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1. Introduction

PCB-Investigator is a tool to view and edit PCB data on your computer. It helps you in the whole development process. From the start on, you can track your changes with different methods. There is also a possibility to pass notes and change requests easily to your customers with Embedded PCB-Investigator.
1.1 Formats

Input: ODB++, Gerber274x, Excellon 1, Excellon 2, Sieb & Meyer

Output: ODB++, Jpg, PNG, TIF, DXF, CatiaScript, IPCD356

1.2 Menu
<table>
<thead>
<tr>
<th>Tool</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom Window</td>
<td>Change drawing mode</td>
</tr>
<tr>
<td>Pan visible area</td>
<td></td>
</tr>
<tr>
<td>Select Object</td>
<td></td>
</tr>
<tr>
<td>Select all Objects in or touching rectangle</td>
<td>Only selected Objects are drawn completely all of the elements become transparent</td>
</tr>
<tr>
<td>Default View</td>
<td>Only selected Objects are drawn completely all other components become transparent</td>
</tr>
<tr>
<td>Select typ by sub items</td>
<td></td>
</tr>
<tr>
<td>In draw mode only selected the surfaces are hidden</td>
<td>Only selected Objects are drawn completely all other components become transparent</td>
</tr>
</tbody>
</table>

- Component Manager: Info Layer shows some details for each element
- Measure Dialog:  
- Net List dialog lists all in the Design included nets.
- Make a image of the screen
- List
2. Menus

2.1 Start Menu

Import | Export | Mouse Tools | Zoom | Selection | Extras | Setting

Import

Import Design
Browse for Job
Import Recent Job
Import Favorite
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create empty Design</td>
<td>Create empty project with one empty layer</td>
</tr>
<tr>
<td>Cam Input</td>
<td>Open simple file import like Gerber, Excellon, etc.</td>
</tr>
<tr>
<td>Add Image</td>
<td>Add a image layer to current Design</td>
</tr>
<tr>
<td>Add Layer from ODB++ Design</td>
<td>Add an extra layer from another ODB++ design to the current design</td>
</tr>
<tr>
<td>IDF Import</td>
<td>Import IDF files</td>
</tr>
<tr>
<td>Import AVL Attribute-List</td>
<td>Import AVL data</td>
</tr>
<tr>
<td>Import DPF (Barco)</td>
<td>Import DPF files</td>
</tr>
<tr>
<td>Import PDF</td>
<td>Import schematics from PDF</td>
</tr>
<tr>
<td>CMP Attribute Import</td>
<td>Import excel data and create objects from the data</td>
</tr>
<tr>
<td>Import GenCad</td>
<td>Import GenCad 1.4 files</td>
</tr>
<tr>
<td>Import DXF</td>
<td>Import DXF files</td>
</tr>
<tr>
<td>Import IPC2581</td>
<td>Import IPC2581 files to the PCB-Investigator</td>
</tr>
<tr>
<td>Import IPC356</td>
<td>Import IPC356 nets data</td>
</tr>
<tr>
<td>Import Components</td>
<td>Import data from CSV and edit the imported components</td>
</tr>
<tr>
<td>Export Current Design</td>
<td></td>
</tr>
</tbody>
</table>
## Mouse Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom</td>
<td>Zoom Window</td>
</tr>
<tr>
<td>Select</td>
<td>Pan visible area</td>
</tr>
<tr>
<td>Select in Rectangle</td>
<td>Select type by sub items</td>
</tr>
<tr>
<td>Select Net</td>
<td>Select all Objects in or touching rectangle</td>
</tr>
<tr>
<td>Pan</td>
<td>Select Object</td>
</tr>
</tbody>
</table>

## Save Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Design</td>
<td>Save Design</td>
</tr>
<tr>
<td>Save as ODB++</td>
<td>Save as ODB++</td>
</tr>
<tr>
<td>Export Embedded</td>
<td>Save PCB-Investigator Embedded Design</td>
</tr>
<tr>
<td>Export Embedded Zip</td>
<td>Save PCB-Investigator Embedded Design in Zip directory</td>
</tr>
<tr>
<td>Export DXF</td>
<td>Export layer or selection to DXF</td>
</tr>
<tr>
<td>Export High Resolution Picture</td>
<td>Save high resolution picture (PNG, JPG, BMP,...)</td>
</tr>
<tr>
<td>Export IPC356</td>
<td>Save IPC356 netlist</td>
</tr>
<tr>
<td>Export BOM</td>
<td>Save BOM as CSV File</td>
</tr>
<tr>
<td>Export Component List</td>
<td>Save Components list as CSV File</td>
</tr>
<tr>
<td>Export Pick and Place</td>
<td>Save Pick and Place list as CSV File</td>
</tr>
<tr>
<td>Export Gerber</td>
<td>Save Gerber File(s) from active project</td>
</tr>
<tr>
<td>Export IDF</td>
<td>Export IDF files</td>
</tr>
<tr>
<td>Export Google Sketchup</td>
<td>Export a google sketch up file of the current design</td>
</tr>
<tr>
<td>Export AOI</td>
<td>Export a very high resolution image, e.g. for AOI machines</td>
</tr>
<tr>
<td>Export GenCad</td>
<td>Export GenCad files</td>
</tr>
</tbody>
</table>

## Export Options

- Save Design
- Save as ODB++
- Save PCB-Investigator Embedded Design
- Save PCB-Investigator Embedded Design in Zip directory
- Export layer or selection to DXF
- Save high resolution picture (PNG, JPG, BMP,...)
- Save IPC356 netlist
- Save BOM as CSV File
- Save Components list as CSV File
- Save Pick and Place list as CSV File
- Save Gerber File(s) from active project
- Export IDF files
- Export a google sketch up file of the current design
- Export a very high resolution image, e.g. for AOI machines
- Export GenCad files
Select net by net number
Select net by net number and check for connections via components
Select net only on current layer
Select net and activate all relevant layers and zoom to the net
Select a net by connected objects on a layer
Select a net by all connected objects, also through drills to other layers

Zoom Home
Zoom Contour
Default View
Selection

Clear Selection
Reverse Selection
Previous Selection
Previous Selection
Extras
- Measure Dialog
  Info Layer shows some details for each element
  Net list dialog lists all in the Design included nets (rename, delete, create)
- Component Manager
  Open currently loaded design path in Windows
  Calculate area of selection or complete layers/board
- Customize the Ribbon Menu
  Customize the Ribbon Menu
- Options
  Setup Colors
  Change Units
- Change Units
  Change Unit to MM
  Change Units to Mils
  Change between mils and mm
  Change between mils and mm
2.2 View Menu

Zoom
- Contour
- Selection
- Default View

View
- Last view
- Set Zoom Factor
- Got to coordinates

Additional options:
- Open menu with special views (Top-, Bot-, Board-View), Setup
- Change to bottom view
- Change drawing mode (Filled/Outline/Both)
- Open the metro style menu
Drills should be highlighted by layer color or mixed like every other layer.

Draw the board contour or not.

Round Measure Cursor

Ruler on/off

Grid on/off

Cross-hair on/off

Highlight

Only selected objects are drawn completely, all other elements become transparent.

In draw mode only the selected surfaces are hidden.

Only selected components are drawn completely, all other components become transparent.

Info Layer

Shows the name of the net.

Show the size of the object.

Show ‘freetext’, which can be set by script or plugins.
2.3 Selection Menu

Mouse Tool

- Select
- Select in Rectangle
- Select Net
- Pan

Selection

- Pan visible areas
- Zoom Window
- Select type by sub items
- Select all objects in or touching rectangle
- Select objects

Highlight

- Assignmen

Search

- Select net by net number
- Select net by net number and check for connections via components
- Select net only on current layer
- Select net and activate all relevant layers and zoom to the net
- Select a net by connected objects on a layer
- Select a net by all connected objects, also through drillst o other layer
Selection

- List
- Properties
- Clear Selection
- Previous Selection
- Reverse Selection
- Select Object by Index
- Selection Filter
- Hide on inactive Layers

Only selected objects are drawn completely, all other elements become transparent.
In draw mode only the selected surfaces are hidden.
Only selected components are drawn completely, all other components become transparent.

Highlight

Gives you an overview of currently selected Objects

Color Assignment

- Assign Color
- Reset Color
- Reset all

Search

Open Find Dialog
2.4 Developer Menu

Components

- Component Manager
- Component View Setup
- Import Components
- Component Editor
- Component Properties
- Color Group
- Component Heights
- Component Report

Nets

- Net Connections
- Net Groups
- Net Length
- Nets of Component
- Generate Netlist

The component report creates a report with all used components including their location and most important properties.

- Change height of all components
- Define colors for groups of components
- Import data from CSV and edit the imported components
- Modify or add components
- Component Properties
2.5 Fabrication Menu

Net List dialog lists all in the Design included nets. There are options to rename/delete and create nets.

Highlight pins of components with different colors for ground and/or VCC or other nets.
Lists all nets of the selected components
Generate Netlist

Create a net list report
Create and manage net groups for easy handling of BUS, POWER or other netgroups
Net length calculation
Edit

- Undo Last Action
- Paste on Active Layer
- Copy selected object
- Add Text as Surface
- Remove Double Elements
- Change Attributes
- Polygonize Selection
- Drill Tool Manager
- Change Job Name
- Transform Layer

Fabrication

Make your own panel or modify existing panels
- Add selection to Outline
- Generate Netlist
- Generate Oversize
- Change height of all components
- Add from Selection Middle
- Set from Selection Middle
- Clear Outline
- All elements from the active layer will be copied to the PCB outline/contour
- Add active Layer to Outline
- Add Selection to Outline
- Create Layer from Outline
- Show S and R
- Set the outline via rectangle by mouse clicks
- Set the outline via lines by mouse clicks
- Set the outline around all elements on active layer
- Calculate the outline bounds and show them in message box
- Clear outline of PCB, all elements from the PCB outline/contour are removed
2.6 Analysis Menu

DFM
- Bare Board Analysis
  - Copper space and trace checks, as well as annular ring checks
  - Analyse result

Assembly
- Connection Analysis
  - Calculate distances between Components for placing/soldering rules or emv risk
- Component Analysis
  - Calculate risk for fast cooling effects

Other
- Hazard Analysis
  - Allows you to check distances for short risks
- Stencil Analysis
  - Reports too small solder pastes depending on the stencil thickness
- Testpoint Report
  - Lists the amount of testpoints for each net
2.7 Extras Menu

**Inspect**
- Calculate Area
- Measure

Measure Dialog
- Calculate area of selection or complete layer/board

**Compare**
- Compare Layer
- Compare Designs
- Database Comparison

Compare all components and nets of two development steps
- Compare two versions of one board
- Compare Layer Graphical
Annotation

Tool to save views, selections and notes for data exchange
Organizer helps to work in team on same database or projects

Image settings of an image layer
Add a image layer to current Design
Add/Edit Notes

Add current view to collaboration list
Next view from collaboration list
Previous view from collaboration list

Documentation

Create Screenshot with layerlist
Create Screenshot and copy image to clipboard
Make a image of the screen

Synchronize with PDF
The Extended Design Report tool creates a detailed report for the current board
The Design Report tool creates a report with the basic design parameters of the current board

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2.8 Help Menu

Strokes
- Activates/Deactivates mouse Gestures
- Stokes Help

Info
- Documentation
- Load Demo
- Tell a Friend
- Terms of Licence
- Edit License
- About
2.9 Signing Menu

Check the signed state of the current design

List of signed designs.
A signed design will lose its 'signed' state if any changes are done

The active project will be signed and added to the list of signed designs
3. Functions

3.1 Opening a job
3.2 View Data

Select easily layers to view or set active. Active means that these layers are editable while the others are protected. Different background colors indicate different kinds of layers. Board layers have an orange background, document layers are light blue highlighted, drill layers are gray highlighted and the background color of mask layers is green.
There is an easy way to get information about sizes of objects. Use the Info layer dialog to get dimensioning of each object on your screen.

Example 1 displays the dimensioning of all objects.

Example 2 displays dimensioning without pads and lines.
Example 3 displays the Netname labeling

### 3.3 Move and Rotate Objects

Maybe you have imported layers from ODB++, Gerber274x or Excellon you may have different origins. With Transform Layer you can move the layer in any direction till all layers fit together.
Transform each active layer

Deactivate the check box to get a selection of layers you want to transform
3.4 Edit Objects

‘Edit Object’ provides all information about a selected object. The properties of this object can be changed. Use the ‘Update’ button to verify your changes. By using ‘Add Symbol’ additional kinds of objects can be created.

3.5 Compare Layers

After selecting two different layers and pressing the ‘Compare’ button a new layer is created which contains the matches of both selected layers. Thereby you can easily check for accordance and differences.
The figure above displays the result of comparing two layers. The green highlighted area indicates that there are no differences, whereas the black space refers to a region where changes were detected.

3.6 Show and Edit Matrix
The Matrix provides an overview about layers in your project. It offers the chance to copy, move and edit layer data in a convenient way.
3.7 Add Bitmap Data

PCB - Investigator can add Bitmap Data to the CAD vector data to compare production result with the CAD data. You can import pictures created with a digital/infrared camera or a scanner. Use ‘Extras’ → ‘Annotation’ → ‘Add Image’ to do so.
3.8 Transform Image Layer

The transform image layer dialog is over the layer List context menu accessible. Or after adding an image layer (Add Bitmap Data).

Choose a image file and then opens the Picture Layer Dialog to set position and size of the new layer.

- Move the layer in arrow direction
- Mirror the image in arrow direction
- Rotate the image in arrow direction
- Scale the image with +/- buttons
- Change the alpha value of the image
- Reset all settings

3.9 View Component Manager

‘Component Manager’ provides a list of each component on the according component layers. This list can be customized according to your wishes. Items can be summed up by e.g. Part-Name to get a BOM. There is also a possibility to save the listed data as .csv or .xml file and to print the data.
3.10 Add ODB++ data

Use ‘Start’ → ‘Import’ → ‘Add Layer from ODB++’. Afterwards you can use the ‘Compare Layers’ option (see section 3.4) to detect alterations to former versions of layers.
3.11 Add Gerber274x, Excellon and Sieb & Meyer data

Use the add CAM input menu to add Gerber274x, Sieb & Meyer and Excellon data with an automated recognition of the format. It is also possible to change it manually.

Gerber274x, Sieb & Meyer and Excellon

Improve Area Fills means

Double lines removing
3.12 Find

Use the Find dialog to search for objects, components, properties, nets or geometries.

![Find dialog](image)
3.13 Strokes

There is a short access to a lot of menus available. Push the middle button or the mouse wheel of your mouse and draw one of the gestures shown below.
4. Terms and definitions

4.1 ODB++

All modern layout tools have options to write ODB++. You can use the option write to directory or the option to write it to .Tgz file. The advantage is to get detailed information within the job. So it can be used during developing process.

4.2 Gerber274x

Gerber274x is ASCII vector graphic format. This format includes also the definition of the apertures which will be used for drawing.

4.3 Excellon

Excellon is used for drill data.

4.4 DXF

DXF is a 2D and 3D Data Exchange Format.

4.5 Sieb & Meyer

Sieb & Meyer data is used for describing CNC manufacturing.

4.6 IPC356

A special definition of netlist data.
### 5. Shortcuts

<table>
<thead>
<tr>
<th>funktion</th>
<th>shortcut</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_COPY_INCLUDE_LAYERLIST</td>
<td>P, Shift</td>
</tr>
<tr>
<td>ID_DELETE</td>
<td>Delete</td>
</tr>
<tr>
<td>ID_ZOOM_IN</td>
<td>PageUp</td>
</tr>
<tr>
<td>ID_ZOOM_OUT</td>
<td>Next</td>
</tr>
<tr>
<td>ID_ZOOM_PROFILE</td>
<td>Home, Control</td>
</tr>
<tr>
<td>ID_ZOOM_HOME</td>
<td>Home</td>
</tr>
<tr>
<td>ID_GRID</td>
<td>G, Control</td>
</tr>
<tr>
<td>ID_LAST_VIEW</td>
<td>Back</td>
</tr>
<tr>
<td>ID_FIND</td>
<td>F, Control</td>
</tr>
<tr>
<td>ID_CLEAR_SELECTION</td>
<td>C, Control</td>
</tr>
<tr>
<td>ID_PREVIOUS_SELECTION</td>
<td>P, Control</td>
</tr>
<tr>
<td>ID_MATRIX</td>
<td>M, Control</td>
</tr>
<tr>
<td>ID_MEASURE</td>
<td>M</td>
</tr>
<tr>
<td>ID_STEP_AND_REPEAT</td>
<td>S, Control</td>
</tr>
<tr>
<td>ID_MOUSE_TOOL_ZOOM</td>
<td>Z</td>
</tr>
<tr>
<td>ID_MOUSE_TOOL_SELECT</td>
<td>S</td>
</tr>
<tr>
<td>ID_FLATTEN_PANEL</td>
<td>Q, Control</td>
</tr>
<tr>
<td>ID_CHANGE_DRAWING_MODE</td>
<td>W, Control</td>
</tr>
<tr>
<td>ID_SHOW_SELECTION_ONLY_ON_ACTIVE_LAYERS</td>
<td>O, Alt</td>
</tr>
<tr>
<td>ID_UNDO_LAST_ACTION</td>
<td>Z, Control</td>
</tr>
<tr>
<td>ID_CREATE_EMPTY_PROJECT</td>
<td>N, Control</td>
</tr>
<tr>
<td>ID_IMPORT_FAVORITES</td>
<td>F, Shift</td>
</tr>
<tr>
<td>ID_IMPORT_RECENT</td>
<td>R, Shift</td>
</tr>
<tr>
<td>ID_IMPORT_BROWSE</td>
<td>B, Shift</td>
</tr>
</tbody>
</table>
6. Plug-Ins

6.1 Component Analysis

Show components by packages or height
Show all components on top or bottom
Includes Pins in the analysis
Start calculation of distances
Open Settings
Save the settings
Enter maximum distance for all components and confirm with OK
Enter maximum distance for every single component
Start calculation of distances
Find bottlenecks between components with the „Component Analysis“ Plug-In and guarantee a smooth production. First set a filter to sort components by packages or heights or no filter for showing all components of one layer. Enter the maximum distance either simultaneously for all components or for every single one.

List of results after the analysis:

Filter the list by using the drop-down menu or by manual input

Visualize selected component in the pcb

Print the list with Print Preview and Page Setup

Export the list as CSV and copy

Show the list without filter
Activate a by double-click selected layer in the layer list

Keep activated layers activate when selecting another layer

Include only selected components in the analysis

Specify the country setting for the export as CSV

Set the unit
6.2 Bare Board Analysis

The “Bare Board Analysis” Plug-In finds bottlenecks between signal layers, drills, annular rings and nets.

Determine the objects, whose distances should be measured. Still acceptable distance. Result overview of the different measurements.

Start the analysis.
Filter the list by using the dropdown menu or by manual input

<table>
<thead>
<tr>
<th>ID</th>
<th>Layer Name</th>
<th>Net1</th>
<th>Net2</th>
<th>Distance in µm</th>
<th>From</th>
<th>To</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>smb</td>
<td>I07_GPIO</td>
<td>I07_GPIO</td>
<td>76.200</td>
<td>179.578</td>
<td>5...</td>
<td>180.34</td>
</tr>
<tr>
<td>2</td>
<td>bottom</td>
<td>I02_MUX</td>
<td>I02_MUX</td>
<td>0.000</td>
<td>798.576</td>
<td>5...</td>
<td>798.576</td>
</tr>
<tr>
<td>3</td>
<td>smb</td>
<td>VSHLD_5S</td>
<td>VSHLD_5S</td>
<td>76.200</td>
<td>813.016</td>
<td>4...</td>
<td>813.054</td>
</tr>
<tr>
<td>4</td>
<td>top</td>
<td>IO11_I2S</td>
<td>IO11_I2S</td>
<td>0.000</td>
<td>-36.322</td>
<td>30...</td>
<td>-36.322</td>
</tr>
<tr>
<td>5</td>
<td>top</td>
<td>$NODES</td>
<td>$NODES</td>
<td>0.000</td>
<td>462.788</td>
<td>1...</td>
<td>462.788</td>
</tr>
<tr>
<td>6</td>
<td>bottom</td>
<td>I02_MUX</td>
<td>I02_MUX</td>
<td>0.000</td>
<td>767.08</td>
<td>56...</td>
<td>767.03</td>
</tr>
<tr>
<td>7</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>44.45</td>
<td>508...</td>
<td>44.45</td>
</tr>
<tr>
<td>8</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>95.25</td>
<td>509...</td>
<td>95.25</td>
</tr>
<tr>
<td>9</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>107.95</td>
<td>50...</td>
<td>107.95</td>
</tr>
<tr>
<td>10</td>
<td>top</td>
<td>$NODES</td>
<td>$NODES</td>
<td>0.000</td>
<td>462.788</td>
<td>1...</td>
<td>462.788</td>
</tr>
<tr>
<td>11</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>82.56</td>
<td>509...</td>
<td>82.56</td>
</tr>
<tr>
<td>12</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>69.85</td>
<td>509...</td>
<td>69.85</td>
</tr>
<tr>
<td>13</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>57.15</td>
<td>509...</td>
<td>57.15</td>
</tr>
<tr>
<td>14</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>133.35</td>
<td>509...</td>
<td>133.35</td>
</tr>
<tr>
<td>15</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>120.65</td>
<td>509...</td>
<td>120.65</td>
</tr>
<tr>
<td>16</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>227.33</td>
<td>509...</td>
<td>227.33</td>
</tr>
<tr>
<td>17</td>
<td>smb</td>
<td>VTT</td>
<td>VTT</td>
<td>25.400</td>
<td>986.069</td>
<td>1...</td>
<td>987.15</td>
</tr>
</tbody>
</table>
Save the distance settings and open them the next time working with the Plug-In.

Export the results as text or CSV or copy them to the clipboard.

Don't include $NONE$-nets, same nets or objects lying on top of each other in the analysis.

Save the distance settings and load them automatically the next time working with the Plug-In.
6.3 Hazard Analysis

"Hazard Analysis" finds all possible shorts created from conductive material. The list of possible shorts helps to predict effects on the production.

- Start the Analysis
- Analyse only certain nets or components
- Filter the results, either by manual input or with the drop-down menu

This value defines the area taken into the calculation.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select CMPs</td>
<td>Show components or objects color marked in the pcb</td>
</tr>
<tr>
<td>Select Objects</td>
<td>Copy, export or print the results</td>
</tr>
<tr>
<td>Copy</td>
<td>Print the list with Print Preview and Page Setup</td>
</tr>
<tr>
<td>Export as CSV</td>
<td>See the results without the filter</td>
</tr>
</tbody>
</table>

**Settings**

- Ignore VIA's
- Ignore SMDs (.smd)
- Ignore Test Points (.test_point)
- Ignore $NONE-$Nets
- Ignore Same CMPs (Reference)

[OK] [Cancel]

Analyse without these parts
6.4 Graphic Board Compare

The Graphic Board Compare Plug-In shows differences between two process steps of one job by comparing the board graphically.

- Load the two jobs.
- Click Compare to select the layers
- Start the comparison
The whole board.

Click on a clip in the list to see it zoomed in in the left handed part of the window and red marked on the whole board.

List of the clips that show differences.
The „Tombstone Analysis“ Plug-In finds components with two pins, which have different sizes. Problems in the production will arise, if the difference in size is too big.

Possibility to filter the packages by name, count and size, according to your demands

Start the analysis
Check the boxes to:
→ see the different widths of the single conductive paths
→ see the belonging package
→ zoom in the component with double click

---

**List of results**

<table>
<thead>
<tr>
<th>Component</th>
<th>Result</th>
<th>Result Diagram</th>
<th>Difference</th>
<th>Pin 1 (μm)</th>
<th>Pin 2 (μm)</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3M13</td>
<td>Bot</td>
<td>Infinity</td>
<td>0</td>
<td>107</td>
<td>107</td>
<td>~</td>
</tr>
<tr>
<td>R2M13</td>
<td>Bot</td>
<td>Infinity</td>
<td>0</td>
<td>132</td>
<td>132</td>
<td>~</td>
</tr>
<tr>
<td>R2M24</td>
<td>Top</td>
<td>Infinity</td>
<td>0</td>
<td>107</td>
<td>107</td>
<td>~</td>
</tr>
<tr>
<td>C4A2</td>
<td>Top</td>
<td>1303.06</td>
<td>3564</td>
<td>254</td>
<td>254</td>
<td>~</td>
</tr>
<tr>
<td>R2M1</td>
<td>Bot</td>
<td>1284.80</td>
<td>1477</td>
<td>107</td>
<td>107</td>
<td>~</td>
</tr>
<tr>
<td>R2L17</td>
<td>Bot</td>
<td>1284.80</td>
<td>1477</td>
<td>107</td>
<td>107</td>
<td>~</td>
</tr>
<tr>
<td>C2M9</td>
<td>Bot</td>
<td>1236.98</td>
<td>107</td>
<td>1426</td>
<td>1426</td>
<td>~</td>
</tr>
<tr>
<td>C2M2</td>
<td>Top</td>
<td>1236.98</td>
<td>107</td>
<td>1426</td>
<td>1426</td>
<td>~</td>
</tr>
<tr>
<td>R1M1</td>
<td>Top</td>
<td>1046.45</td>
<td>107</td>
<td>1223</td>
<td>1223</td>
<td>~</td>
</tr>
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<td>R1M4</td>
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<td>127</td>
<td>127</td>
<td>127</td>
<td>~</td>
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<tr>
<td>R1M5</td>
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<td>1002.06</td>
<td>1400</td>
<td>127</td>
<td>127</td>
<td>~</td>
</tr>
<tr>
<td>C3A19</td>
<td>Top</td>
<td>1001.53</td>
<td>2798</td>
<td>254</td>
<td>254</td>
<td>~</td>
</tr>
<tr>
<td>R1L9</td>
<td>Bot</td>
<td>979.55</td>
<td>5439</td>
<td>508</td>
<td>508</td>
<td>~</td>
</tr>
<tr>
<td>R1L10</td>
<td>Bot</td>
<td>900.00</td>
<td>102</td>
<td>1016</td>
<td>1016</td>
<td>~</td>
</tr>
</tbody>
</table>
6.6 Database Compare

Compare PCB Data shows changes in component and net information of two jobs on one view.

Choose the job to be compared to the active job: Either by Job Library or by searching on your computer.

Start comparison

Filter the display either by manual input or with the drop-down menu.

Overview

Doubleclick on the component to see it selected in PCB Investigator.
All components with reference, part number, coordinates, value and attributes. Listed by existence in one or both jobs and by matches. Click on one component to see the changes in the box below.
6.7 DFX-Import

[Image of a software interface for DFX-Import]

- Import DXF, DWF, CGM, HPGL, PLT
- Import Layer Prefix: DXF
- Replace DXF Line thickness 0 with: 0.0
- Scale during Import: Use DXF Header Units
- Treat Polygons within Polygons as Holes
- Set DXF Layer Colors to Objects
- Fill Poly Lines
- Combine DXF Layers to one EDA Layer

[Checkboxes and options for import settings]

Open File
6.8 GenCad

The GenCAD Plug-In provides a GenCAD interface based on 4.1 version.

There are different ways to work with GenCAD files and PCB-Investigator.

- Load a GenCAD file into PCBI
- Load a GenCAD file and add it as ODB++ step
- Save as PNL file and create a GenCAD file for every ODB++ step
- Specify the unit
- Load a GenCAD file and add it as ODB++ step
- Save as GenCAD file
6.9 Design Report

“Design Report” provides an overview with all relevant data of your printed circuit board.

Generates the report

Enter these data by yourself

Design Report

Created with PCB-Investigator

Company Name: [Redacted]
Editor: [Redacted]
E-Mail: [Redacted]
Telephone: [Redacted]

Username: [Redacted]
Date: 08.12.2015
Data location: [Redacted]

Design overview:

Step count: 1
Layer count: 31
Signal Layer count: 6
Net count: 433

Component layer attributes:

Component count top: 294
6.10 Testpoint Report

The „Testpoint Report“ Plug-In creates a list of all nets of a pcb with testpoints.
Show coordinates of the testpoints in the list of results

Enter the name, you want the Plug-In to search for
6.11 Panel Builder

Panel Builder - PCB-Investigator | www.pcb-investigator.com

Start View Selection Developer Fabrication Analysis Extras Help Signing

Add Copy Paste Undo Change Job Name Remove Double Elements Add Text as Surface

Component Heights Generate Netlist Generate Drivesize

Drill Tool Manager Polygonize Selection Change Attributes

Matrix

Panel Builder

Edit

Panel Builder

File Help

Add Step

Current Panel: pcb

Step: pcb

X (mm) Y (mm) NX-Count NY-Count DX (mm) DY (mm) ANGLE MIRROR

Minimum Distance: 2

Apply

Add
6.12 AOI Import/Export

“AOI” creates high resolution BMP graphics as 1 BPP format from PCB data (with Anti-Alias: 8 BPP).

- Select the exported layers
- Set the internal calculation quantity for the matrix
- Export the complete board or only the visible area
- Multithreading for a faster processing
- Change black-white color assignment
6.13 Net List

„Export Net List“ enables you to export a list with all nets as Excel CSV or text.
6.14 Net Length

“Net Length” calculates the lengths of all nets of a printed circuit board with the following presettings:

- Lines are added up
- Surfaces are not taken into account
- Intersections are plurally counted

Display for the nets and their lengths

Display for all nets which are connected to a certain component.
"Color Group" assigns certain colors to certain components. The color selection allows all windows colors.

Select colors by entering RGB values or by "Select Color" with the color dialog box.

Create groups with leading number tokens.

After choosing the colors, assign colors to the design.
The "PDF Sync" Plug-In shows PCBI information in the according pdf circuit diagram and backwards information of the circuit diagram in the pcb.

According to the same principle you can use the first letter of a component to assign colors.
Mark a net or component in your pdf file

Press „PDF -> PCB“ To see the net/component you selected in PCBInvestigator

Select a net or component in PCBI

Press „PCB -> PDF“ To see the net/component you selected in your pdf file
A printed circuit board runs through many different steps and departments from its development to its production. With PCB-Investigator Embedded, you enable every of these departments working with PCB-Investigator without buying more licenses or running more time-consuming installations.
6.19 Short Cut Top/Bottom View

The Short Cut Top Bottom View Plug-In is a free Plug-In, that makes your workflow more effective. The two icons on the tool bar allow a one-click-switch from Top to Bottom view. As you can see in the setup-screenshot, key shortcuts for a quick switch are available as well. The setup offers different possibilities like defining the concerned layers or mirroring the layers by Bottom View.