ATTRAIBUTES
This category is parent of all other categories in the DDLm dictionary.

ALIAS
The attributes used to specify the aliased names of definitions.

_alias.definition_id (Tag)
Identifier tag of an aliased definition.

_alias.deprecation_date (Date)
Date that the aliased tag was deprecated as a definition tag.

_alias.dictionary_uri (Uri)
Dictionary URI in which the aliased definition belongs.

CATEGORY
The attributes used to specify the properties of a 'category' of data items.

_category.key_id (Tag)
Tag of a single data item in a Loop category which is the generic key to access other items in the category. The value of this item must be unique in order to provide unambiguous access to a packet (row) in the table of values. This may be assumed to be a function of the datanames listed in _category_key.name.

CATEGORY KEY
The attributes used to specify (possibly multiple) keys for a given category.

_category_key.name (Tag)
A minimal list of tag(s) that together constitute a compound key to access other items in a Loop category. In other words, the combined values of the datanames listed in this loop must be unique, so that unambiguous access to a packet (row) in the table of values is possible. The dataname associated with _category.key_id is only included in this loop if no other set of datanames can form a compound key.

DEFINITION
The attributes for classifying dictionary definitions.

_definition.class (Code)
The nature and the function of a definition or definitions.
The data value must be one of the following:
  Attribute Item used as an attribute in the definition of other data items in DDLm dictionaries. These items never appear in data instance files.
  Functions Category of items that are transient function definitions used only in dREL methods scripts. These items never appear in data instance files.
  Datum Item defined in a domain-specific dictionary. These items appear only in data instance files.
  Head Category of items that is the parent of all other categories in the dictionary.
  Loop Category of items that in a data file must reside in a loop-list with a key item defined.
  Set Category of items that form a set (but not a loopable list). These items may be referenced as a class of items in a dREL methods expression.
  Ref-loop A category containing one item that identifies the a category of items that is repeated in a sequence of save frames. The item, which is specified as a as a Ref-table value (see type.container), is looped. This construction is for loop categories that contain child categories. If in the instance file, the child items have only one set of values, the Ref-loop item need not be used and child items need not be placed in a save frame.

_definition.id (Code)
Identifier name of the Item or Category definition contained within a save frame.

_definition.scope (Code)
The extent to which a definition affects other definitions.
The data value must be one of the following:
  Dictionary applies to all defined items in the dictionary
  Category applies to all defined items in the category
  Item applies to a single item definition

_definition.update (Date)
The date that a definition was last changed.

_definition.xref_code (Code)
Code identifying the equivalent definition in the dictionary referenced by the DICTIONARY_XREF attributes.

DEFINITION_REPLACED
Attributes used to describe deprecated and replaced definitions.

_definition_replaced.id (Code)
An opaque identifier for the replacement.

_definition_replaced.by (Tag)
Name of the data item that should be used instead of the defined data item. The defined data item is deprecated and should not be used.
**Description**

The attributes of descriptive (non-machine parsable) parts of definitions.

- **_description.common** *(Text)*
  Commonly-used identifying name for the item.

- **_description.key_words** *(Text)*
  List of key-words categorising the item.

- **_description.text** *(Text)*
  The text description of the defined item.

**Description_example**

The attributes of descriptive (non-machine parsable) examples of values of the defined items.

- **_description_example.case** *(Implied)*
  An example case of the defined item. Instances of this data item inherit the container, content and purpose type constraints of the defining item.

- **_description_example.detail** *(Text)*
  A description of an example case for the defined item.

**Dictionary**

Attributes for identifying and registering the dictionary. The items in this category are **not** used as attributes of INDIVIDUAL data items.

- **_dictionary.class** *(Code)*
  The nature, or field of interest, of data items defined in the dictionary.

  The data value must be one of the following:
  - Reference
  - Instance
  - Template
  - Function

- **_dictionary.date** *(Date)*
  The date that the last dictionary revision took place.

- **_dictionary.ddl_conformance** *(Version)*
  The version number of the DDL dictionary that this dictionary conforms to.

- **_dictionary.formalism** *(Text)*
  The definitions contained in this dictionary are associated with the value of this attribute. Datanames may only be redefined if the value of this attribute is also changed, and any such redefinitions must include the original behaviour as a particular case.

- **_dictionary.namespace** *(Code)*
  The namespace code that may be prefixed (with a trailing colon ‘:’) to an item tag defined in the defining dictionary when used in particular applications. Because tags must be unique, namespace codes are unlikely to be used in data files.

- **_dictionary.title** *(Code)*
  The common title of the dictionary. Will usually match the name attached to the data_statement of the dictionary file.

**Dictionary_audit**

Attributes for identifying and registering the dictionary. The items in this category are **not** used as attributes of individual data items.

- **_dictionary_audit.date** *(Date)*
  The date of each dictionary revision.

- **_dictionary_audit.revision** *(Text)*
  A description of the revision applied for the _dictionary_audit.version.

- **_dictionaryAudit.version** *(Version)*
  A unique version identifier for each revision of the dictionary.

**Dictionary_valid**

Data items which are used to specify the contents of definitions in the dictionary in terms of the _definition.scope and the required and prohibited attributes.

- **_dictionary_valid.application** *(Code[2]*
  Provides the information identifying the definition scope (from the _definition.scope enumeration list) and the validity options (from the _dictionary_valid.option enumeration list), as a two element list. This list signals the validity of applying the attributes given in _dictionary_valid.attributes.

- **_dictionary_valid.attributes** *(Code[])*
  A list of the attribute names and categories that are assessed for application in the item, category and dictionary definitions.

- **_dictionary_valid.option** *(Code[])*
  Option codes for applicability of attributes in definitions.

- **_dictionary_valid.scope** *(Code[])*
  The scope to which the specified restriction on usable attributes applies.

**Dictionary_xref**

Data items which are used to cross reference other dictionaries that have defined the same data items. Data items in this category are **not** used as attributes of individual data items.

- **_dictionary_xref.code** *(Code)*
  A code identifying the cross-referenced dictionary.

- **_dictionary_xref.date** *(Date)*
  Date of the cross-referenced dictionary.
**ENUMERATION**
The attributes for restricting the values of defined data items.

_inside_set.def_index_id_ (Tag)
Specifies the data name with a value used as an index to the
DEFAULT enumeration list (in category ENUMERATION_DEFAULT)
in order to select the default enumeration value for the defined
item. The value of the identified data item must match one of the
_inside_default.def_index_id_ values.

_inside_default.def_index_id_ (Implied)
The default value for the defined item if it is not specified explicitly.

_inside.mandatory_ (Code)
Yes or No flag on whether the enumerate states specified for an
item in the current definition (in which item appears) must be used
on instantiation.
The data value must be one of the following:
Yes Use of state is mandatory
No Use of state is unnecessary

_inside.range_ (Range)
The inclusive range of values ‘from:to’ allowed for the defined
item. If items have associated SU, the reported value may fall out-
side these limits.

**ENUMERATION_DEFAULT**
Loop of pre-determined default enumeration values indexed to a
data item by the item _inside.def_index_id_.

_CATEGORY_KEY_ (_inside.def_index_id_) (Code)
Index key in the list default values referenced to by the value of
_inside.default.def_index_id_.

_inside.default.def_index_id_ (Code)
Default enumeration value in the list referenced by the value of
_inside.default.def_index_id_. The reference index key is given by the
value of _inside.default.def_index_id_ value.

**ENUMERATION_SET**
Attributes of data items which are used to define a set of unique
pre-determined values.

_CATEGORY_KEY_ (_inside.set.state_) (Text)
The meaning of the code (identified by _inside.set.state_) in terms of the value of the quantity it describes.

_inside.set.state_ (Text)
Permitted value state for the defined item.
**DATA_DICTIONARIES**

**_import_details.order**

(order, Integer)

The order in which the import described by the referenced row should be executed.

**_import_details.single**

(Text)

A Table mapping attributes defined individually in category IMPORT to their values; used to import definitions from other dictionaries.

**_import_details.single_index**

(Code)

One of the indices permitted in the entries of values of attribute _import_details.single.

The data value must be one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>URI of source dictionary</td>
</tr>
<tr>
<td>version</td>
<td>version of source dictionary</td>
</tr>
<tr>
<td>save</td>
<td>save framecode of source definition</td>
</tr>
<tr>
<td>mode</td>
<td>mode for including save frames</td>
</tr>
<tr>
<td>dupl</td>
<td>option for duplicate entries</td>
</tr>
<tr>
<td>miss</td>
<td>option for missing duplicate entries</td>
</tr>
</tbody>
</table>

**_type.container**

(Code)

The CONTAINER type of the defined data item value. ‘Implied’ may only be used in an attribute dictionary for attributes whose types are linked to the values of other attributes.

The data value must be one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>single value</td>
</tr>
<tr>
<td>Multiple</td>
<td>values as List or by boolean</td>
</tr>
<tr>
<td>List</td>
<td>ordered set of values. Elements need not be of same content type.</td>
</tr>
<tr>
<td>Array</td>
<td>ordered set of numerical values. Operations across arrays are equivalent to operations across elements of the Array.</td>
</tr>
<tr>
<td>Matrix</td>
<td>ordered set of numerical values for a tensor. Tensor operations such as dot and cross products, are valid cross matrix objects. A matrix with a single dimension is interpreted as a row or column vector as required.</td>
</tr>
<tr>
<td>Table</td>
<td>An unordered set of id:value elements</td>
</tr>
<tr>
<td>Implied</td>
<td>(For use in the attribute dictionary only). Determined by the values of other attributes.</td>
</tr>
</tbody>
</table>

**_type.contents**

(Code)

Syntax of the value elements within the container type. This may be a single enumerated code, or, in the case of a list, a comma-delimited sequence of codes, or, if there are alternate types, a boolean-linked (or range) sequence of codes. The typing of elements is determined by the replication of the minimum set of states declared. Where the definition is of a ‘Table’ container this attribute describes the construction of the value elements within those (Table) values. The CIF2 characterset referenced below consists of the following Unicode code points:


Two ‘case insensitive’ strings are considered identical when they match under the Unicode canonical caseless matching algorithm. In all cases, ‘whitespace’ refers to ASCII whitespace only, that is U+0009, U+000A, U+000D and U+0020. Note that descriptions of text syntax are relevant only to those formats that encode data values as text.

The data value must be one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text</td>
<td>case-sensitive sequence of CIF2 characters</td>
</tr>
<tr>
<td>Code</td>
<td>case-insensitive sequence of CIF2 characters containing no ASCII whitespace</td>
</tr>
<tr>
<td>Name</td>
<td>case-insensitive sequence of ASCII alpha-numeric characters or underscore</td>
</tr>
<tr>
<td>Tag</td>
<td>case-insensitive CIF2 character sequence with leading underscore and no ASCII whitespace</td>
</tr>
<tr>
<td>Uri</td>
<td>A Uniform Resource Identifier per RFC 3986</td>
</tr>
<tr>
<td>Date</td>
<td>ISO standard date format (yyyyy)-&lt;mm&gt;-&lt;dd&gt;</td>
</tr>
<tr>
<td>Date/Time</td>
<td>A timestamp. Text formats must use date-time or full-date productions of RFC3339 ABNF</td>
</tr>
<tr>
<td>Version</td>
<td>version digit string of the form (major).&lt;version&gt;.&lt;update&gt;</td>
</tr>
<tr>
<td>Dimension</td>
<td>Size of an Array/Matrix/List expressed as a text string. The text string itself consists of zeros or more non-negative integers separated by commas placed within bounding square brackets. Empty square brackets represent a list of unknown size</td>
</tr>
<tr>
<td>Range</td>
<td>inclusive range of numerical values min:max</td>
</tr>
<tr>
<td>Count</td>
<td>unsigned integer number (deprecated)</td>
</tr>
<tr>
<td>Index</td>
<td>unsigned non-zero integer number (deprecated)</td>
</tr>
<tr>
<td>Integer</td>
<td>positive or negative integer number</td>
</tr>
<tr>
<td>Real</td>
<td>floating-point real number</td>
</tr>
<tr>
<td>Imag</td>
<td>floating-point imaginary number</td>
</tr>
<tr>
<td>Complex</td>
<td>a complex number</td>
</tr>
</tbody>
</table>
The value of the _definition.id attribute of an attribute definition whose type is to be used also as the type of this item. Meaningful only when this item's _type.contents attribute has value 'ByReference'.

_type.dimension

The dimensions of a list or matrix of elements expressed as a text string. A Matrix with a single dimension is interpreted as a vector.

_type.indices

Used to specify the syntax construction of indices of the entries in the defined object when the defined object has 'Table' as its _type.container attribute. Values are a subset of the codes and constructions defined for attribute _type.contents, accounting for the fact that syntactically, indices are always case-sensitive quoted strings. Meaningful only when the defined item has _type.container 'Table'. See the definition for _type.contents for the character set definition.

_type.indices_referenced_id

The _definition.id attribute of a definition whose type describes the form and construction of the indices of entries in values of the present item. Meaningful only when the defined item's _type.container attribute has value 'Table'. and its _type.indices attribute has value 'ByReference'.

_type.purpose

The primary purpose or function the defined data item serves in a dictionary or a specific data instance.

_UNITS

Extend

Used to extend the DDLm Reference Dictionary

Describe

Used to type items with values that are descriptive text intended for human interpretation.

Encode

Used to type items with values that are text or codes that are formatted to be machine parseable.

State

Used to type items with values that are restricted to codes present in their _enumeration_set.state lists.

Key

Used to type an item with a value that is unique within the looped list of these items, and does not contain encoded information.

Link

Used to type an item that acts as a foreign key between two categories. The definition of the item must additionally contain the attribute '_name.linked_item_id' specifying the data name of the item with unique values in the linked category. The values of the defined item are drawn from the set of values in the referenced item. Cross referencing items from the same category is allowed.

Composite

Used to type items with value strings composed of separate parts. These will usually need to be separated and parsed for complete interpretation and application.

Number

Used to type items that are numerical and exact (i.e. no standard uncertainty value).

Measurand

Used to type an item with a numerically estimated value that has been recorded by measurement or derivation. This value must be accompanied by its standard uncertainty (SU) value, expressed either as:

1. appended integers, in parentheses (), at the precision of the trailing digits, or
2. a separately defined item with the same name as the measurand but with an additional suffix '_su'.

SU

Used to type an item with a numerical value that is the standard uncertainty of another data name. The definition of an SU item must include the attribute '_name.linked_item_id' which explicitly identifies the associated measurand item. SU values must be non-negative.

Internal

Used to type items that serve only internal purposes of the dictionary in which they appear. The particular purpose served is not defined by this state.

_TYPE.source

The origin or source of the defined data item, indicating by what recording process it has been added to the domain instance.

_Import

A value (numerical or otherwise) recorded by observation or measurement during the experimental collection of data. This item is primitive.

_Assigned

A value (numerical or otherwise) assigned as part of the data collection, analysis or modelling required for a specific domain instance. These assignments often represent a decision made that determines the course of the experiment (and therefore may be deemed primitive) or a particular choice in the way the data was analysed (and therefore may be considered not primitive).

_Related

A quantity or tag used in the construction of looped lists of data. Typically identifying an item whose unique value is the reference key for a loop category and/or an item which has values in common with those of another loop category and is considered a Link between these lists.

_Derived

A code which identifies the units of measurement.