



ubconvert
USER'S GUIDE



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About this Guide

This Guide supposes that you have a working knowledge of UniBasic. You should, for example, know how to run the **ubrebuild** utility and your backup programs. A knowledge of the files and how logical units are organized on disk will also be helpful.

This Guide also assumes that you understand the fundamental operations of both UniBasic and Unix. Consult the [UniBasic Reference Guide](#) and your Unix manuals as needed. If you experience difficulty, please contact your dealer or distributor.

Typographical Conventions

This guide uses the following typographic conventions:

Example of convention	Description
GOSUB	Capitalized words in bold indicate language-specified reserved words.
KILL <i>filename</i>	Variables are shown in italic type for clarity and to distinguish them from elements of the language itself.
LIST	Mono-spaced type is used to display screen output and example input commands and program examples.
<letter>	Information inside angle brackets <> must be from specified group, e.g., a single letter.
WHILE UNTIL	A vertical bar indicates that the user must choose one of the items.
[<i>expr</i>]	Items inside square brackets are mandatory.
{ <i>expr</i> }	Items inside braces are optional.
stmt {\ stmt} ...	A series of three periods (...) indicates that the item preceding them can be repeated one or more times.

Introduction

The user may create Universal Data files with UniBasic version 6 and higher. Non-Universal Data files may be converted to Universal Data files with the ubconvert program. This Guide will describe Universal Data files and the ubconvert program.

Universal Data Files

The benefits of UniBasic Universal Data files are:

- They are accessible by all current DCI language products. The user may access the data file(s) with UniBasic, dL4, and IQ programs.
- They are platform independent. The data file(s) may be moved from the system on which created to a system running either Windows or a different version of Unix and be used by that system's UniBasic, dL4, and IQ programs.
- The user cannot inadvertently corrupt the deleted record list of Indexed files.

The following table summarizes the file capabilities of DCI Products with respect to UniBasic Universal Data files.

DCI Product-Version-Platform			Convertible	Build	Access
UniBasic	4	Unix	Yes	No	No
UniBasic	5	Unix	Yes	No	No
UniBasic	6	Unix	Yes	Yes	Yes
dL4	2	Unix			No (1)
dL4	2	Windows			No (1)
dL4	3	Unix			Yes
dL4	3	Windows			Yes
IQ	3	Unix			No
IQ	4	Unix			Yes
IQ	5	Windows			Yes

Note 1. dL4 version 2 can access Universal Files, but it uses a record locking protocol which is incompatible with UniBasic version 6 or dL4 version 3.

The Universal Data files are accessible across all platforms by the following DCI products:

Platform	DCI Product
Unix all	UniBasic (version 6 and higher)
Unix all	dL4 (version 3 and higher)
Unix all	IQ (version 4 and higher)
Windows	dL4 for Windows (version 3.0 and higher)
Windows	IQ for Windows (version 5 and higher).

Creating Universal Data Files

- UniBasic version 6 UniBasic files are Universal Data files if they have a 'U' attribute. A Universal Data file is created with the **BUILD** or **CREATE** statements if the environment variable **PREALLOCATE** has the 8192 flag set or the Supplemental Protection Attribute 'U' is specified in the filename expression.
- dL4 version 3 A file created with an Option Item in the file.spec that includes (NUMMAP=IRIS, CHARSET=IRIS) will be compatible with UniBasic version 6 Universal Data files.
- UniBasic version 5 Cannot create Universal Data files. Files must be converted using the DCI ubconvert program or the DCI ubconvertfiles utility.
- UniBasic version 4 Cannot create Universal Data files. Files must be converted using the DCI ubconvert program or the DCI ubconvertfiles utility.

Note: UniBasic Data files, once converted to Universal Data files, will not be accessible with DCI Products prior to UniBasic release 6, IQ for Unix release 4, IQ for Windows release 5, and dL4 release 3.

Getting Started

This section is an overview of the general information needed to run the ubconvert program.

ubconvert and the **ubconvertfiles** utility are part of the UniBasic (version 6 or greater) distribution. They are executable from the Unix command line.

DCI strongly recommends that you backup your files before conversion.

File Requirements

To guarantee proper conversion to a UniBasic Universal data file, the non-Universal file must be an IRIS style BCD Data file. A file is an IRIS BCD Data file if it was created with the environment variable **PREALLOCATE** 32 flag set or the Supplemental Protection Attribute <Q> was specified in the filename expression. The **QUERY** utility may be used to determine if the attribute <Q> has been set. In the special case of a data file(s) with only string data, a file(s) without the <Q> attribute may be converted with the '-F' option. This is a dangerous option and the results are unpredictable.

Binary data (i.e. packed data) should be avoided for maximum platform independence.

For Indexed files, the Key file must not have IRIS style keys (i.e. must not have the attribute <K> set). The **QUERY** utility may be used to determine if the attribute <K> has been set. It should be noted that the filename of an Indexed file must be 4 characters less than the maximum length allowed by the file system. This is necessary to accommodate the *.ide* extension added to the Indexed portion of the file. Check your system documentation for any filename limits.

Source file(s) must be converted on the native platform on which they were created.

File Permissions

Most 'file open' errors arise from either incorrect file permissions or file(s) are not accessible.

Read and write permissions are required to convert a file. Converted files will retain the permissions and ownership of the original files.

The conversion utility is executed from the Unix environment and does not use the UniBasic **LUST** or the dL4 **LUMAP** mechanisms to find files. The file's path, either absolute or relative, must be part of the filename.

The file(s) to be converted must not be in use by another user.

Disk Space

Converting an Indexed file(s) to a Universal Data file(s) adds a small amount of overhead, typically 1% or less, to the storage requirements of the Index portion of the Indexed file(s). Therefore, the number of records a file of a given size will contain is somewhat less with a Universal Data file.

If converting file(s) in place, the free disk space should be at least the size of the Index portion of the largest file being converted.

If converting file(s) to another directory, the free space on the disk that contains the directory should be at least the total size of all the file(s) being converted.

Verify sufficient disk space is available before starting a conversion.

The ubconvert Program

The **ubconvert** program is a user friendly interface to the **ubconvertfiles** utility, used for converting UniBasic non-Universal Data files to UniBasic Universal Data files. We made **ubconvert** as painless and simple to use as possible while enhancing the power and flexibility of the underlying utility.

ubconvert allows the user to minimize the amount of monitoring required, choose the level of reporting, and streamline the conversion process by specifying files to convert by directory or from an input file that contains a file list. It may also be used to help generate a file list.

Features of the Utility

ubconvert incorporates the following features:

- Specify files to convert by directory.
 - Specify files to convert by type.
 - Specify files to convert from an input file.
 - Retain original files unchanged.
 - Specify a destination directory for the converted files.
 - Specify a destination directory and name for the log files.
 - Generate a list of files to convert.
 - Control the action on encountering errors.
 - Report file statistics without converting.
 - Choose the level of file statistics reported.
 - Automatic logging of file statistics and errors in separate files.
 - On-line Help documentation.
-

How UniBasic Files are Converted

UniBasic Formatted, Contiguous, and Indexed-Contiguous Data files may be converted to UniBasic Universal Data files if they contain IRIS style BCD data.

Converted files will have the 'U' attribute set in their file header and the data will remain unchanged. The UniBasic utility **QUERY** may be used to display file attributes.

The Indexed portion of an Indexed-Contiguous file is scanned and the keys are copied to a file of the same name with a *.idx* extension. The old index file, with the uppercase filename, is deleted. It should be noted that the filename of an Indexed file must be 4 characters less than the maximum length allowed by the file system. This is necessary to accommodate the *.ide* extension added to the Indexed portion of the file. Check your system documentation for any filename limits.

Other file types are not convertible to Universal Data files.

Executing the Program

The following is a checklist of items to consider before starting the conversion.

1. Files have been BACKED-UP.
2. Files are not corrupt.
3. Files do not contain binary (e.g. packed) data.
4. Index Files do not contain IRIS style keys.
5. Files are IRIS BCD type data files.
6. Files have proper permissions.
7. Files are accessible.
8. There is sufficient free disk space.
9. Files are not in use by another user.

ubconvert is a stand alone program that presents the user with an interface to the **ubconvertfiles** utility. The location of these programs should be in the **PATH** environment variable.

ubconvert provides many options to modify and/or control its operation, but to run the program with only the defaults in effect type:

```
ubconvert name
```

from the Unix command line, where *name* is the absolute or relative path and name of a file or a directory. If *name* is a directory all files in that directory and any sub-directory will be processed.

You will need to respond to two prerequisite questions before the conversion is started. The first prerequisite question is:

The following prerequisites should be satisfied before running ubconvert:

1. All files must be backed up so that they can be restored if any problems occur.
2. All indexed files with corrupted free record lists should be repaired with the ubrebuild utility.
3. All files and directories to be converted must be accessible with write permission.
4. Sufficient disk space must be available for temporary use during conversion (the -n option provides an estimate of the amount of disk space needed).

Have all of these prerequisites been satisfied? (Yes or No, default = No)

The second prerequisite question is:

Files must not be in use while they are being converted. If a file is being accessed while it is being converted, the file may be corrupted.

Are the files in use by anyone? (Yes or No, default = Yes)

If the program finds an existing log file, it will ask the question:

Log file (ubconvert.log) exists. Overwrite file? (Yes or No, default = Yes)

If the program finds an existing error file, it will ask the question:

Error file (ubconvert.err) exists. Overwrite file? (Yes or No, default = Yes)

Upon completion the program will display the following information:

report:

Conversion information will be logged to ubconvert.log

Conversion errors will be logged to ubconvert.err

Errors have been detected during the conversion. Please examine the file ubconvert.err for a list of errors.

```
1 file(s) processed
0 file(s) not converted due to errors
0 file(s) ignored
```

The log files are available for inspection.

Log Files

The program logs information about the conversion in two files located in the present working directory or an optionally specified directory.

- `ubconvert.log` contains information about the conversion. The amount and type of information logged may be controlled with the `-v` option. The default is `-v 4` reporting. Options allow the user to specify another directory and/or name for this file. This file, if generated with the `-n` option, is suitable for use with the `-f` option. An example of the `ubconvert.log` is:

```
ubconvert: File conversion started at Wed Apr  8 11:23:46 PDT 1998
ubconvert: options = -v 4
ubconvert: file list =
ubconvert: file/directory arguments = tmp/tmp2/filename
Converting file: tmp/tmp2/filename
'tmp/tmp2/filename' is an Indexed file with 1 indices, 10 active
record(s) of 70 words each
Number of records in free-list 0
Converting directory: 1
Adding key: 1356TL      record #: 1
Adding key: 1743UC      record #: 2
Adding key: 4549DL      record #: 3
Adding key: 6433WL      record #: 4
Adding key: 7857BB      record #: 5
Adding key: 8391PP      record #: 6
Adding key: 8392PP      record #: 7
Adding key: 8564CD      record #: 8
Adding key: 8595RS      record #: 9
Adding key: 9416GW      record #: 10
Added a combined total of 10 keys
IRIS character set selected
IRIS Precision Map selected
```

```
1 files processed
All file(s) converted
ubconvert: Finished at Wed Apr  8 11:23:48 PDT 1998
1 file(s) processed
All files converted
```

- `ubconvert.err` contains information about any errors encountered during conversion. Options allow the user to specify another directory and/or name for this file. An example of `ubconvert.err` is:
Error processing file 'tmp/tmp2/filename': unable to open
c-tree file c-tree error number 46

Options

The full syntax of the `ubconvert` program is:

```
ubconvert { -e path | -f path | -h | -i x | -l path | -n | -o dir | -t x | -v n | -V | -y } [ fn | dir ]
```

fn is a space separated list of the absolute or relative path and name of the file(s) to be converted.

dir is a space separated list of the absolute or relative path and name of the directory(s) of file(s) to be converted. Sub-directories to *dir* will also be processed.

The following options are available to modify the operation of the ubconvert program:

-e *path* user may specify the name and/or location of the error log file. *path* specifies the absolute or relative path and name of the error log file. If not specified errors are written to the file ubconvert.err in the current directory.

-f *path* user may specify that the names of the files to be converted are to be taken from a file. *path* is the absolute or relative path and name of such a file.

-h display the command syntax.

-i *x* user may specify options for converting Indexed files. '*x*' is case insensitive and can be one or a combination of d and c, e, f, or p.

Options c, e, f, and p are mutually exclusive and control the actions to take upon finding a corrupt deleted record list in the Indexed file.

c creates new file with a clear deleted record list

e aborts the conversion of the file

f forces creation of the new deleted record list as it is

p retain existing deleted list to the point of corruption (default)

Option d disables the count of "records-in-use" maintained in the index. Disabling the count will increase file performance when deleting or adding records. It will also, however, cause **SEARCH** statement mode 1, index 0 to report an incorrect result for STATUS=1 (number of available records) and STATUS=7 (number of records in use). In both cases the result will assume that there are no deleted records in the file. Disabling the count does not prevent the reuse of deleted records; it only effects the **SEARCH** functions that return record counts. Note that the "number of records available" is, in fact, always inaccurate because Universal files are dynamically expandable up to the amount of disk space available. The **QUERY** utility uses the **SEARCH** statement and will display an incorrect active record count for any file with the "records-in-use" count disabled.

-l *path* user may specify the name and/or location of the conversion log file. *path* specifies the absolute or relative path and filename of the conversion log file. If not specified statistics are written to the file ubconvert.log in the current directory.

-n non-conversion mode. Print file statistics to the log, but do not convert the file(s). If -n is specified, any -v option specified is ignored. The level of statistics logged will be as specified by the -v 4 option. The resulting log file is suitable for use with the -f option.

-o *dir* user may specify that the Universal file(s) are to be built in another directory and the original file(s) are unchanged. *dir* is the absolute or relative path to that directory.

-t *x* user may specify that only certain file types from the input file list or directory are to be converted. *x* is case insensitive and can be any combination of c, f, or i where

c specifies Contiguous files

f specifies Formatted files

i specifies Indexed files

-v *n* user may specify the amount and type of information logged to the ubconvert.log file. *n* may be 0, 1, 2, 3, 4, 5, or 9 depending on the level of information desired. Refer to the Statistical Reports section for a more complete description of information reported at each level. The default is 4.

-V prints the version number of this program.

- y bypasses the prerequisite questions, which give the user a chance to abort before doing the conversion.

Statistical Reports

Statistical information is written to the file `ubconvert.log`, unless otherwise specified. The user may select the level of detail returned in the statistical report. Each succeeding level returns the previous levels of detail plus its own details. Level 0 (the default) returns the name of the file being converted. Level 1 returns the type of file, number of records, number of indices (if an Indexed file), size of records in words, and number of Items per record (if a Formatted file). A count is also returned of the files processed, converted, and not converted due to errors. Level 2 returns information about the indices of Indexed files. The number of keys, the number of records in the free list, the character set, and the Precision Map selected are returned. Level 3 returns an indication for each directory in the index that is processed. Level 4 returns the keys processed for each directory in the index. Level 5 returns a list of the free records in an Indexed file. Level 9 returns the information of all levels.

The following is an example of the statistical output of an Indexed file conversion using each -v option level:

```

level  stdout
0      Converting file: filename

1      Converting file: filename
       'filename' is an Indexed file with 1 indices, 10 active record(s) of 70
       words each

       1 files processed
       All file(s) converted

2      Converting file: filename
       'filename' is an Indexed file with 1 indices, 10 active record(s) of 70
       words each
       Number of records in free-list 1
       Added a combined total of 10 keys
       IRIS character set selected
       IRIS Precision Map selected

       1 files processed
       All file(s) converted

3      Converting file: filename
       'filename' is an Indexed file with 1 indices, 10 active record(s) of 70
       words each
       Number of records in free-list 1
       Converting directory: 1
       Added a combined total of 10 keys
       IRIS character set selected
       IRIS Precision Map selected

       1 files processed
       All file(s) converted

4      Converting file: filename
       'filename' is an Indexed file with 1 indices, 10 active record(s) of 70
       words each
       Number of records in free-list 1

```

- ```
Converting directory: 1
Adding key: 1356TL record #: 1
Adding key: 4549DL record #: 3
Adding key: 6433WL record #: 4
Adding key: 7857BB record #: 5
Adding key: 8391PP record #: 6
Adding key: 8392PP record #: 7
Adding key: 8564CD record #: 8
Adding key: 8595RS record #: 9
Adding key: 9416GW record #: 10
Added a combined total of 10 keys
IRIS character set selected
IRIS Precision Map selected

1 files processed
All file(s) converted
```
- 5    Converting file: *filename*  
      '*filename*' is an Indexed file with 1 indices, 10 active record(s) of 70 words each  
      Number of records in free-list 1  
      Converting directory: 1  
      Adding key: 1356TL record #: 1  
      Adding key: 4549DL record #: 3  
      Adding key: 6433WL record #: 4  
      Adding key: 7857BB record #: 5  
      Adding key: 8391PP record #: 6  
      Adding key: 8392PP record #: 7  
      Adding key: 8564CD record #: 8  
      Adding key: 8595RS record #: 9  
      Adding key: 9416GW record #: 10  
      Added a combined total of 10 keys  
      **Record Number 2 is free**  
      IRIS character set selected  
      IRIS Precision Map selected  
  
      1 files processed  
      All file(s) converted
- 9    Converting file: *filename*  
      '*filename*' is an Indexed file with 1 indices, 10 active record(s) of 70 words each  
      Number of records in free-list 1  
      Converting directory: 1  
      Adding key: 1356TL record #: 1  
      Adding key: 4549DL record #: 3  
      Adding key: 6433WL record #: 4  
      Adding key: 7857BB record #: 5  
      Adding key: 8391PP record #: 6  
      Adding key: 8392PP record #: 7  
      Adding key: 8564CD record #: 8  
      Adding key: 8595RS record #: 9  
      Adding key: 9416GW record #: 10  
      Added a combined total of 10 keys  
      Record Number 2 is free  
      IRIS character set selected  
      IRIS Precision Map selected  
  
      1 files processed  
      All file(s) converted

## Cleanup

The log files should be inspected and renamed and/or removed as necessary. Subsequent execution of the program may overwrite these files. The log files may provide useful information if problems arise during testing of the converted files. DCI recommends thorough testing of the converted files with existing programs before putting into production.

# Appendix A: Troubleshooting

The most common problems encountered using the conversion utilities are addressed in this section. This Guide assumes a basic knowledge of both UniBasic and Unix. For problems pertaining to UniBasic, consult the [UniBasic Reference Guide](#). For problems related to Unix, consult your Unix manuals.

The following messages are examples of user correctable conditions that may cause the file(s) to not be converted.

**MSG** Error processing file '*filename*': due to No such file or directory

**A** Could not find the specified file '*filename*'; check for correct name and path.

**MSG** Error processing file '*filename*': detected non-convertible file type: Unix

**A** The file '*filename*' is neither a formatted, contiguous, nor indexed contiguous file.

**MSG** Error processing file '*filename*': is a BITS file

**A** The file '*filename*' is not a BCD file. The attribute <Q> is not set for this file.

**MSG** Error processing file '*filename*': file contains IRIS style keys

**A** The index file has the attribute <K> set.

**MSG** Error processing file '*filename*': detected non-convertible file type: dL4  
Contiguous with map

**A** '*filename*' is already a UniBasic Universal Data file or a dL4 portable file.

**MSG** Error processing file '*filename*': unable to open c-tree file c-tree error number 46

**A** The Indexed portion of '*filename*' is corrupt.

**MSG** Error processing file '*filename*': due to Permission denied

**A** Give the user Read and Write permissions to the file '*filename*'.

**MSG** ubconvert: ubconvertfiles: not found

**A** The utility ubconvertfiles is not in the user PATH.

**MSG** Error processing file '*filename*': encountered non-requested file type

**A** '*filename*' is not the file type specified with the -t x option.

Messages that include a c-tree error. Refer to the c\_tree documentation to determine the cause of the failure.

- destination filename too long
- unable to create index file
- unable to create directory
- unable to close newly created index file
- unable to reopen newly created index file
- could not add key 'keyval' in index
- error searching index
- lseek error in AddDeletedRecords
- could not read ctree-header from Indexed file
- could not add deleted record
- unable to close newly created index file
- unable to open destination file

---

cannot determine record count  
cannot lseek before writing

Messages that include a Unix system error. Refer to the Unix system error documentation to determine the cause of the failure.

cannot stat UniBasic file  
cannot chmod destination file  
cannot chown destination file  
cannot lseek to data area in source file  
unable to get size for file

# Appendix B: ubconvertfiles Utility

**SYNOPSIS: Convert UniBasic file(s) to Universal file(s).**

**\$ ubconvertfiles** {-h | -i x | -n | -o dir | -t x | -v n | -C h | -F | -V} *filenames*

## DESCRIPTION

*ubconvertfiles* converts non-Universal UniBasic Indexed, Contiguous, and Formatted file(s) to Universal file(s). The source file(s) must be UniBasic BCD file(s) and must be converted on the native platform. The Indices must not contain IRIS style keys, e.g. the file(s) were created with the **PREALLOCATE** option 64 not set. Binary data (e.g. packed data) should be avoided for maximum platform independence.

The converted file(s) may be read on a different hardware platform using UniBasic and dL4. The converted file(s) may also be read on a Microsoft Windows system using version 3.0 and higher of dL4 for Windows.

It is recommended that you have a current backup of the file(s) to be converted before processing. Also, verify that the file(s) to be converted are currently not in use by someone else. In other words, no one should have the file(s) open.

---

**Note:** You may use the *ubrebuild* utility to verify the integrity of an Indexed file's deleted record list before running this program.

---

*filenames* is a space separated list of files to convert to UniBasic Universal data files. Wildcards characters are accepted in *filenames*.

The command line options are:

- h      print help.
- i x    where 'x' is case insensitive and specifies the option(s) for Indexed Contiguous files. Options c, e, f, and p are mutually exclusive, but may be combined with d to produce the desired results.
  - c    converted file will have no deleted record list.
  - e    abort on corrupted deleted record flag; file is not converted.
  - f    ignore any deleted record flag error; convert file with a possibly corrupt deleted record list.
  - p    on deleted record flag error, stop building the deleted record list and retain the portion of the list already processed. (default)
  - d    disable "records-in-use" count for dL4 files (non-default). Disabling the count will increase file performance when deleting or adding records. It will also, however, cause **SEARCH** statement mode 1, index 0 to report an incorrect result for STATUS=1 (number of available records) and STATUS=7 (number of records in use). In both cases the result will assume that there are no deleted records in the file. Disabling the count does not prevent the reuse of deleted records; it only effects the **SEARCH** functions that return record counts. Note that the "number of records available" is, in fact, always inaccurate because Universal files are dynamically expandable up to the amount of disk space available. The **QUERY** utility uses the **SEARCH** statement and will display an incorrect active record record count for any file with the "records-in-use" count disabled.

- n report information about the file(s) without performing a conversion. May be used to test file(s) and/or gather information on file(s). The information reported is the file name, file type, file format, UniBasic release level, workspace, convertible status, and summary of file(s) processed. For example:

```

cust.master
 Type: INDEXED
 Format: BCD
 Created on UniBasic Level: 5.5
 Work space needed: 2936
 Convertible

```

```

1 file(s) processed
All file(s) are convertible

```

The listing of *filenames* as generated by the *ls* command may be redirected to a file, the file inspected and edited as needed, then used as input to the *ubconvertfiles* utility. For example:

```
ls * >files
```

Creates the file '*files*' which contains the name of all the files in the present working directory. This file may be inspect and/or edited, then used as the source of *filenames* to the *ubconvertfiles* utility as follows:

```
cat files | xargs ubconvertfiles -v9
```

- o *dir* build the Universal file(s) in directory '*dir*' and keep the original file(s) unchanged.
- t *x* where '*x*' is case insensitive and specifies the file type to convert. Multiple options may be specified.
  - i for Indexed
  - c for Contiguous
  - f for Formatted
- v *n* verbose mode '*n*' where '*n*' may be 0, 1, 2, 3, 4, 5, or 9. Each verbose mode outputs its own statistics plus those of the lower modes. Examples may be found in the Statistical Reports section of the *ubconvert User's Guide*.
- C *h* specify dL4 Character set '*h*'.
- F force conversion of non-BCD file(s).
- V print version number of this utility.

### EXAMPLES

```

ubconvertfiles -h
ubconvertfiles -o /tmp /usr/ub/files/ar1
ubconvertfiles -t c /usr/ub/data/sales2

```

### ERRORS

```

Error processing file 'filename': detected non-convertible file type: Unix
Error processing file 'filename': is a BITS file
Error processing file 'filename': file contains IRIS style keys

```

**See also:** Contiguous Files, Formatted Files, Indexed Files, and Universal Files in the UniBasic Reference Guide.