

Swedish KF85 Reader/Writer

The Swedish KF85 Reader and Writer modules allow the Feature Manipulation Engine (FME) to read and write Swedish KF85 files. KF85 is a published ASCII format used by the KF85 product. The *KF85 Reference Manual* describes the KF85 format and all constants it uses.

Overview

KF85 is a two-dimensional (2D) or three-dimensional (3D) system.

KF85 files store both feature geometry and attributes. Both standard attributes and user-defined attributes are supported. All user-defined attributes require integer attribute names. A logical KF85 file consists of one physical file that can have any file extension. The extension `.k85` is added to the base name of the KF85 file when writing files.

The KF85 reader and writer support the storage of point, line, arc, and text geometric data in KF85 files. The KF85 format can also store features with no geometry. Features that have no geometry are referred to as having a geometry of *none*.

The FME automatically recognizes standard KF85 coordinate systems from the header when reading and can convert these projections automatically. When writing KF85, the correct coordinate system string is written to the header and may be overridden with the `COORDINATE_SYSTEM_STRING` directive.

The FME considers a KF85 dataset to be a single KF85 file.

KF85 Quick Facts

Format Type Identifier	KF85
Reader/Writer	Both
Licensing Level	Base
Dependencies	None
Dataset Type	File
Feature Type	Geometry type
Typical File Extensions	.k85 (.klf, .kfp, .apt and others)
Automated Translation Support	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Color Support	No
Spatial Index	Never
Schema Required	No
Transaction Support	No
Enhanced Geometry	Yes
Geometry Type	kf85_type

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

Reader Overview

The KF85 reader opens the input file and immediately starts reading features, returning them to the rest of the FME for processing. The reader does not have any requirement for definition statements as there are no user-defined attributes.

Reader Directives

The directives that are processed by the KF85 reader are listed below. The suffix shown is prefixed by the current <ReaderKeyword> in a mapping file. By default, the <ReaderKeyword> for the KF85 reader is KF85.

DATASET

Required/Optional: *Required*

The value for this directive is the file name of the KF85 file to be read. A typical mapping file fragment specifying an input KF85 dataset looks like:

```
KF85_DATASET /usr/data/KF85/roads.k85
```

Writer Overview

The KF85 writer creates and writes feature data to a KF85 file specified by the `DATASET` directive. Unlike the reader, the file may or may not exist before the translation occurs. An existing file with the same path and name is overwritten with new feature data. Only one KF85 file may be written to in a single FME session (one translation).

Writer Directives

The directives that are processed by the KF85 writer are listed below. The suffixes shown are prefixed by the current `<WriterKeyword>` in a mapping file. By default, the `<WriterKeyword>` for the KF85 writer is `KF85`.

DATASET

Required/Optional: *Required*

The value for this directive is the file name of the KF85 file to be written. A typical mapping file fragment specifying an output KF85 dataset looks like:

```
KF85_DATASET /usr/data/KF85/roads.k85
```

X_ORIGIN

Required/Optional: *Optional*

The value for this directive is the mathematical X coordinate¹ of the false origin in the destination KF85 file. If this directive is not present in the mapping file, a default value of 0 will be used. A typical mapping file fragment specifying an output KF85 X origin coordinate looks like:

```
KF85_X_ORIGIN 100
```

Y_ORIGIN

Required/Optional: *Optional*

The value for this directive is the mathematical Y coordinate² of the false origin in the destination KF85 file. If this directive is not present in the mapping file, a default value of 0 will be used. A typical mapping file fragment specifying an output KF85 Y origin coordinate looks like:

```
KF85_Y_ORIGIN 300
```

1. This is the **horizontal** component.
2. This is the **vertical** component.

SCALE

Required/Optional: *Optional*

The directive value is the scale of the destination KF85 file. If this directive is not present in the mapping file, a default value of 1 will be used. A typical mapping file fragment specifying an output KF85 scale looks like:

```
KF85_SCALE 500
```

TEXT_LENGTH

Required/Optional: *Optional*

The value for this directive is the maximum length of the text strings appended to the lines and points output to KF85. The maximum value for this directive is 20. If this directive is not present, the default of 20 is used. This does not set the length of text on a `text` feature. A typical mapping file fragment specifying an output KF85 text length looks like:

```
KF85_TEXT_LENGTH 15
```

MANAGER

Required/Optional: *Optional*

The value for this directive sets the `MANAGER` field in the `J` header of the output KF85 file. If this directive is not present, the field is left blank. A typical mapping file fragment specifying an output KF85 manager header field looks like:

```
KF85_MANAGER "BJÖRN"
```

COORDINATE_SYSTEM_STRING

Required/Optional: *Optional*

The value for this directive sets the `coordinate system` field in the `G` header of the output KF85 file, even when using the FME reprojection capabilities. This only overrides the output field and does not affect the data projection. If this directive is not present, the coordinate system string is automatically set to the correct value based on the recognized coordinate system. A typical mapping file fragment specifying an output KF85 coordinate system string looks like:

```
KF85_COORDINATE_SYSTEM_STRING "RT 90 2.5 gon V RH 70"
```

Feature Representation

KF85 features consist of geometry and attributes. When reading KF85 files, several predefined attributes hold the data from the file. When writing KF85 files, the values in these predefined attributes are written out to the file. If the feature does not have these predefined attributes, appropriate default values will be used.

Free Attributes or User-Defined Attributes

KF85 files also support free attributes, also known as user-defined attributes. These attributes must have an integer as an attribute name. When a KF85 file is read, each of these attributes is added to the individual features it is associated with. As well, a special attribute `kf85_attribute_list` is attached, whose value is a comma-separated list of all the user-defined attribute names and values present.

When writing KF85 files, all attributes with integer names are interpreted as user-defined attributes and are written out—associated with the appropriate feature. As well, if any feature contains the special attribute `kf85_attribute_list`, this attribute is parsed, looking for attribute name and value pairs. Each of these attributes is written to the KF85 output file as user-defined attributes, associated with the appropriate feature.

Predefined Attributes

All KF85 FME features contain the `kf85_type` attribute to identify the geometric type. All features also have a special KF85 code contained in the `kf85_code` attribute. Depending on the geometric type, the feature contains additional attributes specific to the geometric type. These are described in subsequent sections.

Attribute Name	Contents
<code>kf85_type</code>	The KF85 geometric type of this entity. Required: <code>kf85_point</code> <code>kf85_line</code> <code>kf85_arc</code> <code>kf85_text</code> <code>kf85_common_info</code> <code>kf85_comment</code> <code>kf85_symbol</code> <code>kf85_none</code> Default: NULL
<code>kf85_code</code>	The feature's special code. Required: any 9 digit integer Default: 0
<code>kf85_attribute_list</code>	An alphanumeric comma-separated list of all user-defined attribute names and values present on the feature. Range: maximum 255 character string Default: NULL string

Points

kf85_type: `kf85_point`

A KF85 point feature specifies a single 2D or 3D coordinate and the mean error in both x and y. The point feature may also have text (a label) and/or a symbol associated with the point.

Attribute Name	Contents									
kf85_internal_name	An alphanumeric code for the feature. Range: maximum 9 character string Default: NULL string									
kf85_mean_error_plane	The mean error in the X coordinate of the point measured in millimetres (mm). Range: 0 ... 32767 Default: 0.0									
kf85_mean_error_height	The mean error in the Y coordinate of the point measured in mm. Range: 0 ... 32767 Default: 0.0									
kf85_text_string	The optional text string associated with the point. Range: maximum 20 character string Default: NULL string									
kf85_rotation	The rotation of the text, measured in degrees counter-clockwise from horizontal. (Note that the value actually stored in the file is converted from this into GON.) Range: any real number Default: 0.0									
kf85_text_height	The height of the text measured in mm. Range: any real number Default: 1									
kf85_text_width	The width of the text measured in mm. Range: any real number Default: 1.0									
kf85_text_pos_x	The X coordinate of the point's text. Range: any real number Default: 0.0									
kf85_text_pos_y	The Y coordinate of the point's text. Range: any real number Default: 0.0									
kf85_text_position	The justification of the point's text. Specifically, the point on the text's bounding box where the position is given, as shown below. 0 is an unspecified position. If the value is 0, then the other values relating to the point's text must also be 0. <div style="text-align: center;"> <table> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>7</td> <td>8</td> <td>9</td> </tr> </table> </div> Range: 0 ... 9 Default: 7	1	2	3	4	5	6	7	8	9
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4	5	6								
7	8	9								

Attribute Name	Contents
kf85_symbol_rotation	The rotation of the symbol, measured in degrees counterclockwise from horizontal. (Note that the value actually stored in the file is converted from this into GON.) Range: any real number Default: 0.0
kf85_symbol_height	The height of the symbol measured in mm. Range: any real number Default: 1.0
kf85_symbol_width	The width of the symbol measured in mm. Range: any real number Default: 1.0

Lines

kf85_type: kf85_line

KF85 line features contains 2D or 3D coordinates, as well as an internal name and a text string. This text also has a position, justification, rotation, width, and height.

When reading a KF85 line; its vertices can be defined in two ways. They can be defined by their x,y (and z) co-ordinates. Or they can be defined by specifying the internal_name of another point in the same file. The KF85 Reader supports both methods. The resulting line is the same regardless of which way it is defined.

Attribute Name	Contents
kf85_internal_name	An alphanumeric code for the feature. Range: maximum 9 character string Default: NULL string
kf85_text_string	The optional text string associated with the line. Range: maximum 20 character string Default: NULL string
kf85_rotation	The rotation of the text, measured in degrees counterclockwise from horizontal. (Note that the value actually stored in the file is converted from this into GON.) Range: any real number Default: 0.0
kf85_text_height	The height of the text measured in mm. Range: any real number Default: 1.0
kf85_text_width	The width of the text measured in mm. Range: any real number Default: 1.0

Attribute Name	Contents									
kf85_text_pos_x	The X coordinate of the line's text, relative to the mid-point of the line. Range: any real number Default: 0.0									
kf85_text_pos_y	The Y coordinate of the line's text, relative to the mid-point of the line. Range: any real number Default: 0.0									
kf85_text_position	The justification of the line's text. Specifically, the point on the text's bounding box where the position is given, as shown below. 0 is an unspecified position. If the value is 0, then the other values relating to the line's text must also be 0. <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 0 10px;">1</td> <td style="padding: 0 10px;">2</td> <td style="padding: 0 10px;">3</td> </tr> <tr> <td style="padding: 0 10px;">4</td> <td style="padding: 0 10px;">5</td> <td style="padding: 0 10px;">6</td> </tr> <tr> <td style="padding: 0 10px;">7</td> <td style="padding: 0 10px;">8</td> <td style="padding: 0 10px;">9</td> </tr> </table> Range: 0 ... 9 Default: 7	1	2	3	4	5	6	7	8	9
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Arcs

kf85_type: kf85_arc

Arc features are partial ellipse boundaries with two additional angles that control the portion of the ellipse boundary that is drawn.

Note: The function @Arc() can be used to convert an arc to a linestring. This is useful for storing arcs in systems that do not support them directly.

Attribute Name	Contents
kf85_primary_axis	The length of the semi-major axis in ground units. Range: Any real number > 0 Default: No default
kf85_secondary_axis	The length of the semi-minor axis in ground units. Range: Any real number > 0 Default: No default
kf85_rotation	The rotation of the major axis. The rotation is measured in degrees counterclockwise up from horizontal. Range: -360.0..360.0 Default: 0
kf85_start_angle	Refer to the @Arc (function) in the <i>FME Functions and Factories manual</i> for a detailed definition of start_angle. Range: 0.0..360.0 Default: No default

Attribute Name	Contents
kf85_sweep_angle	Refer to the @Arc (function) in the <i>FME Functions and Factories manual</i> for a detailed definition of sweep_angle. Range: Any real number > 0 Default: No default
kf85_orientation	The orientation of the arc. As the sweep angle is always returned as positive, this field can be used to determine the original orientation of the arc. Range: clockwise counterclockwise Default: none

Text

kf85_type: kf85_text

KF85 text features contain 2D coordinates and a text string, along with the justification, rotation, height, width, font, and distance between lines of the text.

Attribute Name	Contents									
kf85_internal_name	An alphanumeric code for the feature. Range: maximum 9 character string Default: NULL string									
kf85_text_string	The text string. Range: maximum 62 character string Default: NULL string									
kf85_rotation	The rotation of the text, measured in degrees counterclockwise from horizontal. (Note that the value actually stored in the file is converted from this into GON.) Range: any real number Default: 0.0									
kf85_text_height	The height of the text measured in mm. Range: any real number Default: 1.0									
kf85_text_width	The width of the text measured in mm. Range: any real number Default: 1.0									
kf85_text_position	This is the justification of the line's text. Specifically, the point on the text's bounding box where the position is given, as shown below. 0 is an unspecified position. If the value is 0, then the other values relating to the line's text must also be 0. <p style="text-align: center;"> <table style="display: inline-table; border: none;"> <tr> <td style="padding: 0 10px;">1</td> <td style="padding: 0 10px;">2</td> <td style="padding: 0 10px;">3</td> </tr> <tr> <td style="padding: 0 10px;">4</td> <td style="padding: 0 10px;">5</td> <td style="padding: 0 10px;">6</td> </tr> <tr> <td style="padding: 0 10px;">7</td> <td style="padding: 0 10px;">8</td> <td style="padding: 0 10px;">9</td> </tr> </table> </p> Range: 0 ... 9 Default: 7	1	2	3	4	5	6	7	8	9
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Attribute Name	Contents
kf85_text_spacing	The spacing between the text lines. Range: any real number Default: 1.0
kf85_font	The font type for the text. There is no documented standard for this field and, therefore, it must be interpreted by the user. Range: maximum 2 character string Default: NULL string

Common Info

kf85_type: kf85_common_info

KF85 `common info` features result from `common info` records that can occur anywhere within a KF85 file. These features contain no geometry. They are used to store an ID code and string information not associated with any geographic location within the KF85 file.

Attribute Name	Contents
kf85_common_code	The ID code present on the <code>common info</code> . Range: maximum 3 digit integer Default: 0
kf85_common_string	The text string present on the <code>common info</code> . Range: maximum 62 character string Default: NULL string

Comment

kf85_type: kf85_comment

KF85 `comment` features result from `comment` records that can occur anywhere within a KF85 file. These features contain no geometry. They are used to store string information not associated with any geographic location within the KF85 file.

Attribute Name	Contents
kf85_comment_string	The text string present on the <code>comment</code> . Range: maximum 62 character string Default: NULL string

Symbol

kf85_type: kf85_symbol

KF85 symbol features contain 2D coordinates to indicate the location of a symbol. The symbol's height, width, and rotation are also indicated.

Attribute Name	Contents
kf85_rotation	The rotation of the symbol, measured in degrees counter-clockwise from horizontal. (Note that the value actually stored in the file is converted from this into GON.) Range: any real number Default: 0.0
kf85_symbol_height	The height of the symbol measured in mm. Range: any real number Default: 1.0
kf85_symbol_width	The width of the symbol measured in mm. Range: any real number Default: 1.0

