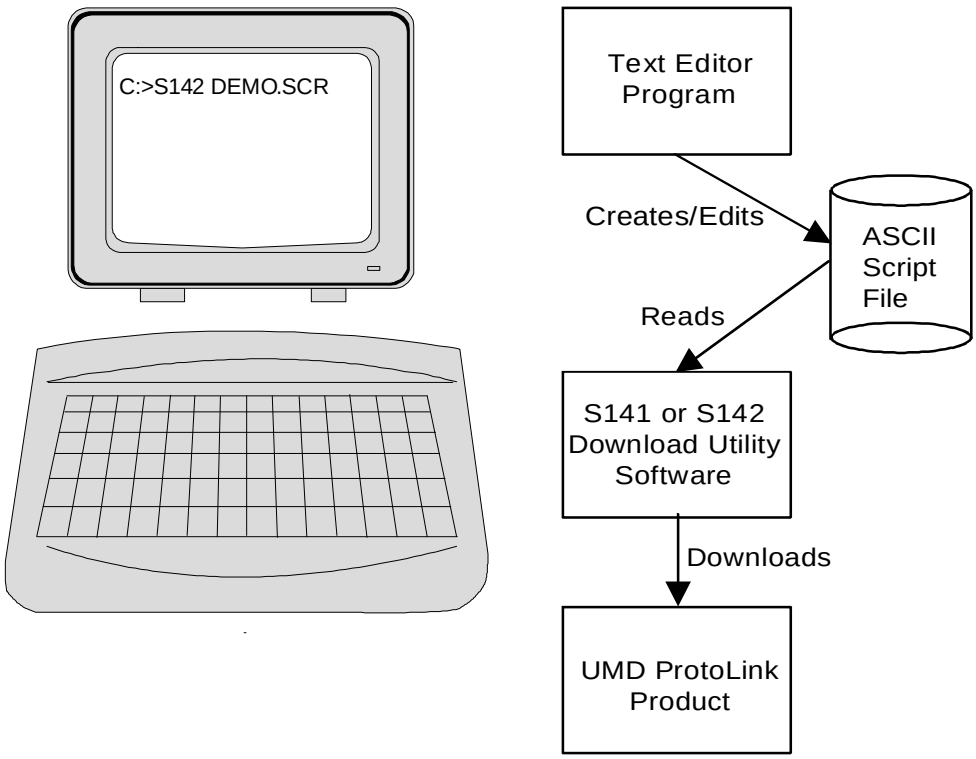

Figure 1

The S143 program addresses the issues of providing all the requirements to program the UMD ProtoLink Products without the need to use external programs and be able to program the keypad definitions and other parameters without consulting complex documentation. The user interacts with this utility using menus. The S143 program can also be command line driven, which **replaces the S142** software. The command line information is obtain by typing "**S143 ?"** at the DOS prompt.

S143 introduces a new concept in the programming of the UMD ProtoLink Products, that of the "Initialisation file" (INI file). The INI file is a text file which holds a list of configuration settings set out in an easily read format.

Backward compatibilty has not been forgotten: S143 can also transfer script files to the UMD ProtoLink Product. Script files can be converted to INI files and vice versa.

Now with the S143 UMD ProtoLink Programming Utility, everything you need to program UMD ProtoLink Products is integrated ino the one software package. Refer to figure 2.

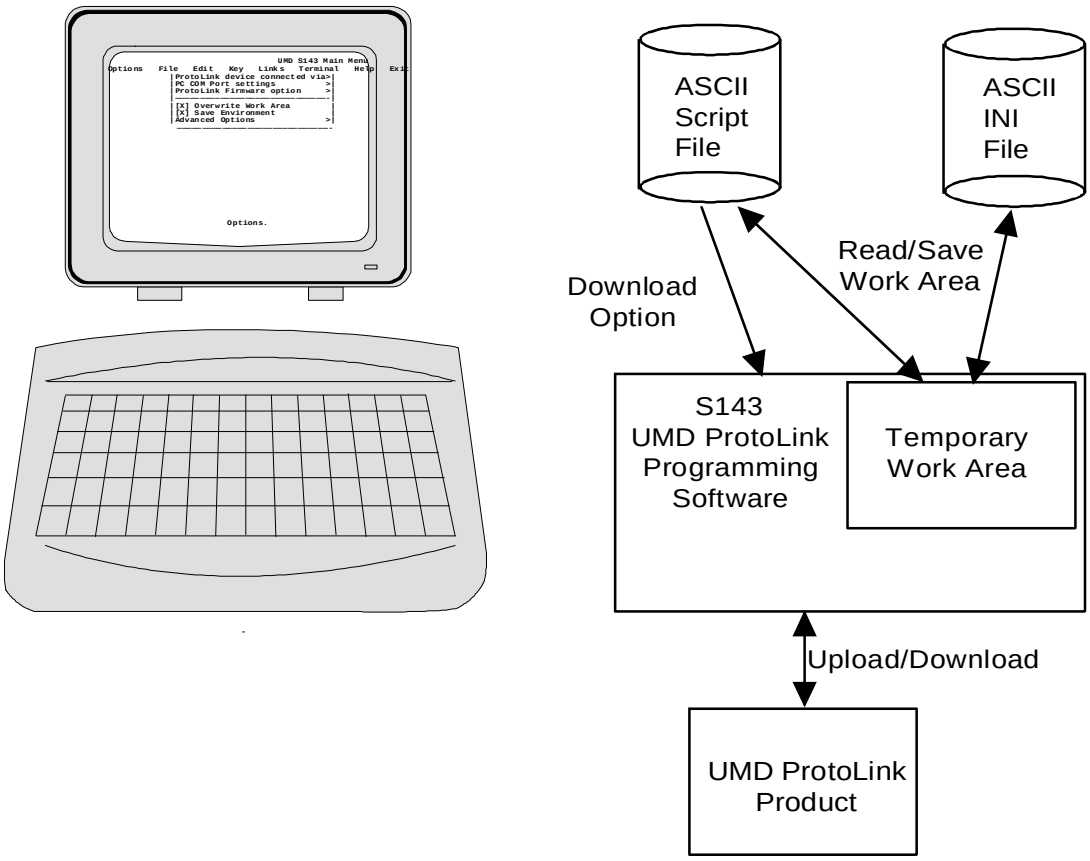

Figure 2

Manual organisation

This manual describes how to install the ProtoLink Programming Utility and operate the S143 software to edit the “Key Definitions”. It is divided into the following sections

- Section 1 Installation
- Section 2 Quick Start

Section One
Installation

1. Requirements

You need the following to install the S143 program:

A personal computer (PC) with a ‘286 or higher CPU, 256K or more of RAM, a floppy and/or hard disk drive, a monitor and a standard PC keyboard.

MS-DOS® operating system, version 3.1 or higher.

2. Connection of UMD ProtoLink Product

There are two ways to program a *UMD ProtoLink Product*, either via the PC’s keyboard interface or via a serial communication’s port. For most applications, the first method of interfacing is used, but both are described here for completeness.

PC Keyboard Interface Connection

1) Turn off the PC.

2) Disconnect standard PC Keyboard.

3) Referring to figure 3, connect one end of the UMD CA202 or CA226 cable to the PC’s keyboard interface connector.

4) Connect the other end of the CA202 or CA226 cable to the 7 pin DIN “Comp Ext Pwr” (Computer and External Power) connector on the UMD ProtoLink Product. Note that the 5 pin DIN connector on the CA202 or CA226 cable mates with 7 pin DIN connector.

5) Attach the standard PC Keyboard to the 5 pin DIN “Ext Kbd” (External Keyboard) connector on the UMD ProtoLink Product. If the keyboard uses a six pin mini DIN connector, you will have to use a CA227 adapter to convert the PC Keyboard’s connector to that on the UMD Protolink Product.

6) Turn on the PC.

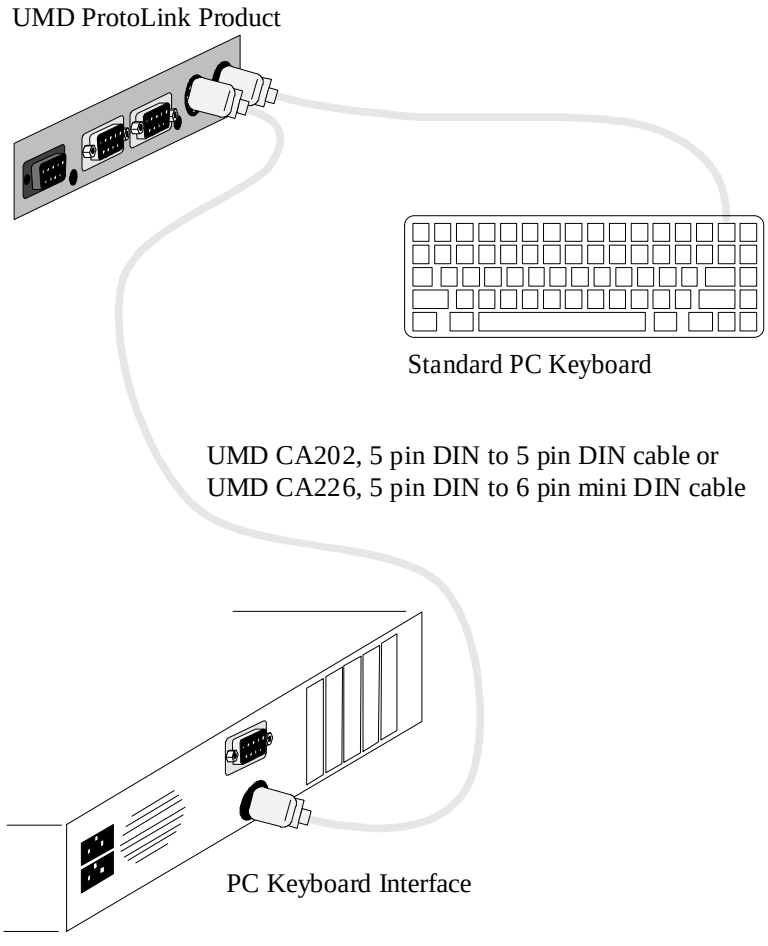

Figure 3

Serial Interface Connection

1) Turn off the PC.

2) Referring to figure 4, connect the UMD CA201 or CA211 serial cable to either the S1 or S2 serial port on the UMD ProtoLink Product.

2) Connect the other end of the serial cable to the COM1: or COM2: serial port on the PC.

3) Connect the power pack to the 7 pin DIN “Comp Ext Pwr” (Computer and External Power) connector.

4) Connect the power pack to the mains power and turn it on.

5) Turn on the PC.

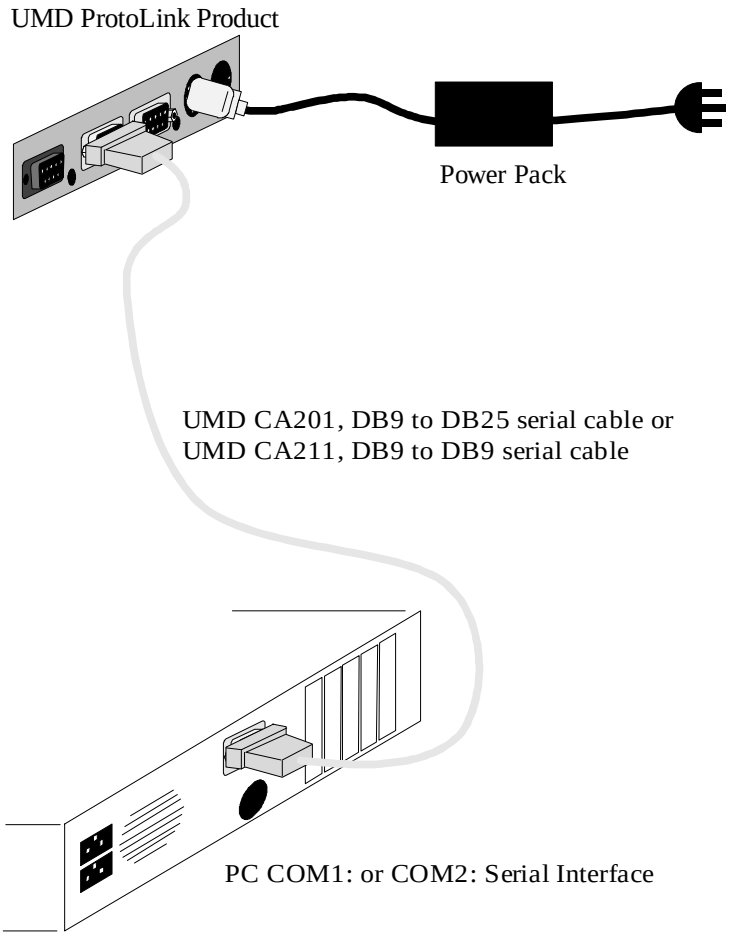

Figure 4

3. Installation of S143 Software

The S143 software may be run directly from the supplied floppy diskette, but it will run much faster if you install the software on a hard drive if this is available. To do this, simply copy the files to an appropriate sub-directory on your hard drive. This is achieved by running the batch file “INSTALL.BAT”from the program diskette which executes the following commands for you:

```
C:
MD \UMD
CD \UMD
COPY A:*.*
```

Section Two
Quick Start

UMD ProtoLink Products contain non-volatile memory which holds configuration parameters and keypad definitions. The S143 program allows you to easily view and edit this memory to configure the ProtoLink Product to suit your application. It also provides keypad testing and serial terminal facilities.

This quick start section provides an excercise on how to create a simple keypad layout definition.

1. S143 Basics

S143 is a DOS based program run from the DOS prompt. It cannot be run from MS-Windows if you will be programming the UMD ProtoLink Product from the keyboard interface. (If you are programming the ProtoLink Product via the serial interface, then you can run the S143 program from MS-Windows either from a "DOS Box" or by running the "S143.PIF" file.)

Files S143.EXE, DEF_F00.INI and DEF_F02.INI need to be in the current working directory for the program to operate.

To run the S143 program, simply type its name and press **ENTER** (ie ↵) from the intallation directory:

```
C:\UMD> S143 ↵
```

S143 uses *menus* to list commands and options.

- To *select* a menu option, use:
  the **LEFT** (ie ⇦**)** and **RIGHT** (ie ⇨) **ARROW keys**.

- To *open* a menu item either
  press the **ENTER** (↵)key whilst the menu item is highlighted
  or
  press the **ALT key** followed by the highlighted letter of the menu item, eg to open the **E**dit menu use **ALT+E.**

- To *run* a menu command
  use the **UP** (ie ⇧) and **DOWN** (ie ⇩) **ARROW keys** until you reach the item you want to select and then press **ENTER** (↵) If the > symbol is present, it indicates that there is a cascading menu to follow and it will open if the **RIGHT ARROW** (⇨)or **ENTER** (↵) keys are used. If the "**...**"symbol is present, this indicates that a dialog box will open when you run this command.

- To *close* the current menu
  use the **ESC** key.

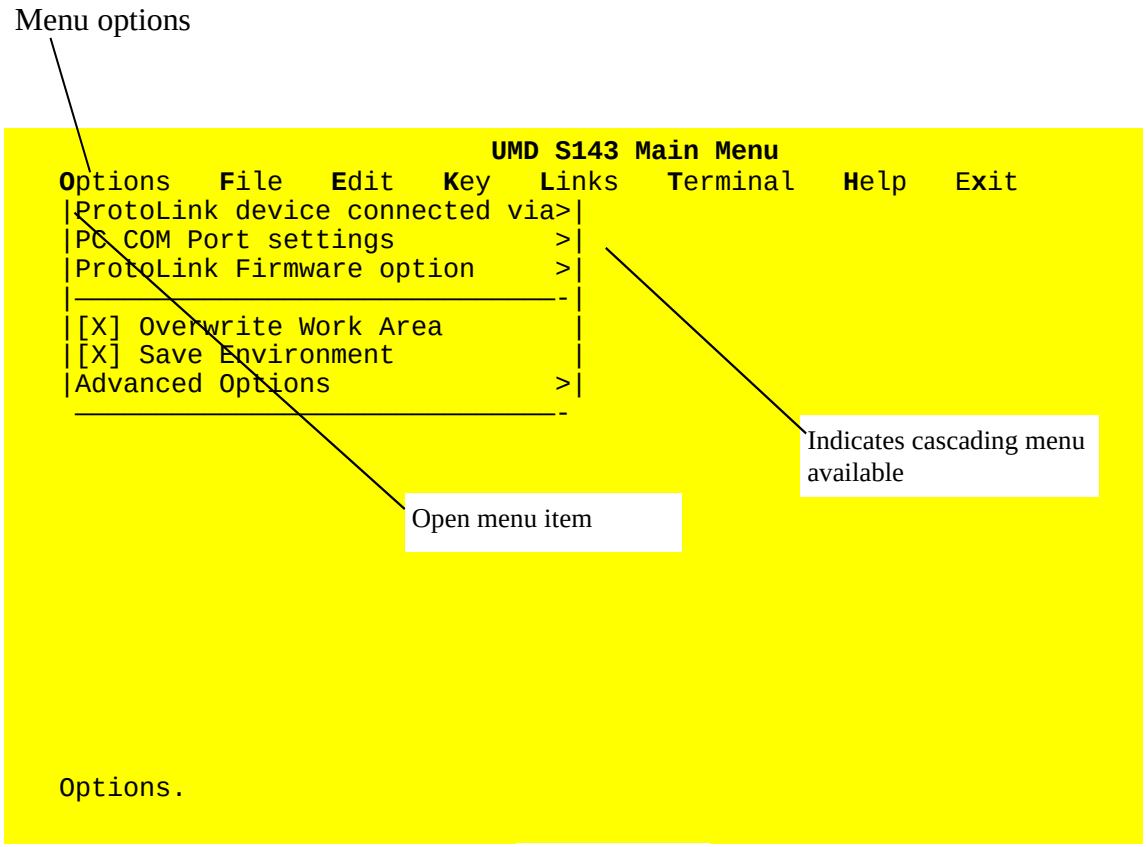
Menu options
UMD S143 Main Menu
Options File Edit Key Links Terminal Help Exit
|ProtoLink device connected via>|
|PC COM Port settings >|
|ProtoLink Firmware option >|
|[X] Overwrite Work Area |
|[X] Save Environment |
|Advanced Options >|
Indicates cascading menu available
Open menu item
Options.

Figure 5

2. Selection of Type of Connection to UMD ProtoLink Product

After starting the S143 program, the first operation is to indicate which interface (keyboard or serial) the UMD ProtoLink Product is connected to. This is done from the **O**ptions menu.

Select the **O**ptions menu from the main screen by pressing **ALT+O** or by moving the highlight to the Options item and pressing ENTER (↵.) In either case, the Options menu is displayed, as shown in figure 5.

Next open the “ProtoLink device connected via” menu item by pressing the DOWN ARROW (⇩) to highlight it and then pressing the RIGHT ARROW (⇨) or ENTER (↵) keys to open it. The screen in figure 6 is displayed. Use the UP (⇧) and DOWN (⇩) ARROW keys to highlight the desired option and select it by pressing ENTER (↵) or SPACE BAR keys. An (X) mark appears next to the selected item. For example, if you have connected the UMD ProtoLink Product using the PC’s Keyboard Interface, then select the “Keyboard Interface” option as shown.

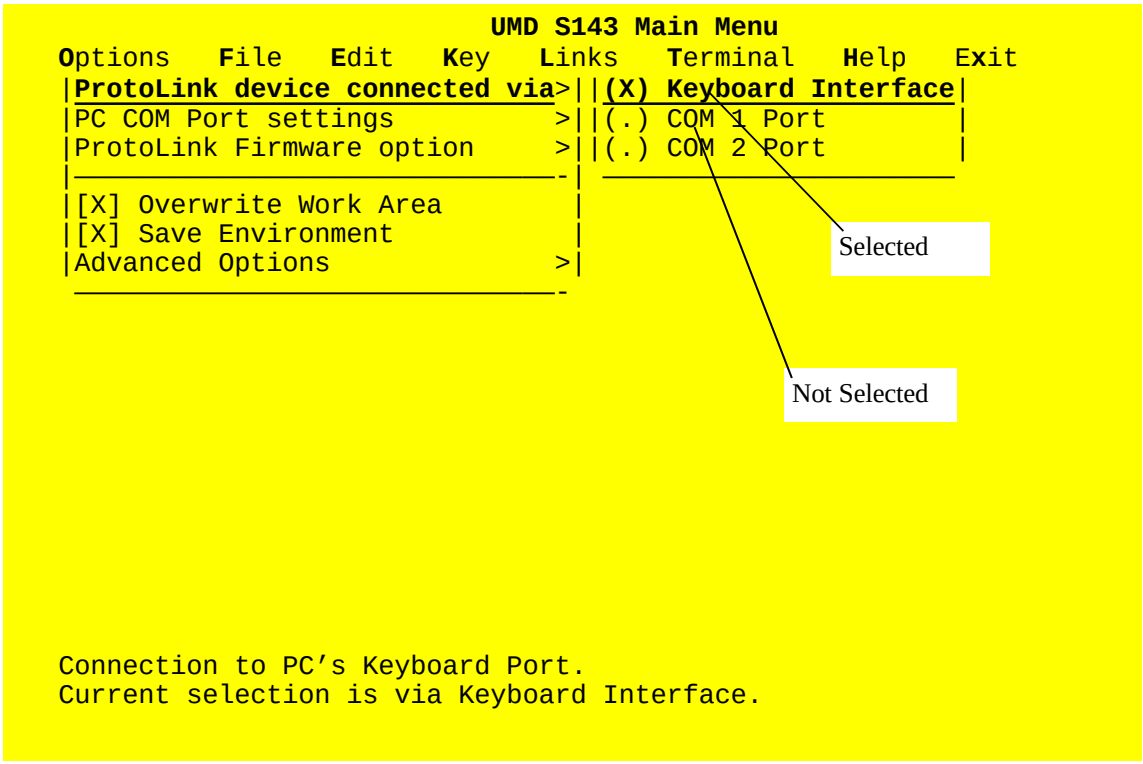

Figure 6

3. Keypad Layout Basics

UMD ProtoLink Products allow you to program each key on the keypad to output the characters you want.

As an excercise, we will

- label key at grid position “e3” with the word “*CASH*”
- program this key to output the characters “CASH” followed by the ENTER (↵) key when pressed
- also program the key to output the characters “OUT” when released. Refer to figure 7.

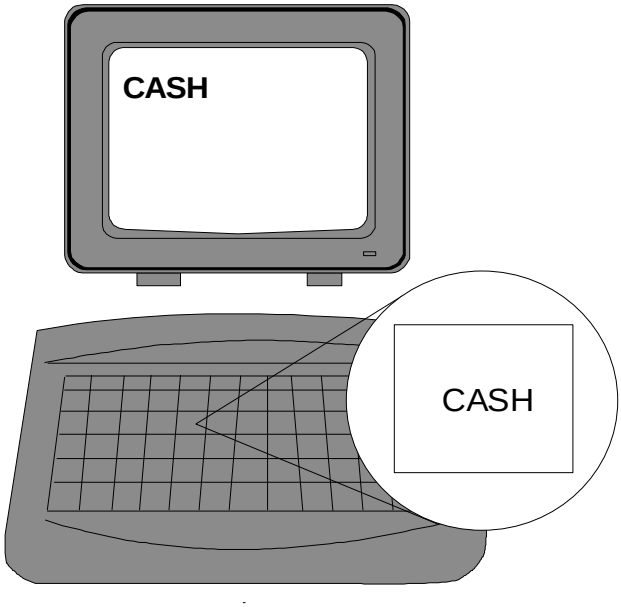

Figure 7

Grid reference

The position of a key on a UMD ProtoLink keypad matrix is given by column and row *grid reference*, as shown in figure 8. The first column is labelled “a” and the first row is numbered “1”. So, the top left key is grid reference “a1”, the next key along the top is “b1” and so on.

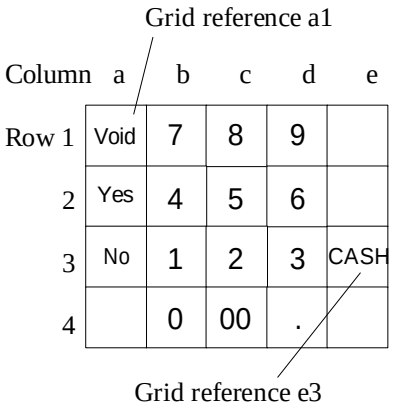

Figure 8

Make and break codes

Each key has two sets of characters programmed for it, one set (“*make codes*”) are sent on pressing a key. The other set (“*break codes*”) are sent on releasing the key. This is outlined in figure 9.

Each make and break sequence can send upto 255 characters. Break codes are usually not required in the majority of applications.

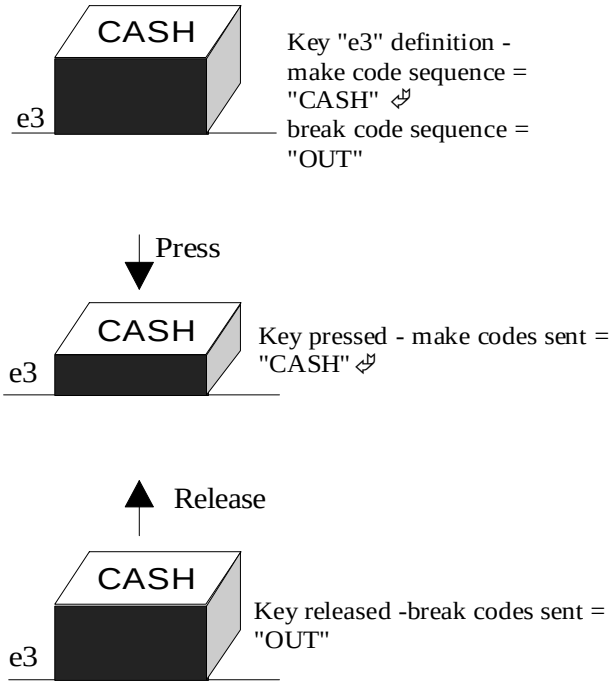

Figure 9

4. Edit Key Definitions

To start entering or editing key definitions, select the **K**ey menu and run the *Edit Key Definitions* command. You will be greeted with the *Edit Key Definitions* screen as shown in figure 10.

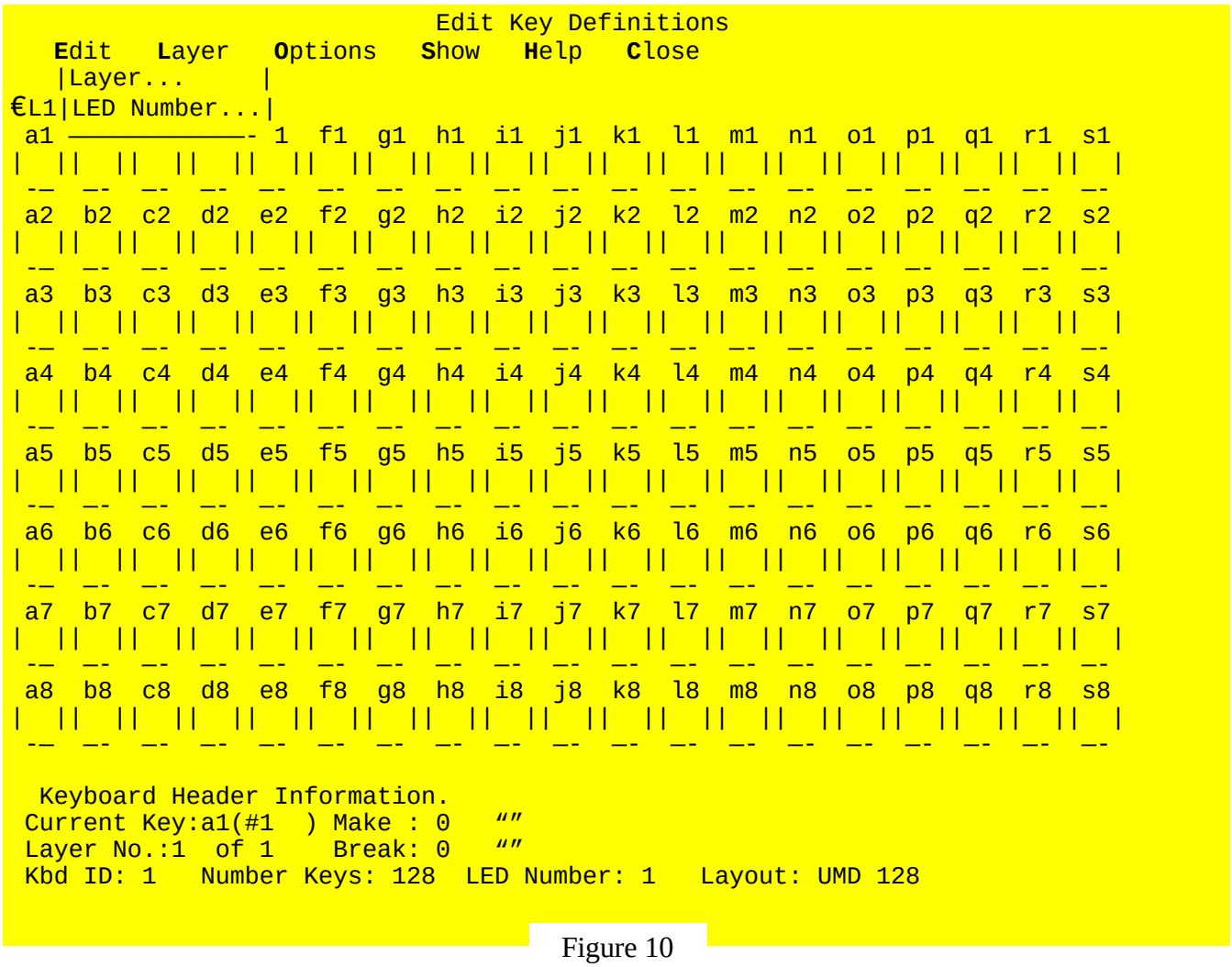

Figure 10

Next, open the **E**dit menu and run the "Layer" command. At this stage the help line will display:

```
Use ↑↓→←,[PgDn],[PgUp] change layer,[ENTER] to edit,[F10] Show,[ESC] Close.
```

At this stage pressing the F10 function key will change the screen to only show keys that have been defined. This display mode may be preferrable. Pressing the F10 function key again will revert to the original display mode.

In either instance, the first key in the keypad grid, key "a1", will be highlighted. Move the highlight to grid location "e3" by using the ⇨ARROW key four times then the ⇩ ARROW key twice. The "Current Key" field in the "Keyboard Header Information" area at the bottom of the screen indicates that key "e3" is selected.

To edit the highlighted "e3" key, press the ENTER (↵) key.

The cursor will now be placed in the "Make :" field at the bottom of the screen. Type in the text that you want sent when this key is pressed. In this example, the word "CASH". As we want to also send the ENTER (↵) character at end of the word "CASH" we need to enter this *special key*. This will be explained more fully later, but for now simply type the four characters "<ENT" and then press the ENTER (↵) key to accept. Notice that "CASH\r" is now displayed. To finish the entry of this Make field, press the ENTER (↵) key once again.

After entry of the "Make" field, the cursor will now be placed in the "Break :" field. Type the word "OUT" followed by pressing the ENTER (↵) key to accept this entry. The grid location "e3" on the screen will now change to a different colour to indicate that it has been defined. Once the ProtoLink keyboard is programmed with this definition, the letters "OUT" will be sent when key "e3" is released.

Whilst entering key definitions, the following *editing keys* may be used:

- `Backspace` : deletes the character before the cursor
- `Delete` : deletes the character under the cursor
- `Home` : takes the cursor to the beginning of the field
- `End` : takes the cursor to the end of the field
- `Enter` : finishes the entering of characters
- `Esc` : cancels the operation (returns key definition to its original value and places the cursor back to the keypad grid.)
- `Left & right` (⇦⇨) : move the cursor along the field
- `Up & down` (⇧⇩) : moves the cursor between the make and break field definitions
- `<` : enter special keys
- `{` : enter ProtoLink commands

Entering special keys

Most *Special keys* may be entered into key definition fields directly by simply pressing them. This includes keys such as function keys, insert, page up, page down etc.

Some special keys, for example, ENTER (↵), DELETE, HOME, END, BACKSPACE and ARROW KEYS cannot be entered directly as they are used in the editing process. To insert these keys into the key definition field, type the "<" character followed by the name of the special key, eg "HOME" for the HOME key, followed by pressing the ENTER (↵) key to accept the entry.

To see a list of available special keys, press the "F1" function key after you have typed the "<" character. The following help screen, figure 11, will be shown. This screen provides an easy way to enter special keys. Here one simply uses the cursor keys to move the highlight to the desired key followed by pressing the ENTER (↵) key to select it. If an *Alt, Ctrl* or *Shift* modified special key is desired, simply press the Alt, Ctrl or Shift keys to enable or disable the shift mode which will be displayed in the "Shift key state" area.. The ESC key is used to exit this option without a selection.

So, in our "CASH" key example, we desire to insert the ENTER (↵) key at the end of the word "CASH" using the alternative help screen method. Type "CASH<" into the make string and then press the F1 function key. The cursor should be highlighting "Enter" by default as shown in figure 11. Simply press the ENTER (↵) key to accept this special key entry afterwhich "CASH\r" will be displayed; the "\r" being short hand for ENTER (↵). Now finish this key entry by pressing the ENTER (↵) key once again.

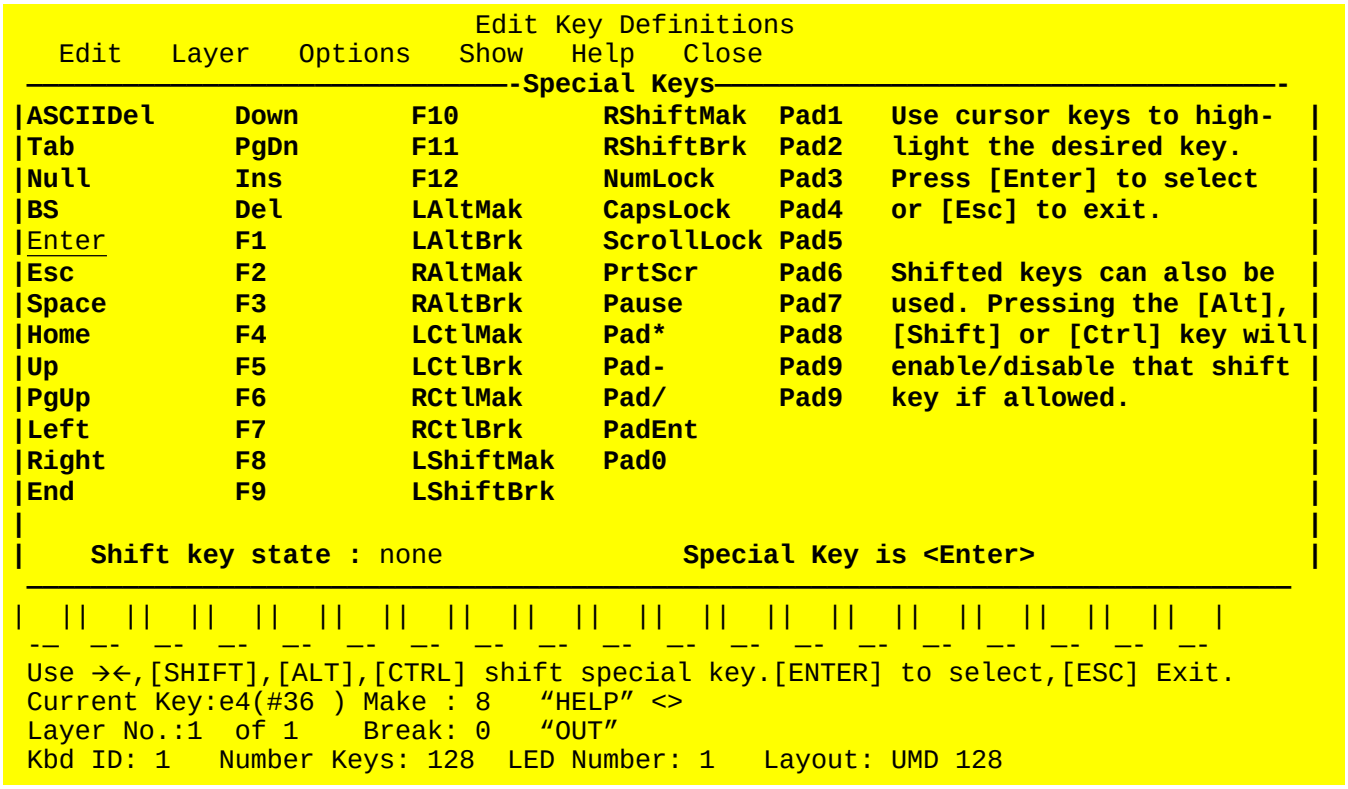

Figure 11

Finishing Key Definition

Once you have finished entering all the key definitions, close the Edit Key Definitions screen by pressing **ALT+C**.

5. Saving Your Work

The S143 program uses the computer's memory as a *work area.* The work area is manipulated by the actions of the user by either using the work area editor or menu operations. For example, the keypad definitions that you entered in the previous section are stored temporarily in the work area.

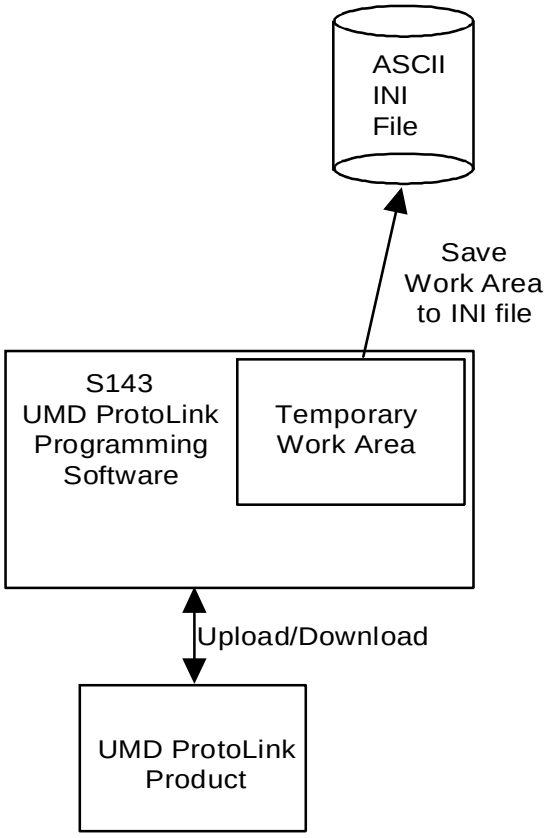

Figure 12

Once you have finished entering the key definitions, the next step is to save your work. This is done from the main menu item, **F**ile. All of the File sub-menu choices are given below with the ones relevant to saving being highlighted:

- Read .INI file to Work Area...
- Read Script file to Work Area...
- **Save Work Area to .INI file...**
- **Save Work Area to Script file...**
- Upload ProtoLink device to Work Area...
- Download Work Area to ProtoLink Device...
- Download Script file to ProtoLink Device...

To save your work as an “INI” file, run the “Save Work Area to .INI file...” command. The “Save INI file” dialog box will open, prompting you to enter a file name. Type in a valid DOS file name, ie up to eight characters with the first character being alphabetic (ie ‘A’ to ‘Z’) followed by pressing the ENTER (↵) key. There is no need to type the “.INI” file extension as this is automatically added.

The TAB key can be used at this stage to move into the directory list which allows you to select an existing file to use or to move through directories by selecting the <DIR> entries.

Once a filename has been entered, you will then be asked to type in a comment for the file if desired, afterwhich the file will be saved.

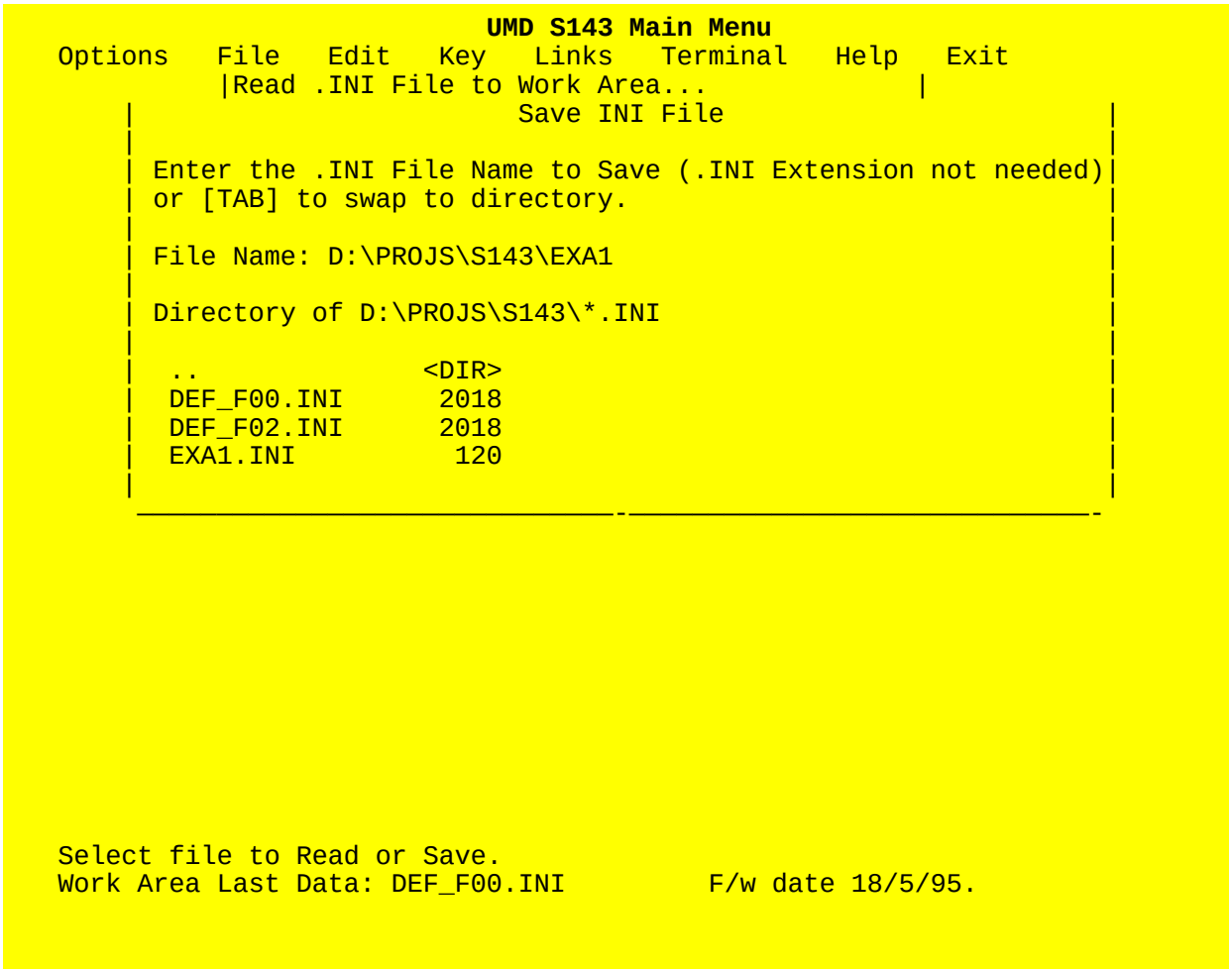

Figure 13

6. Programming the UMD ProtoLink Product

UMD ProtoLink Products contain non-volatile memory which holds configuration parameters and keypad definitions. Information is "downloaded" into a UMD ProtoLink Product by issuing memory write commands, eg "*write value 10 into location 240*".

The S143 software programs UMD ProtoLink Products by either:

- downloading a *script text file* which contains raw memory write (and other) commands

or

- downloading the S143 Work Area, which is essentially a copy of the UMD ProtoLink Product's non-volatile configuration memory.

Note that INI files cannot be directly downloaded, but must be first "read into" the S143 Work Area and after that the Work Area downloaded.

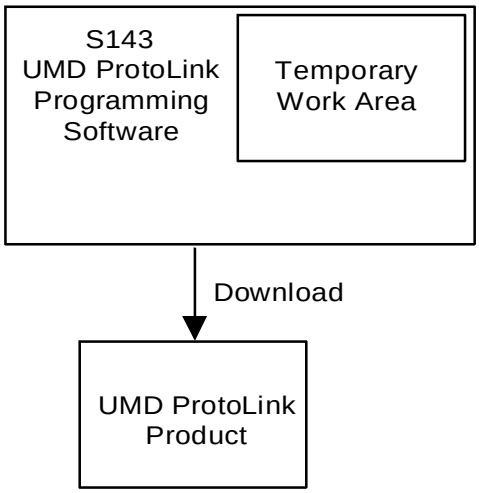

Figure 14

Programming UMD ProtoLink Products is done from the main menu item, **F**ile. The relevent File sub-menu choices are highlighted here:

- Read .INI file to Work Area...
- Read Script file to Work Area...
- Save Work Area to .INI file...
- Save Work Area to Script file...
- Upload ProtoLink device to Work Area...
- **Download Work Area to ProtoLink Device...**
- **Download Script file to ProtoLink Device...**

To program the work that you have done so far into the UMD ProtoLink Product, run the "Download Work Area to ProtoLink Device..." command. This assumes, of course, that the S143 work area has valid data in it. The "Download Work Area to ProtoLink Device" dialog box will open, informing you of the connection to be used (ie either the keyboard interface or serial port). You are asked to make a selection of:

- 'D' Download Work Area parameters that are DIFFERENT from defaults.
- 'A' Download ALL of the Work Area, defaults included.
- ESC to close this dialog.

Press the 'D' key to begin the download operation.

If the connections are correct, the download will proceed. After it is finished, the UMD ProtoLink Product will be issued a reset command which will re-initialise the product making it take up the new configuration from its non-volatile memory.

7. Show Keys

Once the UMD ProtoLink Product has been programmed, the **S**how Keys command can be run from the **K**eys main menu item. This screen will show every active key that is pressed.

Continuing on with our example, pressing the "e3" key should show "C A S H \r" on the Show Keys screen and "O U T" when the key is released.

8. Summary

This Quick Start section has taught you :

A how to use the menu system in the S143 software
B about keypad grid references
C about make and break codes
D how to edit key definitions and enter special keys
E how to save your work to an INI file
F how to program a UMD ProtoLink Product
G how to check your keypad definitions.

This Quick Start section should cover the majority of your needs.

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