

The DSFL Reader module provides the Feature Manipulation Engine (FME) with the ability to read the DSFL basic format which is a genuine subset of the full Danish National Format (DSFL). This chapter assumes familiarity with that format.

Overview

DSFL is an ASCII format, widely used in Denmark for exchanging Geographic Information System (GIS) data between different systems. The information within the DSFL file is contained in these four sections:

- header section – contains global information common to all data
- origin section – where the accuracy and the origin of the data are specified
- data section – where data is referenced by features and where the spatial and non-spatial data for the features are contained
- stop code – this is how the end of the DSFL data set is signalled

The following file extensions are commonly used:

Filename Extension	Content
.dsf, .asc, .txt and others	Feature geometry and attribution data

DSFL Quick Facts

Format Type Identifier	DSFL
Reader/Writer	Reader
Licensing Level	Base
Dependencies	None
Dataset Type	File
Feature Type	Geometry type
Typical File Extensions	.dsf, .fla
Automated Translation Support	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Color Support	No
Spatial Index	Never
Schema Required	Not applicable
Transaction Support	No
Geometry Type	dsfl_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	yes
line	yes	z values	yes
none	no		

Reader Overview

The DSFL reader reads the header information from the DSFL file being processed, and extracts the parameters required to determine the coordinate system and sequence use. The dimension of the input file is also known after the coordinate sequence had been determined. The reader then returns each read-in feature with its attributes to the FME for processing. The DSFL reader doesn't have any requirements for definition statements.

Each feature returned by the DSFL reader has its feature type set to one of the following: `dsfl_point`, `dsfl_line`, `dsfl_polygon`, `dsfl_aggregate`, `dsfl_none`, or `dsfl_header`.

Reader Directives

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

DATASET

Required/Optional: *Required*

The file name of the input DSFL file.

Example:

```
D MDF_DATASET /usr/data/dm df/input.dd1
```

OUTPUT_ORIGINS

Required/Optional: *Optional*

Determines whether or not the origin data is output as a separate features. If the value is YES, then origin data is output as `dsfl_origin` feature type with each feature having its unique index number in `dsfl_record_index_number` attribute. If the value is NO, then the origin data is merged with other data features.

Range: YES | NO

Default: NO

Example:

```
D MDF_RASTER_POINT_FEATURE_CODE HA35000000
```

KEEP_Z_NULL

Required/Optional: *Optional*

This directive determines whether or not to preserve the NULL value placeholder for z coordinates defined by %H9 header tag. If the value is YES, the z coordinate of the geometry will be unchanged; if the value is NO, it will be set to 0.

For example, if the %H9 tag is set to -99.00 and, while reading a feature, it encounters a z coordinate of -99.00, then based on the value of this keyword, either the z coordinate will remain as 99.00 (if value is YES) or changed to 0.0 (if the value is NO).

Range: YES | NO

Default: YES

SPLINE_EDGE_TOLERANCE

Required/Optional: *Optional*

After the DSFL reader has converted splines to straight lines, this directive can be used to remove extraneous points. Real values from 0 and up are acceptable. If a negative number is input, the DSFL reader will ignore it, and not generalize the line. This will only be used if `SPLINE_TO_POINTS` was set to at least 1.

In Workbench, this functions like a LineGeneralizer transformer using the Douglas algorithm.

A recommended use is to set `SPLINE_TO_POINTS` to a moderately high number, such as 100, and then generalize to an acceptable precision. This will keep the overall number of points generated down, but will ensure precision is available where it is needed to keep the error down.

Example:

The following example sets the edge tolerance for generalizing lines to 2.5:

```
DSFL_SPLINE_EDGE_TOLERANCE 2.5
```

SPLINE_TO_POINTS

Required/Optional: *Optional*

The DSFL reader converts all spline curves into straight lines by inserting intermediate points. This directive specifies the number of intermediate points to be inserted. Integer values from 0 to 10 are acceptable. If an illegal value is entered, the DSFL reader will automatically use the default value of 3. The recommended range is 0 to 10.

Example:

The following example sets the number of intermediate points to be calculated to four:

```
DSFL_SPLINE_TO_POINTS 4
```

Range: ≥ 0

Default: 3

COMMA_IS_A_DELIMITER

Required/Optional: *Optional*

When set to "Yes", this directive will tell the DSFL reader to also use the comma (,) as a delimiter when separating DSFL tokens as well as when parsing attributes. This will remove commas from attributes (for example, "Vancouver, Canada" becomes "Vancouver Canada"). Therefore, by setting this value to "No," it will keep the commas in the attributes.

It should be noted that if the DSFL file's tokens or coordinate points were separated with commas, then the reader may not work properly. However, since FME only supports the basic version of DSFL (and commas are not allowed to separate tokens and coordinates in the basic version), this should never be a problem.

The default value of this directive is "No". However, if the directive is missing, then it will implicitly set the value to "Yes" so that workspaces created prior to the addition of this directive will continue to exhibit the same behavior as before.

Example:

```
DSFL_COMMA_IS_A_DELIMITER No
```

Range: Yes | No

Default: No

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.

DSFL features consist of geometry and attributes. When reading-in a feature, the DSFL reader holds a set of currently active DSFL data fields. These active data fields are controlled by definitions of the %D token, found in the DSFL input file. The active data fields are given as attributes to the feature being read. The active set of data fields may be empty. In this case, the feature has no DSFL data fields attributes. The name for these attributes are of the form D_x, where x is a positive integer.

If the feature references any of the accuracy and origin definitions processed at the beginning of the file, these definitions will also become attributes for the referencing feature.

All DSFL features contain a dsfl_type attribute that identifies the geometric type. Depending on the geometric type, the features may contain additional attributes that are specific to them.

Attribute Name	Contents
dsfl_type	The DSFL geometric type of this feature. Range: dsfl_point dsfl_line dsfl_polygon dsfl_text dsfl_aggregate dsfl_none dsfl_header dsfl_origin Default: No default

General Attributes

Attributes specific to each dsfl_type are described in the next sections. All DSFL features, except those features having dsfl_text and dsfl_header as the value of their dsfl_type, may contain the following attributes:

Attribute Name	Contents
dsfl_class	This is the DSFL feature code class.
dsfl_subclass	This is the DSFL feature code subclass.
dsfl_origin_ND1	Acronyms for production, also known as data generation, method Range: DU DF DL SK SL UU FF LL Default: No default
dsfl_origin_ND11	Standard deviation for plane coordinates, in metres with decimals. Default: No default

Attribute Name	Contents
dsfl_origin_ND12	Standard deviation for height coordinate, in metres with decimals Default: No default
dsfl_origin_ND21	Date of base map generation Range: <code>yyymmdd</code> Default: No default
dsfl_origin_ND22	Date of land surveying Range: <code>yyymmdd</code> Default: No default
dsfl_origin_ND23	Date for photo flight Range: <code>yyymmdd</code> Default: No default
dsfl_origin_ND32	Scale of photogrammetric photos Default: No default
dsfl_origin_ND41	Producer of digital data Range: String, maximum 40 characters Default: No default
dsfl_origin_ND51 to dsfl_origin_ND59	Descriptive text Range: String, maximum 40 characters Default: No default

Points

dsfl_type: `dsfl_point`

DSFL point features specify a single x and y coordinate for two-dimensional (2D) data or a single x, y, and z coordinate for three-dimensional (3D) data. Point features may have the following additional special attributes associated with them.

Attribute Name	Contents
dsfl_point_rotation	DSFL angles are defined as grades. The DSFL reader automatically converts these into degrees. The degrees are measured counterclockwise from horizontal. Range: 0.0 .. 360.0 Default: 0.0
z	When the DSFL data is 3D, the <code>dsfl_point</code> will contain this attribute having as its value the third, or z, coordinate of the point.

Lines

dsfl_type: `dsfl_line`

DSFL line features specify linear features by a sequence of x and y coordinates for 2D data or by a sequence of x, y, and z coordinates for 3D data.

Polygons

dsfl_type: dsfl_polygon

DSFL polygon features specify polygon features by a sequence of x and y coordinates for 2D data or by a sequence of x, y, and z coordinates for 3D data. The first and last coordinates of the polygon are equal.

Text

dsfl_type: dsfl_text

DSFL text features are used to specify annotation information. Each text feature has a single x and y coordinate for 2D data or a single x, y, and z coordinate for 3D data. The following table lists the special FME attribute names for the DSFL text feature.

Attribute Name	Contents
dsfl_text_code	The DSFL data field code.
dsfl_text_value	The value for the DSFL data field.
dsfl_rotation	DSFL angles are defined as grades. The DSFL reader automatically converts these into degrees measured counter-clockwise from horizontal. Range: 0.0 .. 360.0 Default: 0.0
dsfl_text_justification	Indicates the position of the text coordinate in relation to the text. Range: dsfl_top_left dsfl_top_center dsfl_top_right dsfl_middle_left dsfl_middle_center dsfl_middle_right dsfl_bottom_left dsfl_bottom_center dsfl_bottom_right Default: No default

Aggregate

dsfl_type: dsfl_aggregate

DSFL aggregates are a collection of dsfl_line or dsfl_polygon features. The geometry of the dsfl_aggregate feature is homogeneous. The dsfl_type attribute of this feature will be set to dsfl_polygon if all composing features are polygons. If all composing features are lines, it will be set to dsfl_line.

None

dsfl_type: dsfl_none

This is a DSFL feature with no geographic representation.

Header

dsfl_type: dsfl_header

This DSFL feature contains the metadata stored in the header section for the input DSFL file. The feature contains no geometry. The following table lists the attributes that this feature contains. Basically, all header tokens with their values become attributes for this feature.

Attribute Name	Contents
H0	Character string specifying the three special Danish characters in upper- and lowercase.
H1	Plane coordinate system—this value is used to set the coordinate system on the features Range: S34J S34S S45B U32 U33 U32W U33W LOK
H2	Acronym for the height coordinate system Range: DNNGI
H3	Coordinate sequence Range: XY XYZ YX YXZ NE NEH
H9	Specific value for “no available height” Range: Real
H11	Supplier’s company name Range: String
H12	Supplier’s address Range: String
H13	Supplier’s postal code Range: String
H14	Supplier’s postal district Range: String
H15	Supplier’s phone number Range: String
H16	Supplier’s fax number Range: String
H41	Date and time of generation for the data set Range: yymmdd hhmm
H58	Data content Range: Basis-udgave 970901 for the DSFL basic format
H59	Version date of DSFL format Range: yymmdd