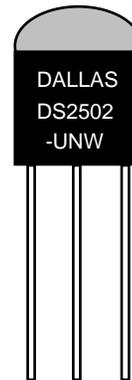
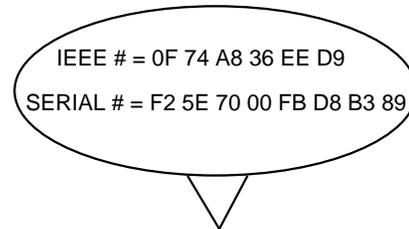


## SPECIAL FEATURES

- Registered silicon chips providing globally unique addresses
- Meets the identification requirements of Ethernet, Token Ring, cellular phones, etc.
- EPROM technology for custom programming and quick delivery
- No NRE charge
- Three device options: 1K bit, 16K-bit and 64K-bit
- Dallas Semiconductor handles serialization and does the bookkeeping of tracking the last number used
- Pages are programmed and locked under strict manufacturing control
- Two data structures: one unnamed file or up to three named files (TMEX™ format)
- Unused memory pages can be programmed in the application
- The unique registration number authenticates the chip and tracks the transfer of ownership
- Customer-specific Project ID number together with custom ROM for highest level of product security
- Programmed devices are made available to the owner of the Project ID or their authorized agents only
- Built-in multidrop controller ensures compatibility with other MicroLAN products
- Reduces control, address, data signals and power to a single pin
- Directly connects to a single port pin of a microprocessor and communicates at up to 16.3 kbits per second

- Low-cost TO-92 or 8-pin SOIC and 6-pin TSOC surface mount packages as well as F3 and F5 stainless steel MicroCans
- Tape & Reel option available (not for MicroCans)
- Reads over a wide voltage range of 2.8V to 6.0V from -40°C to +85°C



## APPLICATIONS

- After-market protection of products by restricted availability
- Node-ID for network cards (IEEE-assigned number)
- Wireless phone ID plus battery information
- Electronic product identification label with serialization

## I. INTRODUCTION

UniqueWare is a convenient and affordable way to electronically label items with a unique serialization and to optionally add some text information around the serialization field.

There are several options that allow you to customize what is programmed into UniqueWare devices. This manual will help you when filling out the screens and explain the effect of your entries to take full advantage of all the options. The data you enter will be used directly as a master to program the UniqueWare devices. Therefore it is important that you understand how data is used and what you can expect to find programmed in your UniqueWare devices.

## II. DEVICE DATA STRUCTURE

### A. Structure of ROM Section

Like other Dallas Semiconductor Automatic Identification Products, UniqueWare devices have a ROM Registration Number (Table 1) that serves several purposes:

1. It identifies the logical behavior of the device by its family code.
2. It stores the device's unique serial number.
3. It validates that a device is genuine UniqueWare. Only UniqueWare Devices have the special identifier code 5E7. Other devices have a different code stored in this location.
4. It provides an 8-bit Cyclic Redundancy Check to verify the integrity of the complete ROM section.
5. It may act as node address to singulate and communicate with one device if several Automatic Identification devices are connected in parallel as a 1-Wire network.

### UNIQUEWARE DEVICES ROM SECTION Table 1

Memory Size	64-Bit ROM Registration Number					
	8-bit CRC	UniqueWare Identifier		Device Serial Number	Family Code	
512-bit		5	E	7	MSB (hex format) LSB	91
1K-bit		5	E	7	MSB (hex format) LSB	89
16K-bit		5	E	7	MSB (hex format) LSB	8B
64K-bit		5	E	7	MSB (hex format) LSB	8F
	1 byte	12 bits		36 bits		1 byte

high address

low address

In addition to the ROM, UniqueWare devices have 64 bytes (512-bit devices DS2501-UNW/DS1981U), 128 bytes (1024-bit devices DS2502-UNW/DS1982U), 2048 bytes (16K-bit devices DS2505-UNW/DS1985U) or 8192 bytes (64K-bit devices DS2506-UNW/DS1986U) of one-time programmable data memory organized as pages of 32 bytes each. Up to four of these pages are factory programmed with a unique Project ID Number, a customer-specified serialization and additional constant data patterns. The UniqueWare identifier in the ROM section together with a unique Project ID number guarantees the authenticity of original UniqueWare parts that are sold only to the owner of the Project ID or other authorized agents. Once programmed, the protected pages of UniqueWare devices cannot be altered.

## B. Structure of Data Memory

This section explains how data within the EPROM memory of UniqueWare Devices is organized. There are basically two options (Table 2):

1. combine all pages into one unnamed file (Default Data Structure) containing UniqueWare data; advantage: up to 57 (121) bytes of user data\* available
2. use one page as a directory and store the UniqueWare data as a named file (TMEX format); advantages of TMEX format:
  - a. up to 24 (80) bytes of user data\* available
  - b. give the UniqueWare data a file name
  - c. use TMEX high level functions to read the UniqueWare file
  - d. get up to two additional files together with the UniqueWare file factory-programmed to the same device (1024-bit and higher density devices only).

\* User data includes the customer specified serialization field.

### DATA ORGANIZATION OPTIONS Table 2

#### 512-bit UniqueWare Devices

	Default Data Structure	TMEX Format
Page 0	UniqueWare File	Device Directory
Page 1	UniqueWare File (cont.) or blank	UniqueWare File

#### 1024-bit and higher density UniqueWare Devices

	Default Data Structure	TMEX Format			
		Case A	Case B	Case C	Case D
Page 0	UniqueWare File	Device Directory			
Page 1	UniqueWare File (cont.) or blank	UniqueWare File			
Page 2	UniqueWare File (cont.) or blank	UniqueWare File (cont.) or blank	UniqueWare File (cont.)	second file	second file
Page 3	UniqueWare File (cont.) or blank	UniqueWare File (cont.) or blank	second File or blank	second file (cont.) or blank	third file

Regardless of which data structure is chosen, the format of the UniqueWare file is very similar. With Default Data Structure it always starts at physical address 0000H, with TMEX format it starts at address 0020H. Table 3 shows the general structure of the UniqueWare file in case of Default Data Structure. With TMEX format the UniqueWare file may occupy up to three pages (1024-bit device). Each page begins with a length byte and ends with a control byte and a CRC16, leaving up to 28 bytes per page for data. For more details please refer to Application Note 114. As with Default Data Structure the Project ID is stored in the beginning of the UniqueWare file. Pages not occupied by the UniqueWare file or device directory are available for programming by the user.

**UNIQUEWARE APPLICATION DATA Table 3****Default Data Structure**

Length	Project ID		Text 1	Serialization Number		Text 2	CRC16	
	LSB	MSB	const. data	LSB (hex. or BCD)	MSB MSB (character format)	const. data	LSB	MSB
1 byte	4 bytes assigned by DS		up to 121 bytes (no file name) extending over adjacent pages				2 bytes	

low address high address

With TMEX format there is a device directory starting at address 0000H. Details are shown in Table 4. According to TMEX rules, the most significant bit of the 1-byte file extension will be set to 1 to indicate that the UniqueWare file is write protected.

**UNIQUEWARE DEVICE DIRECTORY (TMEX FORMAT) Table 4**

Length	Device Control Field							File Entry 1			
	AA	00	00	00	00	xx <sup>1</sup>	yy <sup>1</sup>	Name	Ext.	Address	Length
1 byte	7 bytes							5 bytes		2 bytes	

low address medium address

continued

File Entry 2 <sup>2</sup>				File Entry 3 <sup>2</sup>				Control	CRC16	
N.	E.	A.	L.	N.	E.	A.	L.	00	LSB	MSB
7 bytes				7 bytes				1 byte	2 bytes	

medium address high address

- The codes “xx yy” in the device control field represent the starting page address and length of the bitmap file of used pages, as explained in Application Note 114. The codes are as follows:  
512-bit and 1024-bit devices: 00 01, 16K-bit devices: 08 01, 64K-bit devices: 08 04
- File Entries 2 and 3 are only possible with 1024-bit and higher density devices.

**III. COMPUTER-AIDED DATA SETUP****A. Overview**

Several pieces of information are needed and to get UniqueWare devices programmed for your application. To simplify the process and to avoid misunderstanding and errors introduced by retyping data from paper forms, Dallas Semiconductor has developed a program that prompts for all relevant information, does error checking and writes the result to a data carrier or disk file. Using this program to specify your special UniqueWare device is called a Project Setup Session.

A session to create a set of UniqueWare data consists of seven steps, each having its own screen:

- Screen 1 Address Section: your office address, etc.
- Screen 2 Device specification: 512-bit or higher data densities
- Screen 3 UniqueWare File, Global Specification: data structure, file name (TMEX format only)
- Screen 4 UniqueWare File, Serialization Field: length, counting style, code
- Screen 5 UniqueWare File, Text Section: optional text around the Serialization Field
- Screen 6a TMEX format only: second file specification (if space available)
- Screen 6b TMEX format only: third file specification (if space available)
- Screen 7 Saving session data to an iButton or disk file

You may jump forward or backward between screens by using the “Page Up” and “Page Down” keys of your keyboard. You may reach filled-out fields of a screen by using the cursor keys “up” or “down.” To replace data, use the backspace key or cursor “left” to erase the field and then type the new data. A session can be ended at any time. If the screen “Saving Data” is reached, the entered data can be saved for later review, approval and ordering.

## B. Getting Started

The UniqueWare setup software described in the following pages can be downloaded from the Dallas Semiconductor web site at “ftp://ftp.dalsemi.com/pub/auto\_id/”. Select the file named “unwsetup.exe” and save it as target in a new directory or on a floppy disk. Then double-click on the downloaded copy and the program will extract itself into five files called README.TXT, UNIB.BAT, UNIPS.EXE, TOUCH.EXE, EPROMPC.EXE. The UniqueWare setup software is also included on some of Dallas Semiconductor’s CD-ROMs. When installing from a CD-ROM the extracted files may be found in a directory called “C:\.....\CDROMs\AutoID\software\uniqware\” with the name of the first level of the directory tree being user-specified. Since this software is written for DOS it needs to be run through the DOS window, as explained below. Due to direct hardware access to the serial port this software may not run properly under Windows NT.

To open the DOS window click on the windows “Start” field, move the cursor to “Programs” and then click on “MS-DOS Prompt”. To toggle between full screen mode and Window mode, press Alt+Enter. Using DOS commands now access the drive and directory where the files were are stored.

UNIB.BAT is the essential program to specify UniqueWare data. This batch procedure starts the program UNIPS.EXE. The programs TOUCH.EXE and EPROMPC.EXE are simple, stand-alone utilities that allow viewing data stored in a low density NVRAM or EPROM iButton and copying data from an NVRAM iButton to an DS1982 or DS2502 device, respectively. They require a passive COM-Port Adapter such as the DS9097 or DS1413 for reading and writing NVRAM iButtons or DS9097E, which also allows copying data to an EPROM device using EPROMPC.EXE. The DS9097U adapter, for example, will not work with these programs.

UNIB.BAT allows up to two parameters to be specified when starting. The first parameter is a 1-digit number specifying the COM-port that will be used to program or read an iButton with your data. Without a COM-Port Adapter this parameter becomes a don’t care. You may specify any value from 1 to 4 that your computer accepts. However, you will not be able to program or read an iButton. You will have to store your data on a disk file instead.

The second parameter is alphanumeric. It becomes relevant if you are going to revise data that you have created in an earlier session. If you are using an iButton as data storage, a capital R will tell the program to read data from an iButton through the COM-port specified in the first parameter. If the data is stored on a disk file, just specify the full file name including path.

### Examples:

#### UNIB 2

starts the project setup software and assigns COM-Port 2 to write to an iButton

#### UNIB 2 R

starts the project setup software and assigns COM-Port 2 to first read data from an iButton and to later write back to an iButton

#### UNIB 2 DATA.DAT

starts the project setup software, assigns COM-Port 2 to write to an iButton and loads data from a file with the name DATA.DAT residing in the same directory as UNIB.BAT

## C. Ending the Program

The program is finished after data has been written to an iButton or disk file. It will then prompt for your permission to quit. However, there is an easy way to quit any time. The ESCAPE key of your keyboard can ALWAYS be used to end the program. You may be asked if you really want to quit. Enter a “Y” to quit, otherwise the program will ignore the ESCAPE and resume work at the current location. To close the DOS window, enter “exit” at the DOS prompt.

## IV. A COMPLETE SESSION

After a start without the second parameter, the empty Address Section screen appears. This screen is used to enter the customer address including phone and FAX numbers. This information provides a convenient means to contact you to double-check in case of extremely unusual data specifications.

One can move from one line to the next using the cursor keys “up” and “down” only after data has been entered. However, fields that are not always applicable, such as Mail Stop, State, FAX, may be left empty. The area code (may also include the country code) is separated from the phone number.

## UNIQUEWARE PROJECT SETUP, SCREEN 1

UniqueWare Project Setup Ver. 2.00

Address Section

Company Name :  
 Contact :  
 Street Address :  
 Mail Stop (optional):  
 City :  
 State (optional) :  
 ZIP :  
 Country :

Phone           Area Code :  
                   Number    :  
 FAX (optional) Area Code :  
                   Number    :

*(Numeric input including (/)- only)*

After this screen is filled out, one reaches the device specification screen, either after the FAX number has been entered with <RETURN> or with “Page Down”. This screen is required to select between the 512-bit UniqueWare (DS2501-UNW/DS1981U) or the higher data density versions DS2502-UNW, DS2505-UNW, DS2506-UNW or the respective iButton versions DS1982U, DS1985U, and DS1986U. **Note that the 512-bit UniqueWare is still supported by the setup software but such devices are no longer available for new designs.** Select the 1024-bit version instead. If you need 16K-bit or 64K-bit devices please specify this when sending your data file to Dallas Semiconductor, e-mail address AutoID.Support@dalsemi.com.

Depending on the device selection the global specification screen looks slightly different. In addition, if the higher data density is chosen and the UniqueWare file itself is very short, the project-setup program may have one or two more screens (screens 6 and 6a). After the device type is chosen, either by accepting the 512-bit default device or by overstriking the device type 1 by a 2 and pressing <RETURN> or “Page Down” one reaches screen 3 or 3a, Global Specification.

## UNIQUEWARE PROJECT SETUP, SCREEN 2

UniqueWare Project Setup Ver. 2.00

UniqueWare Device Specification

Select Device Type

enter 1 for 512-bit device

enter 2 for 1024-bit device

DEVICE TYPE :1

Hit <Enter> after entering Device Type to continue.

The screen “UniqueWare File, Global Specifications” is required to select between two possible data structures, called TMEX Format and Default Data Structure. For details on data structures see Table 2, Data Organization Options. Depending on the selected device type either screen 3 (512-bit) or screen 3a (1024-bit) will appear. The major difference between these screens is that screen 3a allows preselection of three different sizes for the UniqueWare file if TMEX Format is selected.

With TMEX Format (file size option 1 on screen 3, options 1 through 3 on screen 3a), one may either accept the default name IDNR.0 for the UniqueWare file (UniqueWare file selection # 1) or specify a different name and extension (UniqueWare file selection # 2). The device directory should be hardware write protected (default).

With Default Data Structure (file size option 2 on screen 3, option 4 on screen 3a) a file name cannot be specified.

After screen 3 or 3a has been reviewed or updated one reaches the next screen with “Page Down” or, if the cursor was positioned in the last applicable field, with <RETURN>.

## UNIQUEWARE PROJECT SETUP, SCREEN 3 (512-bit device)

UniqueWare Project Setup Ver. 2.00

UniqueWare File, Global Specifications

Total File Size (including Serialization Field)

enter 1 for up to 24 bytes (with file name)

enter 2 for up to 57 bytes (no file name)

FILE SIZE :1

Name of UniqueWare File

enter 1 for default name IDNR.0

enter 2 to specify desired file name

UNIQUEWARE FILE SELECTION :1

File Name :<IDNR>

File Extension (0-126) :<0>

*Only applicable with  
File Size Option 1*

WRITE PROTECT DIRECTORY (Y/N) :Y

## UNIQUEWARE PROJECT SETUP, SCREEN 3A (1024-bit device)

```

UniqueWare Project Setup Ver. 2.00

UniqueWare File, Global Specifications

Total File Size (including Serialization Field)
    enter 1 for up to 24 bytes
    enter 2 for 25 to 52 bytes
    enter 3 for 53 to 80 bytes
    enter 4 for up to 121 bytes (no file name)
FILE SIZE      :1

Name of UniqueWare File
    enter 1 for default name IDNR.0
    enter 2 to specify desired file name
UNIQUEWARE FILE SELECTION  :1

    File Name                :<IDNR>
    File Extension (0-126)   :<0>

WRITE PROTECT DIRECTORY (Y/N)  :Y
  
```

*Not applicable with File Size Option 4*

The screen “UniqueWare File, Serialization Field” is the central portion of the whole project setup system. Here the specification of the serialization is done. You may specify how much space (number of bytes) is to be reserved for serialization, if incrementing is to occur on a hexadecimal (as done internally in computers) or a decimal basis (familiar to humans), if the serialization is to be formatted for printing (direct ASCII character representation) or for efficient computation (binary number representation) and the starting value for the serialization. The screen example below shows the default settings for the fields.

## UNIQUEWARE PROJECT SETUP, SCREEN 4

```

UniqueWare Project Setup Ver. 2.00

UniqueWare File, Serialization Field

Number of bytes for serialization (2-24)  :4

Counting Style
    enter 1 for hexadecimal
    enter 2 for decimal
COUNTING STYLE      :1

Number Representation
    enter 1 for binary (includes 4 bit BCD or hexadecimal)
    enter 2 for character (8 bit ASCII code, with decimal counting only)
NUMBER REPRESENTATION  :1

Serialization starts with number:
$ _____
  
```

*Limits the maximum number of devices that can be programmed with the same Project ID*

*Preferred for machine-readable serialization e.g., node addresses*

*Best for easily printed, human readable serialization such as product identification labels*

*If a \$ appears, the starting number has to be entered in hexadecimal form*

The value you specify for “Number of bytes for serialization” directly determines the highest number and with it the maximum possible number range for serialization. If you have decided on the counting style (either hexadecimal or decimal) and the format of number representation (unsigned integer true binary, binary-coded decimal BCD or decimal character ASCII), then you can calculate the number of bytes required for the application.

As an example, if you need up to but no more than a million different serial numbers, the maximum number to be represented is 999 999.

- Counting in **decimal style** and using **character representation**, each of these digits takes 1 byte of memory. The number of bytes for serialization will be 6 in this case.
- If you opt for **BCD number representation** (which also implies decimal counting) then two digits fit into 1 byte. You will only need 3 bytes for serialization for the same number range.
- If you use **hexadecimal counting** style (which implies binary number representation) then you can distinguish 256 different numbers with one byte. Although you will again need 3 bytes for serialization, the highest possible number in this case will be as high as 16.777216 million.

Table 5 shows more examples for the maximum serialization number depending on the number of bytes reserved and the code selected. The maximum supported size for the serialization field is 24 bytes. When using character representation for serialization the serialization field must be at least 4 bytes.

#### EXAMPLES FOR THE MAXIMUM SERIAL NUMBER Table 5

Number of Bytes	2	3	4	5	6
hexadecimal	$65.535 \cdot 10^3$	$16.7772 \cdot 10^6$	$4.29496 \cdot 10^9$	$1.09951 \cdot 10^{12}$	$281.474 \cdot 10^{12}$
decimal, BCD	9 999	999 999	99 999 999	9 999 999 999	999 999 999 999
decimal, character	N/A (99)	N/A (999)	9 999	99 999	999 999

As the last item on this screen, the starting number for serialization may be specified. If the counting style is hexadecimal, the starting number also needs to be specified in hexadecimal (0, 1, 2, ... 9, A, B, C, D, E, F). This situation is indicated by a \$ sign at the beginning of the entry field. If the \$ is not shown, data is understood as a decimal number. If not otherwise specified, the serialization number starts with all zeros. **With character representation, unused bytes (“leading 0s”) are programmed as spaces (code 20H).** Although it is permissible to change the starting number with subsequent UniqueWare orders, the new number has to be higher than any serialization number that has already been used with this data set.

Usually the application determines the counting style and the type of number representation. Hexadecimal counting is the standard choice to create node addresses for networks. The decimal counting with character number representation allows one to easily generate printable as well as machine-readable electronic labels.

After the serialization screen has been completed you reach the next screen with “Page Down” or, if the cursor was positioned in the last applicable field, with <RETURN>. The screen “UniqueWare File, Text Section” allows you to specify up to two text sections surrounding the serialization field. The screen example below shows the default setting for the fields. Depending on your requirements you may select one option of “text section.” Any option other than 0 will prompt for the way you want to enter the text.

## UNIQUEWARE PROJECT SETUP, SCREEN 5

UniqueWare Project Setup Ver. 2.00

UniqueWare File, Text Section

The UniqueWare file may contain up to two text sections.

enter 0 to omit additional text.

enter 1 to define one text preceding the serialization field.

enter 2 to define one text following the serialization field.

enter 3 to define both text sections.

TEXT SECTION :0

Text consists of characters only? (Y/N) :N/A

Text 1 :<none>

*Precedes the serialization field*

*If you enter N you may enter data in hexadecimal format*

Text 2 :<none>

*Follows the serialization field*

*Required since RETURN is treated as a valid character, which is displayed as ◀*

Hit <PageDown> when finished entering text.

The most common way (default) is entering the text directly as if you were running a text editor. To select this way, press RETURN. The software will then accept any characters that your keyboard can generate. Please be aware that you are running a DOS program. Some special characters have different codes in DOS and Windows. (See section VI. of this document for verification of your text entry on the byte level.) While entering text you may use the RETURN key to split the text into several lines. Numbers entered as text are stored with their most significant digit at the lower physical address. (Numbers such as the Project ID or a binary serialization are commonly stored in the reverse direction, i. e., least significant byte at the lower address).

If you need to store information in a code other than ASCII, enter N followed by RETURN. Now you may enter any information representing text, data or control in hexadecimal form. Enter a space-character (“blank”) as a separator between individual bytes. With every byte entered the physical address location within the UniqueWare device will increment.

If you specify two text sections, be aware that **both texts are to be entered in the same way** (either character or hexadecimal). The program will count the characters or bytes you enter and prevent further input if the limit has been reached. Independent of the way you enter text, you may jump between either text section by using the cursor keys “up” and “down.” To make corrections, use the backspace key to reach the character or byte to be replaced and re-enter the trailing data. The insert/overwrite function key is not supported. When ready press the PAGE DOWN key to finish the text entry.

With the 512-bit UniqueWare device data entry is now finished and Screen 7 will appear. The same is true for the 1024-bit device if Default Data Structure was selected on Screen 3a. With TMEX Format, however, if File Size Option 1 or 2 was selected on Screen 3a, the program will next display Screen 6. **The program will not release unused pages if the actual length of the UniqueWare file is shorter than selected on Screen 3A.** The possible combinations of files are shown in Table 2. If, for example, two pages are still available the program assigns them both to the second file; a third file will be accepted

only after the data of the second file has been entered and fits on one page. If the UniqueWare file occupies two pages the size of the second file is limited to one page. After all memory is used up or if one does not specify additional files, Screen 7 will appear.

On Screen 6, Additional File Specification, one basically specifies the name of the additional file and enters data. This screen assumes that one intends to store another file. Answering the question “Store Second File?” with N will transfer to Screen 7. The specification of the file name is done in the same way as on screen 3 or 3a. However, there is no default name for the file. Possible file names consist of up to 4 printable characters. After the file name is entered one reaches the field for the file extension by using the cursor down key or by <RETURN>. The default file extension 0 can be overtyped by any decimal number in the range of 1 to 126 or accepted by again using the cursor or <RETURN>. The program will then check if this file name plus extension is already assigned to another file in the device. If the file name plus extension is duplicated it will display an error message and prompt for a different file extension. After a valid file name is entered one reaches the section of text entry. This section follows the same scheme as with Screen 5 option 1 to 3. Here also <RETURN> is a valid character displayed by a special symbol. To finish text entry one has to use the cursor down key to reach the write protect field. If the file is marked as write protected the file extension stored in the device will be modified to a value of 128 higher than the original value. The file will also be hardware write-protected, even if you did not enter any text data.

Pressing <RETURN> or “page down” finishes the screen and one either reaches Screen 6a or Screen 7.

## UNIQUEWARE PROJECT SETUP, SCREEN 6

```

UniqueWare Project Setup Ver. 2.00

Additional Files Specification (File 2)

There is space for one more data file within the device.
Do you want to store another file together with the UniqueWare?
Store Second File? (Y/N)   :Y

      File Name           : _____  A file name has to be specified
      File Extension (0-126) :0

Text consists of characters only? (Y/N)   :Y
Text   :
                                     If you enter N you may enter
                                     data in hexadecimal format

                                     Use the “cursor down” key when finished entering text. <RETURN>
                                     will be treated as a valid character, which is displayed as ◀

Write Protect File (Y/N)   :Y

```

Screen 6a works in the same way as screen 6, but it applies to a third file. After this screen is finished one reaches Screen 7, Saving Data.

## UNIQUEWARE PROJECT SETUP, SCREEN 6A

```

UniqueWare Project Setup Ver. 2.00

Additional Files Specification (File 3)

There is space for one more data file within the device.
Do you want to store another file together with the Uniqueware?
Store Third File? (Y/N)   :Y

      File Name           :
      File Extension (0-126) :0

Text consists of characters only? (Y/N)   :Y

Text   :                               (Same rules as with screen 6)

Write Protect File (Y/N)   :Y

```

Screen 7, “Saving Data to Touch Memory and/or Disk File,” is the last of the UniqueWare Project Setup Screens. It handles the dialog on how to store the generated data. The picture below shows how this screen looks initially.

You have two choices: a) storing the result of the session in a Memory iButton (“Touch Memory”) and b) saving the result to a disk file. If your computer is equipped for reading/writing iButtons, and you have specified a valid COM port number at the time of starting this program and you have a DS1993 or DS1994 available then you can program the iButton with all your UniqueWare specifications. To do this, just press ENTER and follow the instructions on screen.

## UNIQUEWARE PROJECT SETUP, SCREEN 7

```

UniqueWare Project Setup Ver. 2.00

Saving Data to Touch Memory and/or Disk File

Data Entry for UniqueWare Project Setup is finished.

Copy Data to Touch Memory DS1993? (Y/N)   :Y

```

*Enter N if you are not equipped to  
read and write memory iButtons*

```

Disk File Copy information:
  File Name   :IDNR.0   _____  DOS file name and path conventions apply
  Path       :A:\

```

```

Copy Data to Disk? (Y/N)   :Y   _____  It is recommended to save the results of a session

```

After an iButton has been programmed, or if you have selected N before pressing ENTER, you reach the section, which specifies the name and path of the disk file to save the data of the session. The default file name is either IDNR.0 or the same as specified on screen “UniqueWare File, Global Specification.” The

default path is copied from the drive/directory where the Project Setup Software was started. You may replace the default path and file name with any other specification within the DOS conventions. If you want to finish this session without saving at all, accept the default file information and specify N at the subsequently reached field or press ESCAPE.

If you like to review the session before saving, simply use the Page Up and Page Down keys to jump from one screen to another. The arrow up/down keys allow you to reach every applicable field. You may erase and retype any data.

## V. REVIEWING DATA

After the data generated in a session has been saved either to an iButton or a disk file you can reload it into the Project Setup program, check it, modify it and save it again some time later. The examples in the section “Getting Started” in the beginning of this manual show how to start the program if it has to read from an iButton or disk file. If you load data from an iButton (second command line parameter is R), the program will prompt you to probe the iButton before the Address Section screen appears.

After data has been read from a device or file it is automatically checked for consistency. A modification, for example, from loading the data file to a word processor and saving it even without intentional changes will be discovered by non-matching checksums or other inconsistencies. The data will then be useless and has to be re-entered from scratch. A text editor such as NOTEPAD, for example, replaces a 00 byte with a 20H byte, which represents a space rather than a binary number.

## VI. READING OUTPUT DATA

The format of the first two pages (512-bit device) or four pages (1024-bit or higher data densities) of the data carrier (disk or iButton) that contains the UniqueWare application data are described in detail in the beginning of this document. The only difference between the data submitted and actual programmed devices is that the Project ID field contains 0s rather than your personal Project ID number. Pages 2 and 3 are not accessible with the 512-bit device and will always read “FF” hex.

To get the application data into its intended location and to be able to track products during manufacturing, additional information is required. Beginning at page 4 and extending up to page 14, this information is stored as a Universal Data Packet with several embedded sections. Each of these sections is preceded by an Output ID String, directly followed by the associated data and terminated by the ASCII code for RETURN (0D hex) as a delimiter. See Table 6 for a list of Output ID Strings, their meaning and codes.

To see all the details of a UniqueWare data file you need a program that displays the file contents as hexadecimal data. If you saved your data to an iButton you can use the DOS program TOUCH.EXE or the Windows “iButton-TMEX Runtime Environment (RTE)”, a TMEX-based program with specialized viewers for most 1-Wire chips and iButtons. When running this program make sure that “Debug Enable” of the Options menu is checkmarked and select the “Debug Viewer” to read and display the UniqueWare data in a hexadecimal form. This program and a detailed Reference Manual can be downloaded for free from the iButton Web Site <http://www.ibutton.com/software/tmex/index.html>. If you saved your data to a disk file you need a utility program that often is referred to as “Hex Viewer” or “Hex Editor”. Such programs can be downloaded as Freeware or Shareware from various web sites worldwide, including <http://www.freewarehome.com/>. Let the site’s search engine list all documents that include the string “hex viewer”.

**OUTPUT ID STRINGS Table 6**

<b>OUTPUT ID STRING: MEANING</b>	<b>SPECIFIED WHERE/ THROUGH</b>	<b>VALID CODES/ MEANING</b>
DV: device & data structure	device specification; global specification/file size	1D/512-bit, Default Data Structure; 1E/512-bit, TMEX Format; 2D/1024-bit, Default Data Structure; 2E/1024-bit, TMEX Format; 5D/16K-bit, Default Data Structure; 5E/16K-bit, TMEX Format; 6D/64K-bit, Default Data Structure; 6E/64K-bit, TMEX Format
P0: page 0 control info	(derived by combining several data inputs from different screens)	1st letter: P/program and protect, N/no programming, Y/program, no protection 2nd letter: C/display text as character, H/display text in hex. format, (space)/C, H are not applicable
P1: page 1 control info	(same as with P0:)	(same as with P0:)
P2: page 2 control info	(same as with P0:)	(same as with P0:)
P3: page 3 control info	(same as with P0:)	(same as with P0:)
SESTA: ser. start address	(various sources)	16-bit binary number/byte address of the beginning of the serialization field
LEN: length of serialization	serialization field/number of bytes	8-bit binary number/number or bytes for serialization
CNT: counting style	serialization field/ counting style	HEX/true binary counting (not BCD) DEC/decimal counting (BCD or character)
COD: code for counting	serialization field/number representation	BIN/binary coding (hex. or BCD) ASC/ASCII character coding (decimal)
START#: starting number	serialization field/ser. start number	binary number of LEN bytes/serialization start number
CN: company name	address section/company name	ASCII string up to 40 characters
CT: contact person	address section/contact	ASCII string up to 40 characters
AD: street address	address section/street address	ASCII string up to 40 characters
MS: mail stop	address section/mail stop	ASCII string up to 10 characters
CI: city name	address section/city	ASCII string up to 30 characters
ST: state name	address section/state	ASCII string up to 10 characters
ZI: ZIP or postal code	address section/ZIP	ASCII string up to 10 characters
CO: country name	address section/country	ASCII string up to 20 characters
PH: phone number	address section/phone	ASCII string, two section of up to 10 characters each, separated by a space
FX: FAX number	address section/FAX	ASCII string, two section of up to 10 characters each, separated by a space
DC: date code	(computer clock)	ASCII string MMDDYY hh:mm:ss R.rr/ date of data creation and program revision

## VII. HAND-CRAFTING UNIQUEWARE PROTOTYPES

If you are equipped for programming Add-Only Memories such as DS1982, DS1985, DS1986 (DS9097E COM port adapter) then you can create your own UniqueWare prototypes. These prototypes differ in two important details from real UniqueWare parts: They have neither the UniqueWare ROM code nor a valid Project ID. Such prototypes therefore cannot provide the desired authentication. However, they allow you to look ahead at what you will get and you can continue with the development of your application software. To create such electrically functional prototypes you also need “blank” DS2502 or DS1982 devices, cable to connect the DS2502 as well as an iButton to the DS9097E and at least one DS1993 for intermediate data storage. As preparation, set up your UniqueWare data structure and write the result to the DS1993.

Next run the program EPROMPC.EXE and copy the data from the iButton to the DS2502/DS1982. You may then write-protect the DS2502/DS1982 with another function of EPROMPC. Now run the UniqueWare project setup software again, load the data from the DS1993 iButton, manually increment the Serialization Number and write the result back to the iButton. Now you can again run EPROMPC and program the next device, and so on.

Instead of the DOS program EPROMPC you can use the Windows iButton Copy Machine to copy data from the DS1993 to an EPROM device. The Windows program also supports the higher density devices DS1985/DS2505 and DS1986/DS2506. The copy program can be downloaded for free from [ftp://ftp.dalsemi.com/pub/auto\\_id/softdev/softdev.html](ftp://ftp.dalsemi.com/pub/auto_id/softdev/softdev.html). In the section “iButton-TMEX SDK source code examples” click on “iButton Copy Machine”, save the ZIP file and extract “Ibcopmac.exe”. This application program requires iButton-TMEX Windows 95/NT drivers version 3.10 or newer. These drivers are included in the “iButton-TMEX Runtime Environment (RTE)”, which is mentioned in the section “Reading Output Data”.

## VIII. SKIPPING NUMBER RANGES

During the lifetime of a UniqueWare project it may be necessary to jump forward in the serialization and start at a significantly higher number to indicate a major revision of the product the UniqueWare is embedded in. In such a situation please contact your local Dallas Sales Representative or send e-mail to [AutoID.Support@dalsemi.com](mailto:AutoID.Support@dalsemi.com) or send a fax to (972) 371-3715 specifying your company name, Project ID and the new starting number. The Project ID will not be affected by skipping a number range. **Ranges that once have been skipped cannot be re-used later.** Changes to the text data or serialization style will require a new data file **and** a new Project ID.

## IX. ORDERING INFORMATION

The UniqueWare Project Setup Software as described in this document can be downloaded from the Dallas Semiconductor web site. See section III.B of this document for details. Technical information on UniqueWare devices is found in the DS1982/DS1985/DS1986U and DS2502/DS2505/DS2506UNW data sheets, which can be downloaded from the Dallas Semiconductor web site.

Plastic-packaged UniqueWare devices can be ordered as tape & reel version. When ordering tape & reel, please be aware that there is a certain yield loss in the process of putting the devices on the tape. For the TO-92 and SOIC package this loss is  $1.0 \pm 0.2\%$ , and  $2.0 \pm 1.0\%$  for the TSOC package. To get full reels, it is a good idea to increase the order size by the expected yield loss and have excess devices (if any) shipped separately. One reel holds either 2000 TO-92 packages or 2500 SOIC packages or 4000 TSOC packages.