

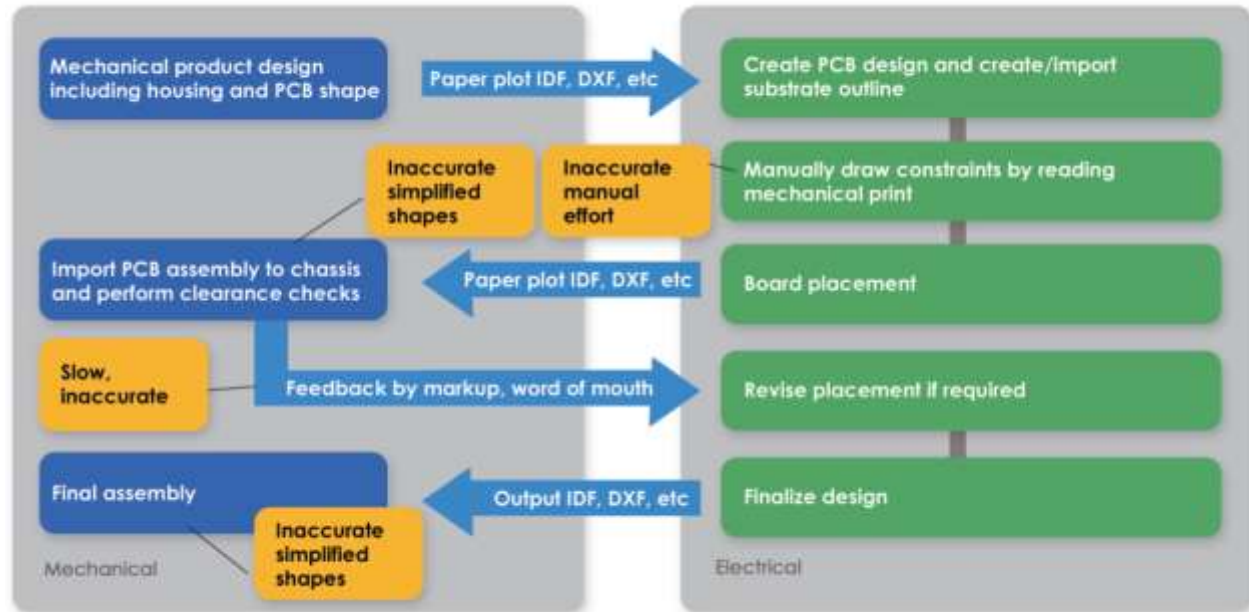
3D Integration for Cadstar - Board Modeler Lite

Overview and Roadmap

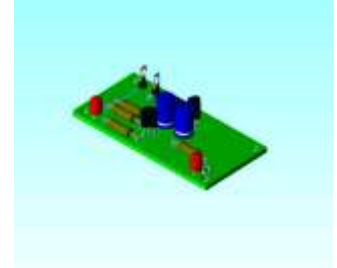


3D Integration for CADSTAR – Why?

- Products are getting smaller, so packaging becomes more critical
- Traditional data transfer processes are no longer adequate



Requirements

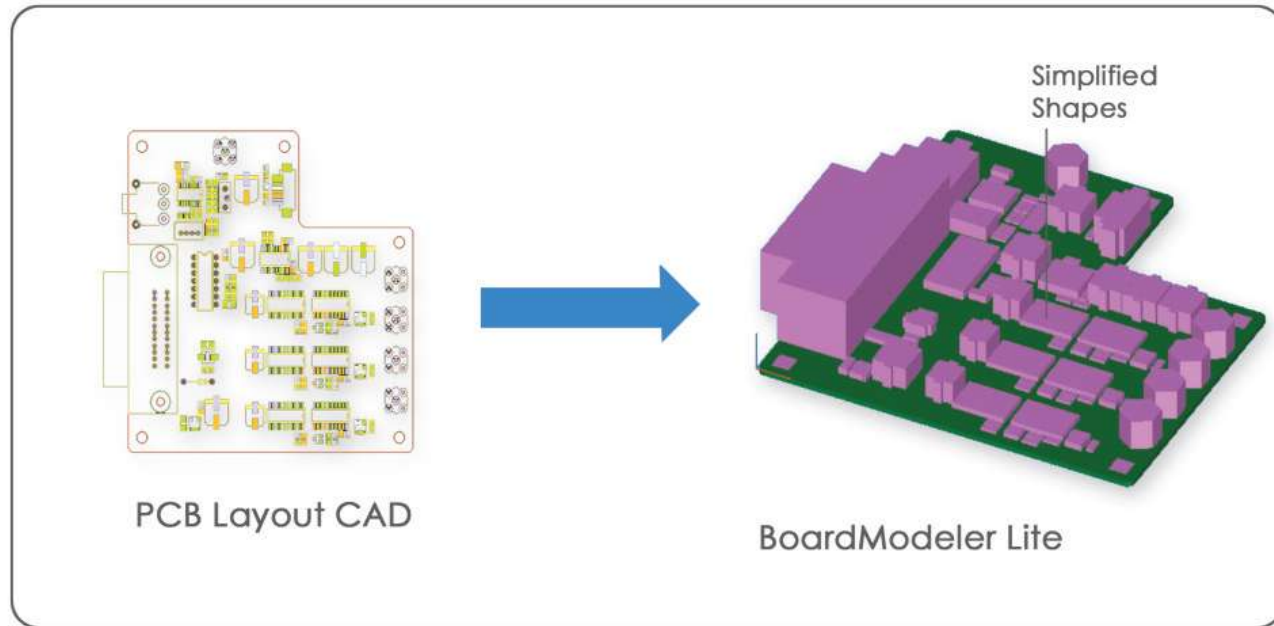


- Visualise the 2D PCB layout in 3D
 - Generate views for documentation
- Replace simple component blocks with true 3D models
 - Import or create 3D component models
- Measure and check the PCB for collisions
 - Ensure true component shapes do not clash
- Check the PCB assembly against the enclosure(s)
 - Check design packaging without having to use MCAD resources
- Export the 3D PCB data to other systems and formats
 - STEP format is generic and free viewers are commonly available
- Import board profiles and placement data from 3D systems

3D Visualisation for Placement Verification



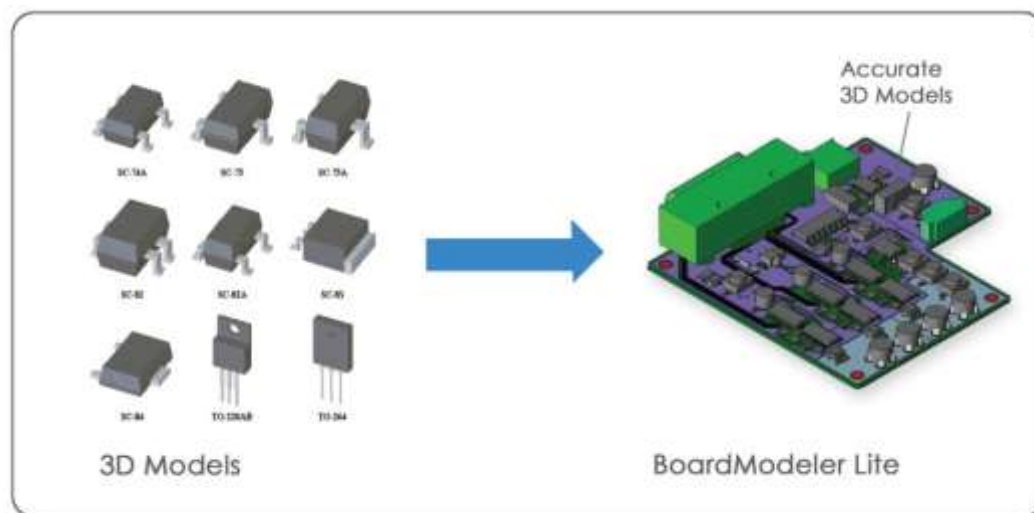
- Following PCB placement, the placed design can be visualised in Board Modeler Lite
- Typically, component shapes comprise the outline from a nominated Layer, extruded by the Height



Enhanced Visualisation

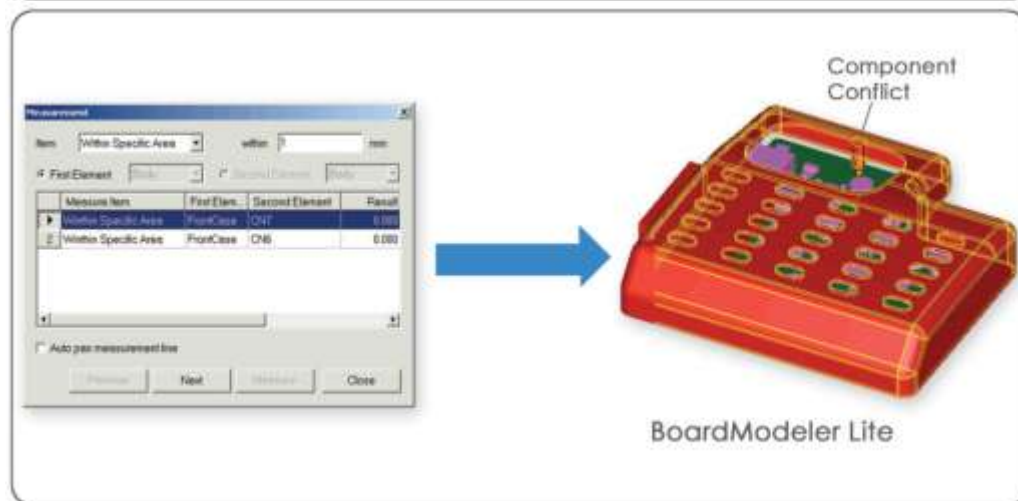
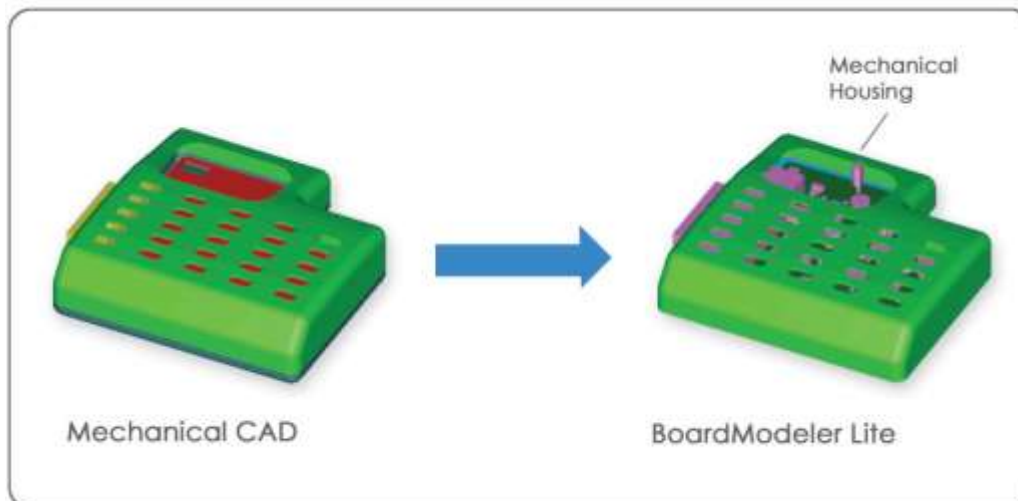
- These simplified PCB shapes can be replaced with accurate 3D component models

- imported from MCAD
- generated using the built-in 3D component generator
- downloaded from the internet
- e.g. www.3dcontentcentral.net



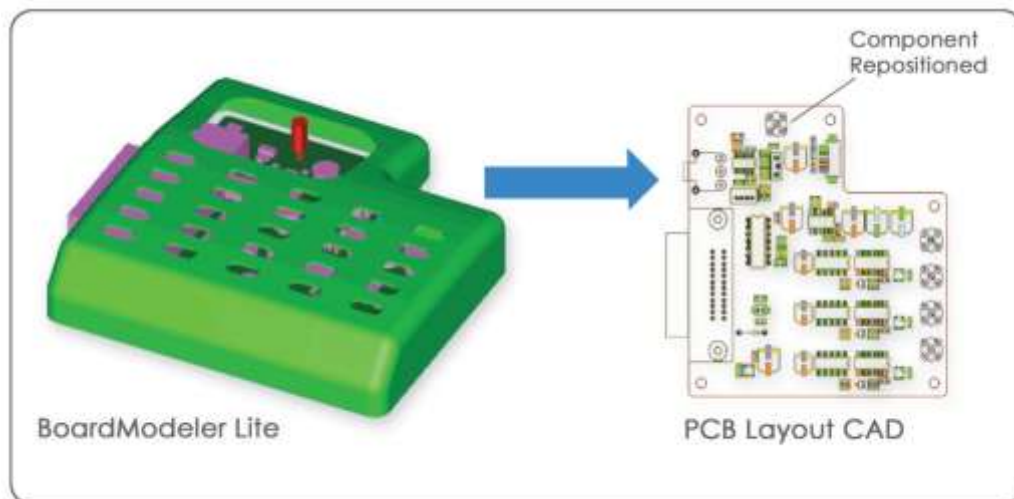
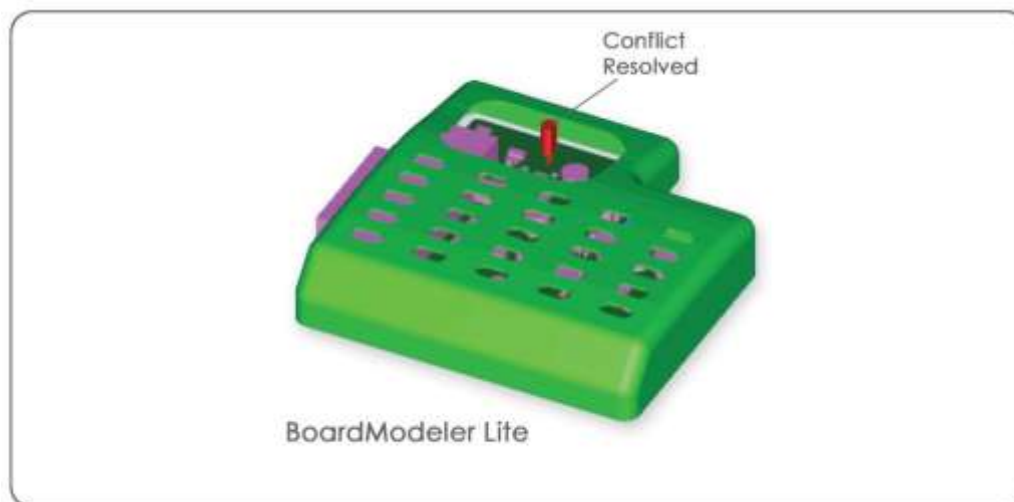
Interference Checking

- Once the simplified shapes have been exchanged for accurate 3D models, housings and other mechanical obstacles can be imported from the mechanical CAD system for checking purposes
- The built-in checking utilities then automatically identify conflicts between components and housing



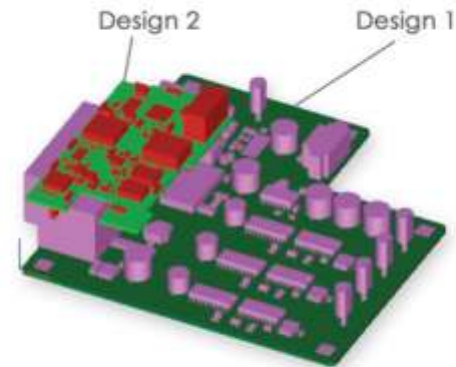
Placement Correction

- The component placement functions allow movement of components within BoardModeler Lite to resolve any resulting conflicts
- The revised placements can be back annotated from BoardModeler Lite to Cadstar



Multiple Assemblies

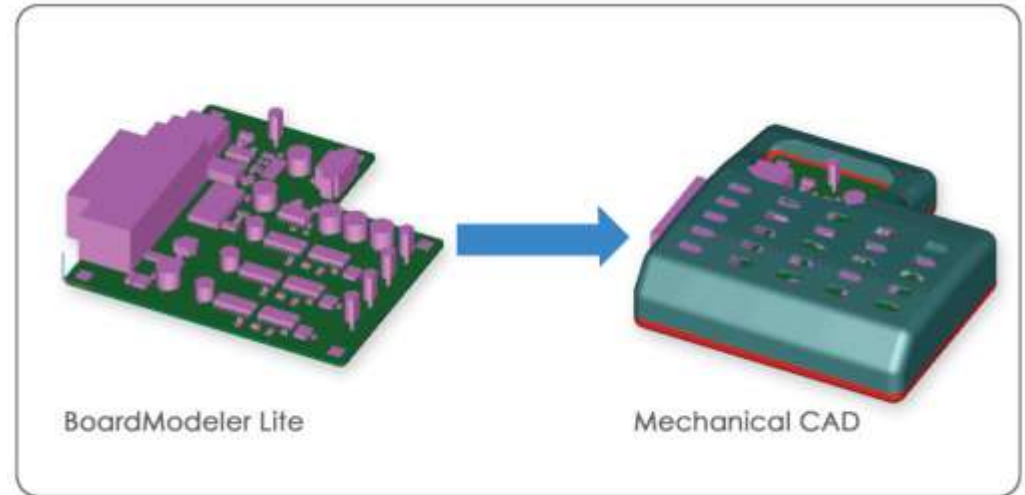
- BoardModeler Lite also supports multiple PCB assemblies to be imported through STEP or ACIS
- Clearances between the boards can be checked, conflicts resolved, and the results can be back annotate to the PCB design



BoardModeler Lite

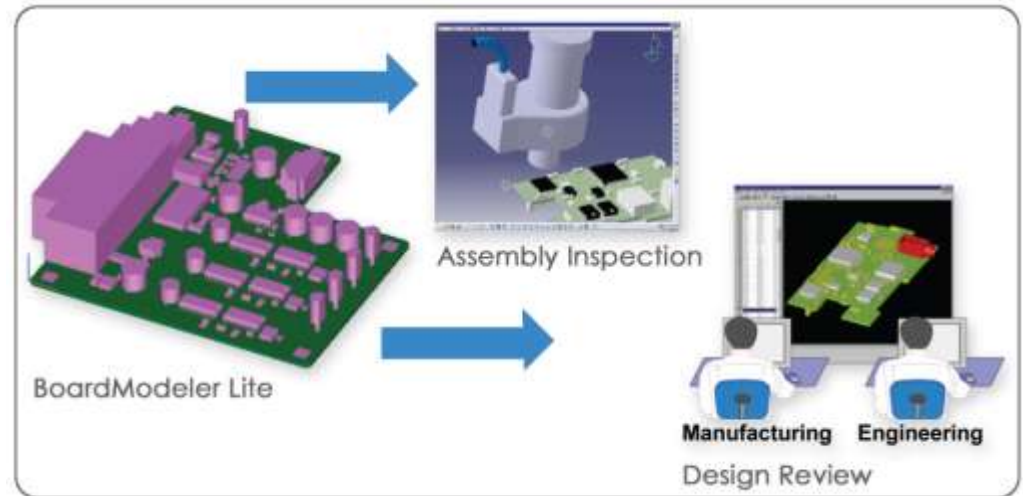
Final Assembly

- The completed PCB assembly can be exported with accurate component models to the mechanical system for a more accurate final assembly

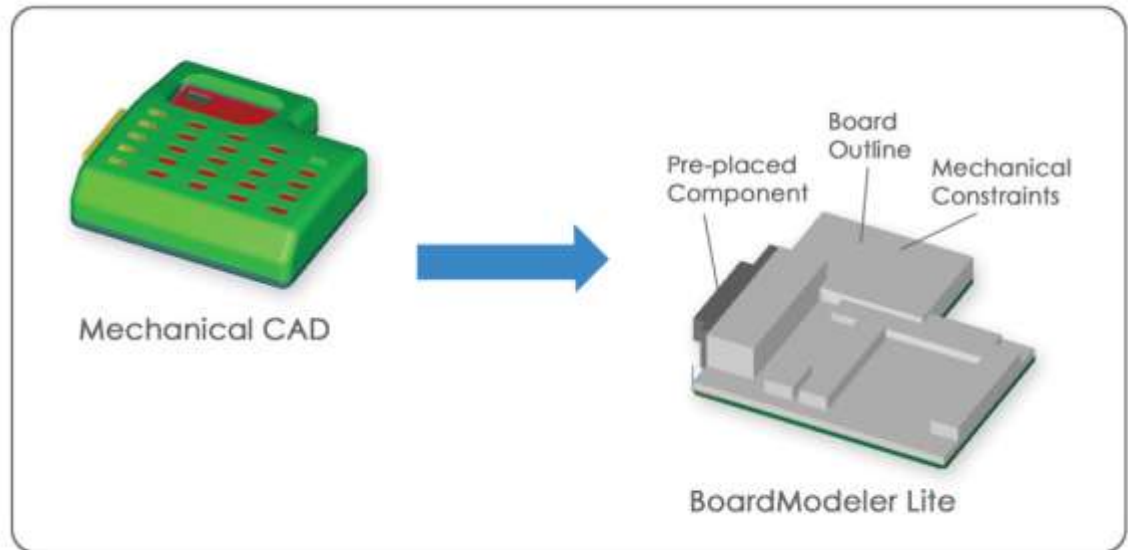


Design Review and Inspection

- The final designs can be inspected and reviewed easily in BoardModeler Lite, displaying both electronic and mechanical information in a single 3D environment

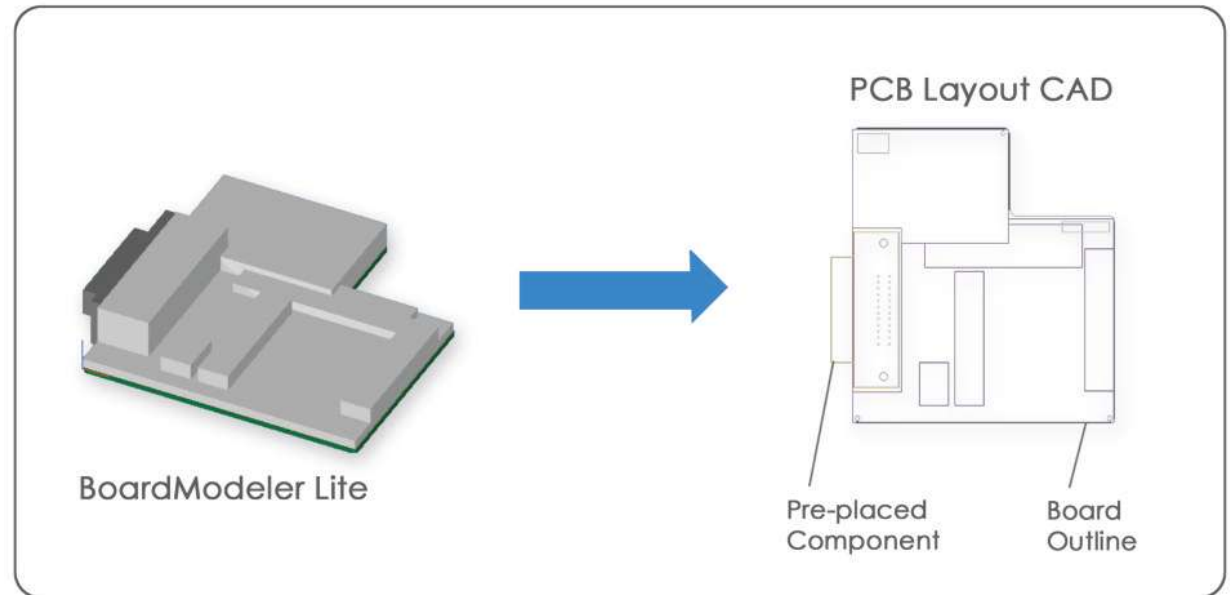


- Prior to PCB layout, BoardModeler Lite can import board outlines, pre-placed components, and other obstacles directly from the mechanical CAD system.
- Each item can then be assigned as a:
 - Height limit
 - Placement keepout
 - Routing keepout
 - Placement area
 - Other constraint



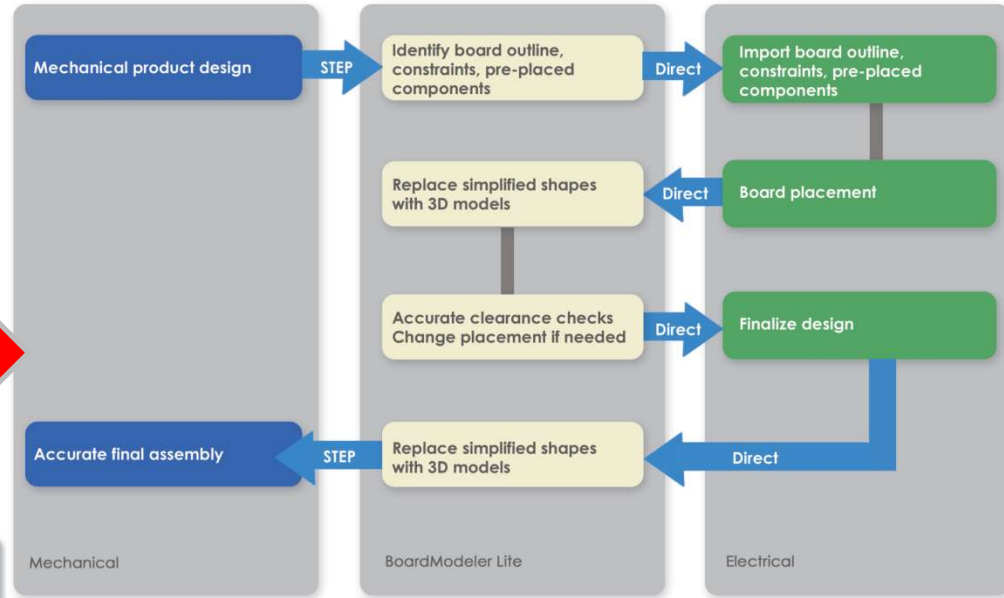
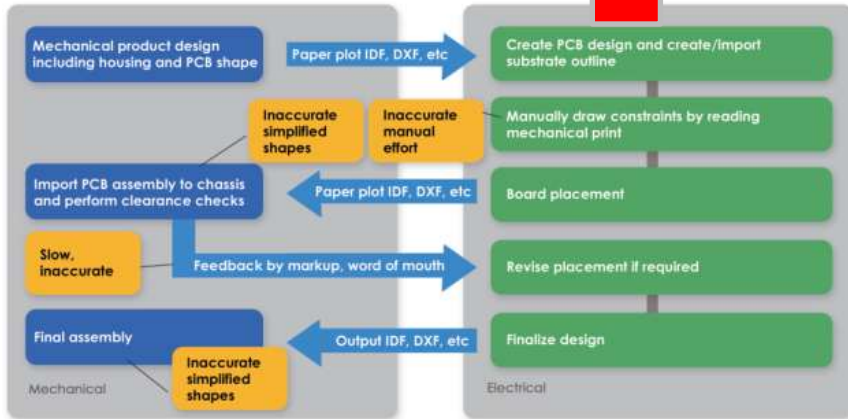


- Board Modeler Lite exports the board outline, constraint areas and pre-placed components directly into CADSTAR.

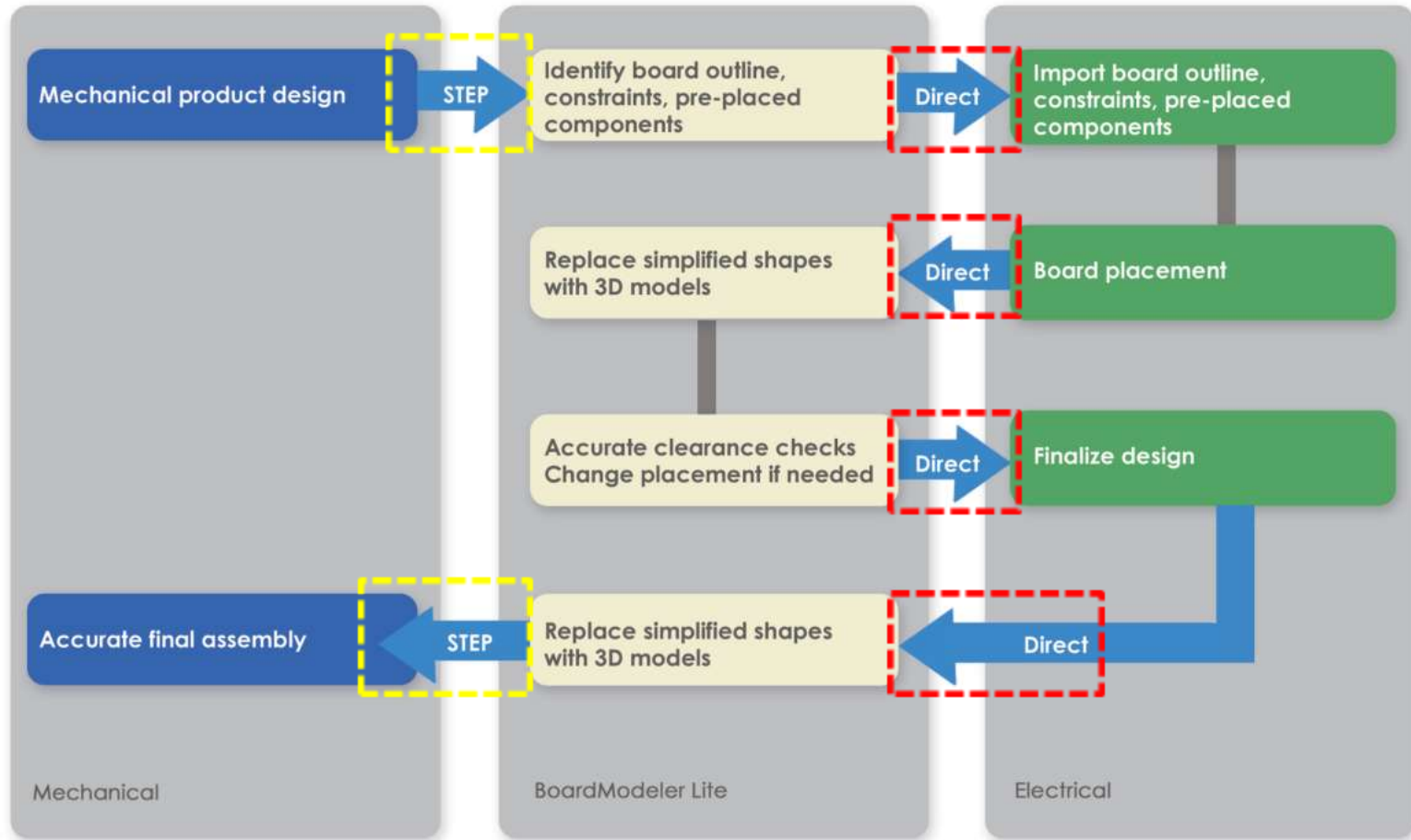


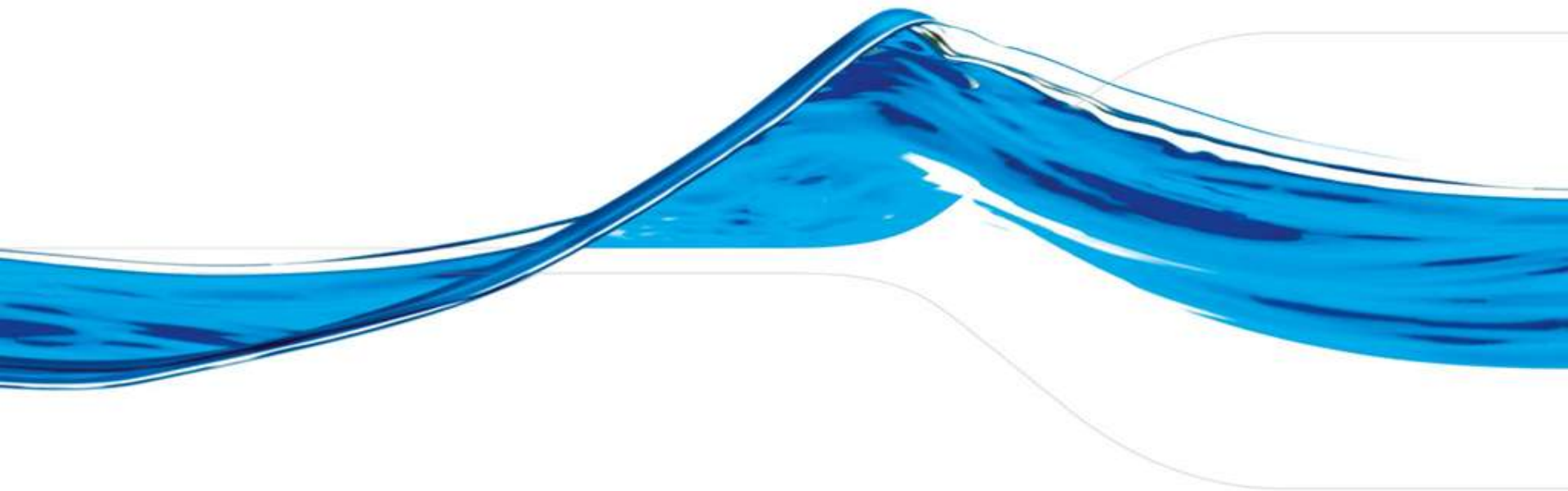
Summary

- Board Modeler Lite helps you replace a slow, error prone process with an automated, reproducible, error-free design environment



Optimised Process



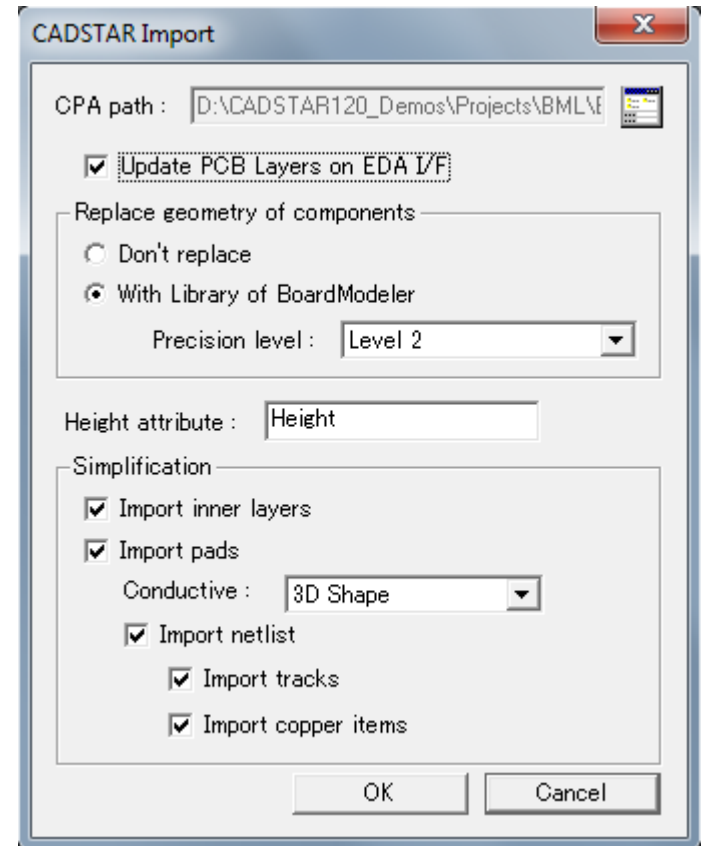


Updates and Release History



BoardModeler Lite 5.0.1

- Enhanced CADSTAR Import
 - Enable/Disable Import of inner layers
 - 3D Shape or 2D Profile
 - Enable/Disable Import pads
 - Enable/Disable Import netlist
 - Import tracks
 - Import copper items



Key-Features in BoardModeler Lite 5.2



- Support of detailed 3D model generators
 - Basic shapes
 - Component Wizards
- Undo/Redo in Library Model Window
 - Increased flexibility when editing models
- Support for slotted holes
 - More accurate representation
 - Compatibility with Layout
- Add 'Assembly layer' to the list of layer sub-types which can be used for the component outline for the simple 3D model
 - Wider choice of component outlines

Key-Features in BoardModeler Lite 5.2



- Ignore line width (e.g. for component outlines)
- Allow the Document Root folder to be changed without the need for Admin privileges
- Improve the performance of STEP Import
- Improved handling of variants (components no longer duplicated)

Key Features *targeted* for 6.2



- Improved 3D model editing functionality
 - Body operations –Offset, Unite, Intersect, Subtract
 - Face operations –Move face
 - Edge operations –Radius and Chamfer
- Improved 3D model manipulation
 - Group / Ungroup objects (bodies)
 - Select, move, copy, delete commands operate on grouped objects
- Support for the SpaceNavigator3D mouse from 3Dconnexion
- Application window size(s) and positions retained between BML sessions
- The folder locations used for Import/Export operations will be remembered and used as the default location for subsequent operations

Key Features *targeted* for 6.2 - continued



- It will be possible to import incremental changes, via STEP, into an existing BML design
 - Design specific mapping files may be specified during the Mechanical file / Import operation to improve the mapping of M-CAD objects to electrical items in BML (not just a single file specified in the Project tab of the Tools / Options dialog)
- Access to common commands to be provided on RMB ‘pop-up’ context menus
 - Based on object currently selected or tool being executed
- Re-assignments defined in CADSTAR will be supported in BML
 - For pads, vias and copper
 - Currently only the main assignment is used
- Component and/or nets will be allowed to have the same names as layer names

Key Features *targeted* for 6.2 - continued



- BML will open all PCBs included in the project automatically when project is loaded
 - No need for separate ‘Open PCB’ operations
 - Controlled by existing setting in Tools / Options
- It will be possible to specify the board thickness to be used by BML on the CADSTAR Import dialog
 - This allows an overall board thickness to be specified even if details have not been fully set-up in the CADSTAR layer stack
 - Insulation/laminate thickness specified in the layer stack will be ignored
 - Electrical layers will be spaced evenly apart
 - Copper thickness will be taken from the layer stack in CADSTAR
 - Will default to 0.0 if not specified

Conclusion

- Board Modeler Lite provides
 - reassurance that the Electrical and Mechanical designs can co-exist
 - And a means to identify and resolve conflicts
 - A standalone mechanism to review the data
 - Independent of PCB Layout or 3D Mechanical

