

IDRISI Vector Format Reader/Writer

The IDRISI Vector Format Reader and Writer modules allow the Feature Manipulation Engine (FME) to read and write IDRISI vector files. IDRISI files use a published binary format. The IDRISI data and the documentation file structure are described in the *IDRISI Guide to GIS and Image Processing, Volume 1*.

IDRISI Quick Facts

Format Type Identifier	IDRISI
Reader/Writer	Both
Licensing Level	Base
Dependencies	None
Dataset Type	Directory or File
Feature Type	File base name
Typical File Extensions	.vlx, .vct, .vdc (.mdb, .adc)
Automated Translation Support	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Color Support	No
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type	idrisi_type

Geometry Support			
Geometry	Supported?	Geometry	Supported?
aggregate	no	point	yes
circles	no	polygon	yes
circular arc	no	raster	no
donut polygon	yes	solid	no
elliptical arc	no	surface	no
ellipses	no	text	no
line	yes	z values	no
none	no		

Overview

IDRISI is a geographic information and image processing software system that is widely used by universities worldwide. It is a two-dimensional (2D) system which allows user-defined attributes stored in an Access database to be linked to its data file.

IDRISI features contain a feature geometry and an id number. An IDRISI file consists of at least two physical files, having the following filename extensions:

Filename Extension	Contents
.vct	Vector data file
.vdc	Vector documentation file

If an Access database is available, the following files should also be available:

Filename Extension	Contents
.v1x	Vector link information file
.mdb	Access database file
.adc	Attribute documentation file

These extensions are added to the basename of the IDRISI file.

The IDRISI reader and writer support the storage of point, line, area (polygon), and text geometric data in the .vct files.

The FME considers an IDRISI dataset to be a collection of IDRISI files in a single directory.

Reader Overview

The IDRISI reader first scans the directory it is given for the IDRISI files defined in the mapping file.

For each IDRISI file that it finds, it checks to see if that file is requested by looking at the list of IDs specified in the mapping file. If a match is made or no IDs were specified in the mapping file, the IDRISI file is opened. The IDRISI reader then extracts features from the file one at a time, and passes them on to the rest of the FME for further processing. If an additional Access database is available, the user-defined attributes will also be passed to the FME. When the file is exhausted, the IDRISI reader move on to the next file in the directory.

Optionally, a single IDRISI file can be specified in the mapping file. If this is the case, only that IDRISI file is read.

Reader Directives

The suffixes listed are prefixed by the current <ReaderKeyword> in a mapping file. By default, the <ReaderKeyword> for the IDRISI reader is IDRISI.

DATASET

Required/Optional: *Required*

The value for this directive is the directory containing the IDRISI files to be read, or a single IDRISI file. A typical mapping file fragment specifying an input IDRISI dataset looks like:

```
IDRISI_DATASET /usr/data/idrisi/input
```

DEF

Required/Optional: *Required*

Each IDRISI file must be defined before it can be read. The definition specifies the base name of the file, and the names and the types of all attributes. The syntax of an IDRISI DEF line is:

```
<ReaderKeyword>_DEF <baseName> \
  [<attrName> <attrType>]+
```

The following table shows the attribute types supported.

Field Type	Description
char (<width>)	Character fields store fixed-length strings. The width parameter controls the maximum number of characters that can be stored by the field. No padding is required for strings shorter than this width. For the IDRISI database, the width is limited to a maximum of 255.
date	Date fields store date as character strings with the format YYYYMMDD.
double	Float fields store 64-bit floating point values. There is no ability to specify the precision and width of the field.
integer	Integer fields store 32-bit signed integers.
logical	Logical fields store TRUE/FALSE data. Data read or written from and to such fields must always have a value of either true or false.

IDs

Required/Optional: *Optional*

This optional specification limits the available and defined IDRISI files read. If no IDs are specified, then all defined and available IDRISI files are read.

The syntax of the IDs directive is:

```
<ReaderKeyword>_IDs<baseName> \
  <baseName1> ... \
  <baseNameN>
```

The basenames must match those used in DEF lines.

The example below selects only the roads IDRISI file for input during a translation:

```
IDRISI_IDS roads
```

Writer Overview

The IDRISI writer creates and writes feature data to IDRISI files in the directory specified by the DATASET directive. As with the reader, the directory must exist before the translation occurs. Any old IDRISI files in the directory having the same name as files being written are overwritten with the new feature data. As features are routed to the IDRISI writer, the IDRISI writer determines the file into which the features are written to and outputs them accordingly. Many IDRISI files can be written during a single FME session.

In IDRISI, each vector file can have only one type of feature. Any feature not matching the feature type as specified in the mapping file will not be written to file. In addition, any user-defined attributes are written to the database only if an Access database is available.

Writer Directives

The directives processed by the IDRISI writer are listed below. The suffixes shown are prefixed by the current <WriterKeyword> in a mapping file. By default, the <WriterKeyword> for the IDRISI writer is IDRISI.

DATASET

Required/Optional: *Required*

The value for this directive is the directory containing the IDRISI files to be written to. A typical mapping file fragment specifying an output IDRISI dataset looks like:

```
IDRISI_DATASET /usr/data/idrisi/output
IDEX_DATASET c:\index\map.idx
```

DEF

Required/Optional: *Required*

Each IDRISI file must be defined before it can be written. The definition specifies the base name of the file, and the names and the types of all attributes. The syntax of a IDRISI DEF line is:

```
<WriterKeyword>_DEF <baseName> \
  [<attrName> <attrType>]+
```

The attribute types supported are the same as those listed under the reader section.

The following table shows the DEF line directives that are supported by IDRISI. They are prefixed by the keyword "IDRISI_".

Keyword Suffix	Value	Required/Optional
TYPE	The feature type of the file. In IDRISI, each file can contain only one feature type. The allowable types are <code>idrisi_point</code> , <code>idrisi_line</code> , <code>idrisi_area</code> and <code>idrisi_text</code> .	Required

Keyword Suffix	Value	Required/Optional
FILE_TITLE	Contains the descriptive name of the file. It is the name which is displayed at the top of the data file. If not specified, this defaults to "unknown".	Optional
REF_SYSTEM	The name of the geographic reference system used with the file. This may be Plane, or Lat/Long and so forth. If not specified, this defaults to "unknown".	Optional
REF_UNITS	The unit of measure used by the reference system. The recognized units are meters, feet, miles, kilometers, degrees and radians. This defaults to "meters" if not specified.	Optional
UNIT_DIST	The scaling factor of the map in relation to the ground. This should be 1 in most cases and this defaults to 1 if not specified.	Optional
POSN_ERROR	The degree of accuracy of the position of the feature in the vector file. If not specified, this defaults to "unknown".	Optional
RESOLUTION	The typical distance between points of a feature in the vector file. If not specified, this defaults to "unknown".	Optional
VALUE_UNITS	The unit of measure of the values used in the vector file. If not specified, this defaults to "unspecified".	Optional
VALUE_ERROR	The degree of error in the data values. For qualitative data, this is recorded as a proportional error value. For quantitative data, this should be recorded as a RMS error value.	Optional
FLAG_VALUE	Any value in the vector file, which is not a data value, but has special meaning. This entry should remain blank if such value does not exist.	Optional
FLAG_DEF	The definition of the above FLAG_VALUE. This field should remain blank if FLAG_VALUE does not exist.	Optional
LEGEND_CAT {<number>}	The legend categories which shows up in the legend box when the vector file is displayed. The <number> can be any positive integer which is larger than 0.	Optional
COMMENT {<number>}	Any additional information about the data. The <number> starts from 1 and increments by one for each additional comment line.	Optional
LINEAGE {<number>}	Any information regarding the history of how the data is recorded. The <number> starts from 1 and increments by one for each additional lineage line.	Optional

Keyword Suffix	Value	Required/Optional
completeness {<number>}	The degree of how well the values describe the subject matter indicated. The <number> starts from 1 and increments by one for each additional lineage line.	Optional
consistency {<number>}	The logical consistency of the file. The <number> starts from 1 and increments by one for each additional consistency line.	Optional

The following mapping file fragment defines two IDRISI files. Note that all but the `IDRISI_TYPE` are optional. There is no need to specify all of them.

The first file provides a simple example as to how some of the `DEF` lines are used. The second file gives an example which has two additional user defined attributes. Note that user-defined attributes are only allowed on Microsoft Windows platforms.

```
IDRISI_DEF landcover \
IDRISI_FILE_TITLE "ExampleFileTitle1" \
IDRISI_TYPE idrisi_area \
IDRISI_REF_SYSTEM "ExampleRefSystem" \
IDRISI_REF_UNITS kilometers \
IDRISI_LEGEND_CAT{-20} "ExampleLegendCat-20" \
IDRISI_LEGEND_CAT{1} "ExampleLegendCat1" \
IDRISI_LEGEND_CAT{-1} "ExampleLegendCat-1" \
IDRISI_COMMENT{1} "ExampleComment1" \
IDRISI_COMMENT{2} "ExampleComment2" \
IDRISI_COMMENT{3} "ExampleComment3"

IDRISI_DEF roads \
IDRISI_FILE_TITLE "ExampleFileTitle2" \
IDRISI_TYPE idrisi_line \
IDRISI_REF_SYSTEM "ExampleRefSystem" \
IDRISI_REF_UNITS kilometers \
IDRISI_LEGEND_CAT{-20} "ExampleLegendCat-20" \
IDRISI_LEGEND_CAT{1} "ExampleLegendCat1" \
IDRISI_LEGEND_CAT{-1} "ExampleLegendCat-1" \
color char(20) \
style logical \
```

COMPRESS_AT_END

Required/Optional: *Optional*

This statement instructs FME to compact the database after all writing has been done. This makes use of the existing MDB database option to compact. The compact operation compresses the output database to a small size on disk.

Example:

```
COMPRESS_AT_END Yes
```

Feature Representation

In addition to the generic FME feature attributes that FME Workbench adds to all features (see *About Feature Attributes* on page 7), this format adds the format-specific attributes described in this section.

IDRISI features consist of geometry and attributes. The attribute names are defined in the DEF line and there is a value for each attribute in each IDRISI feature. In addition, each IDRISI feature contains several special attributes to hold the type of the geometric entity and its display parameters. All IDRISI features contain an `idrisi_type` attribute, which identifies the geometric type. Depending on the geometric type, the feature contains additional attributes specific to the geometric type. These are described in subsequent sections. All features contain an `idrisi_id`.

Points

idrisi_type: `idrisi_point`

IDRISI point features specify a coordinate in addition to its ID value. There are no attributes specific to this type.

Attribute Name	Contents
<code>idrisi_type</code>	The IDRISI geometric type of this entity. Range: <code>idrisi_point</code> <code>idrisi_line</code> <code>idrisi_area</code> <code>idrisi_text</code> Default: No default
<code>idrisi_id</code>	The ID value of the symbol. IDRISI IDs are used to link vector graphics with user-defined attributes. Range: Any real > 0. Default: 1 and increments by 1 for each additional feature

Lines

idrisi_type: `idrisi_line`

IDRISI line features specify linear features defined by an array of x and y coordinates. There are no attributes specific to only this type of element.

Regions

idrisi_type: `idrisi_area`

IDRISI area features specify area (polygonal) features. The areas that make up a single feature may or may not be disjoint, and may contain polygons that have holes. The first and last coordinates must be the same in order for it to be a region.

There are no attributes specific to this type of element.

Text

idrisi_type: idrisi_text

IDRISI text features are used to specify annotation information. Each text feature has a location defined by a single point geometry, and can have its text string, style, justification, and rotation angle set independently.

The following table lists the special FME attribute names used to control the IDRISI text settings.

Attribute Name	Contents
idrisi_text_string	This is the text string that is the label for the feature. Range: 1 - 256 characters Default: Empty string
idrisi_text_size	This the font size of the label for the feature. Range: > 0 Default: 1/10th of the height of the map or 10
idrisi_style	The style code of the text string. This controls the color of the text string. Range: Any integer > 0 Default: 1
idrisi_rotation	The rotation of the text, as measured in degrees counter-clockwise from the horizontal. Range: 0.0 - 360.0 Default: 0.0
idrisi_justification_x	The justification of the text in the X direction. Values approaching 1.00 shift the text to the left of the location point, and values the closer to 0.00 shift the text to the right. Range: 0.00 - 1.00 0.00 Left margin 0.50 Centre 1.00 Right margin Default: 0.00
idrisi_justification_y	The justification of the text in the Y direction. Values approaching 1.00 shift the text upward relative to the location point, and values the closer to 0.00 shift the text downward. Range: 0.00 - 1.00 0.00 Bottom 0.50 Centre 1.00 Top Default: 0.00