

Leica Independent Data Exchange Format (IDEX) Reader/Writer

The Leica Independent Data Exchange Format (IDEX) File Reader and Writer modules provide the Feature Manipulation Engine (FME) with the capability to read and write Leica IDEX files. This chapter assumes you are familiar with this format.

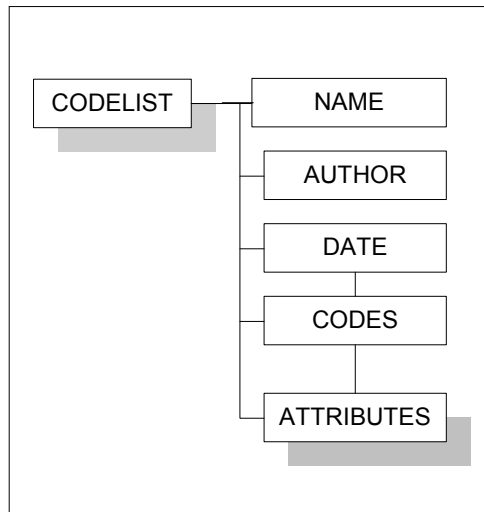
IDEX Quick Facts

Format Type Identifier	IDEX
Reader/Writer	Both
Licensing Level	Base
Dependencies	None
Dataset Type	File
Feature Type	Geometry type
Typical File Extensions	.idx
Automated Translation Support	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Color Support	Yes
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type	idx_type

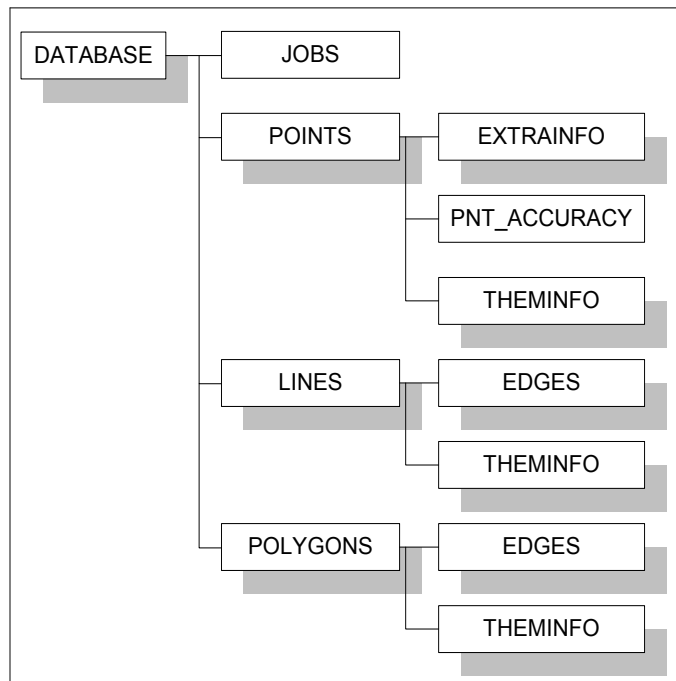
Geometry Support			
Geometry	Supported?	Geometry	Supported?
aggregate	no	point	yes
circles	no	polygon	yes
circular arc	no	raster	no
donut polygon	yes	solid	no
elliptical arc	no	surface	no
ellipses	no	text	no
line	yes	z values	no
none	no		

Overview

The processed sections of the IDEX file are in shaded boxes in the following two figures.



Components of the Codes Section



Components of the Database Section

The *Codes* and *Database* sections contain information about the features and their attributes, as well as information pertaining to the format of a specific IDEX file. The data relating to the features are preserved when reading from an IDEX file, however the IDEX file formatting information is not.

The EAST and NORTH columns are used as coordinates by the FME.

When converting an IDEX file to another format, the FME focuses on the geometric features of IDEX. The supported geometric features are listed here:

Geometric Features	idex_type
Points	idex_point
Lines	idex_line
Polygons	idex_polygon

Limitations of the Leica-provided IDEX dynamic link libraries, upon which this function is based, prevent IDEX to IDEX translations from being performed.

Reader Overview

The IDEX reader first processes point features, and then their associated attribute information. This includes information from the `DATABASE`, `CODES`, `ATTRIBUTES`, and `THEMINFO` sections. After processing the points, the reader then processes the lines and polygons.

During processing, detected error conditions are reported in the FME log file.

Reader Directives

The suffixes listed are prefixed by the current `<ReaderKeyword>` in a mapping file. By default, the `<ReaderKeyword>` for the IDEX reader is `IDEX`. The IDEX reader does not require DEF lines.

DATASET

Required/Optional: *Required*

The value of this directive is the IDEX file to be read. A typical mapping file fragment specifying an input IDEX file looks like:

Example:

```
IDEX_DATASET c:\index\map.idx
```

SNAPPING

Required/Optional: *Optional*

With the snapping option enabled, this reader tries to reconnect all polygons and lines missing either points or edges.

Example:

```
IDEX_SNAPPING YES
```

Writer Overview

The IDEX writer provides the ability to generate IDEX files. All IDEX information translated is put into a single IDEX file.

Unlike the IDEX reader, the writer requires `DEF` lines in the mapping file. Along with defining the attributes, the `DEF` lines tell the IDEX writer which IDEX data names to use.

Writer Directives

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

DATASET

Required/Optional: *Required*

The value of this directive is the IDEX file to be written. A typical mapping file fragment specifying an input IDEX file looks like:

```
IDEX_DATASET c:\index\map.idx
```

DEF

Required/Optional: *Required*

The syntax of an IDEX `DEF` line is:

```
<ReaderKeyword>_DEF <featureType> \
    index_type index_point|index_line|index_polygon \
    [<attrName> <attrType>]+
```

The `<featureType>` is used as the `index_database_code_id` if this attribute is used but not correlated to. The `<attrName>` is an attribute, whereas `<attrType>` is the type of the attribute. Currently supported attribute types are listed in the following table.

Attribute Type	Description
char	Fixed-length character string attribute.
float	Real number attribute.
integer	Integer value attribute.

Example:

```
IDEX_DEF CANADA \
    index_type      index_point\
    Province char   \
    Populationinteger \
    GenderRatiofloat
```

DATANAMES

Required/Optional: *Required*

The syntax of an IDEX DATANAMES line is:

```
<ReaderKeyword>_DATANAMES <index_type> \
  [<dataName> (YES|NO)]+
```

The data name specified in this section determines which data names are formatted in the IDEX output. The tables shown in the following sections identify the data names that the FME supports for each <index_type>. Notice that the word after *index* in the DATANAMES is the IDEX section to which the attribute belongs. For example:

```
IDEX_DATANAMES index_point \
  index_database_east YES \
  index_database_north YES \
  index_database_code_id YES
```

Points

index_type: *index_point*

The following data names are supported for points.

Data Name	Description	Value
index_database_user_id	Specifies the user-defined ID number for this point.	YES NO
index_database_job_number	Specifies the user-defined job number for this point.	YES NO
index_database_coord_system	This is the IDEX coordinate system for the point.	YES NO
index_database_coord_class	This is the IDEX coordinate class for the point.	YES NO
index_database_east	This is the X-coordinate of the point.	YES NO
index_database_north	This is the Y-coordinate of the point.	YES NO
index_database_elevation	This is the Z-coordinate of the point.	YES NO
index_database_longitude	This is the longitude of the point.	YES NO
index_database_latitude	This is the latitude of the point.	YES NO
index_database_code_id	Specifies what type of object this point is.	YES NO
index_database_description	Specifies the point object's description.	YES NO
index_database_color	Specifies the colour of the point.	YES NO
index_database_layer_number	This is the layer number of this point.	YES NO
index_database_symbol1_number	This is the first symbol associated with this point.	YES NO

Data Name	Description	Value
idex_database_symbol2_number	This is the second symbol associated with this point.	YES NO
idex_database_symbol_direction	This is the symbol rotation for this point.	YES NO
idex_database_flag	This is the database flag to be set for the point.	YES NO
idex_codes_name	This is the description of the code in the codes section.	YES NO
idex_codes_layer_number	This is the layer number in the CODES section.	YES NO
idex_theme_attrib_code	This is the code in the ATTRIBUTES section.	YES NO

Lines

idex_type: idex_line

The following data names are supported for lines.

Data Name	Description	Value
idex_database_user_id	Specifies the user-defined ID number for this line.	YES NO
idex_database_job_number	Specifies the user-defined job number for this line.	YES NO
idex_database_code_id	Specifies what type of object this line is.	YES NO
idex_database_description	Specifies the line object's description.	YES NO
idex_database_color	Specifies the colour of the line.	YES NO
idex_database_layer_number	This is the layer number of this point.	YES NO
idex_database_line_style	Specifies the style of this line.	YES NO
idex_database_flag1	This is the first database flag to be set for the line.	YES NO
idex_database_flag2	This is the second database flag to be set for the line.	YES NO
idex_codes_name	This is the description of the code in the CODES section.	YES NO
idex_codes_layer_number	This is the layer number in the CODES section.	YES NO
idex_theme_attrib_code	This is the code in the ATTRIBUTES section.	YES NO

Polygons

idex_type: idex_polygon

The following data names are supported for polygons.

Data Name	Description	Value
idex_database_user_id	Specifies the user-defined ID number for this polygon.	YES NO
idex_database_job_number	Specifies the user-defined job number for this polygon.	YES NO
idex_database_code_id	Specifies what type of object this line is.	YES NO
idex_database_description	Specifies the line object's description.	YES NO
idex_database_color	Specifies the colour of the line.	YES NO
idex_database_layer_number	This is the layer number of this point.	YES NO
idex_database_line_style	Specifies the style of this line.	YES NO
idex_database_symbol_number	This is the symbol associated with the polygon.	YES NO
idex_database_symbol_direction	This is the rotation the symbol associated with this polygon	YES NO
idex_database_flag	This is the database flag to be set for the polygon.	YES NO
idex_database_hatch_color	Specifies the colour of the hatches.	YES NO
idex_database_fill_type	This is the fill type to be set for the polygon.	YES NO
idex_codes_name	This is the description of the code in the CODES section.	YES NO
idex_codes_layer_number	This is the layer number in the CODES section.	YES NO
idex_theme_attrib_code	This is the code in the ATTRIBUTES section.	YES NO

POINT_ID_FRONT

Required/Optional: *Optional*

Points are created by the writer as it writes lines and polygons. Since these points have no user-defined ID, the writer will generate them. To avoid name collisions, the `point_id_front` allows you to set the prefix to the internal point number which is stored as the user ID.

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.

Special FME feature attributes are used to hold IDEX information. These attributes store values from specific sections of the IDEX file. Correspondingly, they enable the writer to write values to specific sections. User-defined attributes are contained in FME features and, when writing, are defined in the `DEF` lines.

IDEX Type

The type of the IDEX feature is stored in `idex_type`. The table shows the choices for the main attribute, which is the type attribute.

Attribute Name	Contents
<code>idex_type</code>	The IDEX geometric type of this feature. Range: <code>idex_point</code> <code>idex_line</code> <code>idex_polygon</code> Default: No default

Points

idex_type: `idex_point`

IDEX point features have a value of `idex_point`. These represent features with a single coordinate.

The following table shows the IDEX attributes specific to the point feature.

Attribute Name (Point)	Contents
<code>idex_database_user_id</code>	The user-defined ID number for the point. Range: String Default: No default
<code>idex_database_job_number</code>	The job number assigned to this point. Range: Integer Default: No default
<code>idex_database_coord_system</code>	The defined coordinate system. Range: Integer Default: No default
<code>idex_database_coord_class</code>	The defined coordinate class. Range: Integer Default: No default
<code>idex_database_longitude</code>	The longitude in degrees. Range: Real number Default: No default

Attribute Name (Point)	Contents
<code>idex_database_latitude</code>	The latitude in degrees. Range: Real number Default: No default
<code>idex_database_code_id</code>	The defined code. Range: String Default: No default
<code>idex_database_flag</code>	The defined flag. Range: Integer Default: No default
<code>idex_codes_name</code>	The name attribute in the CODES section of the IDEX data file. Range: String Default: No default
<code>idex_database_color</code>	The color specification for the point. Range: Unsigned integer Default: 0
<code>idex_codes_layer_number</code>	The layer number attribute in the CODES section of the IDEX data file. Range: Integer Default: No default
<code>idex_attrib_code</code>	The code attribute in the ATTRIBUTES section of the IDEX data file. Range: String Default: No default

Lines

idex_type: `idex_line`

IDEX line features have a value of `idex_line`. These represent line features with two or more coordinates. All attributes are optional for the `idex_line` type.

The following table shows the attributes specific to the line feature.

Attribute Name (Line)	Contents
<code>idex_database_user_id</code>	The user-defined ID number for the point. Range: String Default: No default
<code>idex_database_job_number</code>	The job number assigned to this point. Range: Integer Default: No default
<code>idex_database_code_id</code>	The defined code. Range: String Default: No default

Attribute Name (Line)	Contents
<code>idex_database_flag1</code>	The first defined flag. Range: Integer Default: No default
<code>idex_database_flag2</code>	The second defined flag. Range: Integer Default: No default
<code>is_valid</code>	The validity of the line. Range: String Default: No default
<code>idex_codes_name</code>	The name attribute in the CODES section of the IDEX data file. Range: String Default: No default
<code>idex_database_color</code>	The color specification for the line. Range: Unsigned integer Default: 0
<code>idex_codes_layer_number</code>	The layer number attribute in the CODES section of the IDEX data file. Range: Integer Default: No default
<code>idex_attrib_code</code>	The code attribute in the ATTRIBUTES section of the IDEX data file. Range: String Default: No default

Polygons

idex_type: `idex_polygon`

IDEX polygon features have a value of `idex_polygon`. These represent polygon features having four or more coordinates, with the first coordinate equal to the last coordinate. All attributes are optional for the `idex_polygon` type.

The following table shows the attributes specific to the polygon feature.

Attribute Name (Polygon)	Contents
<code>idex_database_user_id</code>	The user-defined ID number for the point. Range: String Default: No default
<code>idex_database_job_number</code>	The job number assigned to this point. Range: Integer Default: No default
<code>idex_database_code_id</code>	The defined code. Range: String Default: No default

Attribute Name (Polygon)	Contents
idex_database_flag	The defined flag. Range: Integer Default: No default
is_valid	The validity of the polygon. Range: Integer Default: No default
idex_codes_name	The name attribute in the CODES section of the IDEX data file. Range: String Default: No default
idex_database_color	The color specification for the line. Range: Unsigned integer Default: 0
idex_database_hatch_color	The hatch color specification for the polygon. Range: Unsigned integer Default: 0
idex_codes_layer_number	The layer number attribute in the CODES section of the IDEX data file. Range: Integer Default: No default
idex_attrib_code	The code attribute in the ATTRIBUTES section of the IDEX data file. Range: String Default: No default

