

## CAD Enabled Product Configurator

Knowledge Based Engineering (KBE) is a science of linking product Know-How with CAD. It is based on systematic capture and implementation of knowledge. KBE focuses on the design process and indirectly ensures that the result – design automation is met.

Because of focus on process, it allows to continuously change the models, rules, validations, formats, etc. CADECplus is a KBE tool specially developed for equipment manufacturers and is based on Parametric 3D CAD technology. It is a rule based Configurator, and it enforces logical development of product designs.

As an equipment manufacturer develops newer products and variants, design data & references go on increasing exponentially, and design people find it difficult to ask “why”, because finding logical answers needs searching a lot of data. Further, implementing the answer is difficult too, since lot of products already have ad-hoc dimensions or shapes. Due to the increasing design customizations, the organization wants to make things more systematic, for better control over designs. CADECplus comes very handy for everything required to make the right and smart move for such control. CADECplus also helps to keep all the knowledge confidential in rule database and allows to implement rules without sharing the knowledge with everyone.

### Types of rules

Rules are the design calculations or empirical formulae developed by the design team. They can be :

#### Size Rules-

- Algebraic formulae
- If-Else conditions
- Lookup tables
- Series of available sizes
- Range validations for parameters.

#### Shape rules –

- Mandatory features / parts
- Shape-specific features/ parts
- Shape-specific dimension values
- Shape-specific Shapes



CADEC plus is based on a relational database of rules, and it allows to capture, manage, review, control and implement the rules seamlessly.

CADECplus accesses the model tree database of parametric 3D CAD software to capture and modify geometry. It uses its own database of variables & rules to create, manage and implement rules.

CADECplus enables Designers to ask ‘WHY’, and find logical answers. It provides tools to implement Logic within design process of the product variants.



## Configurator Salient Features :

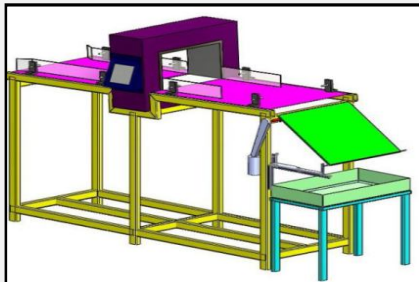
- Part-Feature-Parameter drill down
- Synchronizing changes in parts / features / parameters
- Equation editor
- User Interface Simulator
- To & fro link to geometry
- Enable/ Modify : Parts/ features
- Use of geometry configurations
- Variable definition
- Algebraic formulae
- If / Else-If conditions
- Look-up tables / Series
- Variable range validations

## Creator Salient Features :

- Choose Product Class
- Browse and use existing instance
- Specify shape & size inputs
- Drop-down lists
- Calculate variables, validate variables
- Refresh/ modify/ create Models / Drawings
- Choose view/ download formats
- Shape-specific drawing formats
- Get / Set Custom properties of documents

## Pre-requisites :

- Creation of parametric 3D Master Models / Drawings
- Independent flexible features can give unlimited permutations and combinations of parts / features
- Designer should define parameter calculation rules and equations
- SolidWorks 2010 is pre-requisite for using CADECplus Configurator or Creator



## Master modeling approach –

CADEC uses ‘Object Oriented Geometric Modeling’ – a method of generalization to create an instance from a generalized master. Master model is the heart of the Product Class. The methods of the class will use and modify features and parameters of the master model to create product instances. The master model should have flexible and modifiable features.

## Implementing KBE with CADECplus :

### Crawler-

CADECplus captures the model tree information of Sub-assemblies, Components, Features, Parameters and it makes available in Drill-down format.

### Formulator –

The user can define his/her own variables for shape and size. The variables can be driving or driven. In case of driven variables, their values can be derived by recursive rules of various types.

### Linker –

The variables can be linked to model parameters.

### Creator -

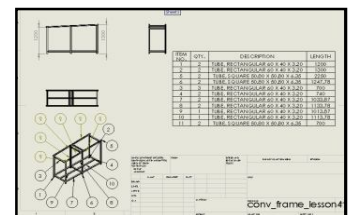
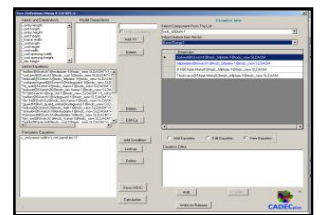
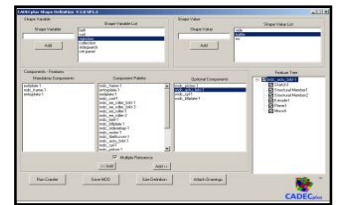
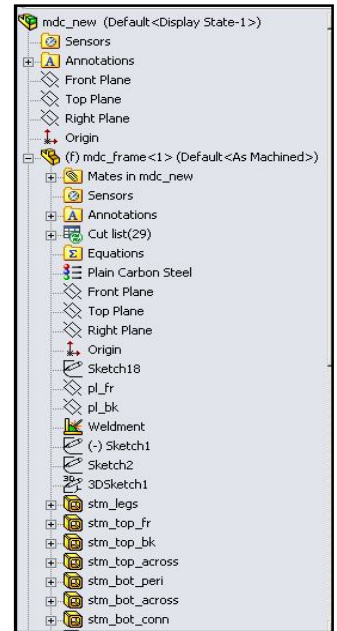
Once the product class is defined (product class model and rules), it can be used by end user to create product instances. The generic user interface to use services of any product classes is called creator. It allows the user to choose shape & size variations and get output in the required 3D / 2D format.

## Optional Add-ons :

### Web Creator –

The creator can also be used over web. Using web creator, customers can configure the required product variant and get models / drawings / layouts / cost sheets / BOMs on their own. The data of configuration specs by different customers is captured in database for further reference.

CADECplus suite has additional integration tools for Library parts, ERP (Creating unique part names, updating part-master, where-used information) PDM Vault (Check-in/out, Search, View, Print). It also supports integration with FEA solver.



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