Variant Design

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Welcome

1.1 Introduction

The 2D parametrics available from *CADdy*$^{++}$ enable you to change contour dimensions, that consist of dimensioned 2D line objects, by changing the individual dimension figures of controlling dimensions.

Variant design in *CADdy*$^{++}$ is based on the 2D parametrics available with *CADdy*$^{++}$ *economy* and above. You can use it to link controlling dimensions with a data source (ODBC link or manual entry).
It enables you to determine and change all controlling dimensions easily, for example, by simply selecting a value from the database.

Furthermore you can save variants in a variant library; insert and edit them as if they were 2D standard parts with different dimensionings.

2 Installation

Install Variant Design when you install *CADdy*$^{++}$ *economy* or *Mechanical Design professional*.

During the installation, select the Variant Design (MVK) line in the list of modules.

3 Creating a Prototype Figure

3.1 General Procedure

A prototype figure is a geometric figure with conditions and controlling dimensions, whose values have been determined from a data source. You can change the figure in the current model by selecting or entering different values for the controlling dimensions.
It can also be saved in a variant library and is then available for inserting into all other models.

To create the prototype for a variant, proceed as follows: - Create and dimension the 2D objects with the 2D commands

- Use the 2D parametric commands to assign conditions and define controlling dimensions
- Create a database table and definition as an ODBC data source

- Link controlling dimensions with the defined data source or with user-defined entries

You can find the procedure for the first two steps in the chapters ***2D Commands*** and ***2D Parametrics***.

The remaining steps are described in the following chapters.

3.2 Creating Database Tables and ODBC Data Sources

Before you can link a controlling dimension with an ODBC data source, the following prerequisites must have been met.

Create Database Table

Before you can link a controlling dimension with an ODBC data source, you need a database table (for example Access, Excel), whose data records are entered in lines, for example:

Type	Length	Width	Radius	Chamfer
1	50	50	10	10
2	100	80	20	15
3	150	120	30	20
4	200	170	40	25
5	250	230	50	30

If you select data records with an SQL query, the table must contain a column that contains unique entries, for example, type or article number.

If you wish to use Excel tables, you must select the area that contains the titles and values and enter a name using the menu command ***Insert, Name, Determine***.

Create ODBC Data Source

After you have created the database table, you must define the ODBC data source:

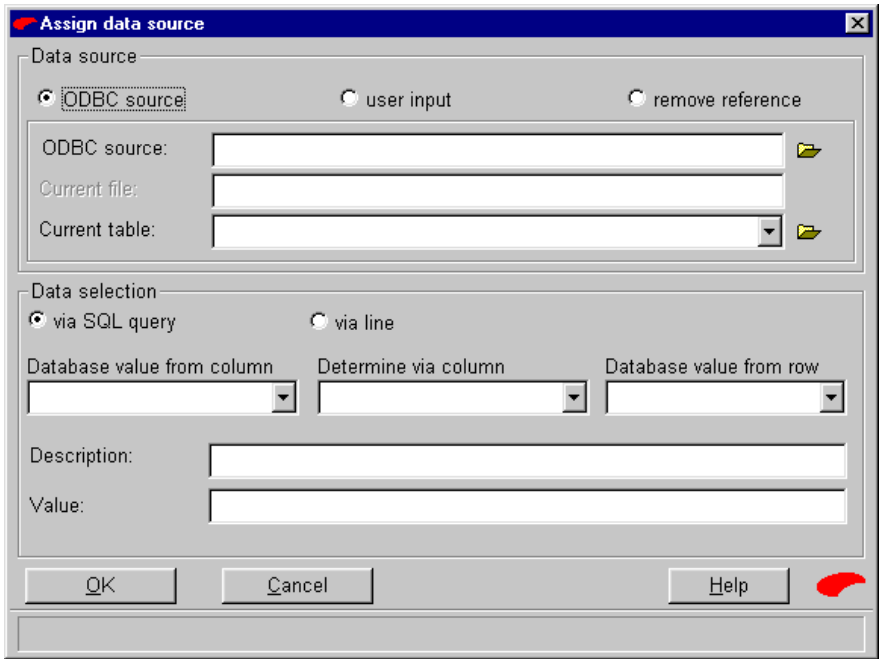
1. In the Windows start menu, call up the command ***Settings, Control panel, ODBC***.
2. In the following dialog window, choose the ***Add*** button.
3. Select the driver name that you wish to use and confirm by choosing ***Finish***.

4. In the ***Data Source Name*** field, enter the name of the data source and supplement this if necessary with a description in the ***Description*** field.
5. Choose ***Select workbook***, select the database table you require and confirm the following entries with ***OK***.

3.3 Link Controlling Dimensions with ODBC Data Sources

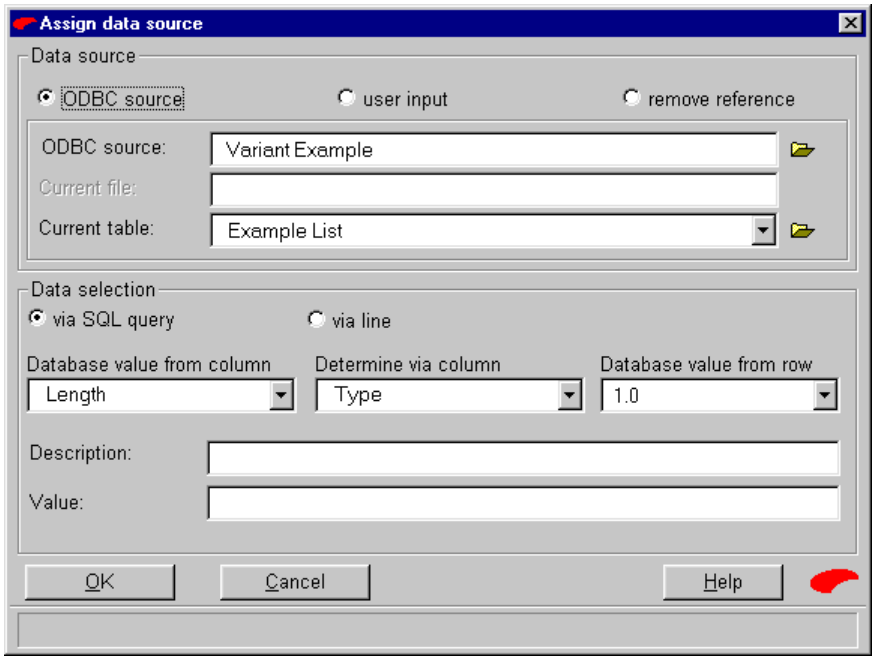
To link controlling dimensions with a previously defined ODBC data source, or to change a link, proceed as follows:

1. Use the menu command ***Insert, Constraints*** to open the ***Constraints*** toolbox.
2.  Use this symbol to choose the ***Define link to data source*** command.
3. Identify the controlling dimension for which you want to determine the link. The system opens the dialog window below:



4.  Choose the ***Select ODBC source*** button.
5. In the following dialog window, open the ***Computer Data Source*** option card.
6. Select the name of the data source you defined previously and confirm with ***OK***.

The system copies the data from the data source (that is, the ODBC source name, database name and one of the tables it contains) to the window, for example:



7.  If the database contains several tables or if the Excel file contains more than one area with a name, choose the symbol pictured here and in the ***Select current table*** list, choose the required table or area.

8. You can either select the data directly by ***via line***, or indirectly by choosing ***via SQL query.*** Choose one of these options to determine the required value from the unique value in another column.
   Note that you can only use one of these options for the prototype figure.

via SQL Query

9. In the ***Data base value from column*** list, choose the column title from which the value for the identified dimension should be determined, for example, the length.

10. In the ***Determine via column*** list, choose the title of the column that contains the unique values, for example, type or article number.

11. Open the ***Data base value from line*** list and choose one of the unique values.
    The system enters the value determined indirectly in the ***Value*** field.

12. In the ***Description*** field, enter a name for the link you have determined. The name must begin with a character. The system does not evaluate the entry now but saves it for future enhancements.
13. Confirm the assignment by choosing ***OK***.

via line

9. In the ***Data base value from column*** list, choose the column title from which the value for the identified dimension should be determined, for example, the length.
10. Open the ***Data base value from line*** list and choose the value required.
    The system enters this value into the ***Value*** field.
11. In the ***Description*** field, enter a description for the link you have determined. The name must begin with a character. The system does not evaluate the entry now but saves it for future enhancements.
12. Confirm the assignment by choosing ***OK***.

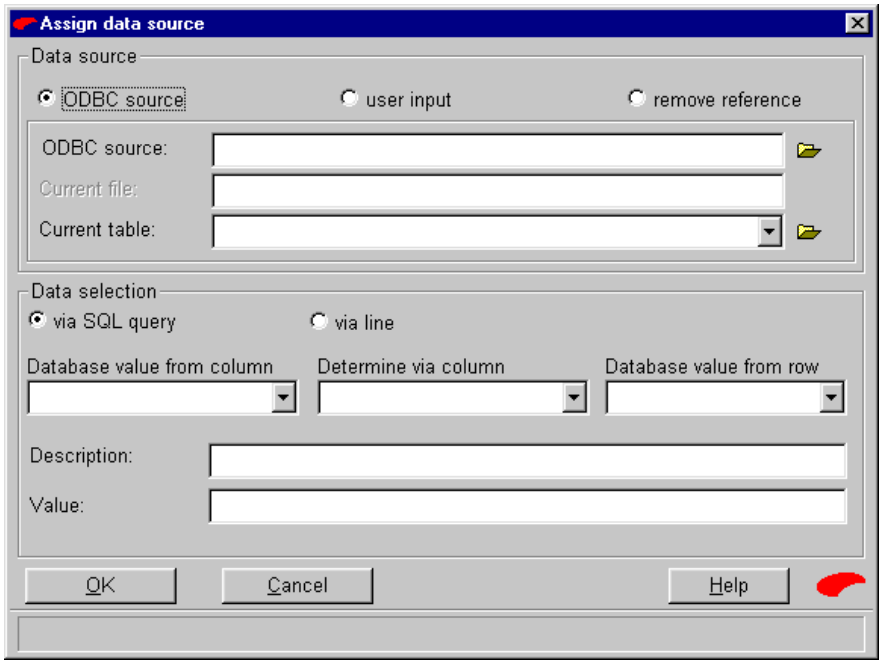
You can continue to link other controlling dimensions with an ODBC data source in this window. Proceed as follows:

1. Identify the controlling dimension.
   If this dimension has not yet been assigned to a data source, or the assignment has been deleted, the data you have just defined remain in the window so that you don't have to repeat all the previous steps.
2. In the ***Data base value from column*** list choose the title of the column from which the value for the identified dimension should be determined.
   The system determines the value from the previously defined line and enters it in the ***Value*** field.
3. If required, enter a new name for the link in the ***Description*** field.
4. Confirm the assignment by choosing ***OK***.

3.4 Link Controlling Dimensions with User Entry

To link controlling dimensions with a user entry, or to change the link, proceed as follows:

1. Choose the menu command ***Insert, Constraints*** and open the ***Conditions*** toolbox.
2.  Use this symbol to choose the ***Define link to data source*** command.
3. Identify the controlling dimension for which you want to determine a link. The following window is displayed:



4. Activate the ***User input*** option.
5. Enter the name of the link you have determined in the ***Description*** field. The name must begin with a character. The system does not evaluate the entry now but saves it for future enhancements.
6. In the ***Value*** field, enter the value of the dimension.
7. Confirm the assignment by choosing ***OK***.

You can link further controlling dimensions with an ODBC data source in the same window. Proceed as follows:

1. Identify the controlling dimension.
   The data you have already defined remains in the window.
2. If required, enter a new name for the link in the ***Description*** field.
3. In the ***Value*** field, enter the value of the dimension.
4. Confirm the assignment by choosing ***OK***.

3.5 Remove Link to Data Source

If you no longer need the links between controlling dimensions and data sources, you can remove them.

Use one of the following procedures:

Action - Selection

1.  In the ***Constraints*** toolbox, choose ***Remove link to data source***.
2. Copy the dimensions you wish to update into the action list.

Selection - Action

1. Copy the dimensions you wish to update into the selection list.
2.  In the ***Constraints*** toolbox, choose ***Remove link to data source***.

The dimensions remain as controlling dimensions and keep the value previously defined by the data source as a constant value.

3.6 Update Controlling Dimension with ODBC Data Source

If you have linked controlling dimensions with an ODBC data source and have changed values in the relevant database table, you can update individual or all controlling dimensions.

Use one of the following procedures:

Action - Selection

1.  In the ***Constraints*** toolbox, choose the ***Update data*** command.
2. Copy the dimensions you wish to update into the action list.

Selection - Action

1. Copy the dimensions you wish to update into the action list.
2.  In the ***Constraints*** toolbox, choose the ***Update data*** command.

Please note:

This command only works on prototype figures and disassembled variants.

4 Use Variants

You can store prototype figures, whose controlling dimensions are linked with data sources, in a variant library.
Regardless of the values that have been stored in the database, this figure is available in various versions with different dimensions, in other words, in variants.

You can select values from the data sources when you insert a variant into the drawing you are working on.

Variants that have been stored as files with extension SYL in the folder for 2D variants, are saved in the variant library and can be searched for there. You can determine this folder using the ***Settings, Folder*** command.
When you select a variant, its name is entered in the ME2DVARI.SEL file. This is an ASCII file whose entries can only be changed with an editor such as NOTEPAD. You can also determine a folder for this file using the ***Settings, Folder*** command.

Variants are managed as objects, in the same way as 2D standard parts. This means that you can give them new dimensions by calling up the ***Process 2D, Edit 2D Standard Parts*** or ***Information, Edit 2D Object*** command.
You can also reassemble the variant into parametric geometry by choosing the ***Process 2D, Disassemble 2D Standard Parts*** command.

Group
When you insert a variant it is embedded in the group you are working on.

Colour, Line Type, Line Width
The objects contained in a variant are linked to layers that are saved in the variant. If the variant contains layers that are also contained in the model, these are used. If the variant contains layers not available in the model, the variant layers are added to the layer structure of the model. The objects in the variant take their display attributes such as colour, line type and width from the layers. You can only change these attributes by changing the layer attributes.

4.1 Save Variant

Once you have defined a prototype figure with conditions, controlling dimensions and their links to data sources, you can save it as a variant in the library.

Proceed as follows:

1. Choose the ***Define, 2D Variant*** menu command.
2. Select all 2D objects and dimensions that you wish to save in the variant.
3. Define the insert point of the variant.
   You should define the insert point on one of the fixed points that have already been defined so that this point agrees with the cursor position when you insert the variant, even if the dimensions have changed.
4.  Choose this button to open the file selection if the ***Variant library*** field does not contain a value.
   Depending on the settings you made in ***Settings, Folder,*** variant libraries are saved and later searched for in the ..\CADDYMA\USER\VAR folder.
5. Select the variant library you require and choose ***Open***.

   If there are no variant libraries in the selection, enter the name of your library in the ***File name*** field and choose ***Open***.
6. Enter the name under which you wish the variant to be saved in the library in the ***Variant name*** field.
7. Confirm your entries by choosing ***OK***.

Please note:

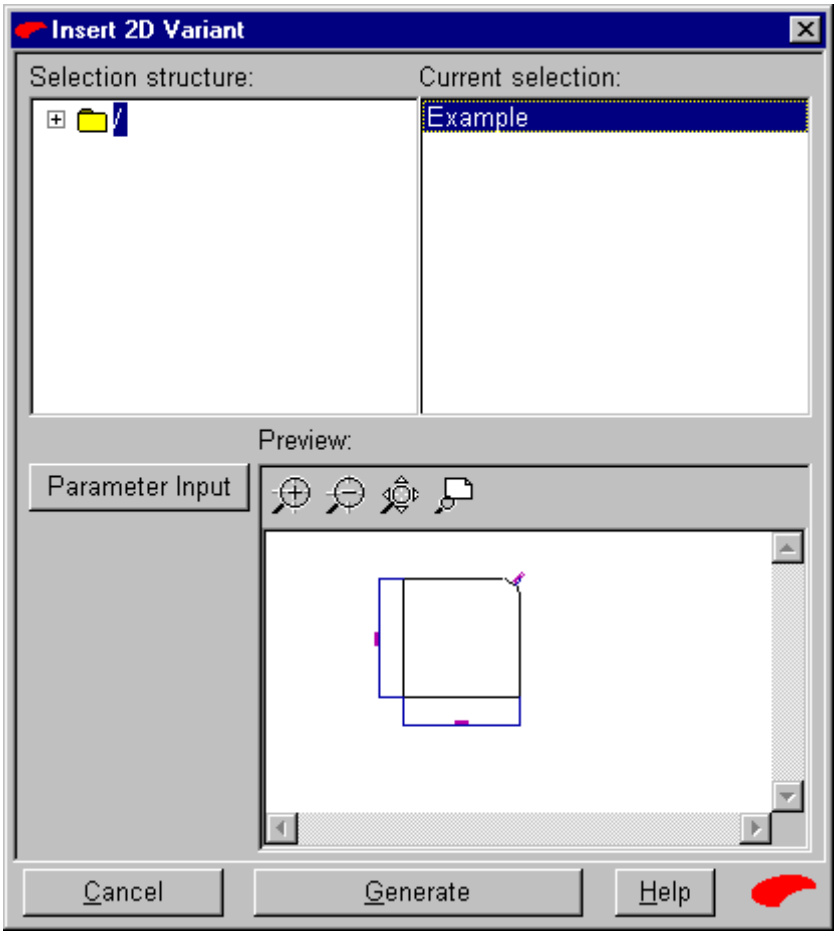
When you save a variant, you can also copy the objects and dimensions you wish to save in the selection list before you call up the ***Define, 2D Variant*** command.

The name of the variant is saved in a file named ME2DVARi.SEL where you can select it later. This file is saved in the folder that you determined under ***Settings, Folder***. In the standard system, this is the folder ..\CADDYMA\USER\SEL. You can only change this file with an editor such as NOTEPAD.

4.2 Insert Variant

To insert a variant in a drawing, proceed as follows:

1. Choose the ***Insert, 2D Variant*** menu command.
   The system displays the following window, for example:



2. Open the structure by choosing the + sign in the left-hand window area.

3. In the central area of the window, choose the name of the variant you wish to insert.

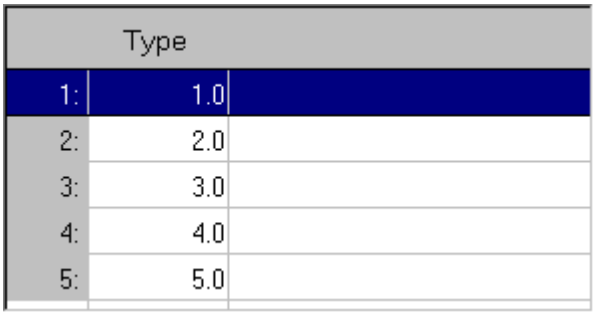
   The system displays a preview in the right-hand area. You can change its display size and position, as well as the horizontal and vertical scroll bars by using the symbols.

4. If the variant is to be inserted with the values that it contained when it was last saved, confirm by choosing ***OK***. Use your insert point to define the position of the variant.

   If you wish to choose other values, choose ***Input parameter***.

via SQL Query

If you defined the values using ***via SQL query***, the system displays a window where you can choose the unique values from the index column, for example:



	Type
1:	1.0
2:	2.0
3:	3.0
4:	4.0
5:	5.0

via line

If you determine values using a line, the system displays a window where you can choose the possible value records.

5. Choose the line you require in the window and confirm by choosing ***OK.***
6. If you didn't link the controlling dimensions to an ODBC data source but linked them with user-defined entries, a window is displayed where you can enter your values.

   Enter the values you require and confirm by choosing ***OK***.
7. Confirm your selection by choosing ***OK*** and use the insert point to define the position of the variant.

4.3 Edit Variant

If you have inserted a saved variant into a drawing, you can replace it with another version.

1.  , 

Choose these symbols to call up the ***Process 2D, Edit 2D Standard Parts*** commands.
2. Identify the variant you wish to process.
   The system displays the dialog window which you use to insert a variant.
3. Choose ***Input Parameter***.

Proceed in the same way as for inserting a variant.

4.4 Disassemble Variant

You can disassemble variants that you have inserted into drawings. This will re-display the parametric objects, conditions and dimensions contained in the variant.

1.  Start the command ***Disassemble 2D object*** witj the dispayed icon.

2. Identify the variant you wish to disassemble.

When you disassemble a variant, the system creates a group with the name *2D Variant* within the group in which the variant was inserted. This group contains the objects that re-appear once the variant has been disassembled.

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