dxflib

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Chapter 1

Todo List

Member DL_Dxf::addAttribute (DL_CreationInterface ∗creationInterface)

add attrib instead of normal text

Member DL_Dxf::getStrippedLine (std::string &s, unsigned int size, FILE ∗stream, bool stripSpace=true)

Change function to use safer FreeBSD strl∗ functions

Is it a problem if line is blank (i.e., newline only)? Then, when function returns, (s==NULL).

Class DL_Writer

Add error checking for string/entry length.

Class DL_WriterA

What if `fname` is NULL? Or `fname` can't be opened for another reason?

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 4

File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 5

Class Documentation

5.1 DL_ArcAlignedTextData Struct Reference

Arc Aligned Text Data.

```
#include <dl_entities.h>
```

Public Attributes

- std::string text
- std::string font
- std::string style
- double cx
- double cy
- double cz
- double radius
- double xScaleFactor
- double height
- double spacing
- double offset
- double rightOffset
- double leftOffset
- double startAngle
- double endAngle
- bool reversedCharacterOrder
- int direction
- int alignment
- int side
- bool bold
- bool italic
- bool underline
- int characerSet
- int pitch
- bool shxFont
- bool wizard
- int arcHandle

5.1.1 Detailed Description

Arc Aligned Text Data.

5.1.2 Member Data Documentation

5.1.2.1 alignment

`int DL_ArcAlignedTextData::alignment`

Alignment: 1: fit 2: left 3: right 4: center

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.2 arcHandle

`int DL_ArcAlignedTextData::arcHandle`

Arc handle/ID

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.3 bold

`bool DL_ArcAlignedTextData::bold`

Bold flag

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.4 characerSet

`int DL_ArcAlignedTextData::characerSet`

Character set value. Windows character set identifier.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.5 cx

`double DL_ArcAlignedTextData::cx`

X coordinate of arc center point.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.6 cy

```
double DL_ArcAlignedTextData::cy
```

Y coordinate of arc center point.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.7 cz

```
double DL_ArcAlignedTextData::cz
```

Z coordinate of arc center point.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.8 direction

```
int DL_ArcAlignedTextData::direction
```

Direction 1: outward from center 2: inward from center

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.9 endAngle

```
double DL_ArcAlignedTextData::endAngle
```

End angle (radians)

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.10 font

```
std::string DL_ArcAlignedTextData::font
```

Font name

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.11 height

```
double DL_ArcAlignedTextData::height
```

Text height

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.12 italic

```
bool DL_ArcAlignedTextData::italic
```

Italic flag

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.13 leftOffset

```
double DL_ArcAlignedTextData::leftOffset
```

Left offset

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.14 offset

```
double DL_ArcAlignedTextData::offset
```

Offset from arc

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.15 pitch

```
int DL_ArcAlignedTextData::pitch
```

Pitch and family value. Windows pitch and character family identifier.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.16 radius

```
double DL_ArcAlignedTextData::radius
```

Arc radius.

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.17 reversedCharacterOrder

```
bool DL_ArcAlignedTextData::reversedCharacterOrder
```

Reversed character order: false: normal true: reversed

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.18 rightOffset

```
double DL_ArcAlignedTextData::rightOffset
```

Right offset

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.19 shxFont

```
bool DL_ArcAlignedTextData::shxFont
```

Font type: false: TTF true: SHX

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.20 side

```
int DL_ArcAlignedTextData::side
```

Side 1: convex 2: concave

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.21 spacing

```
double DL_ArcAlignedTextData::spacing
```

Character spacing

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.22 startAngle

```
double DL_ArcAlignedTextData::startAngle
```

Start angle (radians)

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.23 style

```
std::string DL_ArcAlignedTextData::style
```

Style

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.24 text

```
std::string DL_ArcAlignedTextData::text
```

Text string

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.25 underline

```
bool DL_ArcAlignedTextData::underline
```

Underline flag

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.26 wizard

```
bool DL_ArcAlignedTextData::wizard
```

Wizard flag

Referenced by DL_Dxf::addArcAlignedText().

5.1.2.27 xScaleFactor

```
double DL_ArcAlignedTextData::xScaleFactor
```

Relative X scale factor.

Referenced by DL_Dxf::addArcAlignedText().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.2 DL_ArcData Struct Reference

Arc Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_ArcData (double acx, double acy, double acz, double aRadius, double aAngle1, double aAngle2)
  Constructor.

Public Attributes

- double cx
- double cy
- double cz
- double radius
- double angle1
- double angle2

5.2.1 Detailed Description

Arc Data.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 DL_ArcData()

```
DL_ArcData::DL_ArcData (
              double acx,
              double acy,
              double acz,
              double aRadius,
              double aAngle1,
              double aAngle2 )  [inline]
```

Constructor.

Parameters: see member variables.

5.2.3 Member Data Documentation

5.2.3.1 angle1

```
double DL_ArcData::angle1
```

Startangle of arc in degrees.

Referenced by DL_Dxf::writeArc().

5.2.3.2 angle2

```
double DL_ArcData::angle2
```

Endangle of arc in degrees.

Referenced by DL_Dxf::writeArc().

5.2.3.3 cx

```
double DL_ArcData::cx
```

X Coordinate of center point.

Referenced by DL_Dxf::writeArc().

5.2.3.4 cy

```
double DL_ArcData::cy
```

Y Coordinate of center point.

Referenced by DL_Dxf::writeArc().

5.2.3.5 cz

```
double DL_ArcData::cz
```

Z Coordinate of center point.

Referenced by DL_Dxf::writeArc().

5.2.3.6 radius

```
double DL_ArcData::radius
```

Radius of arc.

Referenced by DL_Dxf::writeArc().

The documentation for this struct was generated from the following file:

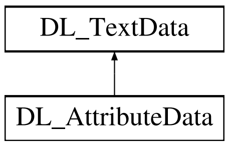
- src/dl_entities.h

5.3 DL_AttributeData Struct Reference

Block attribute data.

```
#include <dl_entities.h>
```

Inheritance diagram for DL_AttributeData:



Public Member Functions

- **DL_AttributeData** (const DL_TextData &tData, const std::string &tag)
- DL_AttributeData (double ipx, double ipy, double ipz, double apx, double apy, double apz, double height, double xScaleFactor, int textGenerationFlags, int hJustification, int vJustification, const std::string &tag, const std::string &text, const std::string &style, double angle)

  Constructor.

Public Member Functions inherited from DL_TextData

- DL_TextData (double ipx, double ipy, double ipz, double apx, double apy, double apz, double height, double xScaleFactor, int textGenerationFlags, int hJustification, int vJustification, const std::string &text, const std↵ ::string &style, double angle)

  Constructor.

Public Attributes

- std::string tag

Public Attributes inherited from DL_TextData

- double ipx
- double ipy
- double ipz
- double apx
- double apy
- double apz
- double height
- double xScaleFactor
- int textGenerationFlags
- int hJustification

  Horizontal justification.
- int vJustification

  Vertical justification.
- std::string text
- std::string style
- double angle

5.3.1 Detailed Description

Block attribute data.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 DL_AttributeData()

```
DL_AttributeData::DL_AttributeData (
             double ipx,
             double ipy,
             double ipz,
             double apx,
             double apy,
             double apz,
             double height,
             double xScaleFactor,
             int textGenerationFlags,
             int hJustification,
             int vJustification,
             const std::string & tag,
             const std::string & text,
             const std::string & style,
             double angle )  [inline]
```

Constructor.

Parameters: see member variables.

5.3.3 Member Data Documentation

5.3.3.1 tag

```
std::string DL_AttributeData::tag
```

Tag.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.4 DL_Attributes Class Reference

Storing and passing around attributes.

```
#include <dl_attributes.h>
```

Public Member Functions

- **DL_Attributes** ()

    Default constructor.
- DL_Attributes (const std::string &layer, int color, int width, const std::string &linetype, double linetypeScale)

    Constructor for DXF attributes.
- DL_Attributes (const std::string &layer, int color, int color24, int width, const std::string &linetype, int handle=-1)

    Constructor for DXF attributes.
- void setLayer (const std::string &layer)

    Sets the layer.
- std::string getLayer () const
- void setColor (int color)

    Sets the color.
- void setColor24 (int color)

    Sets the 24bit color.
- int getColor () const
- int getColor24 () const
- void **setWidth** (int width)

    Sets the width.
- int getWidth () const
- void setLinetype (const std::string &linetype)

    Sets the line type.
- void **setLinetypeScale** (double linetypeScale)

    Sets the entity specific line type scale.
- double **getLinetypeScale** () const
- std::string getLinetype () const
- void **setHandle** (int h)
- int **getHandle** () const
- void **setInPaperSpace** (bool on)
- bool **isInPaperSpace** () const

5.4.1 Detailed Description

Storing and passing around attributes.

Attributes are the layer name, color, width and line type.

Author

Andrew Mustun

5.4.2 Constructor & Destructor Documentation

5.4.2.1 DL_Attributes() [1/2]

```
DL_Attributes::DL_Attributes (
                const std::string & layer,
                int color,
                int width,
                const std::string & linetype,
                double linetypeScale )  [inline]
```

Constructor for DXF attributes.

Parameters

layer	Layer name for this entity or NULL for no layer (every entity should be on a named layer!).
color	Color number (0..256). 0 = BYBLOCK, 256 = BYLAYER.
width	Line thickness. Defaults to zero. -1 = BYLAYER, -2 = BYBLOCK, -3 = default width
linetype	Line type name or ¨BYLAYER¨ or ¨BYBLOCK¨. Defaults to ¨BYLAYER¨

5.4.2.2 DL_Attributes() `[2/2]`

```
DL_Attributes::DL_Attributes (
             const std::string & layer,
             int color,
             int color24,
             int width,
             const std::string & linetype,
             int handle = -1 )  [inline]
```

Constructor for DXF attributes.

Parameters

layer	Layer name for this entity or NULL for no layer (every entity should be on a named layer!).
color	Color number (0..256). 0 = BYBLOCK, 256 = BYLAYER.
color24	24 bit color (0x00RRGGBB, see DXF reference).
width	Line thickness. Defaults to zero. -1 = BYLAYER, -2 = BYBLOCK, -3 = default width
linetype	Line type name or ¨BYLAYER¨ or ¨BYBLOCK¨. Defaults to ¨BYLAYER¨

5.4.3 Member Function Documentation

5.4.3.1 getColor()

```
int DL_Attributes::getColor ( ) const  [inline]
```

Returns

Color.

See also

DL_Codes, dxfColors

Referenced by DL_Dxf::addLayer(), DL_Writer::entityAttributes(), and DL_Dxf::writeLayer().

5.4.3.2 getColor24()

```
int DL_Attributes::getColor24 ( ) const  [inline]
```

Returns

24 bit color or -1 if no 24bit color is defined.

See also

DL_Codes, dxfColors

Referenced by DL_Writer::entityAttributes(), and DL_Dxf::writeLayer().

5.4.3.3 getLayer()

```
std::string DL_Attributes::getLayer ( ) const  [inline]
```

Returns

Layer name.

Referenced by DL_Writer::entityAttributes(), and DL_Dxf::writePolyline().

5.4.3.4 getLinetype()

```
std::string DL_Attributes::getLinetype ( ) const  [inline]
```

Returns

Line type.

Referenced by DL_Dxf::addLayer(), DL_Writer::entityAttributes(), and DL_Dxf::writeLayer().

5.4.3.5 getWidth()

```
int DL_Attributes::getWidth ( ) const  [inline]
```

Returns

Width.

Referenced by DL_Dxf::addLayer(), DL_Writer::entityAttributes(), and DL_Dxf::writeLayer().

5.4.3.6 setColor()

```
void DL_Attributes::setColor (
             int color )  [inline]
```

Sets the color.

See also

DL_Codes, dxfColors

Referenced by DL_Dxf::addLayer().

5.4.3.7 setColor24()

```
void DL_Attributes::setColor24 (
             int color )  [inline]
```

Sets the 24bit color.

See also

DL_Codes, dxfColors

5.4.3.8 setLayer()

```
void DL_Attributes::setLayer (
             const std::string & layer )  [inline]
```

Sets the layer.

If the given pointer points to NULL, the new layer name will be an empty but valid string.

5.4.3.9 setLinetype()

```
void DL_Attributes::setLinetype (
             const std::string & linetype )  [inline]
```

Sets the line type.

This can be any string and is not checked to be a valid line type.

Referenced by DL_Dxf::addLayer().

The documentation for this class was generated from the following file:

- src/dl_attributes.h

5.5 DL_BlockData Struct Reference

Block Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_BlockData (const std::string &bName, int bFlags, double bbpx, double bbpy, double bbpz)

    Constructor.

Public Attributes

- std::string **name**

    Block name.
- int flags

    Block flags.
- double **bpx**

    X Coordinate of base point.
- double **bpy**

    Y Coordinate of base point.
- double **bpz**

    Z Coordinate of base point.

5.5.1 Detailed Description

Block Data.

5.5.2 Constructor & Destructor Documentation

5.5.2.1 DL_BlockData()

```
DL_BlockData::DL_BlockData (
             const std::string & bName,
             int bFlags,
             double bbpx,
             double bbpy,
             double bbpz )  [inline]
```

Constructor.

Parameters: see member variables.

5.5.3 Member Data Documentation

5.5.3.1 flags

```
int DL_BlockData::flags
```

Block flags.

(not used currently)

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.6 DL_CircleData Struct Reference

Circle Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_CircleData (double acx, double acy, double acz, double aRadius)

  Constructor.

Public Attributes

- double cx
- double cy
- double cz
- double radius

5.6.1 Detailed Description

Circle Data.

5.6.2 Constructor & Destructor Documentation

5.6.2.1 DL_CircleData()

```
DL_CircleData::DL_CircleData (
             double acx,
             double acy,
             double acz,
             double aRadius )  [inline]
```

Constructor.

Parameters: see member variables.

5.6.3 Member Data Documentation

5.6.3.1 cx

```
double DL_CircleData::cx
```

X Coordinate of center point.

Referenced by DL_Dxf::writeCircle().

5.6.3.2 cy

```
double DL_CircleData::cy
```

Y Coordinate of center point.

Referenced by DL_Dxf::writeCircle().

5.6.3.3 cz

```
double DL_CircleData::cz
```

Z Coordinate of center point.

Referenced by DL_Dxf::writeCircle().

5.6.3.4 radius

```
double DL_CircleData::radius
```

Radius of arc.

Referenced by DL_Dxf::writeCircle().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.7 DL_Codes Class Reference

Codes for colors and DXF versions.

```
#include <dl_codes.h>
```

Public Types

- enum color {
  black = 250 , **green** = 3 , **red** = 1 , **brown** = 15 ,
  yellow = 2 , **cyan** = 4 , **magenta** = 6 , **gray** = 8 ,
  blue = 5 , **l_blue** = 163 , **l_green** = 121 , **l_cyan** = 131 ,
  l_red = 23 , **l_magenta** = 221 , **l_gray** = 252 , **white** = 7 ,
  bylayer = 256 , **byblock** = 0 }

  Standard DXF colors.
- enum version {
  AC1009_MIN , **AC1009** , **AC1012** , **AC1014** ,
  AC1015 }

  Version numbers for the DXF Format.

5.7.1 Detailed Description

Codes for colors and DXF versions.

The documentation for this class was generated from the following file:

- src/dl_codes.h

5.8 DL_ControlPointData Struct Reference

Spline control point data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_ControlPointData (double px, double py, double pz, double weight)

  Constructor.

Public Attributes

- double x
- double y
- double z
- double w

5.8.1 Detailed Description

Spline control point data.

5.8.2 Constructor & Destructor Documentation

5.8.2.1 DL_ControlPointData()

```
DL_ControlPointData::DL_ControlPointData (
              double px,
              double py,
              double pz,
              double weight )  [inline]
```

Constructor.

Parameters: see member variables.

5.8.3 Member Data Documentation

5.8.3.1 w

```
double DL_ControlPointData::w
```

Weight of control point.

5.8.3.2 x

```
double DL_ControlPointData::x
```

X coordinate of the control point.

Referenced by DL_Dxf::writeControlPoint().

5.8.3.3 y

```
double DL_ControlPointData::y
```

Y coordinate of the control point.

Referenced by DL_Dxf::writeControlPoint().

5.8.3.4 z

```
double DL_ControlPointData::z
```

Z coordinate of the control point.

Referenced by DL_Dxf::writeControlPoint().

The documentation for this struct was generated from the following file:

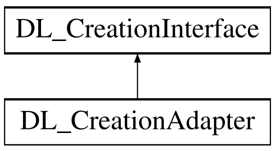
- src/dl_entities.h

5.9 DL_CreationAdapter Class Reference

An abstract adapter class for receiving DXF events when a DXF file is being read.

```
#include <dl_creationadapter.h>
```

Inheritance diagram for DL_CreationAdapter:



Public Member Functions

- virtual void processCodeValuePair (unsigned int, const std::string &)

  Called for every code / value tuple of the DXF file.
- virtual void endSection ()

  Called when a section (entity, table entry, etc.) is finished.
- virtual void addLayer (const DL_LayerData &)

  Called for every layer.
- virtual void addLinetype (const DL_LinetypeData &)

  Called for every linetype.
- virtual void addLinetypeDash (double)

  Called for every dash in linetype pattern.
- virtual void addBlock (const DL_BlockData &)

  Called for every block.
- virtual void endBlock ()

  Called to end the current block.
- virtual void addTextStyle (const DL_StyleData &)

  Called for every text style.
- virtual void addPoint (const DL_PointData &)

  Called for every point.
- virtual void addLine (const DL_LineData &)

  Called for every line.
- virtual void addXLine (const DL_XLineData &)

  Called for every xline.
- virtual void addRay (const DL_RayData &)

  Called for every ray.
- virtual void addArc (const DL_ArcData &)

  Called for every arc.
- virtual void addCircle (const DL_CircleData &)

  Called for every circle.
- virtual void addEllipse (const DL_EllipseData &)

  Called for every ellipse.
- virtual void addPolyline (const DL_PolylineData &)

  Called for every polyline start.
- virtual void addVertex (const DL_VertexData &)

  Called for every polyline vertex.

- virtual void addSpline (const DL_SplineData &)

  Called for every spline.
- virtual void addControlPoint (const DL_ControlPointData &)

  Called for every spline control point.
- virtual void addFitPoint (const DL_FitPointData &)

  Called for every spline fit point.
- virtual void addKnot (const DL_KnotData &)

  Called for every spline knot value.
- virtual void addInsert (const DL_InsertData &)

  Called for every insert.
- virtual void addMText (const DL_MTextData &)

  Called for every multi Text entity.
- virtual void addMTextChunk (const std::string &)

  Called for additional text chunks for MTEXT entities.
- virtual void addText (const DL_TextData &)

  Called for every text entity.
- virtual void addArcAlignedText (const DL_ArcAlignedTextData &)

  Called for every arc aligned text entity.
- virtual void addAttribute (const DL_AttributeData &)

  Called for every block Attribute entity.
- virtual void addDimAlign (const DL_DimensionData &, const DL_DimAlignedData &)

  Called for every aligned dimension entity.
- virtual void addDimLinear (const DL_DimensionData &, const DL_DimLinearData &)

  Called for every linear or rotated dimension entity.
- virtual void addDimRadial (const DL_DimensionData &, const DL_DimRadialData &)

  Called for every radial dimension entity.
- virtual void addDimDiametric (const DL_DimensionData &, const DL_DimDiametricData &)

  Called for every diametric dimension entity.
- virtual void addDimAngular (const DL_DimensionData &, const DL_DimAngular2LData &)

  Called for every angular dimension (2 lines version) entity.
- virtual void addDimAngular3P (const DL_DimensionData &, const DL_DimAngular3PData &)

  Called for every angular dimension (3 points version) entity.
- virtual void addDimOrdinate (const DL_DimensionData &, const DL_DimOrdinateData &)

  Called for every ordinate dimension entity.
- virtual void addLeader (const DL_LeaderData &)

  Called for every leader start.
- virtual void addLeaderVertex (const DL_LeaderVertexData &)

  Called for every leader vertex.
- virtual void addHatch (const DL_HatchData &)

  Called for every hatch entity.
- virtual void addTrace (const DL_TraceData &)

  Called for every trace start.
- virtual void add3dFace (const DL_3dFaceData &)

  Called for every 3dface start.
- virtual void addSolid (const DL_SolidData &)

  Called for every solid start.
- virtual void addImage (const DL_ImageData &)

  Called for every image entity.
- virtual void linkImage (const DL_ImageDefData &)

  Called for every image definition.
- virtual void addHatchLoop (const DL_HatchLoopData &)

Called for every hatch loop.
- virtual void addHatchEdge (const DL_HatchEdgeData &)

  Called for every hatch edge entity.
- virtual void addXRecord (const std::string &)

  Called for every XRecord with the given handle.
- virtual void addXRecordString (int, const std::string &)

  Called for XRecords of type string.
- virtual void addXRecordReal (int, double)

  Called for XRecords of type double.
- virtual void addXRecordInt (int, int)

  Called for XRecords of type int.
- virtual void addXRecordBool (int, bool)

  Called for XRecords of type bool.
- virtual void addXDataApp (const std::string &)

  Called for every beginning of an XData section of the given application.
- virtual void addXDataString (int, const std::string &)

  Called for XData tuples.
- virtual void addXDataReal (int, double)

  Called for XData tuples.
- virtual void addXDataInt (int, int)

  Called for XData tuples.
- virtual void addDictionary (const DL_DictionaryData &)

  Called for dictionary objects.
- virtual void addDictionaryEntry (const DL_DictionaryEntryData &)

  Called for dictionary entries.
- virtual void endEntity ()

  Called after an entity has been completed.
- virtual void addComment (const std::string &)

  Called for every comment in the DXF file (code 999).
- virtual void setVariableVector (const std::string &, double, double, double, int)

  Called for every vector variable in the DXF file (e.g.
- virtual void setVariableString (const std::string &, const std::string &, int)

  Called for every string variable in the DXF file (e.g.
- virtual void setVariableInt (const std::string &, int, int)

  Called for every int variable in the DXF file (e.g.
- virtual void setVariableDouble (const std::string &, double, int)

  Called for every double variable in the DXF file (e.g.
- virtual void endSequence ()

  Called when a SEQEND occurs (when a POLYLINE or ATTRIB is done)

Public Member Functions inherited from DL_CreationInterface

- virtual void processCodeValuePair (unsigned int groupCode, const std::string &groupValue)=0

  Called for every code / value tuple of the DXF file.
- virtual void endSection ()=0

  Called when a section (entity, table entry, etc.) is finished.
- virtual void addLayer (const DL_LayerData &data)=0

  Called for every layer.
- virtual void addLinetype (const DL_LinetypeData &data)=0

  Called for every linetype.

- virtual void addLinetypeDash (double length)=0

    Called for every dash in linetype pattern.
- virtual void addBlock (const DL_BlockData &data)=0

    Called for every block.
- virtual void endBlock ()=0

    Called to end the current block.
- virtual void addTextStyle (const DL_StyleData &data)=0

    Called for every text style.
- virtual void addPoint (const DL_PointData &data)=0

    Called for every point.
- virtual void addLine (const DL_LineData &data)=0

    Called for every line.
- virtual void addXLine (const DL_XLineData &data)=0

    Called for every xline.
- virtual void addRay (const DL_RayData &data)=0

    Called for every ray.
- virtual void addArc (const DL_ArcData &data)=0

    Called for every arc.
- virtual void addCircle (const DL_CircleData &data)=0

    Called for every circle.
- virtual void addEllipse (const DL_EllipseData &data)=0

    Called for every ellipse.
- virtual void addPolyline (const DL_PolylineData &data)=0

    Called for every polyline start.
- virtual void addVertex (const DL_VertexData &data)=0

    Called for every polyline vertex.
- virtual void addSpline (const DL_SplineData &data)=0

    Called for every spline.
- virtual void addControlPoint (const DL_ControlPointData &data)=0

    Called for every spline control point.
- virtual void addFitPoint (const DL_FitPointData &data)=0

    Called for every spline fit point.
- virtual void addKnot (const DL_KnotData &data)=0

    Called for every spline knot value.
- virtual void addInsert (const DL_InsertData &data)=0

    Called for every insert.
- virtual void addTrace (const DL_TraceData &data)=0

    Called for every trace start.
- virtual void add3dFace (const DL_3dFaceData &data)=0

    Called for every 3dface start.
- virtual void addSolid (const DL_SolidData &data)=0

    Called for every solid start.
- virtual void addMText (const DL_MTextData &data)=0

    Called for every multi Text entity.
- virtual void addMTextChunk (const std::string &text)=0

    Called for additional text chunks for MTEXT entities.
- virtual void addText (const DL_TextData &data)=0

    Called for every text entity.
- virtual void addArcAlignedText (const DL_ArcAlignedTextData &data)=0

    Called for every arc aligned text entity.
- virtual void addAttribute (const DL_AttributeData &data)=0

Called for every block Attribute entity.
- virtual void addDimAlign (const DL_DimensionData &data, const DL_DimAlignedData &edata)=0

  Called for every aligned dimension entity.
- virtual void addDimLinear (const DL_DimensionData &data, const DL_DimLinearData &edata)=0

  Called for every linear or rotated dimension entity.
- virtual void addDimRadial (const DL_DimensionData &data, const DL_DimRadialData &edata)=0

  Called for every radial dimension entity.
- virtual void addDimDiametric (const DL_DimensionData &data, const DL_DimDiametricData &edata)=0

  Called for every diametric dimension entity.
- virtual void addDimAngular (const DL_DimensionData &data, const DL_DimAngular2LData &edata)=0

  Called for every angular dimension (2 lines version) entity.
- virtual void addDimAngular3P (const DL_DimensionData &data, const DL_DimAngular3PData &edata)=0

  Called for every angular dimension (3 points version) entity.
- virtual void addDimOrdinate (const DL_DimensionData &data, const DL_DimOrdinateData &edata)=0

  Called for every ordinate dimension entity.
- virtual void addLeader (const DL_LeaderData &data)=0

  Called for every leader start.
- virtual void addLeaderVertex (const DL_LeaderVertexData &data)=0

  Called for every leader vertex.
- virtual void addHatch (const DL_HatchData &data)=0

  Called for every hatch entity.
- virtual void addImage (const DL_ImageData &data)=0

  Called for every image entity.
- virtual void linkImage (const DL_ImageDefData &data)=0

  Called for every image definition.
- virtual void addHatchLoop (const DL_HatchLoopData &data)=0

  Called for every hatch loop.
- virtual void addHatchEdge (const DL_HatchEdgeData &data)=0

  Called for every hatch edge entity.
- virtual void addXRecord (const std::string &handle)=0

  Called for every XRecord with the given handle.
- virtual void addXRecordString (int code, const std::string &value)=0

  Called for XRecords of type string.
- virtual void addXRecordReal (int code, double value)=0

  Called for XRecords of type double.
- virtual void addXRecordInt (int code, int value)=0

  Called for XRecords of type int.
- virtual void addXRecordBool (int code, bool value)=0

  Called for XRecords of type bool.
- virtual void addXDataApp (const std::string &appId)=0

  Called for every beginning of an XData section of the given application.
- virtual void addXDataString (int code, const std::string &value)=0

  Called for XData tuples.
- virtual void addXDataReal (int code, double value)=0

  Called for XData tuples.
- virtual void addXDataInt (int code, int value)=0

  Called for XData tuples.
- virtual void addDictionary (const DL_DictionaryData &data)=0

  Called for dictionary objects.
- virtual void addDictionaryEntry (const DL_DictionaryEntryData &data)=0

  Called for dictionary entries.

- virtual void endEntity ()=0

  Called after an entity has been completed.
- virtual void addComment (const std::string &comment)=0

  Called for every comment in the DXF file (code 999).
- virtual void setVariableVector (const std::string &key, double v1, double v2, double v3, int code)=0

  Called for every vector variable in the DXF file (e.g.
- virtual void setVariableString (const std::string &key, const std::string &value, int code)=0

  Called for every string variable in the DXF file (e.g.
- virtual void setVariableInt (const std::string &key, int value, int code)=0

  Called for every int variable in the DXF file (e.g.
- virtual void setVariableDouble (const std::string &key, double value, int code)=0

  Called for every double variable in the DXF file (e.g.
- virtual void endSequence ()=0

  Called when a SEQEND occurs (when a POLYLINE or ATTRIB is done)
- void **setAttributes** (const DL_Attributes &attrib)

  Sets the current attributes for entities.
- DL_Attributes getAttributes ()
- void **setExtrusion** (double dx, double dy, double dz, double elevation)

  Sets the current attributes for entities.
- DL_Extrusion ∗ getExtrusion ()

Additional Inherited Members

Protected Attributes inherited from DL_CreationInterface

- DL_Attributes **attributes**
- DL_Extrusion ∗ **extrusion**

5.9.1 Detailed Description

An abstract adapter class for receiving DXF events when a DXF file is being read.

The methods in this class are empty. This class exists as convenience for creating listener objects.

Author

Andrew Mustun

5.9.2 Member Function Documentation

5.9.2.1 add3dFace()

```
virtual void DL_CreationAdapter::add3dFace (
            const DL_3dFaceData & data )  [inline], [virtual]
```

Called for every 3dface start.

Implements DL_CreationInterface.

5.9.2.2 addArc()

```
virtual void DL_CreationAdapter::addArc (
             const DL_ArcData & data )  [inline], [virtual]
```

Called for every arc.

Implements DL_CreationInterface.

5.9.2.3 addArcAlignedText()

```
virtual void DL_CreationAdapter::addArcAlignedText (
             const DL_ArcAlignedTextData & data )  [inline], [virtual]
```

Called for every arc aligned text entity.

Implements DL_CreationInterface.

5.9.2.4 addAttribute()

```
virtual void DL_CreationAdapter::addAttribute (
             const DL_AttributeData & data )  [inline], [virtual]
```

Called for every block Attribute entity.

Implements DL_CreationInterface.

5.9.2.5 addBlock()

```
virtual void DL_CreationAdapter::addBlock (
             const DL_BlockData & data )  [inline], [virtual]
```

Called for every block.

Note: all entities added after this command go into this block until endBlock() is called.

See also

endBlock()

Implements DL_CreationInterface.

5.9.2.6 addCircle()

```
virtual void DL_CreationAdapter::addCircle (
             const DL_CircleData & data )  [inline], [virtual]
```

Called for every circle.

Implements DL_CreationInterface.

5.9.2.7 addComment()

```
virtual void DL_CreationAdapter::addComment (
            const std::string & comment )  [inline], [virtual]
```

Called for every comment in the DXF file (code 999).

Implements DL_CreationInterface.

5.9.2.8 addControlPoint()

```
virtual void DL_CreationAdapter::addControlPoint (
            const DL_ControlPointData & data )  [inline], [virtual]
```

Called for every spline control point.

Implements DL_CreationInterface.

5.9.2.9 addDictionary()

```
virtual void DL_CreationAdapter::addDictionary (
            const DL_DictionaryData & data )  [inline], [virtual]
```

Called for dictionary objects.

Implements DL_CreationInterface.

5.9.2.10 addDictionaryEntry()

```
virtual void DL_CreationAdapter::addDictionaryEntry (
            const DL_DictionaryEntryData & data )  [inline], [virtual]
```

Called for dictionary entries.

Implements DL_CreationInterface.

5.9.2.11 addDimAlign()

```
virtual void DL_CreationAdapter::addDimAlign (
            const DL_DimensionData & data,
            const DL_DimAlignedData & edata )  [inline], [virtual]
```

Called for every aligned dimension entity.

Implements DL_CreationInterface.

5.9.2.12 addDimAngular()

```
virtual void DL_CreationAdapter::addDimAngular (
            const DL_DimensionData & data,
            const DL_DimAngular2LData & edata )  [inline], [virtual]
```

Called for every angular dimension (2 lines version) entity.

Implements DL_CreationInterface.

5.9.2.13 addDimAngular3P()

```
virtual void DL_CreationAdapter::addDimAngular3P (
            const DL_DimensionData & data,
            const DL_DimAngular3PData & edata )  [inline], [virtual]
```

Called for every angular dimension (3 points version) entity.

Implements DL_CreationInterface.

5.9.2.14 addDimDiametric()

```
virtual void DL_CreationAdapter::addDimDiametric (
            const DL_DimensionData & data,
            const DL_DimDiametricData & edata )  [inline], [virtual]
```

Called for every diametric dimension entity.

Implements DL_CreationInterface.

5.9.2.15 addDimLinear()

```
virtual void DL_CreationAdapter::addDimLinear (
            const DL_DimensionData & data,
            const DL_DimLinearData & edata )  [inline], [virtual]
```

Called for every linear or rotated dimension entity.

Implements DL_CreationInterface.

5.9.2.16 addDimOrdinate()

```
virtual void DL_CreationAdapter::addDimOrdinate (
            const DL_DimensionData & data,
            const DL_DimOrdinateData & edata )  [inline], [virtual]
```

Called for every ordinate dimension entity.

Implements DL_CreationInterface.

5.9.2.17 addDimRadial()

```
virtual void DL_CreationAdapter::addDimRadial (
             const DL_DimensionData & data,
             const DL_DimRadialData & edata )  [inline], [virtual]
```

Called for every radial dimension entity.

Implements DL_CreationInterface.

5.9.2.18 addEllipse()

```
virtual void DL_CreationAdapter::addEllipse (
             const DL_EllipseData & data )  [inline], [virtual]
```

Called for every ellipse.

Implements DL_CreationInterface.

5.9.2.19 addFitPoint()

```
virtual void DL_CreationAdapter::addFitPoint (
             const DL_FitPointData & data )  [inline], [virtual]
```

Called for every spline fit point.

Implements DL_CreationInterface.

5.9.2.20 addHatch()

```
virtual void DL_CreationAdapter::addHatch (
             const DL_HatchData & data )  [inline], [virtual]
```

Called for every hatch entity.

Implements DL_CreationInterface.

5.9.2.21 addHatchEdge()

```
virtual void DL_CreationAdapter::addHatchEdge (
             const DL_HatchEdgeData & data )  [inline], [virtual]
```

Called for every hatch edge entity.

Implements DL_CreationInterface.

5.9.2.22 addHatchLoop()

```
virtual void DL_CreationAdapter::addHatchLoop (
             const DL_HatchLoopData & data )  [inline], [virtual]
```

Called for every hatch loop.

Implements DL_CreationInterface.

5.9.2.23 addImage()

```
virtual void DL_CreationAdapter::addImage (
             const DL_ImageData & data )  [inline], [virtual]
```

Called for every image entity.

Implements DL_CreationInterface.

5.9.2.24 addInsert()

```
virtual void DL_CreationAdapter::addInsert (
             const DL_InsertData & data )  [inline], [virtual]
```

Called for every insert.

Implements DL_CreationInterface.

5.9.2.25 addKnot()

```
virtual void DL_CreationAdapter::addKnot (
             const DL_KnotData & data )  [inline], [virtual]
```

Called for every spline knot value.

Implements DL_CreationInterface.

5.9.2.26 addLayer()

```
virtual void DL_CreationAdapter::addLayer (
             const DL_LayerData & data )  [inline], [virtual]
```

Called for every layer.

Implements DL_CreationInterface.

5.9.2.27 addLeader()

```
virtual void DL_CreationAdapter::addLeader (
             const DL_LeaderData & data )  [inline], [virtual]
```

Called for every leader start.

Implements DL_CreationInterface.

5.9.2.28 addLeaderVertex()

```
virtual void DL_CreationAdapter::addLeaderVertex (
             const DL_LeaderVertexData & data )  [inline], [virtual]
```

Called for every leader vertex.

Implements DL_CreationInterface.

5.9.2.29 addLine()

```
virtual void DL_CreationAdapter::addLine (
             const DL_LineData & data )  [inline], [virtual]
```

Called for every line.

Implements DL_CreationInterface.

5.9.2.30 addLinetype()

```
virtual void DL_CreationAdapter::addLinetype (
             const DL_LinetypeData & data )  [inline], [virtual]
```

Called for every linetype.

Implements DL_CreationInterface.

5.9.2.31 addLinetypeDash()

```
virtual void DL_CreationAdapter::addLinetypeDash (
             double length )  [inline], [virtual]
```

Called for every dash in linetype pattern.

Implements DL_CreationInterface.

5.9.2.32 addMText()

```
virtual void DL_CreationAdapter::addMText (
             const DL_MTextData & data )  [inline], [virtual]
```

Called for every multi Text entity.

Implements DL_CreationInterface.

5.9.2.33 addMTextChunk()

```
virtual void DL_CreationAdapter::addMTextChunk (
             const std::string & text )  [inline], [virtual]
```

Called for additional text chunks for MTEXT entities.

The chunks come at 250 character in size each. Note that those chunks come **before** the actual MTEXT entity.

Implements DL_CreationInterface.

5.9.2.34 addPoint()

```
virtual void DL_CreationAdapter::addPoint (
             const DL_PointData & data )  [inline], [virtual]
```

Called for every point.

Implements DL_CreationInterface.

5.9.2.35 addPolyline()

```
virtual void DL_CreationAdapter::addPolyline (
             const DL_PolylineData & data )  [inline], [virtual]
```

Called for every polyline start.

Implements DL_CreationInterface.

5.9.2.36 addRay()

```
virtual void DL_CreationAdapter::addRay (
             const DL_RayData & data )  [inline], [virtual]
```

Called for every ray.

Implements DL_CreationInterface.

5.9.2.37 addSolid()

```
virtual void DL_CreationAdapter::addSolid (
             const DL_SolidData & data )  [inline], [virtual]
```

Called for every solid start.

Implements DL_CreationInterface.

5.9.2.38 addSpline()

```
virtual void DL_CreationAdapter::addSpline (
             const DL_SplineData & data )  [inline], [virtual]
```

Called for every spline.

Implements DL_CreationInterface.

5.9.2.39 addText()

```
virtual void DL_CreationAdapter::addText (
             const DL_TextData & data )  [inline], [virtual]
```

Called for every text entity.

Implements DL_CreationInterface.

5.9.2.40 addTextStyle()

```
virtual void DL_CreationAdapter::addTextStyle (
             const DL_StyleData & data )  [inline], [virtual]
```

Called for every text style.

Implements DL_CreationInterface.

5.9.2.41 addTrace()

```
virtual void DL_CreationAdapter::addTrace (
             const DL_TraceData & data )  [inline], [virtual]
```

Called for every trace start.

Implements DL_CreationInterface.

5.9.2.42 addVertex()

```
virtual void DL_CreationAdapter::addVertex (
             const DL_VertexData & data )  [inline], [virtual]
```

Called for every polyline vertex.

Implements DL_CreationInterface.

5.9.2.43 addXDataApp()

```
virtual void DL_CreationAdapter::addXDataApp (
             const std::string & appId )  [inline], [virtual]
```

Called for every beginning of an XData section of the given application.

Implements DL_CreationInterface.

5.9.2.44 addXDataInt()

```
virtual void DL_CreationAdapter::addXDataInt (
             int code,
             int value )  [inline], [virtual]
```

Called for XData tuples.

Implements DL_CreationInterface.

5.9.2.45 addXDataReal()

```
virtual void DL_CreationAdapter::addXDataReal (
             int code,
             double value )  [inline], [virtual]
```

Called for XData tuples.

Implements DL_CreationInterface.

5.9.2.46 addXDataString()

```
virtual void DL_CreationAdapter::addXDataString (
             int code,
             const std::string & value )  [inline], [virtual]
```

Called for XData tuples.

Implements DL_CreationInterface.

5.9.2.47 addXLine()

```
virtual void DL_CreationAdapter::addXLine (
             const DL_XLineData & data )  [inline], [virtual]
```

Called for every xline.

Implements DL_CreationInterface.

5.9.2.48 addXRecord()

```
virtual void DL_CreationAdapter::addXRecord (
             const std::string & handle )  [inline], [virtual]
```

Called for every XRecord with the given handle.

Implements DL_CreationInterface.

5.9.2.49 addXRecordBool()

```
virtual void DL_CreationAdapter::addXRecordBool (
             int code,
             bool value )  [inline], [virtual]
```

Called for XRecords of type bool.

Implements DL_CreationInterface.

5.9.2.50 addXRecordInt()

```
virtual void DL_CreationAdapter::addXRecordInt (
             int code,
             int value )  [inline], [virtual]
```

Called for XRecords of type int.

Implements DL_CreationInterface.

5.9.2.51 addXRecordReal()

```
virtual void DL_CreationAdapter::addXRecordReal (
             int code,
             double value )  [inline], [virtual]
```

Called for XRecords of type double.

Implements DL_CreationInterface.

5.9.2.52 addXRecordString()

```
virtual void DL_CreationAdapter::addXRecordString (
             int code,
             const std::string & value )  [inline], [virtual]
```

Called for XRecords of type string.

Implements DL_CreationInterface.

5.9.2.53 endBlock()

```
virtual void DL_CreationAdapter::endBlock ( )  [inline], [virtual]
```

Called to end the current block.

Implements DL_CreationInterface.

5.9.2.54 endEntity()

```
virtual void DL_CreationAdapter::endEntity ( ) [inline], [virtual]
```

Called after an entity has been completed.

Implements DL_CreationInterface.

5.9.2.55 endSection()

```
virtual void DL_CreationAdapter::endSection ( ) [inline], [virtual]
```

Called when a section (entity, table entry, etc.) is finished.

Implements DL_CreationInterface.

5.9.2.56 endSequence()

```
virtual void DL_CreationAdapter::endSequence ( ) [inline], [virtual]
```

Called when a SEQEND occurs (when a POLYLINE or ATTRIB is done)

Implements DL_CreationInterface.

5.9.2.57 linkImage()

```
virtual void DL_CreationAdapter::linkImage (
             const DL_ImageDefData & data ) [inline], [virtual]
```

Called for every image definition.

Implements DL_CreationInterface.

5.9.2.58 processCodeValuePair()

```
virtual void DL_CreationAdapter::processCodeValuePair (
             unsigned int groupCode,
             const std::string & groupValue ) [inline], [virtual]
```

Called for every code / value tuple of the DXF file.

The complete DXF file contents can be handled by the implemetation of this function.

Implements DL_CreationInterface.

5.9.2.59 setVariableDouble()

```
virtual void DL_CreationAdapter::setVariableDouble (
              const std::string & key,
              double value,
              int code )  [inline], [virtual]
```

Called for every double variable in the DXF file (e.g.

¨$DIMEXO¨).

Implements DL_CreationInterface.

5.9.2.60 setVariableInt()

```
virtual void DL_CreationAdapter::setVariableInt (
              const std::string & key,
              int value,
              int code )  [inline], [virtual]
```

Called for every int variable in the DXF file (e.g.

¨$ACADMAINTVER¨).

Implements DL_CreationInterface.

5.9.2.61 setVariableString()

```
virtual void DL_CreationAdapter::setVariableString (
              const std::string & key,
              const std::string & value,
              int code )  [inline], [virtual]
```

Called for every string variable in the DXF file (e.g.

¨$ACADVER¨).

Implements DL_CreationInterface.

5.9.2.62 setVariableVector()

```
virtual void DL_CreationAdapter::setVariableVector (
              const std::string & key,
              double v1,
              double v2,
              double v3,
              int code )  [inline], [virtual]
```

Called for every vector variable in the DXF file (e.g.

¨$EXTMIN¨).

Implements DL_CreationInterface.

The documentation for this class was generated from the following file:

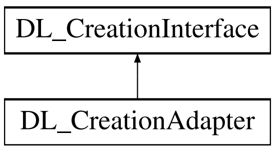
- src/dl_creationadapter.h

5.10 DL_CreationInterface Class Reference

Abstract class (interface) for the creation of new entities.

```
#include <dl_creationinterface.h>
```

Inheritance diagram for DL_CreationInterface:



Public Member Functions

- virtual void processCodeValuePair (unsigned int groupCode, const std::string &groupValue)=0

  Called for every code / value tuple of the DXF file.
- virtual void endSection ()=0

  Called when a section (entity, table entry, etc.) is finished.
- virtual void addLayer (const DL_LayerData &data)=0

  Called for every layer.
- virtual void addLinetype (const DL_LinetypeData &data)=0

  Called for every linetype.
- virtual void addLinetypeDash (double length)=0

  Called for every dash in linetype pattern.
- virtual void addBlock (const DL_BlockData &data)=0

  Called for every block.
- virtual void endBlock ()=0

  Called to end the current block.
- virtual void addTextStyle (const DL_StyleData &data)=0

  Called for every text style.
- virtual void addPoint (const DL_PointData &data)=0

  Called for every point.
- virtual void addLine (const DL_LineData &data)=0

  Called for every line.
- virtual void addXLine (const DL_XLineData &data)=0

  Called for every xline.
- virtual void addRay (const DL_RayData &data)=0

  Called for every ray.
- virtual void addArc (const DL_ArcData &data)=0

  Called for every arc.
- virtual void addCircle (const DL_CircleData &data)=0

  Called for every circle.
- virtual void addEllipse (const DL_EllipseData &data)=0

  Called for every ellipse.
- virtual void addPolyline (const DL_PolylineData &data)=0

  Called for every polyline start.
- virtual void addVertex (const DL_VertexData &data)=0

  Called for every polyline vertex.

- virtual void addSpline (const DL_SplineData &data)=0

    Called for every spline.
- virtual void addControlPoint (const DL_ControlPointData &data)=0

    Called for every spline control point.
- virtual void addFitPoint (const DL_FitPointData &data)=0

    Called for every spline fit point.
- virtual void addKnot (const DL_KnotData &data)=0

    Called for every spline knot value.
- virtual void addInsert (const DL_InsertData &data)=0

    Called for every insert.
- virtual void addTrace (const DL_TraceData &data)=0

    Called for every trace start.
- virtual void add3dFace (const DL_3dFaceData &data)=0

    Called for every 3dface start.
- virtual void addSolid (const DL_SolidData &data)=0

    Called for every solid start.
- virtual void addMText (const DL_MTextData &data)=0

    Called for every multi Text entity.
- virtual void addMTextChunk (const std::string &text)=0

    Called for additional text chunks for MTEXT entities.
- virtual void addText (const DL_TextData &data)=0

    Called for every text entity.
- virtual void addArcAlignedText (const DL_ArcAlignedTextData &data)=0

    Called for every arc aligned text entity.
- virtual void addAttribute (const DL_AttributeData &data)=0

    Called for every block Attribute entity.
- virtual void addDimAlign (const DL_DimensionData &data, const DL_DimAlignedData &edata)=0

    Called for every aligned dimension entity.
- virtual void addDimLinear (const DL_DimensionData &data, const DL_DimLinearData &edata)=0

    Called for every linear or rotated dimension entity.
- virtual void addDimRadial (const DL_DimensionData &data, const DL_DimRadialData &edata)=0

    Called for every radial dimension entity.
- virtual void addDimDiametric (const DL_DimensionData &data, const DL_DimDiametricData &edata)=0

    Called for every diametric dimension entity.
- virtual void addDimAngular (const DL_DimensionData &data, const DL_DimAngular2LData &edata)=0

    Called for every angular dimension (2 lines version) entity.
- virtual void addDimAngular3P (const DL_DimensionData &data, const DL_DimAngular3PData &edata)=0

    Called for every angular dimension (3 points version) entity.
- virtual void addDimOrdinate (const DL_DimensionData &data, const DL_DimOrdinateData &edata)=0

    Called for every ordinate dimension entity.
- virtual void addLeader (const DL_LeaderData &data)=0

    Called for every leader start.
- virtual void addLeaderVertex (const DL_LeaderVertexData &data)=0

    Called for every leader vertex.
- virtual void addHatch (const DL_HatchData &data)=0

    Called for every hatch entity.
- virtual void addImage (const DL_ImageData &data)=0

    Called for every image entity.
- virtual void linkImage (const DL_ImageDefData &data)=0

    Called for every image definition.
- virtual void addHatchLoop (const DL_HatchLoopData &data)=0

Called for every hatch loop.
- virtual void addHatchEdge (const DL_HatchEdgeData &data)=0

  Called for every hatch edge entity.
- virtual void addXRecord (const std::string &handle)=0

  Called for every XRecord with the given handle.
- virtual void addXRecordString (int code, const std::string &value)=0

  Called for XRecords of type string.
- virtual void addXRecordReal (int code, double value)=0

  Called for XRecords of type double.
- virtual void addXRecordInt (int code, int value)=0

  Called for XRecords of type int.
- virtual void addXRecordBool (int code, bool value)=0

  Called for XRecords of type bool.
- virtual void addXDataApp (const std::string &appId)=0

  Called for every beginning of an XData section of the given application.
- virtual void addXDataString (int code, const std::string &value)=0

  Called for XData tuples.
- virtual void addXDataReal (int code, double value)=0

  Called for XData tuples.
- virtual void addXDataInt (int code, int value)=0

  Called for XData tuples.
- virtual void addDictionary (const DL_DictionaryData &data)=0

  Called for dictionary objects.
- virtual void addDictionaryEntry (const DL_DictionaryEntryData &data)=0

  Called for dictionary entries.
- virtual void endEntity ()=0

  Called after an entity has been completed.
- virtual void addComment (const std::string &comment)=0

  Called for every comment in the DXF file (code 999).
- virtual void setVariableVector (const std::string &key, double v1, double v2, double v3, int code)=0

  Called for every vector variable in the DXF file (e.g.
- virtual void setVariableString (const std::string &key, const std::string &value, int code)=0

  Called for every string variable in the DXF file (e.g.
- virtual void setVariableInt (const std::string &key, int value, int code)=0

  Called for every int variable in the DXF file (e.g.
- virtual void setVariableDouble (const std::string &key, double value, int code)=0

  Called for every double variable in the DXF file (e.g.
- virtual void endSequence ()=0

  Called when a SEQEND occurs (when a POLYLINE or ATTRIB is done)
- void **setAttributes** (const DL_Attributes &attrib)

  Sets the current attributes for entities.
- DL_Attributes getAttributes ()
- void **setExtrusion** (double dx, double dy, double dz, double elevation)

  Sets the current attributes for entities.
- DL_Extrusion ∗ getExtrusion ()

Protected Attributes

- DL_Attributes **attributes**
- DL_Extrusion ∗ **extrusion**

5.10.1 Detailed Description

Abstract class (interface) for the creation of new entities.

Inherit your class which takes care of the entities in the processed DXF file from this interface.

Double arrays passed to your implementation contain 3 double values for x, y, z coordinates unless stated differently.

Author

Andrew Mustun

5.10.2 Member Function Documentation

5.10.2.1 add3dFace()

```
virtual void DL_CreationInterface::add3dFace (
             const DL_3dFaceData & data )  [pure virtual]
```

Called for every 3dface start.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::add3dFace().

5.10.2.2 addArc()

```
virtual void DL_CreationInterface::addArc (
             const DL_ArcData & data )  [pure virtual]
```

Called for every arc.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addArc().

5.10.2.3 addArcAlignedText()

```
virtual void DL_CreationInterface::addArcAlignedText (
             const DL_ArcAlignedTextData & data )  [pure virtual]
```

Called for every arc aligned text entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addArcAlignedText().

5.10.2.4 addAttribute()

```
virtual void DL_CreationInterface::addAttribute (
             const DL_AttributeData & data )  [pure virtual]
```

Called for every block Attribute entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addAttribute().

5.10.2.5 addBlock()

```
virtual void DL_CreationInterface::addBlock (
             const DL_BlockData & data )  [pure virtual]
```

Called for every block.

Note: all entities added after this command go into this block until endBlock() is called.

See also

endBlock()

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addBlock().

5.10.2.6 addCircle()

```
virtual void DL_CreationInterface::addCircle (
             const DL_CircleData & data )  [pure virtual]
```

Called for every circle.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addCircle().

5.10.2.7 addComment()

```
virtual void DL_CreationInterface::addComment (
             const std::string & comment )  [pure virtual]
```

Called for every comment in the DXF file (code 999).

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addComment().

5.10.2.8 addControlPoint()

```
virtual void DL_CreationInterface::addControlPoint (
             const DL_ControlPointData & data )  [pure virtual]
```

Called for every spline control point.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSpline().

5.10.2.9 addDictionary()

```
virtual void DL_CreationInterface::addDictionary (
             const DL_DictionaryData & data )  [pure virtual]
```

Called for dictionary objects.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleDictionaryData().

5.10.2.10 addDictionaryEntry()

```
virtual void DL_CreationInterface::addDictionaryEntry (
             const DL_DictionaryEntryData & data )  [pure virtual]
```

Called for dictionary entries.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleDictionaryData().

5.10.2.11 addDimAlign()

```
virtual void DL_CreationInterface::addDimAlign (
             const DL_DimensionData & data,
             const DL_DimAlignedData & edata )  [pure virtual]
```

Called for every aligned dimension entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimAligned().

5.10.2.12 addDimAngular()

```
virtual void DL_CreationInterface::addDimAngular (
             const DL_DimensionData & data,
             const DL_DimAngular2LData & edata )  [pure virtual]
```

Called for every angular dimension (2 lines version) entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimAngular().

5.10.2.13 addDimAngular3P()

```
virtual void DL_CreationInterface::addDimAngular3P (
            const DL_DimensionData & data,
            const DL_DimAngular3PData & edata )  [pure virtual]
```

Called for every angular dimension (3 points version) entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimAngular3P().

5.10.2.14 addDimDiametric()

```
virtual void DL_CreationInterface::addDimDiametric (
            const DL_DimensionData & data,
            const DL_DimDiametricData & edata )  [pure virtual]
```

Called for every diametric dimension entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimDiametric().

5.10.2.15 addDimLinear()

```
virtual void DL_CreationInterface::addDimLinear (
            const DL_DimensionData & data,
            const DL_DimLinearData & edata )  [pure virtual]
```

Called for every linear or rotated dimension entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimLinear().

5.10.2.16 addDimOrdinate()

```
virtual void DL_CreationInterface::addDimOrdinate (
            const DL_DimensionData & data,
            const DL_DimOrdinateData & edata )  [pure virtual]
```

Called for every ordinate dimension entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimOrdinate().

5.10.2.17 addDimRadial()

```
virtual void DL_CreationInterface::addDimRadial (
             const DL_DimensionData & data,
             const DL_DimRadialData & edata )  [pure virtual]
```

Called for every radial dimension entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addDimRadial().

5.10.2.18 addEllipse()

```
virtual void DL_CreationInterface::addEllipse (
             const DL_EllipseData & data )  [pure virtual]
```

Called for every ellipse.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addEllipse().

5.10.2.19 addFitPoint()

```
virtual void DL_CreationInterface::addFitPoint (
             const DL_FitPointData & data )  [pure virtual]
```

Called for every spline fit point.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSpline().

5.10.2.20 addHatch()

```
virtual void DL_CreationInterface::addHatch (
             const DL_HatchData & data )  [pure virtual]
```

Called for every hatch entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addHatch().

5.10.2.21 addHatchEdge()

```
virtual void DL_CreationInterface::addHatchEdge (
             const DL_HatchEdgeData & data )  [pure virtual]
```

Called for every hatch edge entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addHatch().

5.10.2.22 addHatchLoop()

```
virtual void DL_CreationInterface::addHatchLoop (
             const DL_HatchLoopData & data )  [pure virtual]
```

Called for every hatch loop.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addHatch().

5.10.2.23 addImage()

```
virtual void DL_CreationInterface::addImage (
             const DL_ImageData & data )  [pure virtual]
```

Called for every image entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addImage().

5.10.2.24 addInsert()

```
virtual void DL_CreationInterface::addInsert (
             const DL_InsertData & data )  [pure virtual]
```

Called for every insert.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addInsert().

5.10.2.25 addKnot()

```
virtual void DL_CreationInterface::addKnot (
             const DL_KnotData & data )  [pure virtual]
```

Called for every spline knot value.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSpline().

5.10.2.26 addLayer()

```
virtual void DL_CreationInterface::addLayer (
             const DL_LayerData & data )  [pure virtual]
```

Called for every layer.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addLayer().

5.10.2.27 addLeader()

```
virtual void DL_CreationInterface::addLeader (
             const DL_LeaderData & data )  [pure virtual]
```

Called for every leader start.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addLeader().

5.10.2.28 addLeaderVertex()

```
virtual void DL_CreationInterface::addLeaderVertex (
             const DL_LeaderVertexData & data )  [pure virtual]
```

Called for every leader vertex.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addLeader().

5.10.2.29 addLine()

```
virtual void DL_CreationInterface::addLine (
             const DL_LineData & data )  [pure virtual]
```

Called for every line.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addLine().

5.10.2.30 addLinetype()

```
virtual void DL_CreationInterface::addLinetype (
             const DL_LinetypeData & data )  [pure virtual]
```

Called for every linetype.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addLinetype().

5.10.2.31 addLinetypeDash()

```
virtual void DL_CreationInterface::addLinetypeDash (
             double length )  [pure virtual]
```

Called for every dash in linetype pattern.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleLinetypeData().

5.10.2.32 addMText()

```
virtual void DL_CreationInterface::addMText (
             const DL_MTextData & data )  [pure virtual]
```

Called for every multi Text entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addMText().

5.10.2.33 addMTextChunk()

```
virtual void DL_CreationInterface::addMTextChunk (
             const std::string & text )  [pure virtual]
```

Called for additional text chunks for MTEXT entities.

The chunks come at 250 character in size each. Note that those chunks come **before** the actual MTEXT entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleMTextData().

5.10.2.34 addPoint()

```
virtual void DL_CreationInterface::addPoint (
             const DL_PointData & data )  [pure virtual]
```

Called for every point.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addPoint().

5.10.2.35 addPolyline()

```
virtual void DL_CreationInterface::addPolyline (
             const DL_PolylineData & data )  [pure virtual]
```

Called for every polyline start.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addPolyline().

5.10.2.36 addRay()

```
virtual void DL_CreationInterface::addRay (
             const DL_RayData & data )  [pure virtual]
```

Called for every ray.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addRay().

5.10.2.37 addSolid()

```
virtual void DL_CreationInterface::addSolid (
             const DL_SolidData & data )  [pure virtual]
```

Called for every solid start.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSolid().

5.10.2.38 addSpline()

```
virtual void DL_CreationInterface::addSpline (
             const DL_SplineData & data )  [pure virtual]
```

Called for every spline.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSpline().

5.10.2.39 addText()

```
virtual void DL_CreationInterface::addText (
             const DL_TextData & data )  [pure virtual]
```

Called for every text entity.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addText().

5.10.2.40 addTextStyle()

```
virtual void DL_CreationInterface::addTextStyle (
             const DL_StyleData & data )  [pure virtual]
```

Called for every text style.

Implemented in DL_CreationAdapter.

5.10.2.41 addTrace()

```
virtual void DL_CreationInterface::addTrace (
             const DL_TraceData & data )  [pure virtual]
```

Called for every trace start.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addTrace().

5.10.2.42 addVertex()

```
virtual void DL_CreationInterface::addVertex (
             const DL_VertexData & data )  [pure virtual]
```

Called for every polyline vertex.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addPolyline(), and DL_Dxf::addVertex().

5.10.2.43 addXDataApp()

```
virtual void DL_CreationInterface::addXDataApp (
             const std::string & appId )  [pure virtual]
```

Called for every beginning of an XData section of the given application.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXData().

5.10.2.44 addXDataInt()

```
virtual void DL_CreationInterface::addXDataInt (
             int code,
             int value )  [pure virtual]
```

Called for XData tuples.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXData().

5.10.2.45 addXDataReal()

```
virtual void DL_CreationInterface::addXDataReal (
             int code,
             double value )  [pure virtual]
```

Called for XData tuples.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXData().

5.10.2.46 addXDataString()

```
virtual void DL_CreationInterface::addXDataString (
             int code,
             const std::string & value )  [pure virtual]
```

Called for XData tuples.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXData().

5.10.2.47 addXLine()

```
virtual void DL_CreationInterface::addXLine (
             const DL_XLineData & data )  [pure virtual]
```

Called for every xline.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addXLine().

5.10.2.48 addXRecord()

```
virtual void DL_CreationInterface::addXRecord (
             const std::string & handle )  [pure virtual]
```

Called for every XRecord with the given handle.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXRecordData().

5.10.2.49 addXRecordBool()

```
virtual void DL_CreationInterface::addXRecordBool (
             int code,
             bool value )  [pure virtual]
```

Called for XRecords of type bool.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXRecordData().

5.10.2.50 addXRecordInt()

```
virtual void DL_CreationInterface::addXRecordInt (
             int code,
             int value )  [pure virtual]
```

Called for XRecords of type int.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXRecordData().

5.10.2.51 addXRecordReal()

```
virtual void DL_CreationInterface::addXRecordReal (
             int code,
             double value )  [pure virtual]
```

Called for XRecords of type double.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXRecordData().

5.10.2.52 addXRecordString()

```
virtual void DL_CreationInterface::addXRecordString (
             int code,
             const std::string & value )  [pure virtual]
```

Called for XRecords of type string.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::handleXRecordData().

5.10.2.53 endBlock()

```
virtual void DL_CreationInterface::endBlock ( )  [pure virtual]
```

Called to end the current block.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::endBlock().

5.10.2.54 endEntity()

```
virtual void DL_CreationInterface::endEntity ( )  [pure virtual]
```

Called after an entity has been completed.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addHatch(), DL_Dxf::addImage(), DL_Dxf::addImageDef(), DL_Dxf::addLeader(), DL_Dxf::addPolyline(), DL_Dxf::addSpline(), and DL_Dxf::endEntity().

5.10.2.55 endSection()

```
virtual void DL_CreationInterface::endSection ( )  [pure virtual]
```

Called when a section (entity, table entry, etc.) is finished.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::processDXFGroup().

5.10.2.56 endSequence()

```
virtual void DL_CreationInterface::endSequence ( )  [pure virtual]
```

Called when a SEQEND occurs (when a POLYLINE or ATTRIB is done)

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::endSequence().

5.10.2.57 getAttributes()

```
DL_Attributes DL_CreationInterface::getAttributes ( )  [inline]
```

Returns

the current attributes used for new entities.

Referenced by DL_Dxf::addLayer().

5.10.2.58 getExtrusion()

```
DL_Extrusion * DL_CreationInterface::getExtrusion ( )  [inline]
```

Returns

the current attributes used for new entities.

5.10.2.59 linkImage()

```
virtual void DL_CreationInterface::linkImage (
             const DL_ImageDefData & data )  [pure virtual]
```

Called for every image definition.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addImageDef().

5.10.2.60 processCodeValuePair()

```
virtual void DL_CreationInterface::processCodeValuePair (
             unsigned int groupCode,
             const std::string & groupValue )  [pure virtual]
```

Called for every code / value tuple of the DXF file.

The complete DXF file contents can be handled by the implemetation of this function.

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::readDxfGroups().

5.10.2.61 setVariableDouble()

```
virtual void DL_CreationInterface::setVariableDouble (
             const std::string & key,
             double value,
             int code )  [pure virtual]
```

Called for every double variable in the DXF file (e.g.

¨$DIMEXO¨).

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSetting().

5.10.2.62 setVariableInt()

```
virtual void DL_CreationInterface::setVariableInt (
             const std::string & key,
             int value,
             int code )  [pure virtual]
```

Called for every int variable in the DXF file (e.g.

¨$ACADMAINTVER¨).

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSetting().

5.10.2.63 setVariableString()

```
virtual void DL_CreationInterface::setVariableString (
              const std::string & key,
              const std::string & value,
              int code )  [pure virtual]
```

Called for every string variable in the DXF file (e.g.

¨$ACADVER¨).

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSetting().

5.10.2.64 setVariableVector()

```
virtual void DL_CreationInterface::setVariableVector (
              const std::string & key,
              double v1,
              double v2,
              double v3,
              int code )  [pure virtual]
```

Called for every vector variable in the DXF file (e.g.

¨$EXTMIN¨).

Implemented in DL_CreationAdapter.

Referenced by DL_Dxf::addSetting().

The documentation for this class was generated from the following file:

- src/dl_creationinterface.h

5.11 DL_DictionaryData Struct Reference

Dictionary data.

```
#include <dl_entities.h>
```

Public Member Functions

- **DL_DictionaryData** (const std::string &handle)

Public Attributes

- std::string **handle**

5.11.1 Detailed Description

Dictionary data.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.12 DL_DictionaryEntryData Struct Reference

Dictionary entry data.

```
#include <dl_entities.h>
```

Public Member Functions

- **DL_DictionaryEntryData** (const std::string &name, const std::string &handle)

Public Attributes

- std::string **name**
- std::string **handle**

5.12.1 Detailed Description

Dictionary entry data.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.13 DL_DimAlignedData Struct Reference

Aligned Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimAlignedData (double depx1, double depy1, double depz1, double depx2, double depy2, double depz2)

  Constructor.

Public Attributes

- double epx1
- double epy1
- double epz1
- double epx2
- double epy2
- double epz2

5.13.1 Detailed Description

Aligned Dimension Data.

5.13.2 Constructor & Destructor Documentation

5.13.2.1 DL_DimAlignedData()

```
DL_DimAlignedData::DL_DimAlignedData (
              double depx1,
              double depy1,
              double depz1,
              double depx2,
              double depy2,
              double depz2 )  [inline]
```

Constructor.

Parameters: see member variables.

5.13.3 Member Data Documentation

5.13.3.1 epx1

```
double DL_DimAlignedData::epx1
```

X Coordinate of Extension point 1.

Referenced by DL_Dxf::writeDimAligned().

5.13.3.2 epx2

```
double DL_DimAlignedData::epx2
```

X Coordinate of Extension point 2.

Referenced by DL_Dxf::writeDimAligned().

5.13.3.3 epy1

```
double DL_DimAlignedData::epy1
```

Y Coordinate of Extension point 1.

Referenced by DL_Dxf::writeDimAligned().

5.13.3.4 epy2

```
double DL_DimAlignedData::epy2
```

Y Coordinate of Extension point 2.

Referenced by DL_Dxf::writeDimAligned().

5.13.3.5 epz1

```
double DL_DimAlignedData::epz1
```

Z Coordinate of Extension point 1.

5.13.3.6 epz2

```
double DL_DimAlignedData::epz2
```

Z Coordinate of Extension point 2.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.14 DL_DimAngular2LData Struct Reference

Angular Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimAngular2LData (double ddpx1, double ddpy1, double ddpz1, double ddpx2, double ddpy2, double ddpz2, double ddpx3, double ddpy3, double ddpz3, double ddpx4, double ddpy4, double ddpz4)

  Constructor.

Public Attributes

- double dpx1
- double dpy1
- double dpz1
- double dpx2
- double dpy2
- double dpz2
- double dpx3
- double dpy3
- double dpz3
- double dpx4
- double dpy4
- double dpz4

5.14.1 Detailed Description

Angular Dimension Data.

5.14.2 Constructor & Destructor Documentation

5.14.2.1 DL_DimAngular2LData()

```
DL_DimAngular2LData::DL_DimAngular2LData (
              double ddpx1,
              double ddpy1,
              double ddpz1,
              double ddpx2,
              double ddpy2,
              double ddpz2,
              double ddpx3,
              double ddpy3,
              double ddpz3,
              double ddpx4,
              double ddpy4,
              double ddpz4 )  [inline]
```

Constructor.

Parameters: see member variables.

5.14.3 Member Data Documentation

5.14.3.1 dpx1

```
double DL_DimAngular2LData::dpx1
```

X Coordinate of definition point 1.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.2 dpx2

```
double DL_DimAngular2LData::dpx2
```

X Coordinate of definition point 2.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.3 dpx3

```
double DL_DimAngular2LData::dpx3
```

X Coordinate of definition point 3.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.4 dpx4

```
double DL_DimAngular2LData::dpx4
```

X Coordinate of definition point 4.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.5 dpy1

```
double DL_DimAngular2LData::dpy1
```

Y Coordinate of definition point 1.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.6 dpy2

```
double DL_DimAngular2LData::dpy2
```

Y Coordinate of definition point 2.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.7 dpy3

```
double DL_DimAngular2LData::dpy3
```

Y Coordinate of definition point 3.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.8 dpy4

```
double DL_DimAngular2LData::dpy4
```

Y Coordinate of definition point 4.

Referenced by DL_Dxf::writeDimAngular2L().

5.14.3.9 dpz1

```
double DL_DimAngular2LData::dpz1
```

Z Coordinate of definition point 1.

5.14.3.10 dpz2

```
double DL_DimAngular2LData::dpz2
```

Z Coordinate of definition point 2.

5.14.3.11 dpz3

```
double DL_DimAngular2LData::dpz3
```

Z Coordinate of definition point 3.

5.14.3.12 dpz4

```
double DL_DimAngular2LData::dpz4
```

Z Coordinate of definition point 4.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.15 DL_DimAngular3PData Struct Reference

Angular Dimension Data (3 points version).

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimAngular3PData (double ddpx1, double ddpy1, double ddpz1, double ddpx2, double ddpy2, double ddpz2, double ddpx3, double ddpy3, double ddpz3)

  Constructor.

Public Attributes

- double dpx1
- double dpy1
- double dpz1
- double dpx2
- double dpy2
- double dpz2
- double dpx3
- double dpy3
- double dpz3

5.15.1 Detailed Description

Angular Dimension Data (3 points version).

5.15.2 Constructor & Destructor Documentation

5.15.2.1 DL_DimAngular3PData()

```
DL_DimAngular3PData::DL_DimAngular3PData (
            double ddpx1,
            double ddpy1,
            double ddpz1,
            double ddpx2,
            double ddpy2,
            double ddpz2,
            double ddpx3,
            double ddpy3,
            double ddpz3 )  [inline]
```

Constructor.

Parameters: see member variables.

5.15.3 Member Data Documentation

5.15.3.1 dpx1

```
double DL_DimAngular3PData::dpx1
```

X Coordinate of definition point 1 (extension line 1 end).

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.2 dpx2

```
double DL_DimAngular3PData::dpx2
```

X Coordinate of definition point 2 (extension line 2 end).

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.3 dpx3

```
double DL_DimAngular3PData::dpx3
```

X Coordinate of definition point 3 (center).

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.4 dpy1

```
double DL_DimAngular3PData::dpy1
```

Y Coordinate of definition point 1.

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.5 dpy2

```
double DL_DimAngular3PData::dpy2
```

Y Coordinate of definition point 2.

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.6 dpy3

```
double DL_DimAngular3PData::dpy3
```

Y Coordinate of definition point 3.

Referenced by DL_Dxf::writeDimAngular3P().

5.15.3.7 dpz1

```
double DL_DimAngular3PData::dpz1
```

Z Coordinate of definition point 1.

5.15.3.8 dpz2

```
double DL_DimAngular3PData::dpz2
```

Z Coordinate of definition point 2.

5.15.3.9 dpz3

```
double DL_DimAngular3PData::dpz3
```

Z Coordinate of definition point 3.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.16 DL_DimDiametricData Struct Reference

Diametric Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimDiametricData (double ddpx, double ddpy, double ddpz, double dleader)

  Constructor.

Public Attributes

- double dpx
- double dpy
- double dpz
- double leader

5.16.1 Detailed Description

Diametric Dimension Data.

5.16.2 Constructor & Destructor Documentation

5.16.2.1 DL_DimDiametricData()

```
DL_DimDiametricData::DL_DimDiametricData (
              double ddpx,
              double ddpy,
              double ddpz,
              double dleader )  [inline]
```

Constructor.

Parameters: see member variables.

5.16.3 Member Data Documentation

5.16.3.1 dpx

```
double DL_DimDiametricData::dpx
```

X Coordinate of definition point (DXF 15).

Referenced by DL_Dxf::writeDimDiametric().

5.16.3.2 dpy

```
double DL_DimDiametricData::dpy
```

Y Coordinate of definition point (DXF 25).

Referenced by DL_Dxf::writeDimDiametric().

5.16.3.3 dpz

```
double DL_DimDiametricData::dpz
```

Z Coordinate of definition point (DXF 35).

5.16.3.4 leader

```
double DL_DimDiametricData::leader
```

Leader length

Referenced by DL_Dxf::writeDimDiametric().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.17 DL_DimensionData Struct Reference

Generic Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimensionData (double dpx, double dpy, double dpz, double mpx, double mpy, double mpz, int type, int attachmentPoint, int lineSpacingStyle, double lineSpacingFactor, const std::string &text, const std::string &style, double angle, double linearFactor=1.0, double dimScale=1.0)

    Constructor.

Public Attributes

- double dpx
- double dpy
- double dpz
- double mpx
- double mpy
- double mpz
- int type

  Dimension type.
- int attachmentPoint

  Attachment point.
- int lineSpacingStyle

  Line spacing style.
- double lineSpacingFactor

  Line spacing factor.
- std::string text

  Text string.
- std::string style
- double **angle**

  Rotation angle of dimension text away from default orientation.
- double **linearFactor**

  Linear factor style override.
- double **dimScale**

  Dimension scale (dimscale) style override.
- bool **arrow1Flipped**
- bool **arrow2Flipped**

5.17.1 Detailed Description

Generic Dimension Data.

5.17.2 Constructor & Destructor Documentation

5.17.2.1 DL_DimensionData()

```
DL_DimensionData::DL_DimensionData (
                double dpx,
                double dpy,
                double dpz,
                double mpx,
                double mpy,
                double mpz,
                int type,
                int attachmentPoint,
                int lineSpacingStyle,
                double lineSpacingFactor,
                const std::string & text,
                const std::string & style,
                double angle,
                double linearFactor = 1.0,
                double dimScale = 1.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.17.3 Member Data Documentation

5.17.3.1 attachmentPoint

```
int DL_DimensionData::attachmentPoint
```

Attachment point.

1 = Top left, 2 = Top center, 3 = Top right, 4 = Middle left, 5 = Middle center, 6 = Middle right, 7 = Bottom left, 8 = Bottom center, 9 = Bottom right,

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.2 dpx

```
double DL_DimensionData::dpx
```

X Coordinate of definition point.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.3 dpy

```
double DL_DimensionData::dpy
```

Y Coordinate of definition point.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.4 dpz

```
double DL_DimensionData::dpz
```

Z Coordinate of definition point.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.5 lineSpacingFactor

```
double DL_DimensionData::lineSpacingFactor
```

Line spacing factor.

0.25 .. 4.0

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.6 lineSpacingStyle

```
int DL_DimensionData::lineSpacingStyle
```

Line spacing style.

1 = at least, 2 = exact

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.7 mpx

```
double DL_DimensionData::mpx
```

X Coordinate of middle point of the text.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.8 mpy

```
double DL_DimensionData::mpy
```

Y Coordinate of middle point of the text.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.9 mpz

```
double DL_DimensionData::mpz
```

Z Coordinate of middle point of the text.

5.17.3.10 style

```
std::string DL_DimensionData::style
```

Dimension style (font name).

5.17.3.11 text

```
std::string DL_DimensionData::text
```

Text string.

Text string entered explicitly by user or null or ¨<>¨ for the actual measurement or ¨ ¨ (one blank space). for supressing the text.

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

5.17.3.12 type

```
int DL_DimensionData::type
```

Dimension type.

0 Rotated, horizontal, or vertical
1 Aligned
2 Angular
3 Diametric
4 Radius
5 Angular 3-point
6 Ordinate
64 Ordinate type. This is a bit value (bit 7)
used only with integer value 6. If set,
ordinate is X-type; if not set, ordinate is Y-type
128 This is a bit value (bit 8) added to the
other group 70 values if the dimension text has been positioned at a user-defined
location rather than at the default location

Referenced by DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), and DL_Dxf::writeDimRadial().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.18 DL_DimLinearData Struct Reference

Linear (rotated) Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimLinearData (double ddpx1, double ddpy1, double ddpz1, double ddpx2, double ddpy2, double ddpz2, double dAngle, double dOblique)

  Constructor.

Public Attributes

- double dpx1
- double dpy1
- double dpz1
- double dpx2
- double dpy2
- double dpz2
- double angle
- double oblique

5.18.1 Detailed Description

Linear (rotated) Dimension Data.

5.18.2 Constructor & Destructor Documentation

5.18.2.1 DL_DimLinearData()

```
DL_DimLinearData::DL_DimLinearData (
            double ddpx1,
            double ddpy1,
            double ddpz1,
            double ddpx2,
            double ddpy2,
            double ddpz2,
            double dAngle,
            double dOblique )  [inline]
```

Constructor.

Parameters: see member variables.

5.18.3 Member Data Documentation

5.18.3.1 angle

```
double DL_DimLinearData::angle
```

Rotation angle (angle of dimension line) in degrees.

Referenced by DL_Dxf::writeDimLinear().

5.18.3.2 dpx1

```
double DL_DimLinearData::dpx1
```

X Coordinate of Extension point 1.

Referenced by DL_Dxf::writeDimLinear().

5.18.3.3 dpx2

```
double DL_DimLinearData::dpx2
```

X Coordinate of Extension point 2.

Referenced by DL_Dxf::writeDimLinear().

5.18.3.4 dpy1

```
double DL_DimLinearData::dpy1
```

Y Coordinate of Extension point 1.

Referenced by DL_Dxf::writeDimLinear().

5.18.3.5 dpy2

```
double DL_DimLinearData::dpy2
```

Y Coordinate of Extension point 2.

Referenced by DL_Dxf::writeDimLinear().

5.18.3.6 dpz1

```
double DL_DimLinearData::dpz1
```

Z Coordinate of Extension point 1.

5.18.3.7 dpz2

```
double DL_DimLinearData::dpz2
```

Z Coordinate of Extension point 2.

5.18.3.8 oblique

```
double DL_DimLinearData::oblique
```

Oblique angle in degrees.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.19 DL_DimOrdinateData Struct Reference

Ordinate Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimOrdinateData (double ddpx1, double ddpy1, double ddpz1, double ddpx2, double ddpy2, double ddpz2, bool dxtype)

  Constructor.

Public Attributes

- double dpx1
- double dpy1
- double dpz1
- double dpx2
- double dpy2
- double dpz2
- bool xtype

5.19.1 Detailed Description

Ordinate Dimension Data.

5.19.2 Constructor & Destructor Documentation

5.19.2.1 DL_DimOrdinateData()

```
DL_DimOrdinateData::DL_DimOrdinateData (
             double ddpx1,
             double ddpy1,
             double ddpz1,
             double ddpx2,
             double ddpy2,
             double ddpz2,
             bool dxtype )  [inline]
```

Constructor.

Parameters: see member variables.

5.19.3 Member Data Documentation

5.19.3.1 dpx1

```
double DL_DimOrdinateData::dpx1
```

X Coordinate of definition point 1.

Referenced by DL_Dxf::writeDimOrdinate().

5.19.3.2 dpx2

```
double DL_DimOrdinateData::dpx2
```

X Coordinate of definition point 2.

Referenced by DL_Dxf::writeDimOrdinate().

5.19.3.3 dpy1

```
double DL_DimOrdinateData::dpy1
```

Y Coordinate of definition point 1.

Referenced by DL_Dxf::writeDimOrdinate().

5.19.3.4 dpy2

```
double DL_DimOrdinateData::dpy2
```

Y Coordinate of definition point 2.

Referenced by DL_Dxf::writeDimOrdinate().

5.19.3.5 dpz1

```
double DL_DimOrdinateData::dpz1
```

Z Coordinate of definition point 1.

5.19.3.6 dpz2

```
double DL_DimOrdinateData::dpz2
```

Z Coordinate of definition point 2.

5.19.3.7 xtype

```
bool DL_DimOrdinateData::xtype
```

True if the dimension indicates the X-value, false for Y-value

Referenced by DL_Dxf::writeDimOrdinate().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.20 DL_DimRadialData Struct Reference

Radial Dimension Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_DimRadialData (double ddpx, double ddpy, double ddpz, double dleader)
  Constructor.

Public Attributes

- double dpx
- double dpy
- double dpz
- double leader

5.20.1 Detailed Description

Radial Dimension Data.

5.20.2 Constructor & Destructor Documentation

5.20.2.1 DL_DimRadialData()

```
DL_DimRadialData::DL_DimRadialData (
             double ddpx,
             double ddpy,
             double ddpz,
             double dleader )  [inline]
```

Constructor.

Parameters: see member variables.

5.20.3 Member Data Documentation

5.20.3.1 dpx

```
double DL_DimRadialData::dpx
```

X Coordinate of definition point.

Referenced by DL_Dxf::writeDimRadial().

5.20.3.2 dpy

```
double DL_DimRadialData::dpy
```

Y Coordinate of definition point.

Referenced by DL_Dxf::writeDimRadial().

5.20.3.3 dpz

```
double DL_DimRadialData::dpz
```

Z Coordinate of definition point.

5.20.3.4 leader

```
double DL_DimRadialData::leader
```

Leader length

Referenced by DL_Dxf::writeDimRadial().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.21 DL_Dxf Class Reference

Reading and writing of DXF files.

```
#include <dl_dxf.h>
```

Public Member Functions

- **DL_Dxf** ()

  Default constructor.
- ∼**DL_Dxf** ()

  Destructor.
- bool in (const std::string &file, DL_CreationInterface ∗creationInterface)

  Reads the given file and calls the appropriate functions in the given creation interface for every entity found in the file.
- bool readDxfGroups (FILE ∗fp, DL_CreationInterface ∗creationInterface)

  Reads a group couplet from a DXF file.
- bool **readDxfGroups** (std::istream &stream, DL_CreationInterface ∗creationInterface)

  Same as above but for input streams.
- bool in (std::istream &stream, DL_CreationInterface ∗creationInterface)

  Reads a DXF file from an existing stream.
- bool processDXFGroup (DL_CreationInterface ∗creationInterface, int groupCode, const std::string &group←Value)

Processes a group (pair of group code and value).
- void **addSetting** (DL_CreationInterface ∗creationInterface)

  Adds a variable from the DXF file.
- void **addLayer** (DL_CreationInterface ∗creationInterface)

  Adds a layer that was read from the file via the creation interface.
- void **addLinetype** (DL_CreationInterface ∗creationInterface)

  Adds a linetype that was read from the file via the creation interface.
- void **addBlock** (DL_CreationInterface ∗creationInterface)

  Adds a block that was read from the file via the creation interface.
- void **endBlock** (DL_CreationInterface ∗creationInterface)

  Ends a block that was read from the file via the creation interface.
- void **addTextStyle** (DL_CreationInterface ∗creationInterface)
- void **addPoint** (DL_CreationInterface ∗creationInterface)

  Adds a point entity that was read from the file via the creation interface.
- void **addLine** (DL_CreationInterface ∗creationInterface)

  Adds a line entity that was read from the file via the creation interface.
- void **addXLine** (DL_CreationInterface ∗creationInterface)

  Adds an xline entity that was read from the file via the creation interface.
- void **addRay** (DL_CreationInterface ∗creationInterface)

  Adds a ray entity that was read from the file via the creation interface.
- void **addPolyline** (DL_CreationInterface ∗creationInterface)

  Adds a polyline entity that was read from the file via the creation interface.
- void **addVertex** (DL_CreationInterface ∗creationInterface)

  Adds a polyline vertex entity that was read from the file via the creation interface.
- void **addSpline** (DL_CreationInterface ∗creationInterface)

  Adds a spline entity that was read from the file via the creation interface.
- void **addArc** (DL_CreationInterface ∗creationInterface)

  Adds an arc entity that was read from the file via the creation interface.
- void **addCircle** (DL_CreationInterface ∗creationInterface)

  Adds a circle entity that was read from the file via the creation interface.
- void **addEllipse** (DL_CreationInterface ∗creationInterface)

  Adds an ellipse entity that was read from the file via the creation interface.
- void **addInsert** (DL_CreationInterface ∗creationInterface)

  Adds an insert entity that was read from the file via the creation interface.
- void addTrace (DL_CreationInterface ∗creationInterface)

  Adds a trace entity (4 edge closed polyline) that was read from the file via the creation interface.
- void **add3dFace** (DL_CreationInterface ∗creationInterface)

  Adds a 3dface entity that was read from the file via the creation interface.
- void addSolid (DL_CreationInterface ∗creationInterface)

  Adds a solid entity (filled trace) that was read from the file via the creation interface.
- void **addMText** (DL_CreationInterface ∗creationInterface)

  Adds an MText entity that was read from the file via the creation interface.
- void **addText** (DL_CreationInterface ∗creationInterface)

  Adds an text entity that was read from the file via the creation interface.
- void **addArcAlignedText** (DL_CreationInterface ∗creationInterface)

  Adds an arc aligned text entity that was read from the file via the creation interface.
- void addAttribute (DL_CreationInterface ∗creationInterface)

  Adds an attrib entity that was read from the file via the creation interface.
- DL_DimensionData getDimData ()
- void **addDimLinear** (DL_CreationInterface ∗creationInterface)

  Adds a linear dimension entity that was read from the file via the creation interface.

- void **addDimAligned** (DL_CreationInterface ∗creationInterface)

    Adds an aligned dimension entity that was read from the file via the creation interface.
- void **addDimRadial** (DL_CreationInterface ∗creationInterface)

    Adds a radial dimension entity that was read from the file via the creation interface.
- void **addDimDiametric** (DL_CreationInterface ∗creationInterface)

    Adds a diametric dimension entity that was read from the file via the creation interface.
- void **addDimAngular** (DL_CreationInterface ∗creationInterface)

    Adds an angular dimension entity that was read from the file via the creation interface.
- void **addDimAngular3P** (DL_CreationInterface ∗creationInterface)

    Adds an angular dimension entity that was read from the file via the creation interface.
- void **addDimOrdinate** (DL_CreationInterface ∗creationInterface)

    Adds an ordinate dimension entity that was read from the file via the creation interface.
- void **addLeader** (DL_CreationInterface ∗creationInterface)

    Adds a leader entity that was read from the file via the creation interface.
- void **addHatch** (DL_CreationInterface ∗creationInterface)

    Adds a hatch entity that was read from the file via the creation interface.
- void **addHatchLoop** ()
- void **addHatchEdge** ()
- bool **handleHatchData** (DL_CreationInterface ∗creationInterface)

    Handles all hatch data.
- void **addImage** (DL_CreationInterface ∗creationInterface)

    Adds an image entity that was read from the file via the creation interface.
- void **addImageDef** (DL_CreationInterface ∗creationInterface)

    Adds an image definition that was read from the file via the creation interface.
- void **addComment** (DL_CreationInterface ∗creationInterface, const std::string &comment)

    Adds a comment from the DXF file.
- void **addDictionary** (DL_CreationInterface ∗creationInterface)
- void **addDictionaryEntry** (DL_CreationInterface ∗creationInterface)
- bool **handleXRecordData** (DL_CreationInterface ∗creationInterface)

    Handles all XRecord data.
- bool **handleDictionaryData** (DL_CreationInterface ∗creationInterface)

    Handles all dictionary data.
- bool **handleXData** (DL_CreationInterface ∗creationInterface)

    Handles XData for all object types.
- bool **handleMTextData** (DL_CreationInterface ∗creationInterface)

    Handles additional MText data.
- bool **handleLWPolylineData** (DL_CreationInterface ∗creationInterface)

    Handles additional polyline data.
- bool **handleSplineData** (DL_CreationInterface ∗creationInterface)

    Handles additional spline data.
- bool **handleLeaderData** (DL_CreationInterface ∗creationInterface)

    Handles additional leader data.
- bool **handleLinetypeData** (DL_CreationInterface ∗creationInterface)

    Handles all dashes in linetype pattern.
- void **endEntity** (DL_CreationInterface ∗creationInterface)

    Ends some special entities like hatches or old style polylines.
- void **endSequence** (DL_CreationInterface ∗creationInterface)

    Ends a sequence and notifies the creation interface.
- DL_WriterA ∗ out (const char ∗file, DL_Codes::version version=DL_VERSION_2000)

    Converts the given string into an int.
- void **writeHeader** (DL_WriterA &dw)

Writes a DXF header to the file currently opened by the given DXF writer object.
- void writePoint (DL_WriterA &dw, const DL_PointData &data, const DL_Attributes &attrib)

  Writes a point entity to the file.
- void writeLine (DL_WriterA &dw, const DL_LineData &data, const DL_Attributes &attrib)

  Writes a line entity to the file.
- void writeXLine (DL_WriterA &dw, const DL_XLineData &data, const DL_Attributes &attrib)

  Writes an x line entity to the file.
- void writeRay (DL_WriterA &dw, const DL_RayData &data, const DL_Attributes &attrib)

  Writes a ray entity to the file.
- void writePolyline (DL_WriterA &dw, const DL_PolylineData &data, const DL_Attributes &attrib)

  Writes a polyline entity to the file.
- void writeVertex (DL_WriterA &dw, const DL_VertexData &data)

  Writes a single vertex of a polyline to the file.
- void writePolylineEnd (DL_WriterA &dw)

  Writes the polyline end.
- void writeSpline (DL_WriterA &dw, const DL_SplineData &data, const DL_Attributes &attrib)

  Writes a spline entity to the file.
- void writeControlPoint (DL_WriterA &dw, const DL_ControlPointData &data)

  Writes a single control point of a spline to the file.
- void writeFitPoint (DL_WriterA &dw, const DL_FitPointData &data)

  Writes a single fit point of a spline to the file.
- void writeKnot (DL_WriterA &dw, const DL_KnotData &data)

  Writes a single knot of a spline to the file.
- void writeCircle (DL_WriterA &dw, const DL_CircleData &data, const DL_Attributes &attrib)

  Writes a circle entity to the file.
- void writeArc (DL_WriterA &dw, const DL_ArcData &data, const DL_Attributes &attrib)

  Writes an arc entity to the file.
- void writeEllipse (DL_WriterA &dw, const DL_EllipseData &data, const DL_Attributes &attrib)

  Writes an ellipse entity to the file.
- void writeSolid (DL_WriterA &dw, const DL_SolidData &data, const DL_Attributes &attrib)

  Writes a solid entity to the file.
- void writeTrace (DL_WriterA &dw, const DL_TraceData &data, const DL_Attributes &attrib)

  Writes a trace entity to the file.
- void write3dFace (DL_WriterA &dw, const DL_3dFaceData &data, const DL_Attributes &attrib)

  Writes a 3d face entity to the file.
- void writeInsert (DL_WriterA &dw, const DL_InsertData &data, const DL_Attributes &attrib)

  Writes an insert to the file.
- void writeMText (DL_WriterA &dw, const DL_MTextData &data, const DL_Attributes &attrib)

  Writes a multi text entity to the file.
- void writeText (DL_WriterA &dw, const DL_TextData &data, const DL_Attributes &attrib)

  Writes a text entity to the file.
- void **writeAttribute** (DL_WriterA &dw, const DL_AttributeData &data, const DL_Attributes &attrib)
- void **writeDimStyleOverrides** (DL_WriterA &dw, const DL_DimensionData &data)
- void writeDimAligned (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimAlignedData &edata, const DL_Attributes &attrib)

  Writes an aligned dimension entity to the file.
- void writeDimLinear (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimLinearData &edata, const DL_Attributes &attrib)

  Writes a linear dimension entity to the file.
- void writeDimRadial (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimRadialData &edata, const DL_Attributes &attrib)

Writes a radial dimension entity to the file.
- void writeDimDiametric (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimDiametricData &edata, const DL_Attributes &attrib)

  Writes a diametric dimension entity to the file.
- void writeDimAngular2L (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimAngular2LData &edata, const DL_Attributes &attrib)

  Writes an angular dimension entity to the file.
- void writeDimAngular3P (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimAngular3PData &edata, const DL_Attributes &attrib)

  Writes an angular dimension entity (3 points version) to the file.
- void writeDimOrdinate (DL_WriterA &dw, const DL_DimensionData &data, const DL_DimOrdinateData &edata, const DL_Attributes &attrib)

  Writes an ordinate dimension entity to the file.
- void writeLeader (DL_WriterA &dw, const DL_LeaderData &data, const DL_Attributes &attrib)

  Writes a leader entity to the file.
- void writeLeaderVertex (DL_WriterA &dw, const DL_LeaderVertexData &data)

  Writes a single vertex of a leader to the file.
- void **writeLeaderEnd** (DL_WriterA &dw, const DL_LeaderData &data)
- void writeHatch1 (DL_WriterA &dw, const DL_HatchData &data, const DL_Attributes &attrib)

  Writes the beginning of a hatch entity to the file.
- void writeHatch2 (DL_WriterA &dw, const DL_HatchData &data, const DL_Attributes &attrib)

  Writes the end of a hatch entity to the file.
- void writeHatchLoop1 (DL_WriterA &dw, const DL_HatchLoopData &data)

  Writes the beginning of a hatch loop to the file.
- void writeHatchLoop2 (DL_WriterA &dw, const DL_HatchLoopData &data)

  Writes the end of a hatch loop to the file.
- void writeHatchEdge (DL_WriterA &dw, const DL_HatchEdgeData &data)

  Writes the beginning of a hatch entity to the file.
- unsigned long writeImage (DL_WriterA &dw, const DL_ImageData &data, const DL_Attributes &attrib)

  Writes an image entity.
- void **writeImageDef** (DL_WriterA &dw, int handle, const DL_ImageData &data)

  Writes an image definiition entity.
- void writeLayer (DL_WriterA &dw, const DL_LayerData &data, const DL_Attributes &attrib)

  Writes a layer to the file.
- void writeLinetype (DL_WriterA &dw, const DL_LinetypeData &data)

  Writes a line type to the file.
- void writeAppid (DL_WriterA &dw, const std::string &name)

  Writes the APPID section to the DXF file.
- void **writeBlock** (DL_WriterA &dw, const DL_BlockData &data)

  Writes a block's definition (no entities) to the DXF file.
- void writeEndBlock (DL_WriterA &dw, const std::string &name)

  Writes a block end.
- void writeVPort (DL_WriterA &dw)

  Writes a viewport section.
- void writeStyle (DL_WriterA &dw, const DL_StyleData &style)

  Writes a style section.
- void writeView (DL_WriterA &dw)

  Writes a view section.
- void writeUcs (DL_WriterA &dw)

  Writes a ucs section.
- void writeDimStyle (DL_WriterA &dw, double dimasz, double dimexe, double dimexo, double dimgap, double dimtxt)

Writes a dimstyle section.

- void writeBlockRecord (DL_WriterA &dw)

  Writes a blockrecord section.

- void **writeBlockRecord** (DL_WriterA &dw, const std::string &name)

  Writes a single block record with the given name.

- void writeObjects (DL_WriterA &dw, const std::string &appDictionaryName="")

  Writes a objects section.

- void **writeAppDictionary** (DL_WriterA &dw)
- unsigned long **writeDictionaryEntry** (DL_WriterA &dw, const std::string &name)
- void **writeXRecord** (DL_WriterA &dw, int handle, int value)
- void **writeXRecord** (DL_WriterA &dw, int handle, double value)
- void **writeXRecord** (DL_WriterA &dw, int handle, bool value)
- void **writeXRecord** (DL_WriterA &dw, int handle, const std::string &value)
- void writeObjectsEnd (DL_WriterA &dw)

  Writes the end of the objects section.

- void **writeComment** (DL_WriterA &dw, const std::string &comment)

  Writes a comment to the DXF file.

- DL_Codes::version **getVersion** ()
- int getLibVersion (const std::string &str)
- bool **hasValue** (int code)
- int **getIntValue** (int code, int def)
- int **toInt** (const std::string &str)
- int **getInt16Value** (int code, int def)
- int **toInt16** (const std::string &str)
- bool **toBool** (const std::string &str)
- std::string **getStringValue** (int code, const std::string &def)
- double **getRealValue** (int code, double def)
- double **toReal** (const std::string &str)

Static Public Member Functions

- static bool getStrippedLine (std::string &s, unsigned int size, FILE ∗stream, bool stripSpace=true)

  Reads line from file & strips whitespace at start and newline at end.

- static bool **getStrippedLine** (std::string &s, unsigned int size, std::istream &stream, bool stripSpace=true)

  Same as above but for input streams.

- static bool stripWhiteSpace (char ∗∗s, bool stripSpaces=true)

  Strips leading whitespace and trailing Carriage Return (CR) and Line Feed (LF) from NULL terminated string.

- static bool checkVariable (const char ∗var, DL_Codes::version version)

  Converts the given string into a double or returns the given default valud (def) if value is NULL or empty.

- static void test ()

  Converts the given string into a double or returns the given default valud (def) if value is NULL or empty.

5.21.1 Detailed Description

Reading and writing of DXF files.

This class can read in a DXF file and calls methods from the interface DL_EntityContainer to add the entities to the contianer provided by the user of the library.

It can also be used to write DXF files to a certain extent.

When saving entities, special values for colors and linetypes can be used:

Special colors are 0 (=BYBLOCK) and 256 (=BYLAYER). Special linetypes are ¨BYLAYER¨ and ¨BYBLOCK¨.

Author

Andrew Mustun

5.21.2 Member Function Documentation

5.21.2.1 addAttribute()

```
void DL_Dxf::addAttribute (
            DL_CreationInterface * creationInterface )
```

Adds an attrib entity that was read from the file via the creation interface.

Todo add attrib instead of normal text

References DL_CreationInterface::addAttribute().

Referenced by processDXFGroup().

5.21.2.2 addSolid()

```
void DL_Dxf::addSolid (
            DL_CreationInterface * creationInterface )
```

Adds a solid entity (filled trace) that was read from the file via the creation interface.

Author

AHM

References DL_CreationInterface::addSolid(), and DL_TraceData::x.

Referenced by processDXFGroup().

5.21.2.3 addTrace()

```
void DL_Dxf::addTrace (
            DL_CreationInterface * creationInterface )
```

Adds a trace entity (4 edge closed polyline) that was read from the file via the creation interface.

Author

AHM

References DL_CreationInterface::addTrace(), and DL_TraceData::x.

Referenced by processDXFGroup().

5.21.2.4 checkVariable()

```
bool DL_Dxf::checkVariable (
             const char * var,
             DL_Codes::version version )  [static]
```

Converts the given string into a double or returns the given default valud (def) if value is NULL or empty.

Checks if the given variable is known by the given DXF version.

Converts the given string into an int or returns the given default valud (def) if value is NULL or empty. Converts the given string into a string or returns the given default valud (def) if value is NULL or empty.

5.21.2.5 getDimData()

```
DL_DimensionData DL_Dxf::getDimData ( )
```

Returns

dimension data from current values.

Referenced by addDimAligned(), addDimAngular(), addDimAngular3P(), addDimDiametric(), addDimLinear(), addDimOrdinate(), and addDimRadial().

5.21.2.6 getLibVersion()

```
int DL_Dxf::getLibVersion (
             const std::string & str )
```

Returns

the library version as int (4 bytes, each byte one version number). e.g. if str = ¨2.0.2.0¨ getLibVersion returns 0x02000200

Referenced by processDXFGroup().

5.21.2.7 getStrippedLine()

```
bool DL_Dxf::getStrippedLine (
             std::string & s,
             unsigned int size,
             FILE * fp,
             bool stripSpace = true )  [static]
```

Reads line from file & strips whitespace at start and newline at end.

Parameters

s	Output Pointer to character array that chopped line will be returned in.
size	Size of `s`. (Including space for NULL.)
fp	Input Handle of input file.

Return values

true	if line could be read
false	if `fp` is already at end of file

Todo Change function to use safer FreeBSD strl∗ functions

Is it a problem if line is blank (i.e., newline only)? Then, when function returns, (s==NULL).

References stripWhiteSpace().

Referenced by readDxfGroups(), and readDxfGroups().

5.21.2.8 in() [1/2]

```
bool DL_Dxf::in (
            const std::string & file,
            DL_CreationInterface * creationInterface )
```

Reads the given file and calls the appropriate functions in the given creation interface for every entity found in the file.

Parameters

file	Input Path and name of file to read
creationInterface	Pointer to the class which takes care of the entities in the file.

Return values

true	If `file` could be opened.
false	If `file` could not be opened.

References readDxfGroups().

5.21.2.9 in() [2/2]

```
bool DL_Dxf::in (
            std::istream & stream,
            DL_CreationInterface * creationInterface )
```

Reads a DXF file from an existing stream.

Parameters

stream	The input stream.
creationInterface	Pointer to the class which takes care of the entities in the file.

Return values

true	If `file` could be opened.
false	If `file` could not be opened.

References readDxfGroups().

5.21.2.10 out()

```
DL_WriterA * DL_Dxf::out (
            const char * file,
            DL_Codes::version version = DL_VERSION_2000 )
```

Converts the given string into an int.

ok is set to false if there was an error.

Opens the given file for writing and returns a pointer to the dxf writer. This pointer needs to be passed on to other writing functions.

Parameters

file	Full path of the file to open.

Returns

Pointer to an ascii dxf writer object.

References DL_WriterA::openFailed().

5.21.2.11 processDXFGroup()

```
bool DL_Dxf::processDXFGroup (
            DL_CreationInterface * creationInterface,
            int groupCode,
            const std::string & groupValue )
```

Processes a group (pair of group code and value).

Parameters

creationInterface	Handle to class that creates entities and other CAD data from DXF group codes
groupCode	Constant indicating the data type of the group.
groupValue	The data value.

Return values

true	if done processing current entity and new entity begun
false	if not done processing current entity

References add3dFace(), addArc(), addArcAlignedText(), addAttribute(), addBlock(), addCircle(), addComment(), addDimAligned(), addDimAngular(), addDimAngular3P(), addDimDiametric(), addDimLinear(), addDimOrdinate(), addDimRadial(), addEllipse(), addImage(), addImageDef(), addInsert(), addLayer(), addLeader(), addLine(), addLinetype(), addMText(), addPoint(), addPolyline(), addRay(), addSetting(), addSolid(), addSpline(), addText(), addTrace(), addVertex(), addXLine(), endBlock(), endEntity(), DL_CreationInterface::endSection(), endSequence(), getLibVersion(), handleDictionaryData(), handleHatchData(), handleLeaderData(), handleLinetypeData(), handleLWPolylineData(), handleMTextData(), handleSplineData(), handleXData(), handleXRecordData(), DL_CreationInterface::setAttributes(), DL_CreationInterface::setExtrusion(), and DL_Attributes::setLinetypeScale().

Referenced by readDxfGroups(), and readDxfGroups().

5.21.2.12 readDxfGroups()

```
bool DL_Dxf::readDxfGroups (
            FILE * fp,
            DL_CreationInterface * creationInterface )
```

Reads a group couplet from a DXF file.

Calls another function to process it.

A group couplet consists of two lines that represent a single piece of data. An integer constant on the first line indicates the type of data. The value is on the next line.
This function reads a couplet, determines the type of data, and passes the value to the the appropriate handler function of `creationInterface`.
`fp` is advanced so that the next call to `readDXFGroups()` reads the next couplet in the file.

Parameters

fp	Handle of input file
creationInterface	Handle of class which processes entities in the file

Return values

true	If EOF not reached.
false	If EOF reached.

References getStrippedLine(), DL_CreationInterface::processCodeValuePair(), and processDXFGroup().

Referenced by in(), and in().

5.21.2.13 stripWhiteSpace()

```
bool DL_Dxf::stripWhiteSpace (
            char ** s,
            bool stripSpace = true )  [static]
```

Strips leading whitespace and trailing Carriage Return (CR) and Line Feed (LF) from NULL terminated string.

Parameters

s	Input and output. NULL terminates string.

Return values

true	if `s` is non-NULL
false	if `s` is NULL

Referenced by getStrippedLine(), getStrippedLine(), and test().

5.21.2.14 test()

```
void DL_Dxf::test ( )  [static]
```

Converts the given string into a double or returns the given default valud (def) if value is NULL or empty.

Some test routines.

References stripWhiteSpace().

5.21.2.15 write3dFace()

```
void DL_Dxf::write3dFace (
            DL_WriterA & dw,
            const DL_3dFaceData & data,
            const DL_Attributes & attrib )
```

Writes a 3d face entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), and DL_TraceData::x.

5.21.2.16 writeAppid()

```
void DL_Dxf::writeAppid (
            DL_WriterA & dw,
            const std::string & name )
```

Writes the APPID section to the DXF file.

Parameters

name	Application name

References DL_WriterA::dxfInt(), DL_WriterA::dxfString(), and DL_Writer::tableAppidEntry().

5.21.2.17 writeArc()

```
void DL_Dxf::writeArc (
            DL_WriterA & dw,
            const DL_ArcData & data,
            const DL_Attributes & attrib )
```

Writes an arc entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_ArcData::angle1, DL_ArcData::angle2, DL_ArcData::cx, DL_ArcData::cy, DL_ArcData::cz, DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), and DL_ArcData::radius.

5.21.2.18 writeBlockRecord()

```
void DL_Dxf::writeBlockRecord (
            DL_WriterA & dw )
```

Writes a blockrecord section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked BLOCKRECORD section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), and DL_WriterA::dxfString().

5.21.2.19 writeCircle()

```
void DL_Dxf::writeCircle (
            DL_WriterA & dw,
            const DL_CircleData & data,
            const DL_Attributes & attrib )
```

Writes a circle entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_CircleData::cx, DL_CircleData::cy, DL_CircleData::cz, DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), and DL_CircleData::radius.

5.21.2.20 writeControlPoint()

```
void DL_Dxf::writeControlPoint (
            DL_WriterA & dw,
            const DL_ControlPointData & data )
```

Writes a single control point of a spline to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfReal(), DL_ControlPointData::x, DL_ControlPointData::y, and DL_ControlPointData::z.

5.21.2.21 writeDimAligned()

```
void DL_Dxf::writeDimAligned (
            DL_WriterA & dw,
            const DL_DimensionData & data,
            const DL_DimAlignedData & edata,
            const DL_Attributes & attrib )
```

Writes an aligned dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific aligned dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimensionData::dpy, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimAlignedData::epx1, DL_DimAlignedData::epx2, DL_DimAlignedData::epy1, DL_DimAlignedData::epy2, DL_DimensionData::lineSpacingFactor, DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.22 writeDimAngular2L()

```
void DL_Dxf::writeDimAngular2L (
            DL_WriterA & dw,
            const DL_DimensionData & data,
            const DL_DimAngular2LData & edata,
            const DL_Attributes & attrib )
```

Writes an angular dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific angular dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimAngular2LData::dpx1
DL_DimAngular2LData::dpx2, DL_DimAngular2LData::dpx3, DL_DimAngular2LData::dpx4, DL_DimensionData::dpy, DL_DimAngular2LData::dpy1, DL_DimAngular2LData::dpy2, DL_DimAngular2LData::dpy3, DL_DimAngular2LData::dpy4, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimensionData::lineSpacingFactor, DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.23 writeDimAngular3P()

```
void DL_Dxf::writeDimAngular3P (
             DL_WriterA & dw,
             const DL_DimensionData & data,
             const DL_DimAngular3PData & edata,
             const DL_Attributes & attrib )
```

Writes an angular dimension entity (3 points version) to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific angular dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimAngular3PData::dpx
DL_DimAngular3PData::dpx2, DL_DimAngular3PData::dpx3, DL_DimensionData::dpy, DL_DimAngular3PData::dpy1, DL_DimAngular3PData::dpy2, DL_DimAngular3PData::dpy3, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimensionData::lineSpacingFac
DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.24 writeDimDiametric()

```
void DL_Dxf::writeDimDiametric (
             DL_WriterA & dw,
             const DL_DimensionData & data,
             const DL_DimDiametricData & edata,
             const DL_Attributes & attrib )
```

Writes a diametric dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific diametric dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimDiametricData::dpx, DL_DimensionData::dpy, DL_DimDiametricData::dpy, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimDiametricData::leader, DL_DimensionData::lineSpa
DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.25 writeDimLinear()

```
void DL_Dxf::writeDimLinear (
             DL_WriterA & dw,
             const DL_DimensionData & data,
             const DL_DimLinearData & edata,
             const DL_Attributes & attrib )
```

Writes a linear dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific linear dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimLinearData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimLinearData::dpx1, DL_DimLinearData::dpx2, DL_DimensionData::dpy, DL_DimLinearData::dpy1, DL_DimLinearData::dpy2, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimensionData::lineSpacingFactor, DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.26 writeDimOrdinate()

```
void DL_Dxf::writeDimOrdinate (
             DL_WriterA & dw,
             const DL_DimensionData & data,
             const DL_DimOrdinateData & edata,
             const DL_Attributes & attrib )
```

Writes an ordinate dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific ordinate dimension data from the file
attrib	Attributes

References DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimOrdinateData::dpx1, DL_DimOrdinateData::dpx2, DL_DimensionData::dpy, DL_DimOrdinateData::dpy1, DL_DimOrdinateData::dpy2, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimensionData::lineSpacingFactor, DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, DL_DimensionData::type, and DL_DimOrdinateData::xtype.

5.21.2.27 writeDimRadial()

```
void DL_Dxf::writeDimRadial (
            DL_WriterA & dw,
            const DL_DimensionData & data,
            const DL_DimRadialData & edata,
            const DL_Attributes & attrib )
```

Writes a radial dimension entity to the file.

Parameters

dw	DXF writer
data	Generic dimension data for from the file
data	Specific radial dimension data from the file
attrib	Attributes

References DL_DimensionData::angle, DL_DimensionData::attachmentPoint, DL_DimensionData::dpx, DL_DimRadialData::dpx, DL_DimensionData::dpy, DL_DimRadialData::dpy, DL_DimensionData::dpz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_DimRadialData::leader, DL_DimensionData::lineSpacin
DL_DimensionData::lineSpacingStyle, DL_DimensionData::mpx, DL_DimensionData::mpy, DL_DimensionData::text, and DL_DimensionData::type.

5.21.2.28 writeDimStyle()

```
void DL_Dxf::writeDimStyle (
            DL_WriterA & dw,
            double dimasz,
            double dimexe,
            double dimexo,
            double dimgap,
            double dimtxt )
```

Writes a dimstyle section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked DIMSTYLE section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), and DL_WriterA::dxfString().

5.21.2.29 writeEllipse()

```
void DL_Dxf::writeEllipse (
            DL_WriterA & dw,
            const DL_EllipseData & data,
            const DL_Attributes & attrib )
```

Writes an ellipse entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_EllipseData::angle1, DL_EllipseData::angle2, DL_EllipseData::cx, DL_EllipseData::cy, DL_EllipseData::cz, DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_EllipseData::mx, DL_EllipseData::my, DL_EllipseData::mz, and DL_EllipseData::ratio.

5.21.2.30 writeEndBlock()

```
void DL_Dxf::writeEndBlock (
            DL_WriterA & dw,
            const std::string & name )
```

Writes a block end.

Parameters

name	Block name

References DL_Writer::sectionBlockEntryEnd().

5.21.2.31 writeFitPoint()

```
void DL_Dxf::writeFitPoint (
            DL_WriterA & dw,
            const DL_FitPointData & data )
```

Writes a single fit point of a spline to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfReal(), DL_FitPointData::x, DL_FitPointData::y, and DL_FitPointData::z.

5.21.2.32 writeHatch1()

```
void DL_Dxf::writeHatch1 (
            DL_WriterA & dw,
            const DL_HatchData & data,
            const DL_Attributes & attrib )
```

Writes the beginning of a hatch entity to the file.

This must be followed by one or more writeHatchLoop() calls and a writeHatch2() call.

Parameters

dw	DXF writer
data	Entity data.
attrib	Attributes

References DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_HatchData::numLoops, DL_HatchData::pattern, and DL_HatchData::solid.

5.21.2.33 writeHatch2()

```
void DL_Dxf::writeHatch2 (
            DL_WriterA & dw,
            const DL_HatchData & data,
            const DL_Attributes & attrib )
```

Writes the end of a hatch entity to the file.

Parameters

dw	DXF writer
data	Entity data.
attrib	Attributes

References DL_HatchData::angle, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_HatchData::originX, DL_HatchData::scale, and DL_HatchData::solid.

5.21.2.34 writeHatchEdge()

```
void DL_Dxf::writeHatchEdge (
            DL_WriterA & dw,
            const DL_HatchEdgeData & data )
```

Writes the beginning of a hatch entity to the file.

Parameters

dw	DXF writer
data	Entity data.
attrib	Attributes

References DL_HatchEdgeData::angle1, DL_HatchEdgeData::angle2, DL_HatchEdgeData::ccw, DL_HatchEdgeData::cx, DL_HatchEdgeData::cy, DL_HatchEdgeData::degree, DL_Writer::dxfBool(), DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_HatchEdgeData::mx, DL_HatchEdgeData::my, DL_HatchEdgeData::nControl, DL_HatchEdgeData::nFit, DL_HatchEdgeData::nKnots, DL_HatchEdgeData::radius, DL_HatchEdgeData::ratio, DL_HatchEdgeData::type, DL_HatchEdgeData::x1, DL_HatchEdgeData::x2, DL_HatchEdgeData::y1, and DL_HatchEdgeData::y2.

5.21.2.35 writeHatchLoop1()

```
void DL_Dxf::writeHatchLoop1 (
            DL_WriterA & dw,
            const DL_HatchLoopData & data )
```

Writes the beginning of a hatch loop to the file.

This must happen after writing the beginning of a hatch entity.

Parameters

dw	DXF writer
data	Entity data.
attrib	Attributes

References DL_WriterA::dxfInt(), and DL_HatchLoopData::numEdges.

5.21.2.36 writeHatchLoop2()

```
void DL_Dxf::writeHatchLoop2 (
            DL_WriterA & dw,
            const DL_HatchLoopData & data )
```

Writes the end of a hatch loop to the file.

Parameters

dw	DXF writer
data	Entity data.
attrib	Attributes

References DL_WriterA::dxfInt().

5.21.2.37 writeImage()

```
unsigned long DL_Dxf::writeImage (
            DL_WriterA & dw,
            const DL_ImageData & data,
            const DL_Attributes & attrib )
```

Writes an image entity.

Returns

IMAGEDEF handle. Needed for the IMAGEDEF counterpart.

References DL_ImageData::brightness, DL_ImageData::contrast, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_ImageData::fade, DL_Writer::handle(), DL_ImageData::height, DL_ImageData::ipx, DL_ImageData::ipy, DL_ImageData::ipz, DL_ImageData::ux, DL_ImageData::uy, DL_ImageData::uz, DL_ImageData::vx, DL_ImageData::vy, DL_ImageData::vz, and DL_ImageData::width.

5.21.2.38 writeInsert()

```
void DL_Dxf::writeInsert (
            DL_WriterA & dw,
            const DL_InsertData & data,
            const DL_Attributes & attrib )
```

Writes an insert to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_InsertData::angle, DL_InsertData::cols, DL_InsertData::colSp, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_InsertData::ipx, DL_InsertData::ipy, DL_InsertData::ipz, DL_InsertData::name, DL_InsertData::rows, DL_InsertData::rowSp, DL_InsertData::sx, and DL_InsertData::sy.

5.21.2.39 writeKnot()

```
void DL_Dxf::writeKnot (
            DL_WriterA & dw,
            const DL_KnotData & data )
```

Writes a single knot of a spline to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfReal(), and DL_KnotData::k.

5.21.2.40 writeLayer()

```
void DL_Dxf::writeLayer (
            DL_WriterA & dw,
            const DL_LayerData & data,
            const DL_Attributes & attrib )
```

Writes a layer to the file.

Layers are stored in the tables section of a DXF file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), DL_WriterA::dxfString(), DL_LayerData::flags, DL_Attributes::getColor(), DL_Attributes::getColor24(), DL_Attributes::getLinetype(), DL_Attributes::getWidth(), DL_LayerData::name, DL_LayerData::off, and DL_Writer::tableLayerEntry().

5.21.2.41 writeLeader()

```
void DL_Dxf::writeLeader (
            DL_WriterA & dw,
            const DL_LeaderData & data,
            const DL_Attributes & attrib )
```

Writes a leader entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

See also

writeVertex

References DL_LeaderData::arrowHeadFlag, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_LeaderData::hooklineDirectionFlag, DL_LeaderData::hooklineFlag, DL_LeaderData::leaderCreationFlag, DL_LeaderData::leaderPathType, DL_LeaderData::number, DL_LeaderData::textAnnotationHei
and DL_LeaderData::textAnnotationWidth.

5.21.2.42 writeLeaderVertex()

```
void DL_Dxf::writeLeaderVertex (
            DL_WriterA & dw,
            const DL_LeaderVertexData & data )
```

Writes a single vertex of a leader to the file.

Parameters

dw	DXF writer
data	Entity data

References DL_WriterA::dxfReal(), DL_LeaderVertexData::x, and DL_LeaderVertexData::y.

5.21.2.43 writeLine()

```
void DL_Dxf::writeLine (
            DL_WriterA & dw,
            const DL_LineData & data,
            const DL_Attributes & attrib )
```

Writes a line entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_LineData::x1, DL_LineData::x2, DL_LineData::y1, DL_LineData::y2, DL_LineData::z1, and DL_LineData::z2.

5.21.2.44 writeLinetype()

```
void DL_Dxf::writeLinetype (
            DL_WriterA & dw,
            const DL_LinetypeData & data )
```

Writes a line type to the file.

Line types are stored in the tables section of a DXF file.

References DL_LinetypeData::description, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_LinetypeData::flags, DL_LinetypeData::name, DL_LinetypeData::numberOfDashes, DL_LinetypeData::pattern, DL_LinetypeData::patternLength, and DL_Writer::tableLinetypeEntry().

5.21.2.45 writeMText()

```
void DL_Dxf::writeMText (
            DL_WriterA & dw,
            const DL_MTextData & data,
            const DL_Attributes & attrib )
```

Writes a multi text entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_MTextData::angle, DL_MTextData::attachmentPoint, DL_MTextData::drawingDirection, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_MTextData::height, DL_MTextData::ipx, DL_MTextData::ipy, DL_MTextData::ipz, DL_MTextData::lineSpacingFactor, DL_MTextData::lineSpacingStyle, DL_MTextData::style, DL_MTextData::text, and DL_MTextData::width.

5.21.2.46 writeObjects()

```
void DL_Dxf::writeObjects (
            DL_WriterA & dw,
            const std::string & appDictionaryName = "" )
```

Writes a objects section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked OBJECTS section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::getNextHandle(), and DL_Writer::handle().

5.21.2.47 writeObjectsEnd()

```
void DL_Dxf::writeObjectsEnd (
            DL_WriterA & dw )
```

Writes the end of the objects section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked OBJECTS section to make the file readable by Aut∗cad.

References DL_WriterA::dxfString().

5.21.2.48 writePoint()

```
void DL_Dxf::writePoint (
            DL_WriterA & dw,
            const DL_PointData & data,
            const DL_Attributes & attrib )
```

Writes a point entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_PointData::x, DL_PointData::y, and DL_PointData::z.

5.21.2.49 writePolyline()

```
void DL_Dxf::writePolyline (
            DL_WriterA & dw,
            const DL_PolylineData & data,
            const DL_Attributes & attrib )
```

Writes a polyline entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

See also

writeVertex

References DL_WriterA::dxfInt(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_PolylineData::flags, DL_Attributes::getLayer(), and DL_PolylineData::number.

5.21.2.50 writePolylineEnd()

```
void DL_Dxf::writePolylineEnd (
            DL_WriterA & dw )
```

Writes the polyline end.

Only needed for DXF R12.

References DL_Writer::entity().

5.21.2.51 writeRay()

```
void DL_Dxf::writeRay (
            DL_WriterA & dw,
            const DL_RayData & data,
            const DL_Attributes & attrib )
```

Writes a ray entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_RayData::bx, DL_RayData::by, DL_RayData::bz, DL_RayData::dx, DL_WriterA::dxfString(), DL_RayData::dy, DL_RayData::dz, DL_Writer::entity(), and DL_Writer::entityAttributes().

5.21.2.52 writeSolid()

```
void DL_Dxf::writeSolid (
            DL_WriterA & dw,
            const DL_SolidData & data,
            const DL_Attributes & attrib )
```

Writes a solid entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_TraceData::thickness, and DL_TraceData::x.

5.21.2.53 writeSpline()

```
void DL_Dxf::writeSpline (
            DL_WriterA & dw,
            const DL_SplineData & data,
            const DL_Attributes & attrib )
```

Writes a spline entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

See also

writeControlPoint

References DL_SplineData::degree, DL_WriterA::dxfInt(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_SplineData::flags, DL_SplineData::nControl, DL_SplineData::nFit, and DL_SplineData::nKnots.

5.21.2.54 writeStyle()

```
void DL_Dxf::writeStyle (
            DL_WriterA & dw,
            const DL_StyleData & style )
```

Writes a style section.

This section is needed in DL_VERSION_R13.

References DL_StyleData::bigFontFile, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_StyleData::fixedTextHeight, DL_StyleData::flags, DL_Writer::handle(), DL_StyleData::lastHeightUsed, DL_StyleData::name, DL_StyleData::obliqueAngle, DL_StyleData::primaryFontFile, DL_StyleData::textGenerationFlags, and DL_StyleData::widthFactor.

5.21.2.55 writeText()

```
void DL_Dxf::writeText (
            DL_WriterA & dw,
            const DL_TextData & data,
            const DL_Attributes & attrib )
```

Writes a text entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_TextData::angle, DL_TextData::apx, DL_TextData::apy, DL_TextData::apz, DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_TextData::height, DL_TextData::hJustification, DL_TextData::ipx, DL_TextData::ipy, DL_TextData::ipz, DL_TextData::style, DL_TextData::text, DL_TextData::textGenerationFlags, DL_TextData::vJustification, and DL_TextData::xScaleFactor.

5.21.2.56 writeTrace()

```
void DL_Dxf::writeTrace (
            DL_WriterA & dw,
            const DL_TraceData & data,
            const DL_Attributes & attrib )
```

Writes a trace entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_Writer::entityAttributes(), DL_TraceData::thickness, and DL_TraceData::x.

5.21.2.57 writeUcs()

```
void DL_Dxf::writeUcs (
            DL_WriterA & dw )
```

Writes a ucs section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked UCS section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), and DL_WriterA::dxfString().

5.21.2.58 writeVertex()

```
void DL_Dxf::writeVertex (
            DL_WriterA & dw,
            const DL_VertexData & data )
```

Writes a single vertex of a polyline to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_VertexData::bulge, DL_WriterA::dxfReal(), DL_WriterA::dxfString(), DL_Writer::entity(), DL_VertexData::x, DL_VertexData::y, and DL_VertexData::z.

5.21.2.59 writeView()

```
void DL_Dxf::writeView (
            DL_WriterA & dw )
```

Writes a view section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked VIEW section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), and DL_WriterA::dxfString().

5.21.2.60 writeVPort()

```
void DL_Dxf::writeVPort (
            DL_WriterA & dw )
```

Writes a viewport section.

This section is needed in DL_VERSION_R13. Note that this method currently only writes a faked VPORT section to make the file readable by Aut∗cad.

References DL_WriterA::dxfHex(), DL_WriterA::dxfInt(), DL_WriterA::dxfReal(), DL_WriterA::dxfString(), and DL_Writer::handle().

5.21.2.61 writeXLine()

```
void DL_Dxf::writeXLine (
            DL_WriterA & dw,
            const DL_XLineData & data,
            const DL_Attributes & attrib )
```

Writes an x line entity to the file.

Parameters

dw	DXF writer
data	Entity data from the file
attrib	Attributes

References DL_XLineData::bx, DL_XLineData::by, DL_XLineData::bz, DL_XLineData::dx, DL_WriterA::dxfString(), DL_XLineData::dy, DL_XLineData::dz, DL_Writer::entity(), and DL_Writer::entityAttributes().

The documentation for this class was generated from the following files:

- src/dl_dxf.h
- src/dl_dxf.cpp

5.22 DL_EllipseData Struct Reference

Ellipse Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_EllipseData (double cx, double cy, double cz, double mx, double my, double mz, double ratio, double angle1, double angle2)

    Constructor.

Public Attributes

- double cx
- double cy
- double cz
- double mx
- double my
- double mz
- double ratio
- double angle1
- double angle2

5.22.1 Detailed Description

Ellipse Data.

5.22.2 Constructor & Destructor Documentation

5.22.2.1 DL_EllipseData()

```
DL_EllipseData::DL_EllipseData (
                double cx,
                double cy,
                double cz,
                double mx,
                double my,
                double mz,
                double ratio,
                double angle1,
                double angle2 )  [inline]
```

Constructor.

Parameters: see member variables.

5.22.3 Member Data Documentation

5.22.3.1 angle1

```
double DL_EllipseData::angle1
```

Startangle of ellipse in rad.

Referenced by DL_Dxf::writeEllipse().

5.22.3.2 angle2

```
double DL_EllipseData::angle2
```

Endangle of ellipse in rad.

Referenced by DL_Dxf::writeEllipse().

5.22.3.3 cx

```
double DL_EllipseData::cx
```

X Coordinate of center point.

Referenced by DL_Dxf::writeEllipse().

5.22.3.4 cy

```
double DL_EllipseData::cy
```

Y Coordinate of center point.

Referenced by DL_Dxf::writeEllipse().

5.22.3.5 cz

```
double DL_EllipseData::cz
```

Z Coordinate of center point.

Referenced by DL_Dxf::writeEllipse().

5.22.3.6 mx

```
double DL_EllipseData::mx
```

X coordinate of the endpoint of the major axis.

Referenced by DL_Dxf::writeEllipse().

5.22.3.7 my

`double DL_EllipseData::my`

Y coordinate of the endpoint of the major axis.

Referenced by DL_Dxf::writeEllipse().

5.22.3.8 mz

`double DL_EllipseData::mz`

Z coordinate of the endpoint of the major axis.

Referenced by DL_Dxf::writeEllipse().

5.22.3.9 ratio

`double DL_EllipseData::ratio`

Ratio of minor axis to major axis..

Referenced by DL_Dxf::writeEllipse().

The documentation for this struct was generated from the following file:

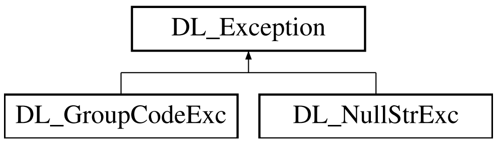
- src/dl_entities.h

5.23 DL_Exception Class Reference

Used for exception handling.

`#include <dl_exception.h>`

Inheritance diagram for DL_Exception:



5.23.1 Detailed Description

Used for exception handling.

The documentation for this class was generated from the following file:

- src/dl_exception.h

5.24 DL_Extrusion Class Reference

Extrusion direction.

```
#include <dl_extrusion.h>
```

Public Member Functions

- **DL_Extrusion** ()

  Default constructor.
- ∼**DL_Extrusion** ()

  Destructor.
- DL_Extrusion (double dx, double dy, double dz, double elevation)

  Constructor for DXF extrusion.
- void **setDirection** (double dx, double dy, double dz)

  Sets the direction vector.
- double ∗ getDirection () const
- void getDirection (double dir[ ]) const
- void **setElevation** (double elevation)

  Sets the elevation.
- double getElevation () const
- DL_Extrusion **operator=** (const DL_Extrusion &extru)

  Copies extrusion (deep copies) from another extrusion object.

5.24.1 Detailed Description

Extrusion direction.

Author

Andrew Mustun

5.24.2 Constructor & Destructor Documentation

5.24.2.1 DL_Extrusion()

```
DL_Extrusion::DL_Extrusion (
                 double dx,
                 double dy,
                 double dz,
                 double elevation )   [inline]
```

Constructor for DXF extrusion.

Parameters

direction	Vector of axis along which the entity shall be extruded this is also the Z axis of the Entity coordinate system
elevation	Distance of the entities XY plane from the origin of the world coordinate system

5.24.3 Member Function Documentation

5.24.3.1 getDirection() [1/2]

```
double * DL_Extrusion::getDirection ( ) const  [inline]
```

Returns

direction vector.

5.24.3.2 getDirection() [2/2]

```
void DL_Extrusion::getDirection (
             double dir[] ) const  [inline]
```

Returns

direction vector.

5.24.3.3 getElevation()

```
double DL_Extrusion::getElevation ( ) const  [inline]
```

Returns

Elevation.

The documentation for this class was generated from the following file:

- src/dl_extrusion.h

5.25 DL_FitPointData Struct Reference

Spline fit point data.

`#include <dl_entities.h>`

Public Member Functions

- DL_FitPointData (double x, double y, double z)
  Constructor.

Public Attributes

- double x
- double y
- double z

5.25.1 Detailed Description

Spline fit point data.

5.25.2 Constructor & Destructor Documentation

5.25.2.1 DL_FitPointData()

```
DL_FitPointData::DL_FitPointData (
                 double x,
                 double y,
                 double z )  [inline]
```

Constructor.

Parameters: see member variables.

5.25.3 Member Data Documentation

5.25.3.1 x

```
double DL_FitPointData::x
```

X coordinate of the fit point.

Referenced by DL_Dxf::writeFitPoint().

5.25.3.2 y

```
double DL_FitPointData::y
```

Y coordinate of the fit point.

Referenced by DL_Dxf::writeFitPoint().

5.25.3.3 z

```
double DL_FitPointData::z
```

Z coordinate of the fit point.

Referenced by DL_Dxf::writeFitPoint().

The documentation for this struct was generated from the following file:

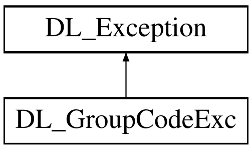
- src/dl_entities.h

5.26 DL_GroupCodeExc Class Reference

Used for exception handling.

`#include <dl_exception.h>`

Inheritance diagram for DL_GroupCodeExc:



5.26.1 Detailed Description

Used for exception handling.

The documentation for this class was generated from the following file:

- src/dl_exception.h

5.27 DL_HatchData Struct Reference

Hatch data.

`#include <dl_entities.h>`

Public Member Functions

- **DL_HatchData** ()

  Default constructor.
- DL_HatchData (int numLoops, bool solid, double scale, double angle, const std::string &pattern, double originX=0.0, double originY=0.0)

  Constructor.

Public Attributes

- int numLoops
- bool solid
- double scale
- double angle
- std::string pattern
- double originX
- double **originY**

5.27.1 Detailed Description

Hatch data.

5.27.2 Constructor & Destructor Documentation

5.27.2.1 DL_HatchData()

```
DL_HatchData::DL_HatchData (
             int numLoops,
             bool solid,
             double scale,
             double angle,
             const std::string & pattern,
             double originX = 0.0,
             double originY = 0.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.27.3 Member Data Documentation

5.27.3.1 angle

```
double DL_HatchData::angle
```

Pattern angle in degrees

Referenced by DL_Dxf::writeHatch2().

5.27.3.2 numLoops

```
int DL_HatchData::numLoops
```

Number of boundary paths (loops).

Referenced by DL_Dxf::writeHatch1().

5.27.3.3 originX

```
double DL_HatchData::originX
```

Pattern origin

Referenced by DL_Dxf::writeHatch2().

5.27.3.4 pattern

```
std::string DL_HatchData::pattern
```

Pattern name.

Referenced by DL_Dxf::writeHatch1().

5.27.3.5 scale

```
double DL_HatchData::scale
```

Pattern scale or spacing

Referenced by DL_Dxf::writeHatch2().

5.27.3.6 solid

```
bool DL_HatchData::solid
```

Solid fill flag (true=solid, false=pattern).

Referenced by DL_Dxf::writeHatch1(), and DL_Dxf::writeHatch2().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.28 DL_HatchEdgeData Struct Reference

Hatch edge data.

```
#include <dl_entities.h>
```

Public Member Functions

- **DL_HatchEdgeData** ()

  Default constructor.
- DL_HatchEdgeData (double x1, double y1, double x2, double y2)

  Constructor for a line edge.
- DL_HatchEdgeData (double cx, double cy, double radius, double angle1, double angle2, bool ccw)

  Constructor for an arc edge.
- DL_HatchEdgeData (double cx, double cy, double mx, double my, double ratio, double angle1, double angle2, bool ccw)

  Constructor for an ellipse arc edge.
- DL_HatchEdgeData (unsigned int degree, bool rational, bool periodic, unsigned int nKnots, unsigned int nControl, unsigned int nFit, const std::vector< double > &knots, const std::vector< std::vector< double > > &controlPoints, const std::vector< std::vector< double > > &fitPoints, const std::vector< double > &weights, double startTangentX, double startTangentY, double endTangentX, double endTangentY)

  Constructor for a spline edge.

Public Attributes

- bool **defined**

  Set to true if this edge is fully defined.
- int type

  Edge type.
- double x1
- double y1
- double x2
- double y2
- double cx
- double cy
- double radius
- double angle1
- double angle2
- bool ccw
- double mx
- double my
- double ratio
- unsigned int degree
- bool **rational**
- bool **periodic**
- unsigned int nKnots
- unsigned int nControl
- unsigned int nFit
- std::vector< std::vector< double > > **controlPoints**
- std::vector< double > **knots**
- std::vector< double > **weights**
- std::vector< std::vector< double > > **fitPoints**
- double **startTangentX**
- double **startTangentY**
- double **endTangentX**
- double **endTangentY**
- std::vector< std::vector< double > > **vertices**

  Polyline boundary vertices (x y [bulge])

5.28.1 Detailed Description

Hatch edge data.

5.28.2 Constructor & Destructor Documentation

5.28.2.1 DL_HatchEdgeData() [1/4]

```
DL_HatchEdgeData::DL_HatchEdgeData (
             double x1,
             double y1,
             double x2,
             double y2 )  [inline]
```

Constructor for a line edge.

Parameters: see member variables.

5.28.2.2 DL_HatchEdgeData() [2/4]

```
DL_HatchEdgeData::DL_HatchEdgeData (
            double cx,
            double cy,
            double radius,
            double angle1,
            double angle2,
            bool ccw ) [inline]
```

Constructor for an arc edge.

Parameters: see member variables.

5.28.2.3 DL_HatchEdgeData() [3/4]

```
DL_HatchEdgeData::DL_HatchEdgeData (
            double cx,
            double cy,
            double mx,
            double my,
            double ratio,
            double angle1,
            double angle2,
            bool ccw ) [inline]
```

Constructor for an ellipse arc edge.

Parameters: see member variables.

5.28.2.4 DL_HatchEdgeData() [4/4]

```
DL_HatchEdgeData::DL_HatchEdgeData (
            unsigned int degree,
            bool rational,
            bool periodic,
            unsigned int nKnots,
            unsigned int nControl,
            unsigned int nFit,
            const std::vector< double > & knots,
            const std::vector< std::vector< double > > & controlPoints,
            const std::vector< std::vector< double > > & fitPoints,
            const std::vector< double > & weights,
            double startTangentX,
            double startTangentY,
            double endTangentX,
            double endTangentY ) [inline]
```

Constructor for a spline edge.

Parameters: see member variables.

5.28.3 Member Data Documentation

5.28.3.1 angle1

```
double DL_HatchEdgeData::angle1
```

Start angle of arc or ellipse arc.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.2 angle2

```
double DL_HatchEdgeData::angle2
```

End angle of arc or ellipse arc.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.3 ccw

```
bool DL_HatchEdgeData::ccw
```

Counterclockwise flag for arc or ellipse arc.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.4 cx

```
double DL_HatchEdgeData::cx
```

Center point of arc or ellipse arc (X).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.5 cy

```
double DL_HatchEdgeData::cy
```

Center point of arc or ellipse arc (Y).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.6 degree

```
unsigned int DL_HatchEdgeData::degree
```

Spline degree

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.7 mx

```
double DL_HatchEdgeData::mx
```

Major axis end point (X).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.8 my

```
double DL_HatchEdgeData::my
```

Major axis end point (Y).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.9 nControl

```
unsigned int DL_HatchEdgeData::nControl
```

Number of control points.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.10 nFit

```
unsigned int DL_HatchEdgeData::nFit
```

Number of fit points.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.11 nKnots

```
unsigned int DL_HatchEdgeData::nKnots
```

Number of knots.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.12 radius

```
double DL_HatchEdgeData::radius
```

Arc radius.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.13 ratio

```
double DL_HatchEdgeData::ratio
```

Axis ratio

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.14 type

```
int DL_HatchEdgeData::type
```

Edge type.

1=line, 2=arc, 3=elliptic arc, 4=spline.

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.15 x1

```
double DL_HatchEdgeData::x1
```

Start point (X).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.16 x2

```
double DL_HatchEdgeData::x2
```

End point (X).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.17 y1

```
double DL_HatchEdgeData::y1
```

Start point (Y).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

5.28.3.18 y2

```
double DL_HatchEdgeData::y2
```

End point (Y).

Referenced by DL_Dxf::handleHatchData(), and DL_Dxf::writeHatchEdge().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.29 DL_HatchLoopData Struct Reference

Hatch boundary path (loop) data.

```
#include <dl_entities.h>
```

Public Member Functions

- **DL_HatchLoopData** ()

    Default constructor.
- DL_HatchLoopData (int hNumEdges)

    Constructor.

Public Attributes

- int numEdges

5.29.1 Detailed Description

Hatch boundary path (loop) data.

5.29.2 Constructor & Destructor Documentation

5.29.2.1 DL_HatchLoopData()

```
DL_HatchLoopData::DL_HatchLoopData (
             int hNumEdges )  [inline]
```

Constructor.

Parameters: see member variables.

5.29.3 Member Data Documentation

5.29.3.1 numEdges

```
int DL_HatchLoopData::numEdges
```

Number of edges in this loop.

Referenced by DL_Dxf::writeHatchLoop1().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.30 DL_ImageData Struct Reference

Image Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_ImageData (const std::string &iref, double iipx, double iipy, double iipz, double iux, double iuy, double iuz, double ivx, double ivy, double ivz, int iwidth, int iheight, int ibrightness, int icontrast, int ifade)
  Constructor.

Public Attributes

- std::string ref
- double ipx
- double ipy
- double ipz
- double ux
- double uy
- double uz
- double vx
- double vy
- double vz
- int width
- int height
- int brightness
- int contrast
- int fade

5.30.1 Detailed Description

Image Data.

5.30.2 Constructor & Destructor Documentation

5.30.2.1 DL_ImageData()

```
DL_ImageData::DL_ImageData (
             const std::string & iref,
             double iipx,
             double iipy,
             double iipz,
             double iux,
             double iuy,
             double iuz,
             double ivx,
             double ivy,
             double ivz,
             int iwidth,
             int iheight,
             int ibrightness,
             int icontrast,
             int ifade )  [inline]
```

Constructor.

Parameters: see member variables.

5.30.3 Member Data Documentation

5.30.3.1 brightness

```
int DL_ImageData::brightness
```

Brightness (0..100, default = 50).

Referenced by DL_Dxf::writeImage().

5.30.3.2 contrast

```
int DL_ImageData::contrast
```

Contrast (0..100, default = 50).

Referenced by DL_Dxf::writeImage().

5.30.3.3 fade

```
int DL_ImageData::fade
```

Fade (0..100, default = 0).

Referenced by DL_Dxf::writeImage().

5.30.3.4 height

```
int DL_ImageData::height
```

Height of image in pixel.

Referenced by DL_Dxf::writeImage(), and DL_Dxf::writeImageDef().

5.30.3.5 ipx

```
double DL_ImageData::ipx
```

X Coordinate of insertion point.

Referenced by DL_Dxf::writeImage().

5.30.3.6 ipy

```
double DL_ImageData::ipy
```

Y Coordinate of insertion point.

Referenced by DL_Dxf::writeImage().

5.30.3.7 ipz

```
double DL_ImageData::ipz
```

Z Coordinate of insertion point.

Referenced by DL_Dxf::writeImage().

5.30.3.8 ref

```
std::string DL_ImageData::ref
```

Reference to the image file (unique, used to refer to the image def object).

Referenced by DL_Dxf::writeImageDef().

5.30.3.9 ux

```
double DL_ImageData::ux
```

X Coordinate of u vector along bottom of image.

Referenced by DL_Dxf::writeImage().

5.30.3.10 uy

```
double DL_ImageData::uy
```

Y Coordinate of u vector along bottom of image.

Referenced by DL_Dxf::writeImage().

5.30.3.11 uz

```
double DL_ImageData::uz
```

Z Coordinate of u vector along bottom of image.

Referenced by DL_Dxf::writeImage().

5.30.3.12 vx

```
double DL_ImageData::vx
```

X Coordinate of v vector along left side of image.

Referenced by DL_Dxf::writeImage().

5.30.3.13 vy

```
double DL_ImageData::vy
```

Y Coordinate of v vector along left side of image.

Referenced by DL_Dxf::writeImage().

5.30.3.14 vz

```
double DL_ImageData::vz
```

Z Coordinate of v vector along left side of image.

Referenced by DL_Dxf::writeImage().

5.30.3.15 width

```
int DL_ImageData::width
```

Width of image in pixel.

Referenced by DL_Dxf::writeImage(), and DL_Dxf::writeImageDef().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.31 DL_ImageDefData Struct Reference

Image Definition Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_ImageDefData (const std::string &iref, const std::string &ifile)
  Constructor.

Public Attributes

- std::string ref
- std::string file

5.31.1 Detailed Description

Image Definition Data.

5.31.2 Constructor & Destructor Documentation

5.31.2.1 DL_ImageDefData()

```
DL_ImageDefData::DL_ImageDefData (
            const std::string & iref,
            const std::string & ifile )  [inline]
```

Constructor.

Parameters: see member variables.

5.31.3 Member Data Documentation

5.31.3.1 file

```
std::string DL_ImageDefData::file
```

Image file

5.31.3.2 ref

```
std::string DL_ImageDefData::ref
```

Reference to the image file (unique, used to refer to the image def object).

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.32 DL_InsertData Struct Reference

Insert Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_InsertData (const std::string &name, double ipx, double ipy, double ipz, double sx, double sy, double sz, double angle, int cols, int rows, double colSp, double rowSp)

  Constructor.

Public Attributes

- std::string name
- double ipx
- double ipy
- double ipz
- double sx
- double sy
- double sz
- double angle
- int cols
- int rows
- double colSp
- double rowSp

5.32.1 Detailed Description

Insert Data.

5.32.2 Constructor & Destructor Documentation

5.32.2.1 DL_InsertData()

```
DL_InsertData::DL_InsertData (
                const std::string & name,
                double ipx,
                double ipy,
                double ipz,
                double sx,
                double sy,
                double sz,
                double angle,
                int cols,
                int rows,
                double colSp,
                double rowSp )  [inline]
```

Constructor.

Parameters: see member variables.

5.32.3 Member Data Documentation

5.32.3.1 angle

```
double DL_InsertData::angle
```

Rotation angle in degrees.

Referenced by DL_Dxf::writeInsert().

5.32.3.2 cols

```
int DL_InsertData::cols
```

Number of colums if we insert an array of the block or 1.

Referenced by DL_Dxf::writeInsert().

5.32.3.3 colSp

```
double DL_InsertData::colSp
```

Values for the spacing between cols.

Referenced by DL_Dxf::writeInsert().

5.32.3.4 ipx

```
double DL_InsertData::ipx
```

X Coordinate of insertion point.

Referenced by DL_Dxf::writeInsert().

5.32.3.5 ipy

```
double DL_InsertData::ipy
```

Y Coordinate of insertion point.

Referenced by DL_Dxf::writeInsert().

5.32.3.6 ipz

```
double DL_InsertData::ipz
```

Z Coordinate of insertion point.

Referenced by DL_Dxf::writeInsert().

5.32.3.7 name

```
std::string DL_InsertData::name
```

Name of the referred block.

Referenced by DL_Dxf::writeInsert().

5.32.3.8 rows

```
int DL_InsertData::rows
```

Number of rows if we insert an array of the block or 1.

Referenced by DL_Dxf::writeInsert().

5.32.3.9 rowSp

```
double DL_InsertData::rowSp
```

Values for the spacing between rows.

Referenced by DL_Dxf::writeInsert().

5.32.3.10 sx

```
double DL_InsertData::sx
```

X Scale factor.

Referenced by DL_Dxf::writeInsert().

5.32.3.11 sy

```
double DL_InsertData::sy
```

Y Scale factor.

Referenced by DL_Dxf::writeInsert().

5.32.3.12 sz

```
double DL_InsertData::sz
```

Z Scale factor.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.33 DL_KnotData Struct Reference

Spline knot data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_KnotData (double pk)

  Constructor.

Public Attributes

- double k

5.33.1 Detailed Description

Spline knot data.

5.33.2 Constructor & Destructor Documentation

5.33.2.1 DL_KnotData()

```
DL_KnotData::DL_KnotData (
            double pk )  [inline]
```

Constructor.

Parameters: see member variables.

5.33.3 Member Data Documentation

5.33.3.1 k

```
double DL_KnotData::k
```

Knot value.

Referenced by DL_Dxf::writeKnot().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.34 DL_LayerData Struct Reference

Layer Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_LayerData (const std::string &name, int flags, bool off=false)

  Constructor.

Public Attributes

- std::string **name**

  Layer name.
- int flags

  Layer flags.
- bool **off**

  Layer is off.

5.34.1 Detailed Description

Layer Data.

5.34.2 Constructor & Destructor Documentation

5.34.2.1 DL_LayerData()

```
DL_LayerData::DL_LayerData (
             const std::string & name,
             int flags,
             bool off = false )  [inline]
```

Constructor.

Parameters: see member variables.

5.34.3 Member Data Documentation

5.34.3.1 flags

```
int DL_LayerData::flags
```

Layer flags.

(1 = frozen, 2 = frozen by default, 4 = locked)

Referenced by DL_Dxf::writeLayer().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.35 DL_LeaderData Struct Reference

Leader (arrow).

```
#include <dl_entities.h>
```

Public Member Functions

- DL_LeaderData (int arrowHeadFlag, int leaderPathType, int leaderCreationFlag, int hooklineDirectionFlag, int hooklineFlag, double textAnnotationHeight, double textAnnotationWidth, int number, double dimScale=1.0)

    Constructor.

Public Attributes

- int arrowHeadFlag
- int leaderPathType
- int leaderCreationFlag
- int hooklineDirectionFlag
- int hooklineFlag
- double textAnnotationHeight
- double textAnnotationWidth
- int number
- double dimScale

5.35.1 Detailed Description

Leader (arrow).

5.35.2 Constructor & Destructor Documentation

5.35.2.1 DL_LeaderData()

```
DL_LeaderData::DL_LeaderData (
                int arrowHeadFlag,
                int leaderPathType,
                int leaderCreationFlag,
                int hooklineDirectionFlag,
                int hooklineFlag,
                double textAnnotationHeight,
                double textAnnotationWidth,
                int number,
                double dimScale = 1.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.35.3 Member Data Documentation

5.35.3.1 arrowHeadFlag

```
int DL_LeaderData::arrowHeadFlag
```

Arrow head flag (71).

Referenced by DL_Dxf::writeLeader().

5.35.3.2 dimScale

```
double DL_LeaderData::dimScale
```

Dimension scale (dimscale) style override.

5.35.3.3 hooklineDirectionFlag

```
int DL_LeaderData::hooklineDirectionFlag
```

Hookline direction flag (74).

Referenced by DL_Dxf::writeLeader().

5.35.3.4 hooklineFlag

```
int DL_LeaderData::hooklineFlag
```

Hookline flag (75)

Referenced by DL_Dxf::writeLeader().

5.35.3.5 leaderCreationFlag

```
int DL_LeaderData::leaderCreationFlag
```

Leader creation flag (73).

Referenced by DL_Dxf::writeLeader().

5.35.3.6 leaderPathType

```
int DL_LeaderData::leaderPathType
```

Leader path type (72).

Referenced by DL_Dxf::writeLeader().

5.35.3.7 number

```
int DL_LeaderData::number
```

Number of vertices in leader (76).

Referenced by DL_Dxf::writeLeader().

5.35.3.8 textAnnotationHeight

```
double DL_LeaderData::textAnnotationHeight
```

Text annotation height (40).

Referenced by DL_Dxf::writeLeader().

5.35.3.9 textAnnotationWidth

```
double DL_LeaderData::textAnnotationWidth
```

Text annotation width (41)

Referenced by DL_Dxf::writeLeader().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.36 DL_LeaderVertexData Struct Reference

Leader Vertex Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_LeaderVertexData (double px=0.0, double py=0.0, double pz=0.0)
  Constructor.

Public Attributes

- double x
- double y
- double z

5.36.1 Detailed Description

Leader Vertex Data.

5.36.2 Constructor & Destructor Documentation

5.36.2.1 DL_LeaderVertexData()

```
DL_LeaderVertexData::DL_LeaderVertexData (
            double px = 0.0,
            double py = 0.0,
            double pz = 0.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.36.3 Member Data Documentation

5.36.3.1 x

```
double DL_LeaderVertexData::x
```

X Coordinate of the vertex.

Referenced by DL_Dxf::writeLeaderVertex().

5.36.3.2 y

```
double DL_LeaderVertexData::y
```

Y Coordinate of the vertex.

Referenced by DL_Dxf::writeLeaderVertex().

5.36.3.3 z

```
double DL_LeaderVertexData::z
```

Z Coordinate of the vertex.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.37 DL_LineData Struct Reference

Line Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_LineData (double lx1, double ly1, double lz1, double lx2, double ly2, double lz2)
  Constructor.

Public Attributes

- double x1
- double y1
- double z1
- double x2
- double y2
- double z2

5.37.1 Detailed Description

Line Data.

5.37.2 Constructor & Destructor Documentation

5.37.2.1 DL_LineData()

```
DL_LineData::DL_LineData (
                double lx1,
                double ly1,
                double lz1,
                double lx2,
                double ly2,
                double lz2 )  [inline]
```

Constructor.

Parameters: see member variables.

5.37.3 Member Data Documentation

5.37.3.1 x1

```
double DL_LineData::x1
```

X Start coordinate of the point.

Referenced by DL_Dxf::writeLine().

5.37.3.2 x2

```
double DL_LineData::x2
```

X End coordinate of the point.

Referenced by DL_Dxf::writeLine().

5.37.3.3 y1

```
double DL_LineData::y1
```

Y Start coordinate of the point.

Referenced by DL_Dxf::writeLine().

5.37.3.4 y2

```
double DL_LineData::y2
```

Y End coordinate of the point.

Referenced by DL_Dxf::writeLine().

5.37.3.5 z1

```
double DL_LineData::z1
```

Z Start coordinate of the point.

Referenced by DL_Dxf::writeLine().

5.37.3.6 z2

```
double DL_LineData::z2
```

Z End coordinate of the point.

Referenced by DL_Dxf::writeLine().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.38 DL_LinetypeData Struct Reference

Line Type Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_LinetypeData (const std::string &name, const std::string &description, int flags, int numberOfDashes, double patternLength, double ∗pattern=NULL)

  Constructor.

Public Attributes

- std::string **name**

  Linetype name.
- std::string **description**

  Linetype description.
- int **flags**

  Linetype flags.
- int **numberOfDashes**

  Number of dashes.
- double **patternLength**

  Pattern length.
- double ∗ **pattern**

  Pattern.

5.38.1 Detailed Description

Line Type Data.

5.38.2 Constructor & Destructor Documentation

5.38.2.1 DL_LinetypeData()

```
DL_LinetypeData::DL_LinetypeData (
            const std::string & name,
            const std::string & description,
            int flags,
            int numberOfDashes,
            double patternLength,
            double * pattern = NULL )  [inline]
```

Constructor.

Parameters: see member variables.

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.39 DL_MTextData Struct Reference

MText Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_MTextData (double ipx, double ipy, double ipz, double dirx, double diry, double dirz, double height, double width, int attachmentPoint, int drawingDirection, int lineSpacingStyle, double lineSpacingFactor, const std↩ ::string &text, const std::string &style, double angle)

  Constructor.

Public Attributes

- double ipx
- double ipy
- double ipz
- double dirx
- double diry
- double dirz
- double height
- double width
- int attachmentPoint

  Attachment point.
- int drawingDirection

  Drawing direction.
- int lineSpacingStyle

  Line spacing style.
- double lineSpacingFactor

  Line spacing factor.
- std::string text
- std::string style
- double angle

5.39.1 Detailed Description

MText Data.

5.39.2 Constructor & Destructor Documentation

5.39.2.1 DL_MTextData()

```
DL_MTextData::DL_MTextData (
             double ipx,
             double ipy,
             double ipz,
             double dirx,
             double diry,
             double dirz,
             double height,
             double width,
             int attachmentPoint,
             int drawingDirection,
             int lineSpacingStyle,
             double lineSpacingFactor,
             const std::string & text,
             const std::string & style,
             double angle )  [inline]
```

Constructor.

Parameters: see member variables.

5.39.3 Member Data Documentation

5.39.3.1 angle

```
double DL_MTextData::angle
```

Rotation angle.

Referenced by DL_Dxf::writeMText().

5.39.3.2 attachmentPoint

```
int DL_MTextData::attachmentPoint
```

Attachment point.

1 = Top left, 2 = Top center, 3 = Top right, 4 = Middle left, 5 = Middle center, 6 = Middle right, 7 = Bottom left, 8 = Bottom center, 9 = Bottom right

Referenced by DL_Dxf::writeMText().

5.39.3.3 dirx

```
double DL_MTextData::dirx
```

X Coordinate of X direction vector.

5.39.3.4 diry

```
double DL_MTextData::diry
```

Y Coordinate of X direction vector.

5.39.3.5 dirz

```
double DL_MTextData::dirz
```

Z Coordinate of X direction vector.

5.39.3.6 drawingDirection

```
int DL_MTextData::drawingDirection
```

Drawing direction.

1 = left to right, 3 = top to bottom, 5 = by style

Referenced by DL_Dxf::writeMText().

5.39.3.7 height

```
double DL_MTextData::height
```

Text height

Referenced by DL_Dxf::writeMText().

5.39.3.8 ipx

```
double DL_MTextData::ipx
```

X Coordinate of insertion point.

Referenced by DL_Dxf::writeMText().

5.39.3.9 ipy

```
double DL_MTextData::ipy
```

Y Coordinate of insertion point.

Referenced by DL_Dxf::writeMText().

5.39.3.10 ipz

```
double DL_MTextData::ipz
```

Z Coordinate of insertion point.

Referenced by DL_Dxf::writeMText().

5.39.3.11 lineSpacingFactor

```
double DL_MTextData::lineSpacingFactor
```

Line spacing factor.

0.25 .. 4.0

Referenced by DL_Dxf::writeMText().

5.39.3.12 lineSpacingStyle

```
int DL_MTextData::lineSpacingStyle
```

Line spacing style.

1 = at least, 2 = exact

Referenced by DL_Dxf::writeMText().

5.39.3.13 style

```
std::string DL_MTextData::style
```

Style string.

Referenced by DL_Dxf::writeMText().

5.39.3.14 text

```
std::string DL_MTextData::text
```

Text string.

Referenced by DL_Dxf::writeMText().

5.39.3.15 width

```
double DL_MTextData::width
```

Width of the text box.

Referenced by DL_Dxf::writeMText().

The documentation for this struct was generated from the following file:

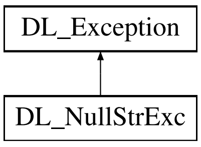
- src/dl_entities.h

5.40 DL_NullStrExc Class Reference

Used for exception handling.

```
#include <dl_exception.h>
```

Inheritance diagram for DL_NullStrExc:



5.40.1 Detailed Description

Used for exception handling.

The documentation for this class was generated from the following file:

- src/dl_exception.h

5.41 DL_PointData Struct Reference

Point Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_PointData (double px=0.0, double py=0.0, double pz=0.0)
  Constructor.

Public Attributes

- double x
- double y
- double z

5.41.1 Detailed Description

Point Data.

5.41.2 Constructor & Destructor Documentation

5.41.2.1 DL_PointData()

```
DL_PointData::DL_PointData (
                double px = 0.0,
                double py = 0.0,
                double pz = 0.0 )   [inline]
```

Constructor.

Parameters: see member variables.

5.41.3 Member Data Documentation

5.41.3.1 x

```
double DL_PointData::x
```

X Coordinate of the point.

Referenced by DL_Dxf::writePoint().

5.41.3.2 y

`double DL_PointData::y`

Y Coordinate of the point.

Referenced by DL_Dxf::writePoint().

5.41.3.3 z

`double DL_PointData::z`

Z Coordinate of the point.

Referenced by DL_Dxf::writePoint().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.42 DL_PolylineData Struct Reference

Polyline Data.

`#include <dl_entities.h>`

Public Member Functions

- DL_PolylineData (int pNumber, int pMVerteces, int pNVerteces, int pFlags, double pElevation=0.0)
  Constructor.

Public Attributes

- unsigned int number
- unsigned int m
- unsigned int n
- double elevation
- int flags

5.42.1 Detailed Description

Polyline Data.

5.42.2 Constructor & Destructor Documentation

5.42.2.1 DL_PolylineData()

```
DL_PolylineData::DL_PolylineData (
             int pNumber,
             int pMVerteces,
             int pNVerteces,
             int pFlags,
             double pElevation = 0.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.42.3 Member Data Documentation

5.42.3.1 elevation

```
double DL_PolylineData::elevation
```

elevation of the polyline.

5.42.3.2 flags

```
int DL_PolylineData::flags
```

Flags

Referenced by DL_Dxf::writePolyline().

5.42.3.3 m

```
unsigned int DL_PolylineData::m
```

Number of vertices in m direction if polyline is a polygon mesh.

5.42.3.4 n

```
unsigned int DL_PolylineData::n
```

Number of vertices in n direction if polyline is a polygon mesh.

5.42.3.5 number

```
unsigned int DL_PolylineData::number
```

Number of vertices in this polyline.

Referenced by DL_Dxf::writePolyline().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.43 DL_RayData Struct Reference

Ray Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_RayData (double bx, double by, double bz, double dx, double dy, double dz)
  Constructor.

Public Attributes

- double bx
- double by
- double bz
- double dx
- double dy
- double dz

5.43.1 Detailed Description

Ray Data.

5.43.2 Constructor & Destructor Documentation

5.43.2.1 DL_RayData()

```
DL_RayData::DL_RayData (
                double bx,
                double by,
                double bz,
                double dx,
                double dy,
                double dz )  [inline]
```

Constructor.

Parameters: see member variables.

5.43.3 Member Data Documentation

5.43.3.1 bx

```
double DL_RayData::bx
```

X base point.

Referenced by DL_Dxf::writeRay().

5.43.3.2 by

```
double DL_RayData::by
```

Y base point.

Referenced by DL_Dxf::writeRay().

5.43.3.3 bz

```
double DL_RayData::bz
```

Z base point.

Referenced by DL_Dxf::writeRay().

5.43.3.4 dx

```
double DL_RayData::dx
```

X direction vector.

Referenced by DL_Dxf::writeRay().

5.43.3.5 dy

```
double DL_RayData::dy
```

Y direction vector.

Referenced by DL_Dxf::writeRay().

5.43.3.6 dz

```
double DL_RayData::dz
```

Z direction vector.

Referenced by DL_Dxf::writeRay().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.44 DL_SplineData Struct Reference

Spline Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_SplineData (int degree, int nKnots, int nControl, int nFit, int flags)

  Constructor.

Public Attributes

- unsigned int degree
- unsigned int nKnots
- unsigned int nControl
- unsigned int nFit
- int flags
- double **tangentStartX**
- double **tangentStartY**
- double **tangentStartZ**
- double **tangentEndX**
- double **tangentEndY**
- double **tangentEndZ**

5.44.1 Detailed Description

Spline Data.

5.44.2 Constructor & Destructor Documentation

5.44.2.1 DL_SplineData()

```
DL_SplineData::DL_SplineData (
              int degree,
              int nKnots,
              int nControl,
              int nFit,
              int flags ) [inline]
```

Constructor.

Parameters: see member variables.

5.44.3 Member Data Documentation

5.44.3.1 degree

```
unsigned int DL_SplineData::degree
```

Degree of the spline curve.

Referenced by DL_Dxf::writeSpline().

5.44.3.2 flags

```
int DL_SplineData::flags
```

Flags

Referenced by DL_Dxf::writeSpline().

5.44.3.3 nControl

```
unsigned int DL_SplineData::nControl
```

Number of control points.

Referenced by DL_Dxf::writeSpline().

5.44.3.4 nFit

```
unsigned int DL_SplineData::nFit
```

Number of fit points.

Referenced by DL_Dxf::writeSpline().

5.44.3.5 nKnots

```
unsigned int DL_SplineData::nKnots
```

Number of knots.

Referenced by DL_Dxf::writeSpline().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.45 DL_StyleData Struct Reference

Text style data.

```
#include <dl_entities.h>
```

Public Member Functions

- **DL_StyleData** (const std::string &name, int flags, double fixedTextHeight, double widthFactor, double obliqueAngle, int textGenerationFlags, double lastHeightUsed, const std::string &primaryFontFile, const std↵ ::string &bigFontFile)

  Constructor Parameters: see member variables.
- bool **operator==** (const DL_StyleData &other)

Public Attributes

- std::string **name**

  Style name.
- int **flags**

  Style flags.
- double **fixedTextHeight**

  Fixed text height or 0 for not fixed.
- double **widthFactor**

  Width factor.
- double **obliqueAngle**

  Oblique angle.
- int **textGenerationFlags**

  Text generation flags.
- double **lastHeightUsed**

  Last height used.
- std::string **primaryFontFile**

  Primary font file name.
- std::string **bigFontFile**

  Big font file name.
- bool **bold**
- bool **italic**

5.45.1 Detailed Description

Text style data.

The documentation for this struct was generated from the following file:

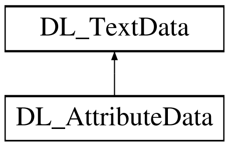
- src/dl_entities.h

5.46 DL_TextData Struct Reference

Text Data.

```
#include <dl_entities.h>
```

Inheritance diagram for DL_TextData:



Public Member Functions

- DL_TextData (double ipx, double ipy, double ipz, double apx, double apy, double apz, double height, double xScaleFactor, int textGenerationFlags, int hJustification, int vJustification, const std::string &text, const std::string &style, double angle)

  Constructor.

Public Attributes

- double ipx
- double ipy
- double ipz
- double apx
- double apy
- double apz
- double height
- double xScaleFactor
- int textGenerationFlags
- int hJustification

  Horizontal justification.
- int vJustification

  Vertical justification.
- std::string text
- std::string style
- double angle

5.46.1 Detailed Description

Text Data.

5.46.2 Constructor & Destructor Documentation

5.46.2.1 DL_TextData()

```
DL_TextData::DL_TextData (
            double ipx,
            double ipy,
            double ipz,
            double apx,
            double apy,
            double apz,
            double height,
            double xScaleFactor,
            int textGenerationFlags,
            int hJustification,
            int vJustification,
            const std::string & text,
            const std::string & style,
            double angle )  [inline]
```

Constructor.

Parameters: see member variables.

5.46.3 Member Data Documentation

5.46.3.1 angle

```
double DL_TextData::angle
```

Rotation angle of dimension text away from default orientation.

Referenced by DL_Dxf::writeText().

5.46.3.2 apx

```
double DL_TextData::apx
```

X Coordinate of alignment point.

Referenced by DL_Dxf::writeText().

5.46.3.3 apy

```
double DL_TextData::apy
```

Y Coordinate of alignment point.

Referenced by DL_Dxf::writeText().

5.46.3.4 apz

```
double DL_TextData::apz
```

Z Coordinate of alignment point.

Referenced by DL_Dxf::writeText().

5.46.3.5 height

```
double DL_TextData::height
```

Text height

Referenced by DL_Dxf::writeText().

5.46.3.6 hJustification

```
int DL_TextData::hJustification
```

Horizontal justification.

0 = Left (default), 1 = Center, 2 = Right, 3 = Aligned, 4 = Middle, 5 = Fit For 3, 4, 5 the vertical alignment has to be 0.

Referenced by DL_Dxf::writeText().

5.46.3.7 ipx

```
double DL_TextData::ipx
```

X Coordinate of insertion point.

Referenced by DL_Dxf::writeText().

5.46.3.8 ipy

```
double DL_TextData::ipy
```

Y Coordinate of insertion point.

Referenced by DL_Dxf::writeText().

5.46.3.9 ipz

```
double DL_TextData::ipz
```

Z Coordinate of insertion point.

Referenced by DL_Dxf::writeText().

5.46.3.10 style

```
std::string DL_TextData::style
```

Style (font).

Referenced by DL_Dxf::writeText().

5.46.3.11 text

```
std::string DL_TextData::text
```

Text string.

Referenced by DL_Dxf::writeText().

5.46.3.12 textGenerationFlags

```
int DL_TextData::textGenerationFlags
```

0 = default, 2 = Backwards, 4 = Upside down

Referenced by DL_Dxf::writeText().

5.46.3.13 vJustification

```
int DL_TextData::vJustification
```

Vertical justification.

0 = Baseline (default), 1 = Bottom, 2 = Middle, 3= Top

Referenced by DL_Dxf::writeText().

5.46.3.14 xScaleFactor

```
double DL_TextData::xScaleFactor
```

Relative X scale factor.

Referenced by DL_Dxf::writeText().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.47 DL_TraceData Struct Reference

Trace Data / solid data / 3d face data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_TraceData (double sx1, double sy1, double sz1, double sx2, double sy2, double sz2, double sx3, double sy3, double sz3, double sx4, double sy4, double sz4, double sthickness=0.0)

    Constructor.

Public Attributes

- double thickness
- double x [4]
- double **y** [4]
- double **z** [4]

5.47.1 Detailed Description

Trace Data / solid data / 3d face data.

5.47.2 Constructor & Destructor Documentation

5.47.2.1 DL_TraceData()

```
DL_TraceData::DL_TraceData (
                 double sx1,
                 double sy1,
                 double sz1,
                 double sx2,
                 double sy2,
                 double sz2,
                 double sx3,
                 double sy3,
                 double sz3,
                 double sx4,
                 double sy4,
                 double sz4,
                 double sthickness = 0.0 )   [inline]
```

Constructor.

Parameters: see member variables.

5.47.3 Member Data Documentation

5.47.3.1 thickness

```
double DL_TraceData::thickness
```

Thickness

Referenced by DL_Dxf::writeSolid(), and DL_Dxf::writeTrace().

5.47.3.2 x

```
double DL_TraceData::x[4]
```

Points

Referenced by DL_Dxf::add3dFace(), DL_Dxf::addSolid(), DL_Dxf::addTrace(), DL_Dxf::write3dFace(), DL_Dxf::writeSolid(), and DL_Dxf::writeTrace().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

5.48 DL_VertexData Struct Reference

Vertex Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_VertexData (double px=0.0, double py=0.0, double pz=0.0, double pBulge=0.0)
  Constructor.

Public Attributes

- double x
- double y
- double z
- double bulge

5.48.1 Detailed Description

Vertex Data.

5.48.2 Constructor & Destructor Documentation

5.48.2.1 DL_VertexData()

```
DL_VertexData::DL_VertexData (
             double px = 0.0,
             double py = 0.0,
             double pz = 0.0,
             double pBulge = 0.0 )  [inline]
```

Constructor.

Parameters: see member variables.

5.48.3 Member Data Documentation

5.48.3.1 bulge

```
double DL_VertexData::bulge
```

Bulge of vertex. (The tangent of 1/4 of the arc angle or 0 for lines)

Referenced by DL_Dxf::writeVertex().

5.48.3.2 x

```
double DL_VertexData::x
```

X Coordinate of the vertex.

Referenced by DL_Dxf::writeVertex().

5.48.3.3 y

```
double DL_VertexData::y
```

Y Coordinate of the vertex.

Referenced by DL_Dxf::writeVertex().

5.48.3.4 z

```
double DL_VertexData::z
```

Z Coordinate of the vertex.

Referenced by DL_Dxf::writeVertex().

The documentation for this struct was generated from the following file:

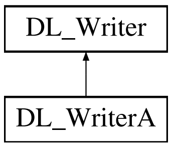
- src/dl_entities.h

5.49 DL_Writer Class Reference

Defines interface for writing low level DXF constructs to a file.

```
#include <dl_writer.h>
```

Inheritance diagram for DL_Writer:



Public Member Functions

- DL_Writer (DL_Codes::version version)
- void section (const char ∗name) const

  Generic section for section 'name'.
- void sectionHeader () const

  Section HEADER.
- void sectionTables () const

  Section TABLES.
- void sectionBlocks () const

  Section BLOCKS.
- void sectionEntities () const

  Section ENTITIES.
- void sectionClasses () const

  Section CLASSES.
- void sectionObjects () const

  Section OBJECTS.
- void sectionEnd () const

  End of a section.
- void table (const char ∗name, int num, int h=0) const

  Generic table for table 'name' with 'num' entries:
- void tableLayers (int num) const

  Table for layers.
- void tableLinetypes (int num) const

  Table for line types.
- void tableAppid (int num) const

  Table for application id.
- void tableStyle (int num) const

  Table for text style.
- void tableEnd () const

  End of a table.
- void dxfEOF () const

  End of the DXF file.
- void comment (const char ∗text) const

  Comment.
- void entity (const char ∗entTypeName) const

Entity.

- void entityAttributes (const DL_Attributes &attrib) const

  Attributes of an entity.
- void **subClass** (const char ∗sub) const

  Subclass.
- void tableLayerEntry (unsigned long int h=0) const

  Layer (must be in the TABLES section LAYER).
- void tableLinetypeEntry (unsigned long int h=0) const

  Line type (must be in the TABLES section LTYPE).
- void tableAppidEntry (unsigned long int h=0) const

  Appid (must be in the TABLES section APPID).
- void sectionBlockEntry (unsigned long int h=0) const

  Block (must be in the section BLOCKS).
- void sectionBlockEntryEnd (unsigned long int h=0) const

  End of Block (must be in the section BLOCKS).
- void **color** (int col=256) const
- void **linetype** (const char ∗lt) const
- void **linetypeScale** (double scale) const
- void **lineWeight** (int lw) const
- void **coord** (int gc, double x, double y, double z=0) const
- void **coordTriplet** (int gc, const double ∗value) const
- void **resetHandle** () const
- unsigned long **handle** (int gc=5) const

  Writes a unique handle and returns it.
- unsigned long getNextHandle () const
- virtual void dxfReal (int gc, double value) const =0

  Must be overwritten by the implementing class to write a real value to the file.
- virtual void dxfInt (int gc, int value) const =0

  Must be overwritten by the implementing class to write an int value to the file.
- virtual void dxfBool (int gc, bool value) const

  Can be overwritten by the implementing class to write a bool value to the file.
- virtual void dxfHex (int gc, int value) const =0

  Must be overwritten by the implementing class to write an int value (hex) to the file.
- virtual void dxfString (int gc, const char ∗value) const =0

  Must be overwritten by the implementing class to write a string to the file.
- virtual void dxfString (int gc, const std::string &value) const =0

  Must be overwritten by the implementing class to write a string to the file.

Protected Attributes

- unsigned long **m_handle**
- unsigned long **modelSpaceHandle**
- unsigned long **paperSpaceHandle**
- unsigned long **paperSpace0Handle**
- DL_Codes::version **version**

  DXF version to be created.

5.49.1 Detailed Description

Defines interface for writing low level DXF constructs to a file.

Implementation is defined in derived classes that write to binary or ASCII files.

Implements functions that write higher level constructs in terms of the low level ones.

Todo Add error checking for string/entry length.

5.49.2 Constructor & Destructor Documentation

5.49.2.1 DL_Writer()

```
DL_Writer::DL_Writer (
            DL_Codes::version version )  [inline]
```

Parameters

version	DXF version. Defaults to DL_VERSION_2002.

5.49.3 Member Function Documentation

5.49.3.1 comment()

```
void DL_Writer::comment (
            const char * text ) const  [inline]
```

Comment.

```
 999
 text
```

Referenced by DL_Dxf::writeHeader().

5.49.3.2 dxfBool()

```
virtual void DL_Writer::dxfBool (
            int gc,
            bool value ) const  [inline], [virtual]
```

Can be overwritten by the implementing class to write a bool value to the file.

Parameters

gc	Group code.
value	The bool value.

Referenced by DL_Dxf::writeHatchEdge().

5.49.3.3 dxfEOF()

```
void DL_Writer::dxfEOF ( ) const  [inline]
```

End of the DXF file.

```
  0
 EOF
```

5.49.3.4 dxfHex()

```
virtual void DL_Writer::dxfHex (
            int gc,
            int value ) const  [pure virtual]
```

Must be overwritten by the implementing class to write an int value (hex) to the file.

Parameters

gc	Group code.
value	The int value.

Implemented in DL_WriterA.

5.49.3.5 dxfInt()

```
virtual void DL_Writer::dxfInt (
            int gc,
            int value ) const  [pure virtual]
```

Must be overwritten by the implementing class to write an int value to the file.

Parameters

gc	Group code.
value	The int value.

Implemented in DL_WriterA.

5.49.3.6 dxfReal()

```
virtual void DL_Writer::dxfReal (
            int gc,
            double value ) const  [pure virtual]
```

Must be overwritten by the implementing class to write a real value to the file.

Parameters

gc	Group code.
value	The real value.

Implemented in DL_WriterA.

5.49.3.7 dxfString() [1/2]

```
virtual void DL_Writer::dxfString (
            int gc,
            const char * value ) const  [pure virtual]
```

Must be overwritten by the implementing class to write a string to the file.

Parameters

gc	Group code.
value	The string.

Implemented in DL_WriterA.

5.49.3.8 dxfString() [2/2]

```
virtual void DL_Writer::dxfString (
            int gc,
            const std::string & value ) const  [pure virtual]
```

Must be overwritten by the implementing class to write a string to the file.

Parameters

gc	Group code.
value	The string.

Implemented in DL_WriterA.

5.49.3.9 entity()

```
void DL_Writer::entity (
            const char * entTypeName ) const  [inline]
```

Entity.

```
  0
 entTypeName
```

Returns

Unique handle or 0.

Referenced by DL_Dxf::write3dFace(), DL_Dxf::writeArc(), DL_Dxf::writeCircle(), DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), DL_Dxf::writeDimRadial(), DL_Dxf::writeEllipse(), DL_Dxf::writeHatch1(), DL_Dxf::writeImage(), DL_Dxf::writeInsert(), DL_Dxf::writeLeader(), DL_Dxf::writeLine(), DL_Dxf::writeMText(), DL_Dxf::writePoint(), DL_Dxf::writePolyline(), DL_Dxf::writePolylineEnd(), DL_Dxf::writeRay(), DL_Dxf::writeSolid(), DL_Dxf::writeSpline(), DL_Dxf::writeText(), DL_Dxf::writeTrace(), DL_Dxf::writeVertex(), and DL_Dxf::writeXLine().

5.49.3.10 entityAttributes()

```
void DL_Writer::entityAttributes (
            const DL_Attributes & attrib ) const  [inline]
```

Attributes of an entity.

```
  8
 layer
 62
 color
 39
 width
  6
 linetype
```

References DL_Attributes::getColor(), DL_Attributes::getColor24(), DL_Attributes::getLayer(), DL_Attributes::getLinetype(), and DL_Attributes::getWidth().

Referenced by DL_Dxf::write3dFace(), DL_Dxf::writeArc(), DL_Dxf::writeCircle(), DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), DL_Dxf::writeDimRadial(), DL_Dxf::writeEllipse(), DL_Dxf::writeHatch1(), DL_Dxf::writeImage(), DL_Dxf::writeInsert(), DL_Dxf::writeLeader(), DL_Dxf::writeLine(), DL_Dxf::writeMText(), DL_Dxf::writePoint(), DL_Dxf::writePolyline(), DL_Dxf::writeRay(), DL_Dxf::writeSolid(), DL_Dxf::writeSpline(), DL_Dxf::writeText(), DL_Dxf::writeTrace(), and DL_Dxf::writeXLine().

5.49.3.11 getNextHandle()

```
unsigned long DL_Writer::getNextHandle ( ) const  [inline]
```

Returns

Next handle that will be written.

Referenced by DL_Dxf::writeObjects().

5.49.3.12 section()

```
void DL_Writer::section (
             const char * name ) const  [inline]
```

Generic section for section 'name'.

```
  0
 SECTION
  2
 name
```

5.49.3.13 sectionBlockEntry()

```
void DL_Writer::sectionBlockEntry (
             unsigned long int h = 0 ) const  [inline]
```

Block (must be in the section BLOCKS).

```
  0
 BLOCK
```

Referenced by DL_Dxf::writeBlock().

5.49.3.14 sectionBlockEntryEnd()

```
void DL_Writer::sectionBlockEntryEnd (
             unsigned long int h = 0 ) const  [inline]
```

End of Block (must be in the section BLOCKS).

```
  0
 ENDBLK
```

Referenced by DL_Dxf::writeEndBlock().

5.49.3.15 sectionBlocks()

```
void DL_Writer::sectionBlocks ( ) const  [inline]
```

Section BLOCKS.

```
  0
 SECTION
  2
 BLOCKS
```

5.49.3.16 sectionClasses()

```
void DL_Writer::sectionClasses ( ) const  [inline]
```

Section CLASSES.

```
  0
 SECTION
  2
 CLASSES
```

5.49.3.17 sectionEnd()

```
void DL_Writer::sectionEnd ( ) const  [inline]
```

End of a section.

```
  0
 ENDSEC
```

5.49.3.18 sectionEntities()

```
void DL_Writer::sectionEntities ( ) const  [inline]
```

Section ENTITIES.

```
  0
 SECTION
  2
 ENTITIES
```

5.49.3.19 sectionHeader()

```
void DL_Writer::sectionHeader ( ) const  [inline]
```

Section HEADER.

```
  0
 SECTION
  2
 HEADER
```

Referenced by DL_Dxf::writeHeader().

5.49.3.20 sectionObjects()

```
void DL_Writer::sectionObjects ( ) const [inline]
```

Section OBJECTS.

```
  0
 SECTION
  2
 OBJECTS
```

5.49.3.21 sectionTables()

```
void DL_Writer::sectionTables ( ) const [inline]
```

Section TABLES.

```
  0
 SECTION
  2
 TABLES
```

5.49.3.22 table()

```
void DL_Writer::table (
             const char * name,
             int num,
             int h = 0 ) const [inline]
```

Generic table for table 'name' with 'num' entries:

```
  0
 TABLE
  2
 name
 70
  num
```

5.49.3.23 tableAppid()

```
void DL_Writer::tableAppid (
             int num ) const [inline]
```

Table for application id.

Parameters

num	Number of registered applications in total.

```
  0
 TABLE
  2
 APPID
  70
     num
```

5.49.3.24 tableAppidEntry()

```
void DL_Writer::tableAppidEntry (
            unsigned long int h = 0 ) const  [inline]
```

Appid (must be in the TABLES section APPID).

```
  0
 APPID
```

Referenced by DL_Dxf::writeAppid().

5.49.3.25 tableEnd()

```
void DL_Writer::tableEnd ( ) const  [inline]
```

End of a table.

```
  0
 ENDTAB
```

5.49.3.26 tableLayerEntry()

```
void DL_Writer::tableLayerEntry (
            unsigned long int h = 0 ) const  [inline]
```

Layer (must be in the TABLES section LAYER).

```
  0
 LAYER
```

Referenced by DL_Dxf::writeLayer().

5.49.3.27 tableLayers()

```
void DL_Writer::tableLayers (
            int num ) const  [inline]
```

Table for layers.

Parameters

num	Number of layers in total.

```
  0
 TABLE
  2
 LAYER
  70
     num
```

5.49.3.28 tableLinetypeEntry()

```
void DL_Writer::tableLinetypeEntry (
            unsigned long int h = 0 ) const  [inline]
```

Line type (must be in the TABLES section LTYPE).

```
  0
 LTYPE
```

Referenced by DL_Dxf::writeLinetype().

5.49.3.29 tableLinetypes()

```
void DL_Writer::tableLinetypes (
            int num ) const  [inline]
```

Table for line types.

Parameters

num	Number of line types in total.

```
  0
 TABLE
  2
 LTYPE
  70
     num
```

5.49.3.30 tableStyle()

```
void DL_Writer::tableStyle (
            int num ) const  [inline]
```

Table for text style.

Parameters

num	Number of text styles.

```
  0
 TABLE
  2
 STYLE
  70
     num
```

The documentation for this class was generated from the following file:

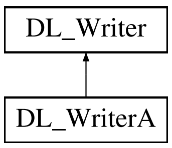
- src/dl_writer.h

5.50 DL_WriterA Class Reference

Implements functions defined in DL_Writer for writing low level DXF constructs to an ASCII format DXF file.

`#include <dl_writer_ascii.h>`

Inheritance diagram for DL_WriterA:



Public Member Functions

- **DL_WriterA** (const char ∗fname, DL_Codes::version version=DL_VERSION_2000)
- bool openFailed () const
- void **close** () const

  Closes the output file.
- void dxfReal (int gc, double value) const

  Writes a real (double) variable to the DXF file.
- void dxfInt (int gc, int value) const

  Writes an int variable to the DXF file.
- void dxfHex (int gc, int value) const

  Writes a hex int variable to the DXF file.
- void dxfString (int gc, const char ∗value) const

  Writes a string variable to the DXF file.
- void dxfString (int gc, const std::string &value) const

  Must be overwritten by the implementing class to write a string to the file.

Public Member Functions inherited from DL_Writer

- DL_Writer (DL_Codes::version version)
- void section (const char ∗name) const

  Generic section for section 'name'.
- void sectionHeader () const

  Section HEADER.
- void sectionTables () const

  Section TABLES.
- void sectionBlocks () const

  Section BLOCKS.
- void sectionEntities () const

  Section ENTITIES.
- void sectionClasses () const

  Section CLASSES.
- void sectionObjects () const

  Section OBJECTS.
- void sectionEnd () const

  End of a section.
- void table (const char ∗name, int num, int h=0) const

  Generic table for table 'name' with 'num' entries:
- void tableLayers (int num) const

  Table for layers.
- void tableLinetypes (int num) const

  Table for line types.
- void tableAppid (int num) const

  Table for application id.
- void tableStyle (int num) const

  Table for text style.
- void tableEnd () const

  End of a table.
- void dxfEOF () const

  End of the DXF file.
- void comment (const char ∗text) const

  Comment.
- void entity (const char ∗entTypeName) const

  Entity.
- void entityAttributes (const DL_Attributes &attrib) const

  Attributes of an entity.
- void **subClass** (const char ∗sub) const

  Subclass.
- void tableLayerEntry (unsigned long int h=0) const

  Layer (must be in the TABLES section LAYER).
- void tableLinetypeEntry (unsigned long int h=0) const

  Line type (must be in the TABLES section LTYPE).
- void tableAppidEntry (unsigned long int h=0) const

  Appid (must be in the TABLES section APPID).
- void sectionBlockEntry (unsigned long int h=0) const

  Block (must be in the section BLOCKS).
- void sectionBlockEntryEnd (unsigned long int h=0) const

  End of Block (must be in the section BLOCKS).

- void **color** (int col=256) const
- void **linetype** (const char ∗lt) const
- void **linetypeScale** (double scale) const
- void **lineWeight** (int lw) const
- void **coord** (int gc, double x, double y, double z=0) const
- void **coordTriplet** (int gc, const double ∗value) const
- void **resetHandle** () const
- unsigned long **handle** (int gc=5) const

  Writes a unique handle and returns it.
- unsigned long getNextHandle () const
- virtual void dxfReal (int gc, double value) const =0

  Must be overwritten by the implementing class to write a real value to the file.
- virtual void dxfInt (int gc, int value) const =0

  Must be overwritten by the implementing class to write an int value to the file.
- virtual void dxfBool (int gc, bool value) const

  Can be overwritten by the implementing class to write a bool value to the file.
- virtual void dxfHex (int gc, int value) const =0

  Must be overwritten by the implementing class to write an int value (hex) to the file.
- virtual void dxfString (int gc, const char ∗value) const =0

  Must be overwritten by the implementing class to write a string to the file.
- virtual void dxfString (int gc, const std::string &value) const =0

  Must be overwritten by the implementing class to write a string to the file.

Static Public Member Functions

- static void **strReplace** (char ∗str, char src, char dest)

  Replaces every occurence of src with dest in the null terminated str.

Additional Inherited Members

Protected Attributes inherited from DL_Writer

- unsigned long **m_handle**
- unsigned long **modelSpaceHandle**
- unsigned long **paperSpaceHandle**
- unsigned long **paperSpace0Handle**
- DL_Codes::version **version**

  DXF version to be created.

5.50.1 Detailed Description

Implements functions defined in DL_Writer for writing low level DXF constructs to an ASCII format DXF file.

@para fname File name of the file to be created. @para version DXF version. Defaults to DL_VERSION_2002.

Todo What if `fname` is NULL? Or `fname` can't be opened for another reason?

5.50.2 Member Function Documentation

5.50.2.1 dxfHex()

```
void DL_WriterA::dxfHex (
             int gc,
             int value ) const  [virtual]
```

Writes a hex int variable to the DXF file.

Parameters

gc	Group code.
value	Int value

Implements DL_Writer.

References dxfString().

Referenced by DL_Dxf::writeBlockRecord(), DL_Dxf::writeBlockRecord(), DL_Dxf::writeDimStyle(), DL_Dxf::writeHeader(), DL_Dxf::writeImageDef(), DL_Dxf::writeLayer(), DL_Dxf::writeObjects(), DL_Dxf::writeUcs(), DL_Dxf::writeView(), and DL_Dxf::writeVPort().

5.50.2.2 dxfInt()

```
void DL_WriterA::dxfInt (
            int gc,
            int value ) const  [virtual]
```

Writes an int variable to the DXF file.

Parameters

gc	Group code.
value	Int value

Implements DL_Writer.

Referenced by DL_Dxf::writeAppid(), DL_Dxf::writeBlock(), DL_Dxf::writeBlockRecord(), DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), DL_Dxf::writeDimRadial(), DL_Dxf::writeDimStyle(), DL_Dxf::writeHatch1(), DL_Dxf::writeHatch2(), DL_Dxf::writeHatchEdge(), DL_Dxf::writeHatchLoop1(), DL_Dxf::writeHatchLoop2(), DL_Dxf::writeImage(), DL_Dxf::writeImageDef(), DL_Dxf::writeInsert(), DL_Dxf::writeLayer(), DL_Dxf::writeLeader(), DL_Dxf::writeLinetype(), DL_Dxf::writeMText(), DL_Dxf::writeObjects(), DL_Dxf::writePolyline(), DL_Dxf::writeSpline(), DL_Dxf::writeStyle(), DL_Dxf::writeText(), DL_Dxf::writeUcs(), DL_Dxf::writeView(), and DL_Dxf::writeVPort().

5.50.2.3 dxfReal()

```
void DL_WriterA::dxfReal (
            int gc,
            double value ) const  [virtual]
```

Writes a real (double) variable to the DXF file.

Parameters

gc	Group code.
value	Double value

Implements DL_Writer.

References dxfString(), strReplace(), and DL_Writer::version.

Referenced by DL_Dxf::writeArc(), DL_Dxf::writeCircle(), DL_Dxf::writeControlPoint(), DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), DL_Dxf::writeDimRadial(), DL_Dxf::writeDimStyle(), DL_Dxf::writeEllipse(), DL_Dxf::writeFitPoint(), DL_Dxf::writeHatch1(), DL_Dxf::writeHatch2(), DL_Dxf::writeHatchEdge(), DL_Dxf::writeImage(), DL_Dxf::writeImageDef(), DL_Dxf::writeInsert(), DL_Dxf::writeKnot(), DL_Dxf::writeLeader(), DL_Dxf::writeLeaderVertex(), DL_Dxf::writeLinetype(), DL_Dxf::writeMText(), DL_Dxf::writeObjects(), DL_Dxf::writeSolid(), DL_Dxf::writeStyle(), DL_Dxf::writeText(), DL_Dxf::writeTrace(), DL_Dxf::writeVertex(), and DL_Dxf::writeVPort().

5.50.2.4 dxfString() [1/2]

```
void DL_WriterA::dxfString (
            int gc,
            const char * value ) const  [virtual]
```

Writes a string variable to the DXF file.

Parameters

gc	Group code.
value	String

Implements DL_Writer.

Referenced by dxfHex(), dxfReal(), DL_Dxf::write3dFace(), DL_Dxf::writeAppid(), DL_Dxf::writeArc(), DL_Dxf::writeBlock(), DL_Dxf::writeBlockRecord(), DL_Dxf::writeBlockRecord(), DL_Dxf::writeCircle(), DL_Dxf::writeComment(), DL_Dxf::writeDimAligned(), DL_Dxf::writeDimAngular2L(), DL_Dxf::writeDimAngular3P(), DL_Dxf::writeDimDiametric(), DL_Dxf::writeDimLinear(), DL_Dxf::writeDimOrdinate(), DL_Dxf::writeDimRadial(), DL_Dxf::writeDimStyle(), DL_Dxf::writeEllipse(), DL_Dxf::writeHatch1(), DL_Dxf::writeHatch2(), DL_Dxf::writeHeader(), DL_Dxf::writeImage(), DL_Dxf::writeImageDef(), DL_Dxf::writeInsert(), DL_Dxf::writeLayer(), DL_Dxf::writeLeader(), DL_Dxf::writeLine(), DL_Dxf::writeLinetype(), DL_Dxf::writeMText(), DL_Dxf::writeObjects(), DL_Dxf::writeObjectsEnd(), DL_Dxf::writePoint(), DL_Dxf::writePolyline(), DL_Dxf::writeRay(), DL_Dxf::writeSolid(), DL_Dxf::writeSpline(), DL_Dxf::writeStyle(), DL_Dxf::writeText(), DL_Dxf::writeTrace(), DL_Dxf::writeUcs(), DL_Dxf::writeVertex(), DL_Dxf::writeView(), DL_Dxf::writeVPort(), and DL_Dxf::writeXLine().

5.50.2.5 dxfString() [2/2]

```
void DL_WriterA::dxfString (
            int gc,
            const std::string & value ) const  [virtual]
```

Must be overwritten by the implementing class to write a string to the file.

Parameters

gc	Group code.
value	The string.

Implements DL_Writer.

5.50.2.6 openFailed()

```
bool DL_WriterA::openFailed ( ) const
```

Return values

true	Opening file has failed.
false	Otherwise.

Referenced by DL_Dxf::out().

The documentation for this class was generated from the following files:

- src/dl_writer_ascii.h
- src/dl_writer_ascii.cpp

5.51 DL_XLineData Struct Reference

XLine Data.

```
#include <dl_entities.h>
```

Public Member Functions

- DL_XLineData (double bx, double by, double bz, double dx, double dy, double dz)
  Constructor.

Public Attributes

- double bx
- double by
- double bz
- double dx
- double dy
- double dz

5.51.1 Detailed Description

XLine Data.

5.51.2 Constructor & Destructor Documentation

5.51.2.1 DL_XLineData()

```
DL_XLineData::DL_XLineData (
              double bx,
              double by,
              double bz,
              double dx,
              double dy,
              double dz )  [inline]
```

Constructor.

Parameters: see member variables.

5.51.3 Member Data Documentation

5.51.3.1 bx

```
double DL_XLineData::bx
```

X base point.

Referenced by DL_Dxf::writeXLine().

5.51.3.2 by

```
double DL_XLineData::by
```

Y base point.

Referenced by DL_Dxf::writeXLine().

5.51.3.3 bz

```
double DL_XLineData::bz
```

Z base point.

Referenced by DL_Dxf::writeXLine().

5.51.3.4 dx

```
double DL_XLineData::dx
```

X direction vector.

Referenced by DL_Dxf::writeXLine().

5.51.3.5 dy

```
double DL_XLineData::dy
```

Y direction vector.

Referenced by DL_Dxf::writeXLine().

5.51.3.6 dz

```
double DL_XLineData::dz
```

Z direction vector.

Referenced by DL_Dxf::writeXLine().

The documentation for this struct was generated from the following file:

- src/dl_entities.h

Chapter 6

File Documentation

6.1 dl_attributes.h

```
/****************************************************************************
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**
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**********************************************************************/

#ifndef DL_ATTRIBUTES_H
#define DL_ATTRIBUTES_H

#include "dl_global.h"

#include <string>
#include <vector>

#include "dl_codes.h"

class DXFLIB_EXPORT DL_Attributes {

public:

    DL_Attributes() :
        layer(""),
        color(0),
        color24(-1),
        width(0),
        linetype("BYLAYER"),
        linetypeScale(1.0),
        handle(-1),
        inPaperSpace(false) {
    }

    DL_Attributes(const std::string& layer,
                  int color, int width,
                  const std::string& linetype,
                  double linetypeScale) :
        layer(layer),
        color(color),
        color24(-1),
        width(width),
        linetype(linetype),
        linetypeScale(linetypeScale),
        handle(-1),
        inPaperSpace(false) {

    }

    DL_Attributes(const std::string& layer,
                  int color, int color24, int width,
                  const std::string& linetype,
                  int handle=-1)  :
        layer(layer),
        color(color),
        color24(color24),
        width(width),
        linetype(linetype),
        linetypeScale(1.0),
        handle(handle),
        inPaperSpace(false) {
    }

    void setLayer(const std::string& layer) {
        this->layer = layer;
    }

    std::string getLayer() const {
        return layer;
    }

    void setColor(int color) {
        this->color = color;
    }

    void setColor24(int color) {
        this->color24 = color;
    }

    int getColor() const {
        return color;
    }

    int getColor24() const {
        return color24;
    }

    void setWidth(int width) {
        this->width = width;
    }

    int getWidth() const {
        return width;
    }

    void setLinetype(const std::string& linetype) {
        this->linetype = linetype;
    }

    void setLinetypeScale(double linetypeScale) {
        this->linetypeScale = linetypeScale;
    }

    double getLinetypeScale() const {
        return linetypeScale;
    }

    std::string getLinetype() const {
        if (linetype.length()==0) {
            return "BYLAYER";
        } else {
            return linetype;
        }
    }

    void setHandle(int h) {
        handle = h;
    }

    int getHandle() const {
        return handle;
    }

    void setInPaperSpace(bool on) {
        inPaperSpace = on;
    }

    bool isInPaperSpace() const {
        return inPaperSpace;
    }
```

```

private:
    std::string layer;
    int color;
    int color24;
    int width;
    std::string linetype;
    double linetypeScale;
    int handle;

    // DXF code 67 (true: entity in paper space, false: entity in model space (default):
    bool inPaperSpace;
};

#endif

// EOF
```

6.2 dl_codes.h

```
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**
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**********************************************************************/

#ifndef DXF_CODES_H
#define DXF_CODES_H

#include "dl_global.h"

#if _MSC_VER > 1000
#pragma once
#endif // _MSC_VER > 1000

#if defined(__OS2__)||defined(__EMX__)
#define strcasecmp(s,t) stricmp(s,t)
#endif

#if defined(_WIN32)
#define strcasecmp(s,t) _stricmp(s,t)
#endif


#ifdef _WIN32
#undef M_PI
#define M_PI   3.14159265358979323846
#pragma warning(disable : 4800)
#endif

#ifndef M_PI
#define M_PI 3.1415926535897932384626433832795
#endif

#define DL_DXF_MAXLINE 1024
#define DL_DXF_MAXGROUPCODE 1100

// used to mark invalid vectors:
//#define DL_DXF_MAXDOUBLE 1.0E+10

class DXFLIB_EXPORT DL_Codes {
public:
    enum color {
        black = 250,
        green = 3,
        red = 1,
        brown = 15,
        yellow = 2,
        cyan = 4,
        magenta = 6,
        gray = 8,
        blue = 5,
        l_blue = 163,
        l_green = 121,
        l_cyan = 131,
        l_red = 23,
        l_magenta = 221,
        l_gray = 252,
        white = 7,
        bylayer = 256,
        byblock = 0
    };

    enum version {
        AC1009_MIN,     // R12, minimalistic
        AC1009,         // R12
        AC1012,
        AC1014,
        AC1015          // R2000
    };
};


// Extended color palette:
// The first entry is only for direct indexing starting with [1]
// Color 1 is red (1,0,0)
const double dxfColors[][3] = {
                                  {0,0,0},                // unused
                                  {1,0,0},                // 1
                                  {1,1,0},
                                  {0,1,0},
                                  {0,1,1},
                                  {0,0,1},
                                  {1,0,1},
                                  {1,1,1},                // black or white
                                  {0.5,0.5,0.5},
                                  {0.75,0.75,0.75},
                                  {1,0,0},                // 10
                                  {1,0.5,0.5},
                                  {0.65,0,0},
                                  {0.65,0.325,0.325},
                                  {0.5,0,0},
                                  {0.5,0.25,0.25},
                                  {0.3,0,0},
                                  {0.3,0.15,0.15},
                                  {0.15,0,0},
                                  {0.15,0.075,0.075},
                                  {1,0.25,0},             // 20
                                  {1,0.625,0.5},
                                  {0.65,0.1625,0},
                                  {0.65,0.4063,0.325},
                                  {0.5,0.125,0},
                                  {0.5,0.3125,0.25},
                                  {0.3,0.075,0},
                                  {0.3,0.1875,0.15},
                                  {0.15,0.0375,0},
                                  {0.15,0.0938,0.075},
                                  {1,0.5,0},              // 30
                                  {1,0.75,0.5},
                                  {0.65,0.325,0},
                                  {0.65,0.4875,0.325},
                                  {0.5,0.25,0},
                                  {0.5,0.375,0.25},
                                  {0.3,0.15,0},
                                  {0.3,0.225,0.15},
                                  {0.15,0.075,0},
                                  {0.15,0.1125,0.075},
                                  {1,0.75,0},             // 40
                                  {1,0.875,0.5},
                                  {0.65,0.4875,0},
                                  {0.65,0.5688,0.325},
                                  {0.5,0.375,0},
                                  {0.5,0.4375,0.25},
                                  {0.3,0.225,0},
                                  {0.3,0.2625,0.15},
                                  {0.15,0.1125,0},
                                  {0.15,0.1313,0.075},
                                  {1,1,0},                // 50
                                  {1,1,0.5},
                                  {0.65,0.65,0},
                                  {0.65,0.65,0.325},
                                  {0.5,0.5,0},
                                  {0.5,0.5,0.25},
                                  {0.3,0.3,0},
                                  {0.3,0.3,0.15},
                                  {0.15,0.15,0},
                                  {0.15,0.15,0.075},
                                  {0.75,1,0},             // 60
                                  {0.875,1,0.5},
                                  {0.4875,0.65,0},
                                  {0.5688,0.65,0.325},
                                  {0.375,0.5,0},
                                  {0.4375,0.5,0.25},
                                  {0.225,0.3,0},
                                  {0.2625,0.3,0.15},
                                  {0.1125,0.15,0},
                                  {0.1313,0.15,0.075},
                                  {0.5,1,0},              // 70
                                  {0.75,1,0.5},
                                  {0.325,0.65,0},
                                  {0.4875,0.65,0.325},
                                  {0.25,0.5,0},
                                  {0.375,0.5,0.25},
                                  {0.15,0.3,0},
                                  {0.225,0.3,0.15},
                                  {0.075,0.15,0},
                                  {0.1125,0.15,0.075},
                                  {0.25,1,0},             // 80
                                  {0.625,1,0.5},
                                  {0.1625,0.65,0},
                                  {0.4063,0.65,0.325},
                                  {0.125,0.5,0},
                                  {0.3125,0.5,0.25},
                                  {0.075,0.3,0},
                                  {0.1875,0.3,0.15},
                                  {0.0375,0.15,0},
                                  {0.0938,0.15,0.075},
                                  {0,1,0},                // 90
                                  {0.5,1,0.5},
                                  {0,0.65,0},
                                  {0.325,0.65,0.325},
                                  {0,0.5,0},
                                  {0.25,0.5,0.25},
                                  {0,0.3,0},
                                  {0.15,0.3,0.15},
                                  {0,0.15,0},
                                  {0.075,0.15,0.075},
                                  {0,1,0.25},             // 100
                                  {0.5,1,0.625},
                                  {0,0.65,0.1625},
                                  {0.325,0.65,0.4063},
                                  {0,0.5,0.125},
                                  {0.25,0.5,0.3125},
                                  {0,0.3,0.075},
                                  {0.15,0.3,0.1875},
                                  {0,0.15,0.0375},
                                  {0.075,0.15,0.0938},
                                  {0,1,0.5},              // 110
                                  {0.5,1,0.75},
                                  {0,0.65,0.325},
                                  {0.325,0.65,0.4875},
                                  {0,0.5,0.25},
                                  {0.25,0.5,0.375},
                                  {0,0.3,0.15},
                                  {0.15,0.3,0.225},
                                  {0,0.15,0.075},
                                  {0.075,0.15,0.1125},
                                  {0,1,0.75},             // 120
                                  {0.5,1,0.875},
                                  {0,0.65,0.4875},
                                  {0.325,0.65,0.5688},
                                  {0,0.5,0.375},
                                  {0.25,0.5,0.4375},
                                  {0,0.3,0.225},
                                  {0.15,0.3,0.2625},
                                  {0,0.15,0.1125},
                                  {0.075,0.15,0.1313},
                                  {0,1,1},                // 130
                                  {0.5,1,1},
                                  {0,0.65,0.65},
                                  {0.325,0.65,0.65},
                                  {0,0.5,0.5},
                                  {0.25,0.5,0.5},
                                  {0,0.3,0.3},
                                  {0.15,0.3,0.3},
                                  {0,0.15,0.15},
                                  {0.075,0.15,0.15},
                                  {0,0.75,1},             // 140
                                  {0.5,0.875,1},
                                  {0,0.4875,0.65},
                                  {0.325,0.5688,0.65},
                                  {0,0.375,0.5},
                                  {0.25,0.4375,0.5},
                                  {0,0.225,0.3},
                                  {0.15,0.2625,0.3},
                                  {0,0.1125,0.15},
                                  {0.075,0.1313,0.15},
                                  {0,0.5,1},              // 150
                                  {0.5,0.75,1},
                                  {0,0.325,0.65},
                                  {0.325,0.4875,0.65},
                                  {0,0.25,0.5},
                                  {0.25,0.375,0.5},
                                  {0,0.15,0.3},
                                  {0.15,0.225,0.3},
                                  {0,0.075,0.15},
                                  {0.075,0.1125,0.15},
                                  {0,0.25,1},             // 160
                                  {0.5,0.625,1},
                                  {0,0.1625,0.65},
                                  {0.325,0.4063,0.65},
                                  {0,0.125,0.5},
                                  {0.25,0.3125,0.5},
                                  {0,0.075,0.3},
                                  {0.15,0.1875,0.3},
                                  {0,0.0375,0.15},
                                  {0.075,0.0938,0.15},
                                  {0,0,1},                // 170
                                  {0.5,0.5,1},
                                  {0,0,0.65},
                                  {0.325,0.325,0.65},
                                  {0,0,0.5},
                                  {0.25,0.25,0.5},
                                  {0,0,0.3},
                                  {0.15,0.15,0.3},
                                  {0,0,0.15},
                                  {0.075,0.075,0.15},
                                  {0.25,0,1},             // 180
                                  {0.625,0.5,1},
                                  {0.1625,0,0.65},
                                  {0.4063,0.325,0.65},
                                  {0.125,0,0.5},
                                  {0.3125,0.25,0.5},
                                  {0.075,0,0.3},
                                  {0.1875,0.15,0.3},
                                  {0.0375,0,0.15},
                                  {0.0938,0.075,0.15},
                                  {0.5,0,1},              // 190
                                  {0.75,0.5,1},
                                  {0.325,0,0.65},
                                  {0.4875,0.325,0.65},
                                  {0.25,0,0.5},
                                  {0.375,0.25,0.5},
                                  {0.15,0,0.3},
                                  {0.225,0.15,0.3},
                                  {0.075,0,0.15},
                                  {0.1125,0.075,0.15},
                                  {0.75,0,1},             // 200
                                  {0.875,0.5,1},
                                  {0.4875,0,0.65},
                                  {0.5688,0.325,0.65},
                                  {0.375,0,0.5},
                                  {0.4375,0.25,0.5},
                                  {0.225,0,0.3},
                                  {0.2625,0.15,0.3},
                                  {0.1125,0,0.15},
                                  {0.1313,0.075,0.15},
                                  {1,0,1},                // 210
                                  {1,0.5,1},
                                  {0.65,0,0.65},
                                  {0.65,0.325,0.65},
                                  {0.5,0,0.5},
                                  {0.5,0.25,0.5},
                                  {0.3,0,0.3},
                                  {0.3,0.15,0.3},
                                  {0.15,0,0.15},
                                  {0.15,0.075,0.15},
                                  {1,0,0.75},             // 220
                                  {1,0.5,0.875},
                                  {0.65,0,0.4875},
                                  {0.65,0.325,0.5688},
                                  {0.5,0,0.375},
                                  {0.5,0.25,0.4375},
                                  {0.3,0,0.225},
                                  {0.3,0.15,0.2625},
                                  {0.15,0,0.1125},
                                  {0.15,0.075,0.1313},
                                  {1,0,0.5},               // 230
                                  {1,0.5,0.75},
                                  {0.65,0,0.325},
                                  {0.65,0.325,0.4875},
                                  {0.5,0,0.25},
                                  {0.5,0.25,0.375},
                                  {0.3,0,0.15},
                                  {0.3,0.15,0.225},
                                  {0.15,0,0.075},
                                  {0.15,0.075,0.1125},
                                  {1,0,0.25},              // 240
                                  {1,0.5,0.625},
                                  {0.65,0,0.1625},
                                  {0.65,0.325,0.4063},
                                  {0.5,0,0.125},
                                  {0.5,0.25,0.3125},
                                  {0.3,0,0.075},
                                  {0.3,0.15,0.1875},
                                  {0.15,0,0.0375},
                                  {0.15,0.075,0.0938},
                                  {0.33,0.33,0.33},        // 250
                                  {0.464,0.464,0.464},
                                  {0.598,0.598,0.598},
                                  {0.732,0.732,0.732},
                                  {0.866,0.866,0.866},
                                  {1,1,1}                  // 255
                              }
                              ;


// AutoCAD VERSION aliases
#define DL_VERSION_R12    DL_Codes::AC1009
#define DL_VERSION_LT2    DL_Codes::AC1009
#define DL_VERSION_R13    DL_Codes::AC1012   // not supported yet
#define DL_VERSION_LT95   DL_Codes::AC1012   // not supported yet
#define DL_VERSION_R14    DL_Codes::AC1014   // not supported yet
#define DL_VERSION_LT97   DL_Codes::AC1014   // not supported yet
#define DL_VERSION_LT98   DL_Codes::AC1014   // not supported yet
#define DL_VERSION_2000   DL_Codes::AC1015
#define DL_VERSION_2002   DL_Codes::AC1015


// DXF Group Codes:

// Strings
#define DL_STRGRP_START      0
#define DL_STRGRP_END        9

// Coordinates
#define DL_CRDGRP_START     10
#define DL_CRDGRP_END       19

// Real values
#define DL_RLGRP_START      38
#define DL_RLGRP_END        59

// Short integer values
#define DL_SHOGRP_START     60
#define DL_SHOGRP_END       79

// New in Release 13,
#define DL_SUBCLASS        100

// More coordinates
#define DL_CRD2GRP_START   210
#define DL_CRD2GRP_END     239

// Extended data strings
#define DL_ESTRGRP_START  1000
#define DL_ESTRGRP_END    1009

// Extended data reals
#define DL_ERLGRP_START   1010
#define DL_ERLGRP_END     1059


#define DL_Y8_COORD_CODE       28
#define DL_Z0_COORD_CODE       30
#define DL_Z8_COORD_CODE       38

#define DL_POINT_COORD_CODE    10
#define DL_INSERT_COORD_CODE   10

#define DL_CRD2GRP_START      210
#define DL_CRD2GRP_END        239
```

```

#define DL_THICKNESS             39
#define DL_FIRST_REAL_CODE       THICKNESS
#define DL_LAST_REAL_CODE        59
#define DL_FIRST_INT_CODE        60
#define DL_ATTFLAGS_CODE         70
#define DL_PLINE_FLAGS_CODE      70
#define DL_LAYER_FLAGS_CODE      70
#define DL_FLD_LEN_CODE          73 // Inside ATTRIB resbuf
#define DL_LAST_INT_CODE         79
#define DL_X_EXTRU_CODE         210
#define DL_Y_EXTRU_CODE         220
#define DL_Z_EXTRU_CODE         230
#define DL_COMMENT_CODE         999

// Start and endpoints of a line
#define DL_LINE_START_CODE       10  // Followed by x coord
#define DL_LINE_END_CODE         11  // Followed by x coord

// Some codes used by blocks
#define DL_BLOCK_FLAGS_CODE      70  // An int containing flags
#define DL_BLOCK_BASE_CODE       10  // Origin of block definition
#define DL_XREF_DEPENDENT        16  // If a block contains an XREF
#define DL_XREF_RESOLVED         32  // If a XREF resolved ok
#define DL_REFERENCED            64  // If a block is ref'd in DWG

#define DL_XSCALE_CODE           41
#define DL_YSCALE_CODE           42
#define DL_ANGLE_CODE            50
#define DL_INS_POINT_CODE        10  // Followed by x of ins pnt
#define DL_NAME2_CODE             3  // Second appearance of name

// Some codes used by circle entities
#define DL_CENTER_CODE           10  // Followed by x of center
#define DL_RADIUS_CODE           40  // Followd by radius of circle

#define DL_COND_OP_CODE          -4  // Conditional op,ads_ssget

// When using ads_buildlist you MUST use RTDXF0 instead of these
#define DL_ENTITY_TYPE_CODE       0  // Then there is LINE, 3DFACE..
#define DL_SES_CODE               0  // Start End String Code
#define DL_FILE_SEP_CODE          0  // File separator
#define DL_SOT_CODE               0  // Start Of Table
#define DL_TEXTVAL_CODE           1
#define DL_NAME_CODE              2
#define DL_BLOCK_NAME_CODE        2
#define DL_SECTION_NAME_CODE      2
#define DL_ENT_HAND_CODE          5  // What follows is hexa string
#define DL_TXT_STYLE_CODE         7  // Inside attributes
#define DL_LAYER_NAME_CODE        8  // What follows is layer name
#define DL_FIRST_XCOORD_CODE     10  // Group code x of 1st coord
#define DL_FIRST_YCOORD_CODE     20  // Group code y of 1st coord
#define DL_FIRST_ZCOORD_CODE     30  // Group code z of 1st coord
#define DL_L_START_CODE          10
#define DL_L_END_CODE            11
#define DL_TXTHI_CODE            40
#define DL_SCALE_X_CODE          41
#define DL_SCALE_Y_CODE          42
#define DL_SCALE_Z_CODE          43
#define DL_BULGE_CODE            42  // Used in PLINE verts for arcs
#define DL_ROTATION_CODE         50
#define DL_COLOUR_CODE           62  // What follows is a color int
#define DL_LTYPE_CODE             6  // What follows is a linetype


// Attribute flags
#define DL_ATTS_FOLLOW_CODE      66
#define DL_ATT_TAG_CODE           2
#define DL_ATT_VAL_CODE           1
#define DL_ATT_FLAGS_CODE        70  // 4 1 bit flags as follows...
#define DL_ATT_INVIS_FLAG         1
#define DL_ATT_CONST_FLAG         2
#define DL_ATT_VERIFY_FLAG        4 // Prompt and verify
#define DL_ATT_PRESET_FLAG        8 // No prompt and no verify

// PLINE defines
// Flags
#define DL_OPEN_PLINE        0x00
#define DL_CLOSED_PLINE      0x01
#define DL_POLYLINE3D        0x08
#define DL_PFACE_MESH        0x40
#define DL_PGON_MESH         0x10
// Vertices follow entity, required in POLYLINES
#define DL_VERTS_FOLLOW_CODE   66 // Value should always be 1
#define DL_VERTEX_COORD_CODE   10


```

```
// LAYER flags
#define DL_FROZEN           1
#define DL_FROZEN_BY_DEF    2
#define DL_LOCKED           4
#define DL_OBJECT_USED     64   // Object is ref'd in the dwg

#define DL_BLOCK_EN_CODE   -2   // Block entity definition
#define DL_E_NAME          -1   // Entity name

// Extended data codes
#define DL_EXTD_SENTINEL    (-3)
#define DL_EXTD_STR         1000
#define DL_EXTD_APP_NAME    1001
#define DL_EXTD_CTL_STR     1002
#define DL_EXTD_LYR_STR     1003
#define DL_EXTD_CHUNK       1004
#define DL_EXTD_HANDLE      1005
#define DL_EXTD_POINT       1010
#define DL_EXTD_POS         1011
#define DL_EXTD_DISP        1012
#define DL_EXTD_DIR         1013
#define DL_EXTD_FLOAT       1040
#define DL_EXTD_DIST        1041
#define DL_EXTD_SCALE       1042
#define DL_EXTD_INT16       1070
#define DL_EXTD_INT32       1071

// UCS codes for use in ads_trans
#define DL_WCS_TRANS_CODE      0
#define DL_UCS_TRANS_CODE      1
#define DL_DCS_TRANS_CODE      2
#define DL_PCS_TRANS_CODE      3

#endif

```

6.3 dl_creationadapter.h

```
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**
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**********************************************************************/

#ifndef DL_CREATIONADAPTER_H
#define DL_CREATIONADAPTER_H

#include "dl_global.h"

#include "dl_creationinterface.h"

class DXFLIB_EXPORT DL_CreationAdapter : public DL_CreationInterface {
public:
    DL_CreationAdapter() {}
    virtual ~DL_CreationAdapter() {}
    virtual void processCodeValuePair(unsigned int, const std::string&) {}
    virtual void endSection() {}
    virtual void addLayer(const DL_LayerData&) {}
    virtual void addLinetype(const DL_LinetypeData&) {}
    virtual void addLinetypeDash(double) {}
    virtual void addBlock(const DL_BlockData&) {}
    virtual void endBlock() {}
    virtual void addTextStyle(const DL_StyleData&) {}
    virtual void addPoint(const DL_PointData&) {}
    virtual void addLine(const DL_LineData&) {}
    virtual void addXLine(const DL_XLineData&) {}
    virtual void addRay(const DL_RayData&) {}

    virtual void addArc(const DL_ArcData&) {}
    virtual void addCircle(const DL_CircleData&) {}
    virtual void addEllipse(const DL_EllipseData&) {}

    virtual void addPolyline(const DL_PolylineData&) {}
    virtual void addVertex(const DL_VertexData&) {}

    virtual void addSpline(const DL_SplineData&) {}
    virtual void addControlPoint(const DL_ControlPointData&) {}
    virtual void addFitPoint(const DL_FitPointData&) {}
    virtual void addKnot(const DL_KnotData&) {}

    virtual void addInsert(const DL_InsertData&) {}

    virtual void addMText(const DL_MTextData&) {}
    virtual void addMTextChunk(const std::string&) {}
    virtual void addText(const DL_TextData&) {}
    virtual void addArcAlignedText(const DL_ArcAlignedTextData&) {}
    virtual void addAttribute(const DL_AttributeData&) {}

    virtual void addDimAlign(const DL_DimensionData&,
                            const DL_DimAlignedData&) {}
    virtual void addDimLinear(const DL_DimensionData&,
                             const DL_DimLinearData&) {}
    virtual void addDimRadial(const DL_DimensionData&,
                             const DL_DimRadialData&) {}
    virtual void addDimDiametric(const DL_DimensionData&,
                             const DL_DimDiametricData&) {}
    virtual void addDimAngular(const DL_DimensionData&,
                             const DL_DimAngular2LData&) {}
    virtual void addDimAngular3P(const DL_DimensionData&,
                             const DL_DimAngular3PData&) {}
    virtual void addDimOrdinate(const DL_DimensionData&,
                            const DL_DimOrdinateData&) {}
    virtual void addLeader(const DL_LeaderData&) {}
    virtual void addLeaderVertex(const DL_LeaderVertexData&) {}

    virtual void addHatch(const DL_HatchData&) {}

    virtual void addTrace(const DL_TraceData&) {}
    virtual void add3dFace(const DL_3dFaceData&) {}
    virtual void addSolid(const DL_SolidData&) {}

    virtual void addImage(const DL_ImageData&) {}
    virtual void linkImage(const DL_ImageDefData&) {}
    virtual void addHatchLoop(const DL_HatchLoopData&) {}
    virtual void addHatchEdge(const DL_HatchEdgeData&) {}

    virtual void addXRecord(const std::string&) {}
    virtual void addXRecordString(int, const std::string&) {}
    virtual void addXRecordReal(int, double) {}
    virtual void addXRecordInt(int, int) {}
    virtual void addXRecordBool(int, bool) {}

    virtual void addXDataApp(const std::string&) {}
    virtual void addXDataString(int, const std::string&) {}
    virtual void addXDataReal(int, double) {}
    virtual void addXDataInt(int, int) {}

    virtual void addDictionary(const DL_DictionaryData&) {}
    virtual void addDictionaryEntry(const DL_DictionaryEntryData&) {}

    virtual void endEntity() {}

    virtual void addComment(const std::string&) {}

    virtual void setVariableVector(const std::string&,  double, double, double, int) {}
    virtual void setVariableString(const std::string&, const std::string&, int) {}
    virtual void setVariableInt(const std::string&, int, int) {}
    virtual void setVariableDouble(const std::string&, double, int) {}
#ifdef DL_COMPAT
    virtual void setVariableVector(const char*,  double, double, double, int) {}
    virtual void setVariableString(const char*, const char*, int) {}
    virtual void setVariableInt(const char*, int, int) {}
    virtual void setVariableDouble(const char*, double, int) {}
    virtual void processCodeValuePair(unsigned int, char*) {}
    virtual void addComment(const char*) {}
    virtual void addMTextChunk(const char*) {}
#endif
    virtual void endSequence() {}
};

#endif
```

6.4 dl_creationinterface.h

```
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**********************************************************************/

#ifndef DL_CREATIONINTERFACE_H
#define DL_CREATIONINTERFACE_H

#include "dl_global.h"

#include <string.h>

#include "dl_attributes.h"
#include "dl_codes.h"
#include "dl_entities.h"
#include "dl_extrusion.h"

class DXFLIB_EXPORT DL_CreationInterface {
public:
    DL_CreationInterface() {
        extrusion = new DL_Extrusion;
    }
    virtual ~DL_CreationInterface() {
        delete extrusion;
    }

    virtual void processCodeValuePair(unsigned int groupCode, const std::string& groupValue) = 0;

    virtual void endSection() = 0;

    virtual void addLayer(const DL_LayerData& data) = 0;

    virtual void addLinetype(const DL_LinetypeData& data) = 0;

    virtual void addLinetypeDash(double length) = 0;

    virtual void addBlock(const DL_BlockData& data) = 0;

    virtual void endBlock() = 0;

    virtual void addTextStyle(const DL_StyleData& data) = 0;

    virtual void addPoint(const DL_PointData& data) = 0;

    virtual void addLine(const DL_LineData& data) = 0;

    virtual void addXLine(const DL_XLineData& data) = 0;

    virtual void addRay(const DL_RayData& data) = 0;

    virtual void addArc(const DL_ArcData& data) = 0;

    virtual void addCircle(const DL_CircleData& data) = 0;

    virtual void addEllipse(const DL_EllipseData& data) = 0;

    virtual void addPolyline(const DL_PolylineData& data) = 0;

    virtual void addVertex(const DL_VertexData& data) = 0;

    virtual void addSpline(const DL_SplineData& data) = 0;

    virtual void addControlPoint(const DL_ControlPointData& data) = 0;

    virtual void addFitPoint(const DL_FitPointData& data) = 0;

    virtual void addKnot(const DL_KnotData& data) = 0;

    virtual void addInsert(const DL_InsertData& data) = 0;

    virtual void addTrace(const DL_TraceData& data) = 0;

    virtual void add3dFace(const DL_3dFaceData& data) = 0;

    virtual void addSolid(const DL_SolidData& data) = 0;


    virtual void addMText(const DL_MTextData& data) = 0;

    virtual void addMTextChunk(const std::string& text) = 0;

    virtual void addText(const DL_TextData& data) = 0;

    virtual void addArcAlignedText(const DL_ArcAlignedTextData& data) = 0;

    virtual void addAttribute(const DL_AttributeData& data) = 0;

    virtual void addDimAlign(const DL_DimensionData& data,
                             const DL_DimAlignedData& edata) = 0;
    virtual void addDimLinear(const DL_DimensionData& data,
                              const DL_DimLinearData& edata) = 0;

    virtual void addDimRadial(const DL_DimensionData& data,
                              const DL_DimRadialData& edata) = 0;

    virtual void addDimDiametric(const DL_DimensionData& data,
                              const DL_DimDiametricData& edata) = 0;

    virtual void addDimAngular(const DL_DimensionData& data,
                              const DL_DimAngular2LData& edata) = 0;

    virtual void addDimAngular3P(const DL_DimensionData& data,
                              const DL_DimAngular3PData& edata) = 0;

    virtual void addDimOrdinate(const DL_DimensionData& data,
                             const DL_DimOrdinateData& edata) = 0;

    virtual void addLeader(const DL_LeaderData& data) = 0;

    virtual void addLeaderVertex(const DL_LeaderVertexData& data) = 0;

    virtual void addHatch(const DL_HatchData& data) = 0;

    virtual void addImage(const DL_ImageData& data) = 0;

    virtual void linkImage(const DL_ImageDefData& data) = 0;

    virtual void addHatchLoop(const DL_HatchLoopData& data) = 0;

    virtual void addHatchEdge(const DL_HatchEdgeData& data) = 0;

    virtual void addXRecord(const std::string& handle) = 0;

    virtual void addXRecordString(int code, const std::string& value) = 0;

    virtual void addXRecordReal(int code, double value) = 0;

    virtual void addXRecordInt(int code, int value) = 0;

    virtual void addXRecordBool(int code, bool value) = 0;

    virtual void addXDataApp(const std::string& appId) = 0;

    virtual void addXDataString(int code, const std::string& value) = 0;

    virtual void addXDataReal(int code, double value) = 0;

    virtual void addXDataInt(int code, int value) = 0;

    virtual void addDictionary(const DL_DictionaryData& data) = 0;

    virtual void addDictionaryEntry(const DL_DictionaryEntryData& data) = 0;

    virtual void endEntity() = 0;

    virtual void addComment(const std::string& comment) = 0;

    virtual void setVariableVector(const std::string& key,  double v1, double v2, double v3, int code)
 = 0;

    virtual void setVariableString(const std::string& key, const std::string& value, int code) = 0;

    virtual void setVariableInt(const std::string& key, int value, int code) = 0;

    virtual void setVariableDouble(const std::string& key, double value, int code) = 0;

#ifdef DL_COMPAT
    virtual void setVariableVector(const char* key,  double v1, double v2, double v3, int code) = 0;
    virtual void setVariableString(const char* key, const char* value, int code) = 0;
    virtual void setVariableInt(const char* key, int value, int code) = 0;
    virtual void setVariableDouble(const char* key, double value, int code) = 0;
    virtual void processCodeValuePair(unsigned int groupCode, char* groupValue) = 0;
    virtual void addComment(const char* comment) = 0;
    virtual void addMTextChunk(const char* text) = 0;
#endif

    virtual void endSequence() = 0;

    void setAttributes(const DL_Attributes& attrib) {
        attributes = attrib;
    }

    DL_Attributes getAttributes() {
        return attributes;
    }

    void setExtrusion(double dx, double dy, double dz, double elevation) {
        extrusion->setDirection(dx, dy, dz);
        extrusion->setElevation(elevation);
    }

    DL_Extrusion* getExtrusion() {
        return extrusion;
    }

protected:
    DL_Attributes attributes;
    DL_Extrusion *extrusion;
};

#endif
```

6.5 dl_dxf.h

```
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**
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**********************************************************************/

#ifndef DL_DXF_H
#define DL_DXF_H

#include "dl_global.h"

#include <limits>
#include <stdio.h>
#include <stdlib.h>
#include <string>
#include <sstream>
#include <map>

#include "dl_attributes.h"
#include "dl_codes.h"
#include "dl_entities.h"
#include "dl_writer_ascii.h"

#ifdef _WIN32
```

```
#undef M_PI
#define M_PI   3.14159265358979323846
#pragma warning(disable : 4800)
#endif

#ifndef M_PI
#define M_PI 3.1415926535897932384626433832795
#endif

#ifndef DL_NANDOUBLE
#define DL_NANDOUBLE std::numeric_limits<double>::quiet_NaN()
#endif

class DL_CreationInterface;
class DL_WriterA;


#define DL_VERSION "3.26.4.0"

#define DL_VERSION_MAJOR    3
#define DL_VERSION_MINOR    26
#define DL_VERSION_REV      4
#define DL_VERSION_BUILD    0

#define DL_UNKNOWN               0
#define DL_LAYER                10
#define DL_BLOCK                11
#define DL_ENDBLK               12
#define DL_LINETYPE             13
#define DL_STYLE                20
#define DL_SETTING              50
#define DL_ENTITY_POINT        100
#define DL_ENTITY_LINE         101
#define DL_ENTITY_POLYLINE     102
#define DL_ENTITY_LWPOLYLINE   103
#define DL_ENTITY_VERTEX       104
#define DL_ENTITY_SPLINE       105
#define DL_ENTITY_KNOT         106
#define DL_ENTITY_CONTROLPOINT 107
#define DL_ENTITY_ARC          108
#define DL_ENTITY_CIRCLE       109
#define DL_ENTITY_ELLIPSE      110
#define DL_ENTITY_INSERT       111
#define DL_ENTITY_TEXT         112
#define DL_ENTITY_MTEXT        113
#define DL_ENTITY_DIMENSION    114
#define DL_ENTITY_LEADER       115
#define DL_ENTITY_HATCH        116
#define DL_ENTITY_ATTRIB       117
#define DL_ENTITY_IMAGE        118
#define DL_ENTITY_IMAGEDEF     119
#define DL_ENTITY_TRACE        120
#define DL_ENTITY_SOLID        121
#define DL_ENTITY_3DFACE       122
#define DL_ENTITY_XLINE        123
#define DL_ENTITY_RAY          124
#define DL_ENTITY_ARCALIGNEDTEXT 125
#define DL_ENTITY_SEQEND       126
#define DL_XRECORD             200
#define DL_DICTIONARY          210


class DXFLIB_EXPORT DL_Dxf {
public:
    DL_Dxf();
    ~DL_Dxf();

    bool in(const std::string& file,
            DL_CreationInterface* creationInterface);
    bool readDxfGroups(FILE* fp,
                       DL_CreationInterface* creationInterface);
    static bool getStrippedLine(std::string& s, unsigned int size,
                                FILE* stream, bool stripSpace = true);

    bool readDxfGroups(std::istream& stream,
                       DL_CreationInterface* creationInterface);
    bool in(std::istream &stream,
            DL_CreationInterface* creationInterface);
    static bool getStrippedLine(std::string& s, unsigned int size,
                                std::istream& stream, bool stripSpace = true);

    static bool stripWhiteSpace(char** s, bool stripSpaces = true);

    bool processDXFGroup(DL_CreationInterface* creationInterface,
                         int groupCode, const std::string& groupValue);
    void addSetting(DL_CreationInterface* creationInterface);
    void addLayer(DL_CreationInterface* creationInterface);
    void addLinetype(DL_CreationInterface *creationInterface);
    void addBlock(DL_CreationInterface* creationInterface);
    void endBlock(DL_CreationInterface* creationInterface);
    void addTextStyle(DL_CreationInterface* creationInterface);

    void addPoint(DL_CreationInterface* creationInterface);
    void addLine(DL_CreationInterface* creationInterface);
    void addXLine(DL_CreationInterface* creationInterface);
    void addRay(DL_CreationInterface* creationInterface);

    void addPolyline(DL_CreationInterface* creationInterface);
    void addVertex(DL_CreationInterface* creationInterface);

    void addSpline(DL_CreationInterface* creationInterface);

    void addArc(DL_CreationInterface* creationInterface);
    void addCircle(DL_CreationInterface* creationInterface);
    void addEllipse(DL_CreationInterface* creationInterface);
    void addInsert(DL_CreationInterface* creationInterface);

    void addTrace(DL_CreationInterface* creationInterface);
    void add3dFace(DL_CreationInterface* creationInterface);
    void addSolid(DL_CreationInterface* creationInterface);

    void addMText(DL_CreationInterface* creationInterface);
    void addText(DL_CreationInterface* creationInterface);
    void addArcAlignedText(DL_CreationInterface* creationInterface);

    void addAttribute(DL_CreationInterface* creationInterface);

    DL_DimensionData getDimData();
    void addDimLinear(DL_CreationInterface* creationInterface);
    void addDimAligned(DL_CreationInterface* creationInterface);
    void addDimRadial(DL_CreationInterface* creationInterface);
    void addDimDiametric(DL_CreationInterface* creationInterface);
    void addDimAngular(DL_CreationInterface* creationInterface);
    void addDimAngular3P(DL_CreationInterface* creationInterface);
    void addDimOrdinate(DL_CreationInterface* creationInterface);

    void addLeader(DL_CreationInterface* creationInterface);

    void addHatch(DL_CreationInterface* creationInterface);
    void addHatchLoop();
    void addHatchEdge();
    bool handleHatchData(DL_CreationInterface* creationInterface);

    void addImage(DL_CreationInterface* creationInterface);
    void addImageDef(DL_CreationInterface* creationInterface);

    void addComment(DL_CreationInterface* creationInterface, const std::string& comment);

    void addDictionary(DL_CreationInterface* creationInterface);
    void addDictionaryEntry(DL_CreationInterface* creationInterface);

    bool handleXRecordData(DL_CreationInterface* creationInterface);
    bool handleDictionaryData(DL_CreationInterface* creationInterface);

    bool handleXData(DL_CreationInterface *creationInterface);
    bool handleMTextData(DL_CreationInterface* creationInterface);
    bool handleLWPolylineData(DL_CreationInterface* creationInterface);
    bool handleSplineData(DL_CreationInterface* creationInterface);
    bool handleLeaderData(DL_CreationInterface* creationInterface);
    bool handleLinetypeData(DL_CreationInterface* creationInterface);

    void endEntity(DL_CreationInterface* creationInterface);

    void endSequence(DL_CreationInterface* creationInterface);

    //int  stringToInt(const char* s, bool* ok=NULL);

    DL_WriterA* out(const char* file,
                    DL_Codes::version version=DL_VERSION_2000);

    void writeHeader(DL_WriterA& dw);

    void writePoint(DL_WriterA& dw,
                    const DL_PointData& data,
                    const DL_Attributes& attrib);
    void writeLine(DL_WriterA& dw,
                   const DL_LineData& data,
                   const DL_Attributes& attrib);
    void writeXLine(DL_WriterA& dw,
                   const DL_XLineData& data,
                   const DL_Attributes& attrib);
    void writeRay(DL_WriterA& dw,
                    const DL_RayData& data,
                    const DL_Attributes& attrib);
    void writePolyline(DL_WriterA& dw,
                       const DL_PolylineData& data,
                       const DL_Attributes& attrib);
    void writeVertex(DL_WriterA& dw,
                     const DL_VertexData& data);
    void writePolylineEnd(DL_WriterA& dw);
    void writeSpline(DL_WriterA& dw,
                       const DL_SplineData& data,
                       const DL_Attributes& attrib);
    void writeControlPoint(DL_WriterA& dw,
                     const DL_ControlPointData& data);
    void writeFitPoint(DL_WriterA& dw,
                       const DL_FitPointData& data);
    void writeKnot(DL_WriterA& dw,
                     const DL_KnotData& data);
    void writeCircle(DL_WriterA& dw,
                     const DL_CircleData& data,
                     const DL_Attributes& attrib);
    void writeArc(DL_WriterA& dw,
                  const DL_ArcData& data,
                  const DL_Attributes& attrib);
    void writeEllipse(DL_WriterA& dw,
                      const DL_EllipseData& data,
                      const DL_Attributes& attrib);
    void writeSolid(DL_WriterA& dw,
                   const DL_SolidData& data,
                   const DL_Attributes& attrib);
    void writeTrace(DL_WriterA& dw,
                    const DL_TraceData& data,
                    const DL_Attributes& attrib);
    void write3dFace(DL_WriterA& dw,
                   const DL_3dFaceData& data,
                   const DL_Attributes& attrib);
    void writeInsert(DL_WriterA& dw,
                     const DL_InsertData& data,
                     const DL_Attributes& attrib);
    void writeMText(DL_WriterA& dw,
                    const DL_MTextData& data,
                    const DL_Attributes& attrib);
    void writeText(DL_WriterA& dw,
                   const DL_TextData& data,
                   const DL_Attributes& attrib);
    void writeAttribute(DL_WriterA& dw,
                   const DL_AttributeData& data,
                   const DL_Attributes& attrib);
    void writeDimStyleOverrides(DL_WriterA& dw,
                               const DL_DimensionData& data);
    void writeDimAligned(DL_WriterA& dw,
                         const DL_DimensionData& data,
                         const DL_DimAlignedData& edata,
                         const DL_Attributes& attrib);
    void writeDimLinear(DL_WriterA& dw,
                        const DL_DimensionData& data,
                        const DL_DimLinearData& edata,
                        const DL_Attributes& attrib);
    void writeDimRadial(DL_WriterA& dw,
                        const DL_DimensionData& data,
                        const DL_DimRadialData& edata,
                        const DL_Attributes& attrib);
    void writeDimDiametric(DL_WriterA& dw,
                           const DL_DimensionData& data,
                           const DL_DimDiametricData& edata,
                           const DL_Attributes& attrib);
    void writeDimAngular2L(DL_WriterA& dw,
                         const DL_DimensionData& data,
                         const DL_DimAngular2LData& edata,
                         const DL_Attributes& attrib);
    void writeDimAngular3P(DL_WriterA& dw,
                           const DL_DimensionData& data,
                           const DL_DimAngular3PData& edata,
                           const DL_Attributes& attrib);
    void writeDimOrdinate(DL_WriterA& dw,
                         const DL_DimensionData& data,
                         const DL_DimOrdinateData& edata,
                         const DL_Attributes& attrib);
    void writeLeader(DL_WriterA& dw,
                     const DL_LeaderData& data,
                     const DL_Attributes& attrib);
    void writeLeaderVertex(DL_WriterA& dw,
                           const DL_LeaderVertexData& data);
    void writeLeaderEnd(DL_WriterA& dw,
                     const DL_LeaderData& data);
    void writeHatch1(DL_WriterA& dw,
                     const DL_HatchData& data,
                     const DL_Attributes& attrib);
    void writeHatch2(DL_WriterA& dw,
                     const DL_HatchData& data,
                     const DL_Attributes& attrib);
    void writeHatchLoop1(DL_WriterA& dw,
                         const DL_HatchLoopData& data);
    void writeHatchLoop2(DL_WriterA& dw,
                         const DL_HatchLoopData& data);
    void writeHatchEdge(DL_WriterA& dw,
                        const DL_HatchEdgeData& data);

    unsigned long writeImage(DL_WriterA& dw,
                   const DL_ImageData& data,
                   const DL_Attributes& attrib);

    void writeImageDef(DL_WriterA& dw, int handle,
                       const DL_ImageData& data);

    void writeLayer(DL_WriterA& dw,
                    const DL_LayerData& data,
                    const DL_Attributes& attrib);

    void writeLinetype(DL_WriterA& dw,
                       const DL_LinetypeData& data);

    void writeAppid(DL_WriterA& dw, const std::string& name);

    void writeBlock(DL_WriterA& dw,
                    const DL_BlockData& data);
    void writeEndBlock(DL_WriterA& dw, const std::string& name);

    void writeVPort(DL_WriterA& dw);
    void writeStyle(DL_WriterA& dw, const DL_StyleData& style);
    void writeView(DL_WriterA& dw);
    void writeUcs(DL_WriterA& dw);
    void writeDimStyle(DL_WriterA& dw,
                       double dimasz, double dimexe, double dimexo,
                       double dimgap, double dimtxt);
    void writeBlockRecord(DL_WriterA& dw);
    void writeBlockRecord(DL_WriterA& dw, const std::string& name);
    void writeObjects(DL_WriterA& dw, const std::string& appDictionaryName = "");
    void writeAppDictionary(DL_WriterA& dw);
    unsigned long writeDictionaryEntry(DL_WriterA& dw, const std::string& name);
    void writeXRecord(DL_WriterA& dw, int handle, int value);
    void writeXRecord(DL_WriterA& dw, int handle, double value);
    void writeXRecord(DL_WriterA& dw, int handle, bool value);
    void writeXRecord(DL_WriterA& dw, int handle, const std::string& value);
    void writeObjectsEnd(DL_WriterA& dw);

    void writeComment(DL_WriterA& dw, const std::string& comment);

    //static double toReal(const char* value, double def=0.0);

//    static int toInt(const char* value, int def=0) {
//        if (value!=NULL && value[0] != '\0') {
//            return atoi(value);
//        }

//        return def;
//    }

//    static const char* toString(const char* value, const char* def="") {
//        if (value!=NULL && value[0] != '\0') {
//            return value;
//        } else {
//            return def;
//        }
//    }

    static bool checkVariable(const char* var, DL_Codes::version version);

    DL_Codes::version getVersion() {
        return version;
    }

    int getLibVersion(const std::string &str);

    static void test();

    bool hasValue(int code) {
        return values.count(code)==1;
    }

    int getIntValue(int code, int def) {
        if (!hasValue(code)) {
            return def;
        }
        return toInt(values[code]);
    }

    int toInt(const std::string& str) {
        char* p;
        return strtol(str.c_str(), &p, 10);
    }

    int getInt16Value(int code, int def) {
        if (!hasValue(code)) {
            return def;
        }
        return toInt16(values[code]);
    }

    int toInt16(const std::string& str) {
        char* p;
        return strtol(str.c_str(), &p, 16);
    }

    bool toBool(const std::string& str) {
        char* p;
        return (bool)strtol(str.c_str(), &p, 10);
    }

    std::string getStringValue(int code, const std::string& def) {
        if (!hasValue(code)) {
            return def;
        }
        return values[code];
    }

    double getRealValue(int code, double def) {
        if (!hasValue(code)) {
            return def;
        }
        return toReal(values[code]);
    }

    double toReal(const std::string& str) {
        double ret;
        // make sure the real value uses '.' not ',':
        std::string str2 = str;
        std::replace(str2.begin(), str2.end(), ',', '.');
        // make sure c++ expects '.' not ',':
        std::istringstream istr(str2);
        //istr.imbue(std::locale("C"));
        istr » ret;
        return ret;
    }

private:
    DL_Codes::version version;

    std::string polylineLayer;
    double* vertices;
    int maxVertices;
    int vertexIndex;

    double* knots;
    int maxKnots;
    int knotIndex;

    double* weights;
    int weightIndex;

    double* controlPoints;
    int maxControlPoints;
    int controlPointIndex;

    double* fitPoints;
    int maxFitPoints;
    int fitPointIndex;

    double* leaderVertices;
    int maxLeaderVertices;
    int leaderVertexIndex;

    bool firstHatchLoop;
    DL_HatchEdgeData hatchEdge;
    std::vector<std::vector<DL_HatchEdgeData> > hatchEdges;

    std::string xRecordHandle;
    bool xRecordValues;

    // Only the useful part of the group code
    std::string groupCodeTmp;
    // ...same as integer
    unsigned int groupCode;
    // Only the useful part of the group value
    std::string groupValue;
    // Current entity type
    int currentObjectType;
    // Value of the current setting
    char settingValue[DL_DXF_MAXLINE+1];
    // Key of the current setting (e.g. "$ACADVER")
    std::string settingKey;
    // Stores the group codes
    std::map<int, std::string> values;
    // First call of this method. We initialize all group values in
    //  the first call.
    bool firstCall;
    // Attributes of the current entity (layer, color, width, line type)
    DL_Attributes attrib;
    // library version. hex: 0x20003001 = 2.0.3.1
    int libVersion;
    // app specific dictionary handle:
    unsigned long appDictionaryHandle;
    // handle of standard text style, referenced by dimstyle:
    unsigned long styleHandleStd;
};

#endif

// EOF
```

6.6 dl_entities.h

```
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**********************************************************************/

#ifndef DL_ENTITIES_H
#define DL_ENTITIES_H

#include "dl_global.h"

#include <string>
#include <vector>

struct DXFLIB_EXPORT DL_LayerData {
    DL_LayerData(const std::string& name,
                 int flags, bool off = false) :
        name(name), flags(flags), off(off) {
    }

    std::string name;
    int flags;
    bool off;
};



struct DXFLIB_EXPORT DL_BlockData {
    DL_BlockData(const std::string& bName,
                 int bFlags,
                 double bbpx, double bbpy, double bbpz) {
        name = bName;
        flags = bFlags;
        bpx = bbpx;
        bpy = bbpy;
        bpz = bbpz;
    }

    std::string name;
    int flags;
    double bpx;
    double bpy;
    double bpz;
};


struct DXFLIB_EXPORT DL_LinetypeData {
    DL_LinetypeData(
        const std::string& name,
        const std::string& description,
        int flags,
        int numberOfDashes,
        double patternLength,
        double* pattern = NULL
        )
        : name(name),
        description(description),
        flags(flags),
        numberOfDashes(numberOfDashes),
        patternLength(patternLength),
        pattern(pattern)
    {}

    std::string name;
    std::string description;
    int flags;
    int numberOfDashes;
    double patternLength;
    double* pattern;
};



struct DXFLIB_EXPORT DL_StyleData {
    DL_StyleData(
        const std::string& name,
        int flags,
        double fixedTextHeight,
        double widthFactor,
        double obliqueAngle,
        int textGenerationFlags,
        double lastHeightUsed,
        const std::string& primaryFontFile,
        const std::string& bigFontFile
        )
        : name(name),
        flags(flags),
        fixedTextHeight(fixedTextHeight),
        widthFactor(widthFactor),
        obliqueAngle(obliqueAngle),
        textGenerationFlags(textGenerationFlags),
        lastHeightUsed(lastHeightUsed),
        primaryFontFile(primaryFontFile),
        bigFontFile(bigFontFile),
        bold(false),
        italic(false) {
    }

    bool operator==(const DL_StyleData& other) {
        // ignore lastHeightUsed:
        return (name==other.name &&
            flags==other.flags &&
            fixedTextHeight==other.fixedTextHeight &&
            widthFactor==other.widthFactor &&
            obliqueAngle==other.obliqueAngle &&
            textGenerationFlags==other.textGenerationFlags &&
            primaryFontFile==other.primaryFontFile &&
            bigFontFile==other.bigFontFile);
    }

    std::string name;
    int flags;
    double fixedTextHeight;
    double widthFactor;
    double obliqueAngle;
    int textGenerationFlags;
    double lastHeightUsed;
    std::string primaryFontFile;
    std::string bigFontFile;

    bool bold;
    bool italic;
};

```

```
struct DXFLIB_EXPORT DL_PointData {
    DL_PointData(double px=0.0, double py=0.0, double pz=0.0) {
        x = px;
        y = py;
        z = pz;
    }

    double x;
    double y;
    double z;
};



struct DXFLIB_EXPORT DL_LineData {
    DL_LineData(double lx1, double ly1, double lz1,
                double lx2, double ly2, double lz2) {
        x1 = lx1;
        y1 = ly1;
        z1 = lz1;

        x2 = lx2;
        y2 = ly2;
        z2 = lz2;
    }

    double x1;
    double y1;
    double z1;

    double x2;
    double y2;
    double z2;
};

struct DXFLIB_EXPORT DL_XLineData {
    DL_XLineData(double bx, double by, double bz,
                double dx, double dy, double dz) :
        bx(bx), by(by), bz(bz),
        dx(dx), dy(dy), dz(dz) {
    }

    double bx;
    double by;
    double bz;

    double dx;
    double dy;
    double dz;
};

struct DXFLIB_EXPORT DL_RayData {
    DL_RayData(double bx, double by, double bz,
               double dx, double dy, double dz) :
        bx(bx), by(by), bz(bz),
        dx(dx), dy(dy), dz(dz) {
    }

    double bx;
    double by;
    double bz;

    double dx;
    double dy;
    double dz;
};



struct DXFLIB_EXPORT DL_ArcData {
    DL_ArcData(double acx, double acy, double acz,
               double aRadius,
               double aAngle1, double aAngle2) {

        cx = acx;
        cy = acy;
        cz = acz;
        radius = aRadius;
        angle1 = aAngle1;
        angle2 = aAngle2;
    }

    double cx;
    double cy;
    double cz;

    double radius;
    double angle1;
    double angle2;
};



struct DXFLIB_EXPORT DL_CircleData {
    DL_CircleData(double acx, double acy, double acz,
                  double aRadius) {

        cx = acx;
        cy = acy;
        cz = acz;
        radius = aRadius;
    }

    double cx;
    double cy;
    double cz;

    double radius;
};



struct DXFLIB_EXPORT DL_PolylineData {
    DL_PolylineData(int pNumber, int pMVerteces, int pNVerteces, int pFlags, double pElevation = 0.0)
{
        number = pNumber;
        m = pMVerteces;
        n = pNVerteces;
        elevation = pElevation;
        flags = pFlags;
    }

    unsigned int number;

    unsigned int m;

    unsigned int n;

    double elevation;

    int flags;
};



struct DXFLIB_EXPORT DL_VertexData {
    DL_VertexData(double px=0.0, double py=0.0, double pz=0.0,
                  double pBulge=0.0) {
        x = px;
        y = py;
        z = pz;
        bulge = pBulge;
    }

    double x;
    double y;
    double z;
    double bulge;
};


struct DXFLIB_EXPORT DL_TraceData {
    DL_TraceData() {
        thickness = 0.0;
        for (int i=0; i<4; i++) {
            x[i] = 0.0;
            y[i] = 0.0;
            z[i] = 0.0;
        }
    }

    DL_TraceData(double sx1, double sy1, double sz1,
                double sx2, double sy2, double sz2,
                double sx3, double sy3, double sz3,
                double sx4, double sy4, double sz4,
                double sthickness=0.0) {

        thickness = sthickness;

        x[0] = sx1;
        y[0] = sy1;
        z[0] = sz1;

        x[1] = sx2;
        y[1] = sy2;
        z[1] = sz2;

        x[2] = sx3;
        y[2] = sy3;
        z[2] = sz3;

        x[3] = sx4;
        y[3] = sy4;
        z[3] = sz4;
    }

    double thickness;

    double x[4];
    double y[4];
    double z[4];
};





typedef DL_TraceData DL_SolidData;


typedef DL_TraceData DL_3dFaceData;


struct DXFLIB_EXPORT DL_SplineData {
    DL_SplineData(int degree,
                  int nKnots,
                  int nControl,
                  int nFit,
                  int flags) :
        degree(degree),
        nKnots(nKnots),
        nControl(nControl),
        nFit(nFit),
        flags(flags) {
    }

    unsigned int degree;

    unsigned int nKnots;

    unsigned int nControl;

    unsigned int nFit;

    int flags;

    double tangentStartX;
    double tangentStartY;
    double tangentStartZ;
    double tangentEndX;
    double tangentEndY;
    double tangentEndZ;
};



struct DXFLIB_EXPORT DL_KnotData {
    DL_KnotData() {}
    DL_KnotData(double pk) {
        k = pk;
    }

    double k;
};



struct DXFLIB_EXPORT DL_ControlPointData {
    DL_ControlPointData(double px, double py, double pz, double weight) {
        x = px;
        y = py;
        z = pz;
        w = weight;
    }

    double x;
    double y;
    double z;
    double w;
};

```

```


struct DXFLIB_EXPORT DL_FitPointData {
    DL_FitPointData(double x, double y, double z) : x(x), y(y), z(z) {}

    double x;
    double y;
    double z;
};



struct DXFLIB_EXPORT DL_EllipseData {
    DL_EllipseData(double cx, double cy, double cz,
                   double mx, double my, double mz,
                   double ratio,
                   double angle1, double angle2)
        : cx(cx),
          cy(cy),
          cz(cz),
          mx(mx),
          my(my),
          mz(mz),
          ratio(ratio),
          angle1(angle1),
          angle2(angle2) {
    }

    double cx;
    double cy;
    double cz;

    double mx;
    double my;
    double mz;

    double ratio;
    double angle1;
    double angle2;
};



struct DXFLIB_EXPORT DL_InsertData {
    DL_InsertData(const std::string& name,
                  double ipx, double ipy, double ipz,
                  double sx, double sy, double sz,
                  double angle,
                  int cols, int rows,
                  double colSp, double rowSp) :
          name(name),
          ipx(ipx), ipy(ipy), ipz(ipz),
          sx(sx), sy(sy), sz(sz),
          angle(angle),
          cols(cols), rows(rows),
          colSp(colSp), rowSp(rowSp) {
    }

    std::string name;
    double ipx;
    double ipy;
    double ipz;
    double sx;
    double sy;
    double sz;
    double angle;
    int cols;
    int rows;
    double colSp;
    double rowSp;
};



struct DXFLIB_EXPORT DL_MTextData {
    DL_MTextData(double ipx, double ipy, double ipz,
                 double dirx, double diry, double dirz,
                 double height, double width,
                 int attachmentPoint,
                 int drawingDirection,
                 int lineSpacingStyle,
                 double lineSpacingFactor,
                 const std::string& text,
                 const std::string& style,
                 double angle) :
         ipx(ipx), ipy(ipy), ipz(ipz),
         dirx(dirx), diry(diry), dirz(dirz),
         height(height), width(width),
         attachmentPoint(attachmentPoint),
         drawingDirection(drawingDirection),
         lineSpacingStyle(lineSpacingStyle),
         lineSpacingFactor(lineSpacingFactor),
         text(text),
         style(style),
         angle(angle) {

     }

     double ipx;
     double ipy;
     double ipz;
    double dirx;
    double diry;
    double dirz;
    double height;
    double width;
    int attachmentPoint;
    int drawingDirection;
    int lineSpacingStyle;
    double lineSpacingFactor;
    std::string text;
    std::string style;
    double angle;
};



struct DXFLIB_EXPORT DL_TextData {
    DL_TextData(double ipx, double ipy, double ipz,
                double apx, double apy, double apz,
                double height, double xScaleFactor,
                int textGenerationFlags,
                int hJustification,
                int vJustification,
                const std::string& text,
                const std::string& style,
                double angle)
        : ipx(ipx), ipy(ipy), ipz(ipz),
          apx(apx), apy(apy), apz(apz),
          height(height), xScaleFactor(xScaleFactor),
          textGenerationFlags(textGenerationFlags),
          hJustification(hJustification),
          vJustification(vJustification),
          text(text),
          style(style),
          angle(angle) {
    }

    double ipx;
    double ipy;
    double ipz;

    double apx;
    double apy;
    double apz;

    double height;
    double xScaleFactor;
    int textGenerationFlags;
    int hJustification;
    int vJustification;
    std::string text;
    std::string style;
    double angle;
};

struct DXFLIB_EXPORT DL_ArcAlignedTextData {

    std::string text;
    std::string font;
    std::string style;

    double cx;
    double cy;
    double cz;
    double radius;

    double xScaleFactor;
    double height;
    double spacing;
    double offset;
    double rightOffset;
    double leftOffset;
    double startAngle;
    double endAngle;
    bool reversedCharacterOrder;
    int direction;
    int alignment;
    int side;
    bool bold;
    bool italic;
    bool underline;
    int characerSet;
    int pitch;
    bool shxFont;
    bool wizard;
    int arcHandle;
};

struct DXFLIB_EXPORT DL_AttributeData : public DL_TextData {
    DL_AttributeData(const DL_TextData& tData, const std::string& tag)
        : DL_TextData(tData), tag(tag) {

    }

    DL_AttributeData(double ipx, double ipy, double ipz,
                double apx, double apy, double apz,
                double height, double xScaleFactor,
                int textGenerationFlags,
                int hJustification,
                int vJustification,
                const std::string& tag,
                const std::string& text,
                const std::string& style,
                double angle)
        : DL_TextData(ipx, ipy, ipz,
                apx, apy, apz,
                height, xScaleFactor,
                textGenerationFlags,
                hJustification,
                vJustification,
                text,
                style,
                angle),
          tag(tag) {
    }

    std::string tag;
};


struct DXFLIB_EXPORT DL_DimensionData {
    DL_DimensionData(double dpx, double dpy, double dpz,
                     double mpx, double mpy, double mpz,
                     int type,
                     int attachmentPoint,
                     int lineSpacingStyle,
                     double lineSpacingFactor,
                     const std::string& text,
                     const std::string& style,
                     double angle,
                     double linearFactor = 1.0,
                     double dimScale = 1.0) :
        dpx(dpx), dpy(dpy), dpz(dpz),
        mpx(mpx), mpy(mpy), mpz(mpz),
        type(type),
        attachmentPoint(attachmentPoint),
        lineSpacingStyle(lineSpacingStyle),
        lineSpacingFactor(lineSpacingFactor),
        text(text),
        style(style),
        angle(angle),
        linearFactor(linearFactor),
        dimScale(dimScale) {

    }

    double dpx;
    double dpy;
    double dpz;
    double mpx;
    double mpy;
    double mpz;
    int type;
    int attachmentPoint;
    int lineSpacingStyle;
    double lineSpacingFactor;
    std::string text;
    std::string style;
    double angle;
    double linearFactor;
    double dimScale;
    bool arrow1Flipped;
    bool arrow2Flipped;
};



struct DXFLIB_EXPORT DL_DimAlignedData {
    DL_DimAlignedData(double depx1, double depy1, double depz1,
                      double depx2, double depy2, double depz2) {

        epx1 = depx1;
        epy1 = depy1;
        epz1 = depz1;

        epx2 = depx2;
        epy2 = depy2;
        epz2 = depz2;
    }

    double epx1;
    double epy1;
    double epz1;

    double epx2;
    double epy2;
    double epz2;
};



struct DXFLIB_EXPORT DL_DimLinearData {
    DL_DimLinearData(double ddpx1, double ddpy1, double ddpz1,
                     double ddpx2, double ddpy2, double ddpz2,
                     double dAngle, double dOblique) {

        dpx1 = ddpx1;
        dpy1 = ddpy1;
        dpz1 = ddpz1;

        dpx2 = ddpx2;
        dpy2 = ddpy2;
        dpz2 = ddpz2;

        angle = dAngle;
        oblique = dOblique;
    }

    double dpx1;
    double dpy1;
    double dpz1;

    double dpx2;
    double dpy2;
    double dpz2;

    double angle;
    double oblique;
};



struct DXFLIB_EXPORT DL_DimRadialData {
    DL_DimRadialData(double ddpx, double ddpy, double ddpz, double dleader) {
        dpx = ddpx;
        dpy = ddpy;
        dpz = ddpz;

        leader = dleader;
    }

    double dpx;
    double dpy;
    double dpz;

    double leader;
};



struct DXFLIB_EXPORT DL_DimDiametricData {
    DL_DimDiametricData(double ddpx, double ddpy, double ddpz, double dleader) {
        dpx = ddpx;
        dpy = ddpy;
        dpz = ddpz;

        leader = dleader;
    }

    double dpx;
    double dpy;
    double dpz;

    double leader;
};



struct DXFLIB_EXPORT DL_DimAngular2LData {
    DL_DimAngular2LData(double ddpx1, double ddpy1, double ddpz1,
                      double ddpx2, double ddpy2, double ddpz2,
                      double ddpx3, double ddpy3, double ddpz3,
                      double ddpx4, double ddpy4, double ddpz4) {

        dpx1 = ddpx1;
        dpy1 = ddpy1;
        dpz1 = ddpz1;

        dpx2 = ddpx2;
        dpy2 = ddpy2;
        dpz2 = ddpz2;

        dpx3 = ddpx3;
        dpy3 = ddpy3;
        dpz3 = ddpz3;

        dpx4 = ddpx4;
        dpy4 = ddpy4;
        dpz4 = ddpz4;
    }

    double dpx1;
    double dpy1;
    double dpz1;

    double dpx2;
    double dpy2;
    double dpz2;

    double dpx3;
    double dpy3;
    double dpz3;

    double dpx4;
    double dpy4;
    double dpz4;
};



struct DXFLIB_EXPORT DL_DimAngular3PData {
    DL_DimAngular3PData(double ddpx1, double ddpy1, double ddpz1,
                        double ddpx2, double ddpy2, double ddpz2,
                        double ddpx3, double ddpy3, double ddpz3) {

        dpx1 = ddpx1;
        dpy1 = ddpy1;
        dpz1 = ddpz1;

        dpx2 = ddpx2;
        dpy2 = ddpy2;
        dpz2 = ddpz2;

        dpx3 = ddpx3;
        dpy3 = ddpy3;
        dpz3 = ddpz3;
    }

    double dpx1;
    double dpy1;
    double dpz1;

    double dpx2;
    double dpy2;
    double dpz2;

    double dpx3;
    double dpy3;
    double dpz3;
};



struct DXFLIB_EXPORT DL_DimOrdinateData {
    DL_DimOrdinateData(double ddpx1, double ddpy1, double ddpz1,
                       double ddpx2, double ddpy2, double ddpz2,
                       bool dxtype) {

        dpx1 = ddpx1;
        dpy1 = ddpy1;
        dpz1 = ddpz1;

        dpx2 = ddpx2;
        dpy2 = ddpy2;
        dpz2 = ddpz2;

        xtype = dxtype;
    }

    double dpx1;
    double dpy1;
    double dpz1;

    double dpx2;
    double dpy2;
    double dpz2;

    bool xtype;
};



struct DXFLIB_EXPORT DL_LeaderData {
    DL_LeaderData(int arrowHeadFlag,
                  int leaderPathType,
                  int leaderCreationFlag,
                  int hooklineDirectionFlag,
                  int hooklineFlag,
                  double textAnnotationHeight,
                  double textAnnotationWidth,
                  int number,
                  double dimScale = 1.0) :
        arrowHeadFlag(arrowHeadFlag),
        leaderPathType(leaderPathType),
        leaderCreationFlag(leaderCreationFlag),
        hooklineDirectionFlag(hooklineDirectionFlag),
        hooklineFlag(hooklineFlag),
        textAnnotationHeight(textAnnotationHeight),
        textAnnotationWidth(textAnnotationWidth),
        number(number),
        dimScale(dimScale) {

    }

    int arrowHeadFlag;
    int leaderPathType;
    int leaderCreationFlag;
    int hooklineDirectionFlag;
    int hooklineFlag;
    double textAnnotationHeight;
    double textAnnotationWidth;
    int number;
    double dimScale;
};



struct DXFLIB_EXPORT DL_LeaderVertexData {
    DL_LeaderVertexData(double px=0.0, double py=0.0, double pz=0.0) {
        x = px;
        y = py;
        z = pz;
    }

    double x;
    double y;
    double z;
};



struct DXFLIB_EXPORT DL_HatchData {
    DL_HatchData() {}

    DL_HatchData(int numLoops,
                 bool solid,
                 double scale,
                 double angle,
                 const std::string& pattern,
                 double originX = 0.0,
                 double originY = 0.0) :
        numLoops(numLoops),
        solid(solid),
        scale(scale),
        angle(angle),
        pattern(pattern),
        originX(originX),
        originY(originY) {

    }

    int numLoops;
    bool solid;
    double scale;
    double angle;
    std::string pattern;
    double originX;
    double originY;
};



struct DXFLIB_EXPORT DL_HatchLoopData {
    DL_HatchLoopData() {}
    DL_HatchLoopData(int hNumEdges) {
        numEdges = hNumEdges;
    }

    int numEdges;
};



struct DXFLIB_EXPORT DL_HatchEdgeData {
    DL_HatchEdgeData() : defined(false), x1(0.0), y1(0.0), x2(0.0), y2(0.0) {
    }

    DL_HatchEdgeData(double x1, double y1,
                     double x2, double y2) :
        defined(true),
        type(1),
        x1(x1),
        y1(y1),
        x2(x2),
        y2(y2) {
    }

    DL_HatchEdgeData(double cx, double cy,
                     double radius,
                     double angle1, double angle2,
                     bool ccw) :
        defined(true),
        type(2),
        cx(cx),
        cy(cy),
        radius(radius),
        angle1(angle1),
        angle2(angle2),
        ccw(ccw) {
    }

    DL_HatchEdgeData(double cx, double cy,
                     double mx, double my,
                     double ratio,
                     double angle1, double angle2,
                     bool ccw) :
        defined(true),
        type(3),
        cx(cx),
        cy(cy),
        angle1(angle1),
        angle2(angle2),
        ccw(ccw),
        mx(mx),
        my(my),
        ratio(ratio) {
    }

    DL_HatchEdgeData(unsigned int degree,
                     bool rational,
                     bool periodic,
                     unsigned int nKnots,
                     unsigned int nControl,
                     unsigned int nFit,
                     const std::vector<double>& knots,
                     const std::vector<std::vector<double> >& controlPoints,
                     const std::vector<std::vector<double> >& fitPoints,
                     const std::vector<double>& weights,
                     double startTangentX,
                       double startTangentY,
                       double endTangentX,
                       double endTangentY) :
        defined(true),
        type(4),
        degree(degree),
        rational(rational),
        periodic(periodic),
        nKnots(nKnots),
        nControl(nControl),
        nFit(nFit),
        controlPoints(controlPoints),
        knots(knots),
        weights(weights),
        fitPoints(fitPoints),
        startTangentX(startTangentX),
        startTangentY(startTangentY),
        endTangentX(endTangentX),
        endTangentY(endTangentY) {
    }

    bool defined;

    int type;

    // line edges:

    double x1;
    double y1;
    double x2;
    double y2;

    double cx;
    double cy;
    double radius;
    double angle1;
    double angle2;
    bool ccw;

    double mx;
    double my;
    double ratio;


    unsigned int degree;
    bool rational;
    bool periodic;
    unsigned int nKnots;
    unsigned int nControl;
    unsigned int nFit;

    std::vector<std::vector<double> > controlPoints;
    std::vector<double> knots;
    std::vector<double> weights;
    std::vector<std::vector<double> > fitPoints;

    double startTangentX;
    double startTangentY;

    double endTangentX;
    double endTangentY;

    std::vector<std::vector<double> > vertices;
    //bool closed;
};



struct DXFLIB_EXPORT DL_ImageData {
    DL_ImageData(const std::string& iref,
                 double iipx, double iipy, double iipz,
                 double iux, double iuy, double iuz,
                 double ivx, double ivy, double ivz,
                 int iwidth, int iheight,
                 int ibrightness, int icontrast, int ifade) {
        ref = iref;
        ipx = iipx;
        ipy = iipy;
        ipz = iipz;
        ux = iux;
        uy = iuy;
        uz = iuz;
        vx = ivx;
        vy = ivy;
        vz = ivz;
        width = iwidth;
        height = iheight;
        brightness = ibrightness;
        contrast = icontrast;
        fade = ifade;
    }

    std::string ref;
    double ipx;
    double ipy;
    double ipz;
    double ux;
    double uy;
    double uz;
    double vx;
    double vy;
    double vz;
    int width;
    int height;
    int brightness;
    int contrast;
    int fade;
};



struct DXFLIB_EXPORT DL_ImageDefData {
    DL_ImageDefData(const std::string& iref,
                 const std::string& ifile) {
        ref = iref;
        file = ifile;
    }

    std::string ref;

    std::string file;
};



struct DXFLIB_EXPORT DL_DictionaryData {
    DL_DictionaryData(const std::string& handle) : handle(handle) {}
    std::string handle;
};



struct DXFLIB_EXPORT DL_DictionaryEntryData {
    DL_DictionaryEntryData(const std::string& name, const std::string& handle) :
        name(name), handle(handle) {}

    std::string name;
    std::string handle;
};

#endif

// EOF
```

6.7 dl_exception.h

```
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```

```

#ifndef DL_EXCEPTION_H
#define DL_EXCEPTION_H

#include "dl_global.h"

#if _MSC_VER > 1000
#pragma once
#endif // _MSC_VER > 1000

class DXFLIB_EXPORT DL_Exception {}
;

class DXFLIB_EXPORT DL_NullStrExc : public DL_Exception {}
;

class DXFLIB_EXPORT DL_GroupCodeExc : public DL_Exception {
    DL_GroupCodeExc(int gc=0) : groupCode(gc) {}
    int groupCode;
};
#endif

```

6.8 dl_extrusion.h

```
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**********************************************************************/

#ifndef DL_EXTRUSION_H
#define DL_EXTRUSION_H

#include "dl_global.h"

#include <math.h>


class DXFLIB_EXPORT DL_Extrusion {

public:

    DL_Extrusion() {
        direction = new double[3];
        setDirection(0.0, 0.0, 1.0);
        setElevation(0.0);
    }


    ~DL_Extrusion() {
        delete[] direction ;
    }


    DL_Extrusion(double dx, double dy, double dz, double elevation) {
        direction = new double[3];
        setDirection(dx, dy, dz);
        setElevation(elevation);
    }



    void setDirection(double dx, double dy, double dz) {
        direction[0]=dx;
        direction[1]=dy;
        direction[2]=dz;
    }



    double* getDirection() const {
        return direction;
    }



    void getDirection(double dir[]) const {
        dir[0]=direction[0];
        dir[1]=direction[1];
        dir[2]=direction[2];
    }



    void setElevation(double elevation) {
        this->elevation = elevation;
    }



    double getElevation() const {
        return elevation;
    }



    DL_Extrusion operator = (const DL_Extrusion& extru) {
        setDirection(extru.direction[0], extru.direction[1], extru.direction[2]);
        setElevation(extru.elevation);

        return *this;
    }



private:
    double *direction;
    double elevation;
};

#endif

```

6.9 dl_global.h

```
#if defined(DXFLIB_DLL)
#   ifdef _WIN32
#       if defined(DXFLIB_LIBRARY)
#           define DXFLIB_EXPORT __declspec(dllexport)
#       else
#           define DXFLIB_EXPORT __declspec(dllimport)
#       endif
#   else
#       define DXFLIB_EXPORT
#   endif
#else
#   define DXFLIB_EXPORT
#endif
```

6.10 dl_writer.h

```
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**********************************************************************/

#ifndef DL_WRITER_H
#define DL_WRITER_H

#include "dl_global.h"

#ifndef _WIN32
#include <strings.h>
#endif

#if _MSC_VER > 1000
#pragma once
#endif // _MSC_VER > 1000

#include <cstring>
#include <iostream>
#include <algorithm>

#include "dl_attributes.h"
#include "dl_codes.h"



class DXFLIB_EXPORT DL_Writer {
public:
    DL_Writer(DL_Codes::version version) : m_handle(0x30) {
        this->version = version;
        modelSpaceHandle = 0;
        paperSpaceHandle = 0;
        paperSpace0Handle = 0;
    }

    virtual ~DL_Writer() {}
    ;

    void section(const char* name) const {
        dxfString(0, "SECTION");
        dxfString(2, name);
    }

    void sectionHeader() const {
        section("HEADER");
    }

    void sectionTables() const {
        section("TABLES");
    }

    void sectionBlocks() const {
        section("BLOCKS");
    }

    void sectionEntities() const {
        section("ENTITIES");
    }

    void sectionClasses() const {
        section("CLASSES");
    }

    void sectionObjects() const {
        section("OBJECTS");
    }

    void sectionEnd() const {
        dxfString(0, "ENDSEC");
    }

    void table(const char* name, int num, int h=0) const {
        dxfString(0, "TABLE");
        dxfString(2, name);
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            }
            else {
                dxfHex(5, h);
            }
            dxfString(100, "AcDbSymbolTable");
        }
        dxfInt(70, num);
    }

    void tableLayers(int num) const {
        table("LAYER", num, 2);
    }

    void tableLinetypes(int num) const {
        //linetypeHandle = 5;
        table("LTYPE", num, 5);
    }

    void tableAppid(int num) const {
        table("APPID", num, 9);
    }

    void tableStyle(int num) const {
        table("STYLE", num, 3);
    }

    void tableEnd() const {
        dxfString(0, "ENDTAB");
    }

    void dxfEOF() const {
        dxfString(0, "EOF");
    }

    void comment(const char* text) const {
        dxfString(999, text);
    }

    void entity(const char* entTypeName) const {
        dxfString(0, entTypeName);
        if (version>=DL_VERSION_2000) {
            handle();
        }
    }

    void entityAttributes(const DL_Attributes& attrib) const {

        // layer name:
        dxfString(8, attrib.getLayer());

        // R12 doesn't accept BYLAYER values. The value has to be missing
        //   in that case.
        if (version>=DL_VERSION_2000 || attrib.getColor()!=256) {
            dxfInt(62, attrib.getColor());
        }
        if (version>=DL_VERSION_2000 && attrib.getColor24()!=-1) {
            dxfInt(420, attrib.getColor24());
        }
        if (version>=DL_VERSION_2000) {
            dxfInt(370, attrib.getWidth());
        }
        if (version>=DL_VERSION_2000) {
            dxfReal(48, attrib.getLinetypeScale());
        }
        std::string linetype = attrib.getLinetype();
        std::transform(linetype.begin(), linetype.end(), linetype.begin(), ::toupper);
        if (version>=DL_VERSION_2000 || linetype=="BYLAYER") {
            dxfString(6, attrib.getLinetype());
        }
    }

    void subClass(const char* sub) const {
        dxfString(100, sub);
    }

    void tableLayerEntry(unsigned long int h=0)  const {
        dxfString(0, "LAYER");
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            } else {
                dxfHex(5, h);
            }
            dxfString(100, "AcDbSymbolTableRecord");
            dxfString(100, "AcDbLayerTableRecord");
        }
    }

    void tableLinetypeEntry(unsigned long int h=0)  const {
        dxfString(0, "LTYPE");
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            } else {
                dxfHex(5, h);
            }
            //dxfHex(330, 0x5);
            dxfString(100, "AcDbSymbolTableRecord");
            dxfString(100, "AcDbLinetypeTableRecord");
        }
    }

    void tableAppidEntry(unsigned long int h=0)  const {
        dxfString(0, "APPID");
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            } else {
                dxfHex(5, h);
            }
            //dxfHex(330, 0x9);
            dxfString(100, "AcDbSymbolTableRecord");
            dxfString(100, "AcDbRegAppTableRecord");
        }
    }

    void sectionBlockEntry(unsigned long int h=0)  const {
        dxfString(0, "BLOCK");
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            } else {
                dxfHex(5, h);
            }
            //dxfHex(330, blockHandle);
            dxfString(100, "AcDbEntity");
            if (h==0x1C) {
                dxfInt(67, 1);
            }
            dxfString(8, "0");                 // TODO: Layer for block
            dxfString(100, "AcDbBlockBegin");
        }
    }

    void sectionBlockEntryEnd(unsigned long int h=0)  const {
        dxfString(0, "ENDBLK");
        if (version>=DL_VERSION_2000) {
            if (h==0) {
                handle();
            } else {
                dxfHex(5, h);
            }
            //dxfHex(330, blockHandle);
            dxfString(100, "AcDbEntity");
            if (h==0x1D) {
                dxfInt(67, 1);
            }
            dxfString(8, "0");                 // TODO: Layer for block
            dxfString(100, "AcDbBlockEnd");
        }
    }

    void color(int col=256) const {
        dxfInt(62, col);
    }
    void linetype(const char *lt) const {
        dxfString(6, lt);
    }
    void linetypeScale(double scale) const {
        dxfReal(48, scale);
    }
    void lineWeight(int lw) const {
        dxfInt(370, lw);
    }

    void coord(int gc, double x, double y, double z=0) const {
        dxfReal(gc, x);
        dxfReal(gc+10, y);
        dxfReal(gc+20, z);
    }

    void coordTriplet(int gc, const double* value) const {
        if (value) {
            dxfReal(gc, *value++);
            dxfReal(gc+10, *value++);
            dxfReal(gc+20, *value++);
        }
    }

    void resetHandle() const {
        m_handle = 1;
    }

    unsigned long handle(int gc=5) const {
        // handle has to be hex
        dxfHex(gc, m_handle);
        return m_handle++;
    }

    unsigned long getNextHandle() const {
        return m_handle;
    }

    virtual void dxfReal(int gc, double value) const = 0;

    virtual void dxfInt(int gc, int value) const = 0;

    virtual void dxfBool(int gc, bool value) const {
        dxfInt(gc, (int)value);
    }

    virtual void dxfHex(int gc, int value) const = 0;

    virtual void dxfString(int gc, const char* value) const = 0;

    virtual void dxfString(int gc, const std::string& value) const = 0;

protected:
    mutable unsigned long m_handle;
    mutable unsigned long modelSpaceHandle;
    mutable unsigned long paperSpaceHandle;
    mutable unsigned long paperSpace0Handle;

    DL_Codes::version version;
private:
};

#endif
```

6.11 dl_writer_ascii.h

```
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**********************************************************************/

#ifndef DL_WRITER_ASCII_H
#define DL_WRITER_ASCII_H

#include "dl_global.h"

#if _MSC_VER > 1000
#pragma once
#endif // _MSC_VER > 1000

#include "dl_writer.h"
#include <fstream>
#include <string>
```

```

class DXFLIB_EXPORT DL_WriterA : public DL_Writer {
public:
    DL_WriterA(const char* fname, DL_Codes::version version=DL_VERSION_2000)
            : DL_Writer(version), m_ofile(fname) {}
    virtual ~DL_WriterA() {}

    bool openFailed() const;
    void close() const;
    void dxfReal(int gc, double value) const;
    void dxfInt(int gc, int value) const;
    void dxfHex(int gc, int value) const;
    void dxfString(int gc, const char* value) const;
    void dxfString(int gc, const std::string& value) const;

    static void strReplace(char* str, char src, char dest);

private:
    mutable std::ofstream m_ofile;

};

#endif

```

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