SB200a Professional PCB Stackup Design System

SB200a User Guide

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SB200a User Guide

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SB200a Specifications

Maximum layer count	64+
Via rules	Conventional, blind and buried
Materials library	Foils RCC foils Cores Pre-Preg Solder mask Ident Peelable mask Coverlay
Post press compensation	Yes (user defined)
Finished thickness compensation	Yes
Cu thickness calculation	Yes
Board thickness calculation	Yes
User library	Yes
Save builds	Yes

Personal Computer Requirements

Computer	IBM PC AT or compatible
Processor	Pentium 1GHz or better
Operating system	Windows 98 Microsoft Windows NT, Windows 2000 SP4/XP
Environment	Latest .NET framework installed
System memory required	128MB recommended
Hard disk space required	200MB (min.)
Video standard	SVGA (1024 x 768 min.) Hi color 16 bit
CDROM drive	
Mouse	Microsoft compatible
Licensing	Fixed: Parallel/USB key
	Floating FlexLM licence (Windows and Linux servers only)

Guide To The Manual

Introduction	Introduces the Polar Instruments SB200a.
Installation/set up	Instructions for installing/uninstalling and activating the SB200a software.
Using the SB200a	Discussion of the SB200a user interface; creating and editing stackups.
Adding controlled impedance structures	Working with the Si8000 to add controlled impedance structures to the stackup model. Using the goal seeking facilities of the Si8000 to obtain the correct impedance for a structure.
The SB200a Materials libraries	Using the SB200a materials libraries, creating new libraries, adding material to the library.
Design rule checking	Using the SB200a Design Rule Checker to correct stackup design errors.

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Introduction to the SB200a

The SB200a Stackup Design System

The Polar SB200a PCB Stackup Design System is designed to reduce the amount of time consumed in PCB stackup documentation and control. The SB200a offers both interconnect designers (PCB layout engineers) and PCB front-end engineers a fast and professional solution to layer stackup creation. The SB200a is both graphical and easy to use while providing formal documentation for everyone involved in ensuring the correct materials are used in the build process.

The SB200a allows the user to view stackup in 2d or 3d format. Layer and material annotation is clear and easy to read and each layer may be selected and queried to display the associated material type and properties, including the associated data file. Visible drill information ensures that designers instantly know which layers support conventional, blind and buried vias.

Integration with the Si8000

The SB200a is fully integrated with the Si8000 Controlled Impedance Quick Solver so the user can quickly add controlled impedance structures to layers in the stackup. Using the Goal Seek facility of the Si8000 the designer or board fabricator can rapidly arrive at the controlled impedance structure parameters to produce the target impedance.

Materials library

The SB200a supports a flexible materials library. This allows the designer to use standard materials data, and also provides the facility to create new material libraries. PCB fabricators can also build libraries of commonly stocked materials to give interconnect designers visibility of materials held in stock.

Preferred builds

PCB fabricators are able to create and share preferred builds and exchange this information with designers. Build information also includes blind and buried via information.

This simplifies the task of sharing stackup and drilling information between board shops and the design community.

Dimensional information

Finished thickness is a critical dimension in many applications, the SB200a keeps track of finished thickness and tolerance, and allows fabricators the flexibility of adding in house post press thickness for pre preg layers. Additionally the SB200a takes into account plating thickness where appropriate.

Graphical interface

The SB200a offers an easy to interpret graphical interface. Clearly showing the layers supporting blind and buried vias, the SB200a also records the data file for each layer (including ident and peelable mask layers). The graphical interface is especially designed to simplify the process of communication between interconnect designer and fabricator. OEMs who need to manage boards sourced from multiple suppliers will also find this facility invaluable. In addition to physical layers the SB200a adds mask and notation for electrical layers.

Installing the SB200a

Activating the SB200a

Activation will depend on the license purchased. It will be necessary to activate the product license prior to performing calculations with the SB200a. The SB200a is licensed using the FlexLM License Manager via a license file on a license server or the local machine or a software key connected to either the parallel port (typically LPT1) or a USB port. The FlexLM licensing files should be installed and running on a locally accessible server (the server must be running to manage licensing) or on the local machine for a node-locked license.

Licensing the SB200a using FlexLM

When the first stackup build is performed the SB200a FlexLM License finder asks for the name of the License Server or License File.

Ensure the **Specify the License File** option is selected and press **Next**.

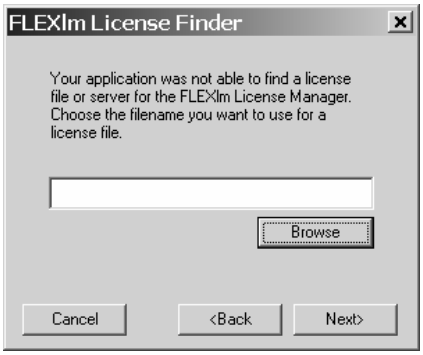
Activation using a node-locked license

Enter the name of the license file or browse the local machine to locate the license file and press **Next**.

Activation using a license server

Enter the name of the license file or browse the network to locate the license file and press **Next**.

The name of the license server will normally be the Network Identification name of the computer acting as the Licensing Server.



The SB200a will perform stackup builds within the terms of the license purchased.

Installing the software key

If a software key is used insert the key into the parallel printer port or USB port; if required, plug the printer cable into the software key. Locate the license file as described above.

Note: If installing the software key on a Microsoft Windows NT or Windows 2000/XP system it will be necessary to be logged on as Administrator.

Uninstalling the software

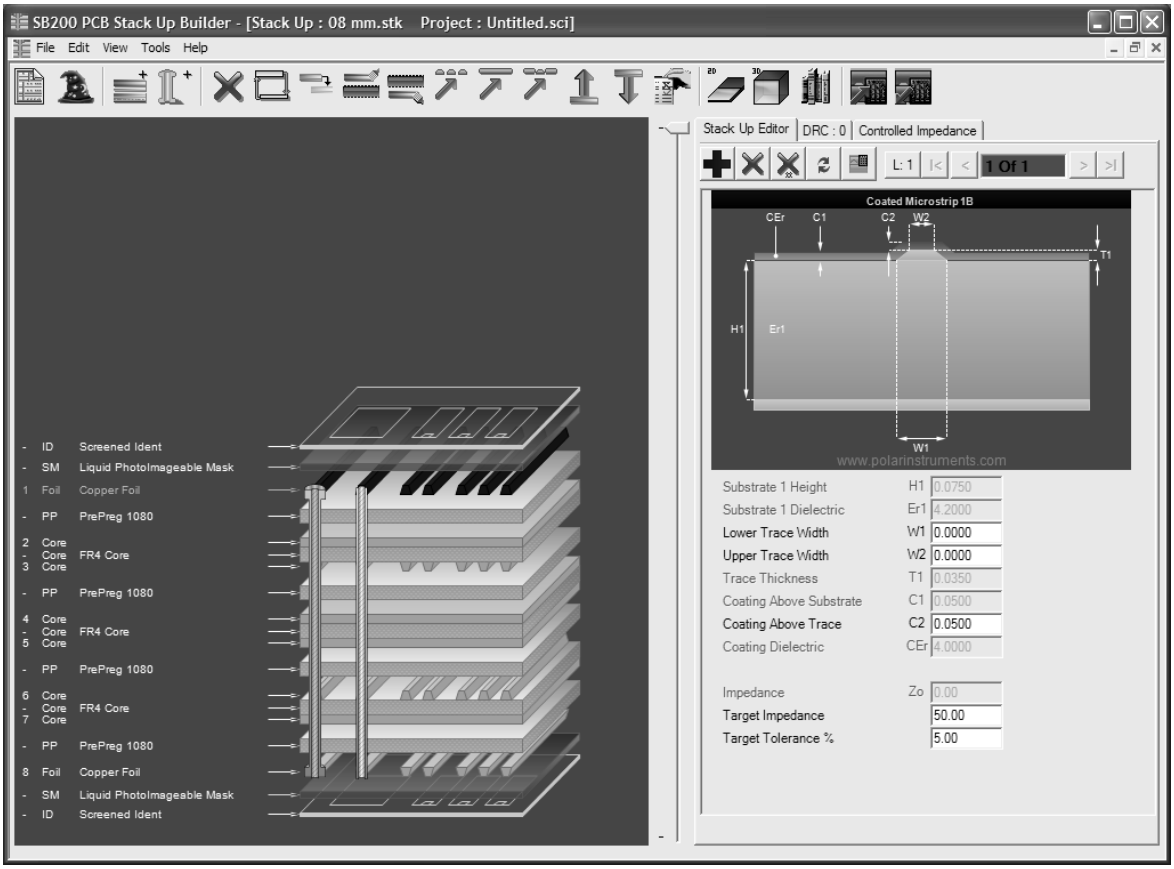
To uninstall the SB200a software click the Windows Start button and choose Settings and Control Panel.

Double-click Add/Remove Programs and choose SB200a from the list. Click Remove.

Using the SB200a Stackup Design System

The SB200a Stackup Design System

Double-click the SB200a icon to start the SB200a program. The main screen is displayed.



The SB200a screen comprises:

- The menu bar — drop-down menus containing all the SB200a commands
- The tool bar — incorporating short cut tool buttons to the most common menu commands
- The stackup build and construction window — where the board stack up is built and edited

- The Controlled Impedance window displaying the controlled impedance structures (if any) for the selected layer.
- Stack Up Notes/DRC (design rules check) — a free form text area for explanatory or commentary notes/DRC
- Stack Up Information properties area — table containing information related to the whole stackup.
- Selected Item Information area — properties table containing the attributes of the layer currently selected in the stackup

The SB200a Menu System

The File menu

The **File** menu allows for creation of new stackups and projects, opening, saving and printing existing stackups and projects.

Saving stackups
Click the Save button to save the stackup. Users are recommended to save the stackup frequently during the stackup creation process to avoid data loss.

Saving projects
Stackups that incorporate controlled impedance structures are saved as *projects*. Use the Save Projects command to save a stackup and its controlled impedance structures; projects are saved as .sci files.

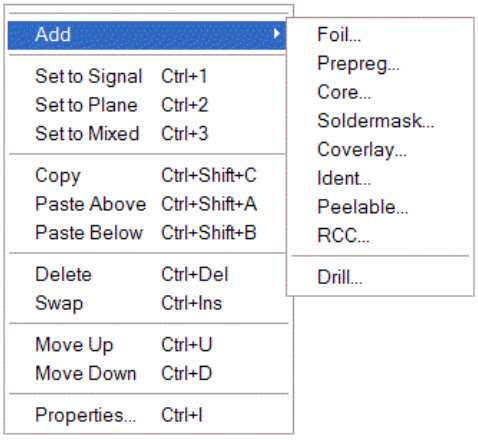
Printing stackup information
To print the stackup information, choose the Print… command from the File menu. Choose Print Preview to examine the stackup information prior to printing.

Exporting stackup information
The SB200 incorporates the facility to export the printed output in Gerber, DXF and CSV formats. From the File menu choose the Export To command and choose the format from the Export To sub-menu.

Backing up stackups and libraries

Stackup files (assigned the .stk extension), project files (assigned the .sci extension) and library files (assigned the .mlb extension) should be backed up to a secure location.

The Edit menu



The **Edit** menu contains most of the commands necessary to create and modify board stack ups. The designer/fabricator works within the free-form stackup build and construction window and adds layers of core, prepreg, foil, etc., from the materials library.

Layers can be changed to signal, plane or mixed, moved up or down or copied and pasted, or assigned properties as required.

The SB200a will apply design rules to the finished stackup to ensure compliance with good board design, (for example, the SB200a will check for symmetrical layers, misplaced layer types, adjscent copper layers, etc.)

The View menu

The **View** menu allows the SB200a to display the stackup in a 2-dimensional or 3-dimensional aspect.

The SB200a toolbar

The SB200a toolbar comprises shortcut links to the most popular commands.

Pause the mouse over each tool button to display the tool's screen tip

File operations

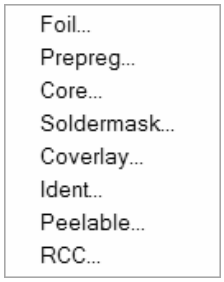
Create new stackup

Stackup Wizard

Adding layers to the stackup

Add layer to the stackup

Click to select the layer type. The list of layer types is displayed in the associated sub-menu.



Layers available include:

Foil…	Add foil layer to the stackup
Prepreg…	Add prepreg layer
Core…	Add core layer
Soldermask…	Add solder mask
Coverlay…	Add Coverlay layer
Ident…	Add screened ident layer
Peelable…	Add peelable mask
RCC…	Add resin coated copper layer

Add mechanical/laser drill between layers

Editing the stackup

Delete selected stackup layer or drill

Swap selected material

Copy material of the selected layer

Paste material above selected layer

Paste material below selected layer

Set the selected electrical layer as a signal layer

Set the selected electrical layer as a plane

Set the selected electrical layer as a mixed signal/plane layer

Move selected layer up one layer

Move selected layer down one layer

Display properties dialog for the selected layer or drill

Changing the stackup view

Display 2-dimensional view

Display 3-dimensional view

Managing the materials library

Display materials library

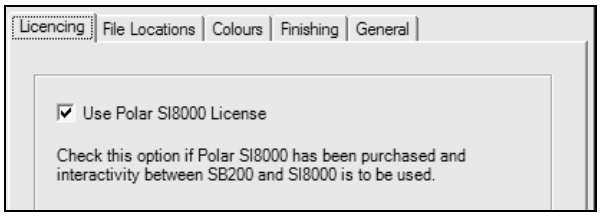
Exchanging data with the Si8000

Copy controlled impedance data to Si8000

Paste controlled impedance data from Si8000

Configuring the SB200

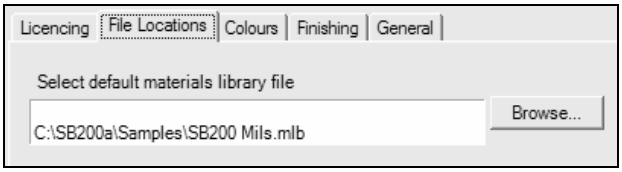
From the Tools menu choose the Options command to display the Configurations Options dialog.



To activate the SB200 controlled impedance function ensure the Use Polar Si8000 License check box is ticked.

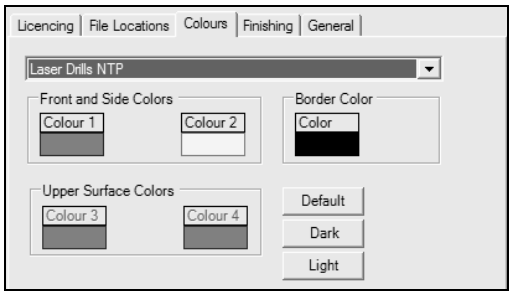
Choosing the default materials library

Users can choose which materials library the SB200 uses at start-up. Click the File Locations tab and use the Browse button to navigate to the library file.



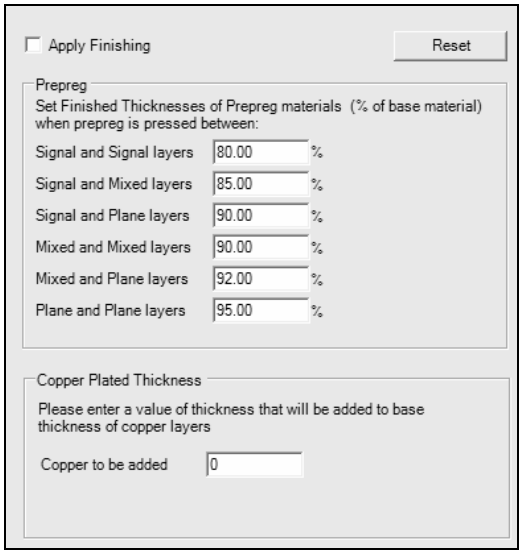
Choosing background and stackup layer colors

Choose the Colours tab to change colors from their factory defaults.



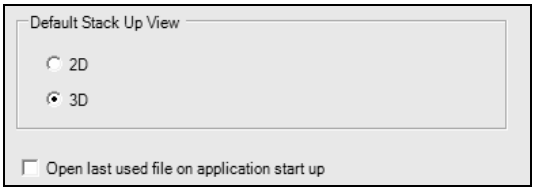
Choosing finished dimensions

The finished dimensions of layers in the stackup will vary from the initial dimensions as result of pressing and processing. Use the Finishing options to specify the pre/post processing factors to be used for the finished stackup.



Specifying the default view and opening file

Select the General tab to specify the default view, two or three-dimensional, and that the SB200 opens the last used file on start-up.



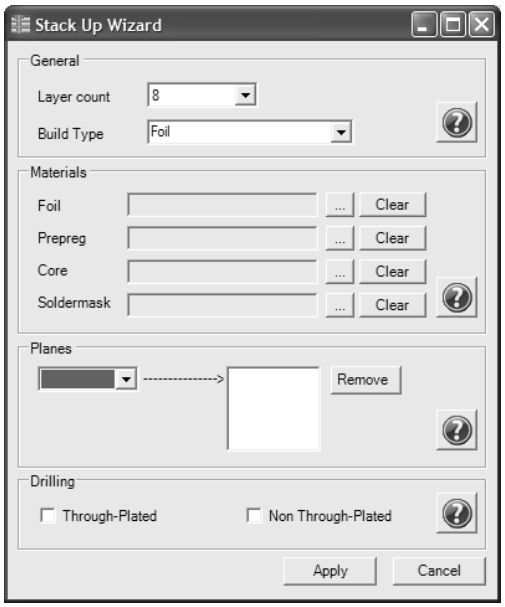
Creating a new stackup

Stackups may be created using the Stackup Wizard or manually using the editing window.

Using the Stackup wizard

Stackup wizard button

The Stackup Wizard guides the user through the process of creating complex stackups in only a few steps. Click the Stackup Wizard button or choose the Stackup Wizard command from the File|New sub menu. The stackup editing window is cleared and the Stackup Wizard is displayed.



Stackup Wizard

Using the Wizard the user can specify the layer count and build type, stackup materials, planes and drill types in a single operation.

Electrical layer count

Begin by specifying the electrical layer count — up to 64 electrical layers may be specified. Choose the number of layers from the drop down list box.

Build type

Choose the build type (Foil or Core) from the drop down list box. Core builds contain only core materials; most builds will be foil builds — containing internal layers of cores with two outer cores.

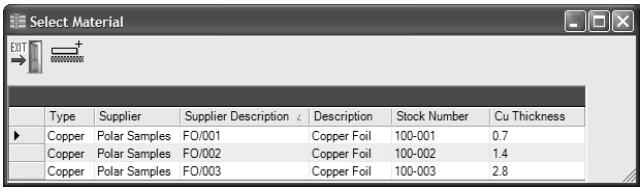
Choosing stackup materials

Note; if Core build type has been specified the Foil material control will be disabled.

Add material button

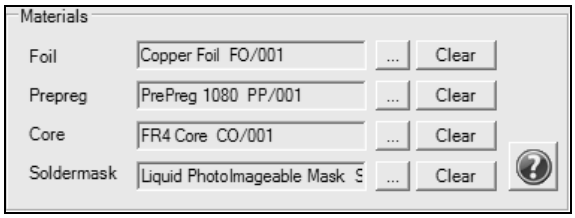
To include a foil layer click the Foil **Add Material** button; the library of foil materials is displayed.

Choose the foil material from the list of materials available and click the **Select Highlighted Material** button; the material is added as a foil layer to the stackup.



Repeat the procedure for prepreg and core materials and the (optional) solder mask layers.

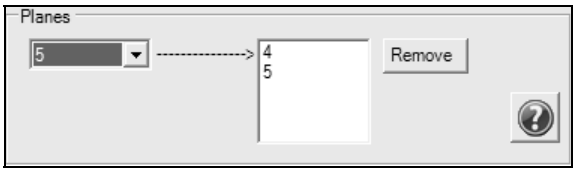
Use the **Clear** button to remove a layer from the stackup.



Stackup materials selected

Nominating power planes

Use the drop down list box to specify that a plane should be a power plane. Select all planes as required. To remove a power plane from the list select the plane number from the list and click Remove.



Layers 4 and 5 specified as power planes

Adding drill information

To add a drill information between electrical layer 1 and the last layer click the Through-Plated and Non-Through-Plated check boxes as required.

With all build options specified click **Apply** to complete the stackup. The finished stackup appears in the stackup window.

Creating and editing stackups

The SB200a allows the designer to add or edit stackup layers in any order, from top to bottom, bottom to top or from the center layer outwards. In this example we create a four layer stackup, starting at the center core layer and adding layers above and below.

Adding layers to the stackup

Display materials library

Items added to the stackup are added from the currently open materials library. The SB200a opens *Program Files\Polar\SB200\default.mlb* if it exists; if a different library is required open it via the Materials Library command.

Note: the SB200 does not ship with the default.mlb library. For this discussion open one of the two sample library files, *SB200 inch.mlb* or *SB200 mm.mlb* (stored in the *Program Files\Polar\SB200\Samples* folder at installation time for a default installation.)

Caution: Consistency of units

When defining dimensions for a stackup (for example, layer thicknesses) ensure that all measurements are defined using the same units (mils, mm, etc.) throughout the structure and its libraries.

Note: the libraries supplied for these examples are preloaded with sample data only.

Click File|New to clear the stackup screen and notes and information text areas.

Click the File|Save Stackup or Save Project command to save the stackup or project. Users are recommended to save stackups or projects frequently during the stackup creation process to avoid data loss. Stackup files (.stk), project files (.sci) and library files (.mlb) should be backed up to a secure location.

Adding a core layer

Add Layer Material *button*

Click the **Add Layer Material** button and choose Core…the Core library is displayed

The Core library contains full details of the core material, including base and finished thicknesses, dielectric constant, and upper and lower copper thicknesses.

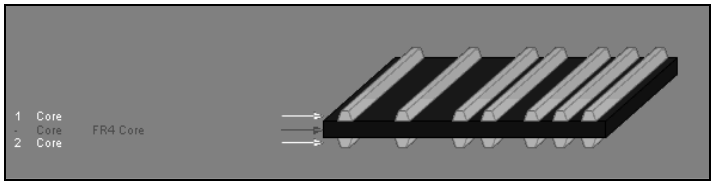
Base Thickness	Finished Thickness	Dielectric Constant	Upper Cu Thickness	Lower Cu Thickness
0.05	0.05	4.2	0.018	0.018
0.05	0.05	4.2	0.035	0.035
0.05	0.05	4.2	0.07	0.07

Click on the column button to sort the library list by the selected column.

Choose a core type from the list of cores and click the Add Above button

Add core above selected layer

Add core above selected layer. The core is added to the stackup screen.



Stackup core layer

Layers may also be added below the selected layer.

Add core below selected layer

As each layer is added the stackup information table is updated to reflect the current status of the stackup.

Stack Up Information

Field	Value
Electrical Layer Count	2
Stack Up Thickness	1.0700
Dielectric Thickness	1.0000
Copper Thickness	0.0700

Stackup information table

With the core selected, the Selected Item table displays the properties of the core.

Selected Item Information : Core

Field	Value
Supplier	SuperLaminates Inc
Supplier Description	CO/026
Description	FR4 Core
Stock Number	400-026
Upper Cu Base Thickness	0.035
Upper Cu Finished Thickness	0.035
Data Filenames	
Dielectric Base Thickness	1
Dielectric Finished Thickness	1
Dielectric Constant	4.2
Lower Cu Base Thickness	0.035
Lower Cu Finished Thickness	0.035
Data Filenames	

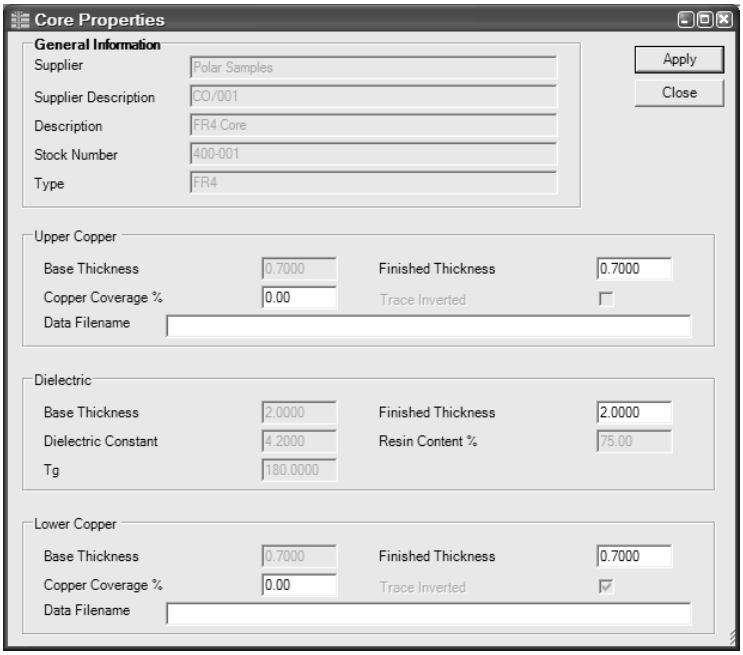
Core layer information

Editing the selected layer properties

To change the properties of the selected object (for example, to modify the value for the finished thickness of the dielectric), right click the object in the stackup and choose Properties from the shortcut menu; the Core Properties dialog is displayed.

Note: the on-screen descriptive text to the left of each layer is plain free form text derived from the layer properties and can be modified using the layer properties dialogs.

When altering descriptions, keep the description short and avoid using dimensional information in text fields which produce on-screen display; if the dimensions specified in the dialog's other text boxes are subsequently changed the on-screen description may not match the true dimensions.



Change the Dielectric finished thickness to the corrected value and click Apply.

Adding data file names

If available, add the data file name(s) to the upper and lower copper layers and click Apply.

Close the dialog when all changes are completed.

Changes will be reflected in the Stackup Information table

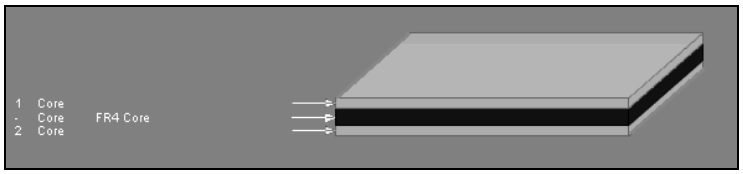
Changing a layer function

Set Layer Plane

In this example we change both signal layers above and below the core dielectric to planes.

Click the lower signal layer and click the Set Layer Plane button. Repeat for the upper signal layer.

The changes are reflected in the stackup window



Exchanging layers

Library Swap button

To change just the core dielectric (leaving the copper layers unaffected) select the core material (for example the FR4 in the graphic above) and click the Swap Selected Material button. Choose the new core type from the library and click the Swap button.

The layer properties will change to reflect the new material and changes appear in the Stackup Information table.

Adding Prepreg layers

Add Layer Material button

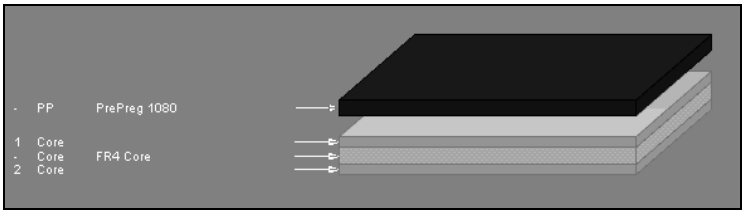
With the core selected, click the **Add Layer Material** button and choose Prepreg…; the Add Prepreg library is displayed.

Description	Stock Number	Base Thickness	Finished Thickness	Dielectric Constant
PrePreg 1080	300-001	0.075	0.075	4.2
PrePreg 3080	300-002	0.077	0.077	4.2
PrePreg 3113	300-003	0.102	0.102	4.2
PrePreg 1651	300-004	0.152	0.152	4.2
PrePreg 7628	300-005	0.2	0.2	4.2

The Prepreg library contains details of the Prepreg material, including the Prepreg's base and finished thickness and dielectric constant.

Add Prepreg Above

Choose the Prepreg material from the database and click the Add Prepreg Above button.



The Prepreg layer is added above the core.

To change the properties of the prepreg material richt click the layer and choose Properties form the short cut menu. For example, modify the value for Finished Thickness to reflect the effects of the pressing process.

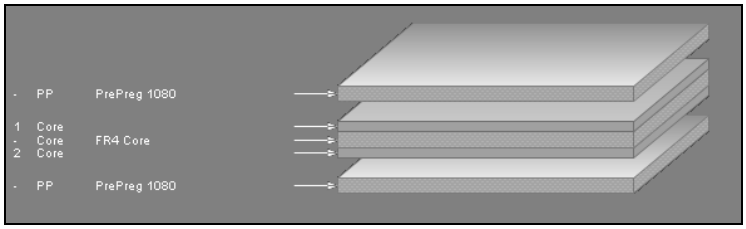
Note: Using the Configuration Options, the SB200a user can specify finished thickness of prepreg materials as percentage of base material thickness when the prepreg is

pressed between a variety of layer types (e.g. (e.g. signal and plane layers, mixed and plane, etc.). The SB200a will apply the settings specified.

Add Prepreg Below

Click the Add Prepreg button to display the Add Prepreg library and click the Add Below button

The layer of Prepreg is added below the core.



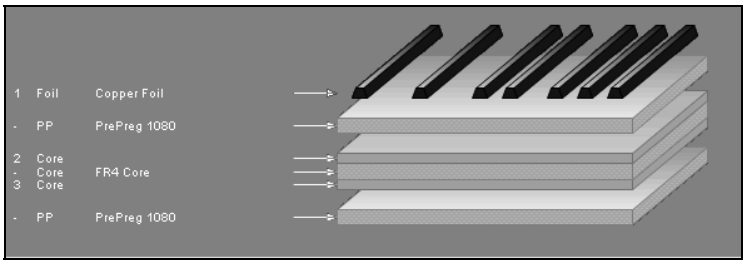
Modify the properties as necessary.

Adding a layer of copper foil

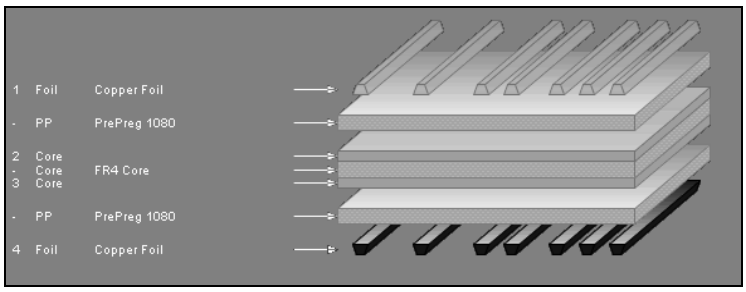
Select the upper layer of Prepreg and click the **Add Layer Material** button and choose Foil to display the copper foil library.

	Supplier	Supplier Description	Description	Stock Number	Cu Thickness
▶	SuperLaminates Inc	FO/001	Copper Foil	100-001	0.018
	SuperLaminates Inc	FO/002	Copper Foil	100-002	0.035
	SuperLaminates Inc	FO/003	Copper Foil	100-003	0.07

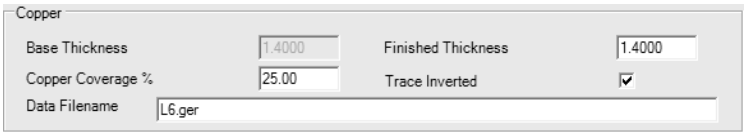
Choose the foil type and click Add Above, the copper foil layer is added above the selected Prepreg layer.



Repeat the procedure for the lower Prepreg layer: select the lower Prepreg layer and add a layer of copper foil below the layer.



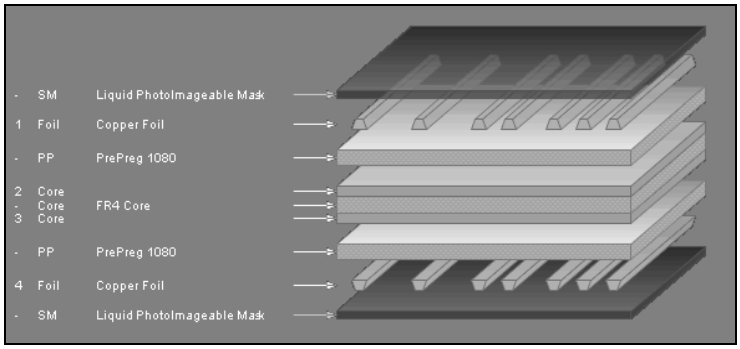
To alter the foil properties, right-click the foil layer and choose Properties. Using the Properties dialog the user can, for example, specify that the trace is shown inverted.



Note the stackup is built symmetrically about the center layer.

Adding solder mask layers

With the upper layer of foil selected, click the **Add Layer Material** button and choose Soldermask to add a layer of LPI solder mask above the foil. Repeat the process for the lower foil layer.

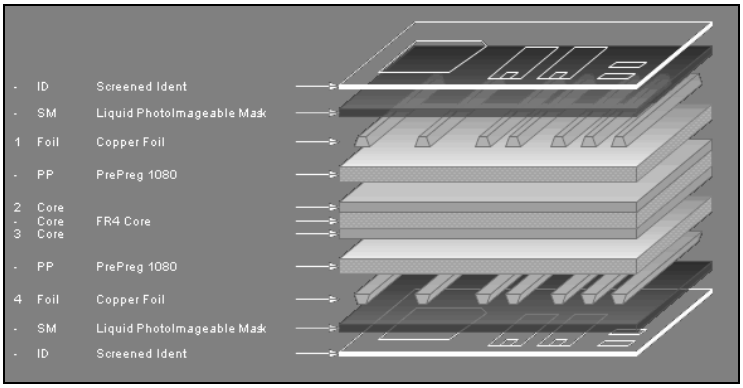


Adding the Ident layers

Select the lower LPI soldermask layer and click the **Add Layer Material** button and choose Ident to add a layer of Screened Ident below the layer. The sample Ident library includes ink thickness and color

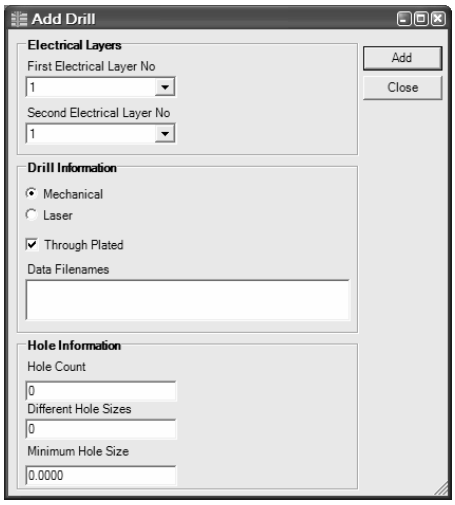
	Supplier	Supplier Description	Description	Stock Number	Ink Thickness	Ink Colour
▶	SuperInks Inc	ID/001	Screened Ident	600-001	0.05	White
	SuperInks Inc	ID/002	Screened Ident	600-002	0.05	Yellow
	SuperInks Inc	ID/003	Screened Ident	600-003	0.05	Black

Repeat for the upper layer.



Adding drill information

To add a drill information between layers click the Add Drill button; the Add Drill dialog is displayed.



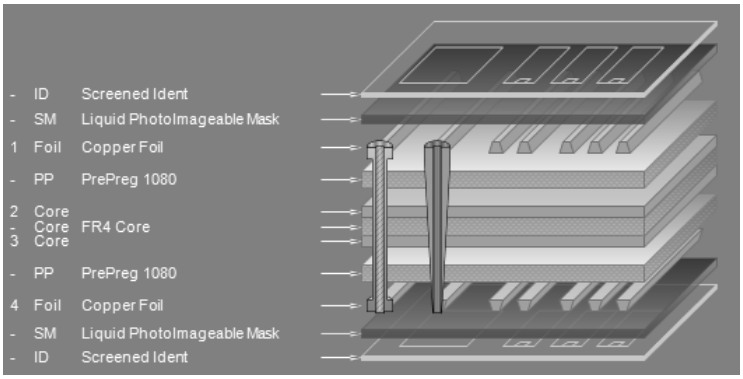
Choose the first and second electrical layer numbers (layers 1 and 4 in the example).

Specify the drill type, mechanical or laser and whether through plated.

Optionally, add the NC drill data filenames.

Optionally, add the hole count, number of different hole sizes and the minimum hole size. Click Add and close the dialog. The drill information is added to the stackup. In the example we have added through plated and laser drill information.

This completes the stackup; the finished stackup is shown below



Completed stackup

Deleting a layer

To remove a layer from the stackup select the layer and click the Delete button.

Delete layer

Copying layers

Copy Material

With layers defined it will often be found more convenient to copy an existing layer and paste it into the stackup than to create a new layer “from scratch”. Select the layer to be copied and click the Copy Material button.

Click the layer nearest the destination location and choose Paste Above or Paste Below as appropriate

Note: when modifying the stackup it may be necessary to redefine the drill information to reflect the changes.

Moving layers

To move layers within the stackup use the Move Up and Move down buttons.

Move selected layer up one layer

When a layer is moved it is exchanged with the layer above or below, respectively.

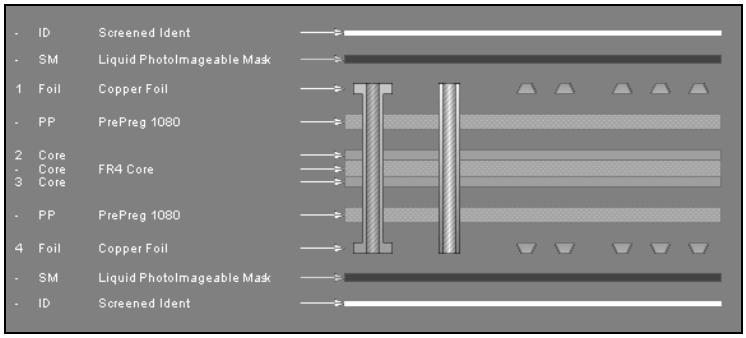
Move selected layer down one layer

Displaying the stackup in 2-dimensional view

To change the view of the stackup from its default 3-dimensional aspect, click the View 2D button.

View 2D button

The stackup is displayed in 2-dimensional view.



Click the View 3D button to restore the 3 dimensional view.

Display 3D button

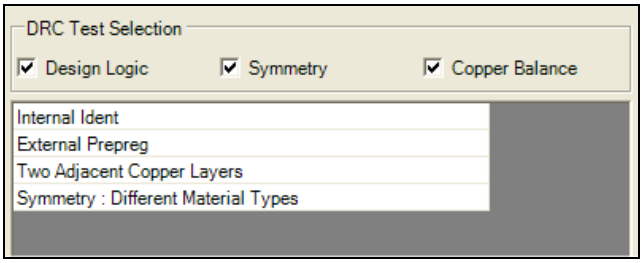
Design Rule Checking

The SB200a includes facilities to check for errors in stackup design, such as layers placed in invalid order or asymmetrical structures.

The Design Rule Checker (DRC) displays results in the DRC dialog. As each design rule is broken the SB200a increments the error count on the DRC tab.

Viewing design rule errors

Click the DRC tab to view errors.



The Design Rule Checker checks include checking for:

Two Adjacent Copper Layers

Resin Coated Copper on Internal Layer

External Prepreg

Internal Solder Mask

Internal Ident

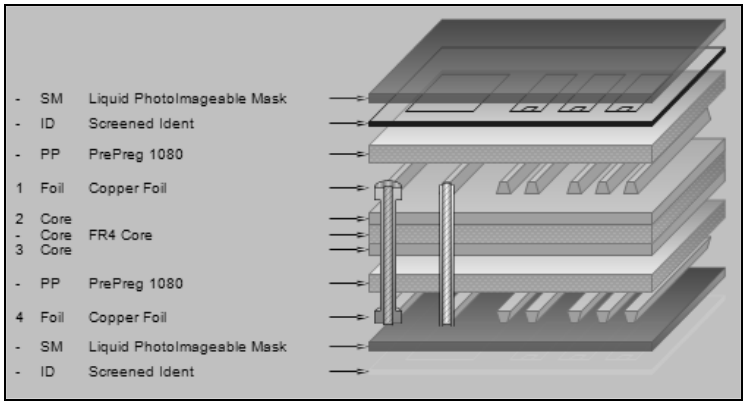
Internal Peelable Mask

Symmetry : Different Material Types

Copper not Balanced

Users can choose to display all errors or to select from a combination of Design Errors, Symmetry errors and Copper balance errors; check the boxes as required.

The errors shown in the dialog above correspond to the stackup structure below. Errors are highlighted in red.



Correcting design rule errors

Users are strongly recommended to work through and correct errors in the order in which the errors are listed.

In the example stackup one of the Prepreg layers is external to the layer of copper foil. This will result in three errors: the *External Prepreg* error, the *Two Adjacent Copper Layers* error and the *Symmetry: Different material types* error. Placing the Prepreg layer into its correct position in the stack will clear both errors.

The Ident layer (normally the outermost layer) is located on an internal layer.

Two layers of copper are adjacent (effectively a short circuit between copper layers).

The stackup is built asymmetrically.

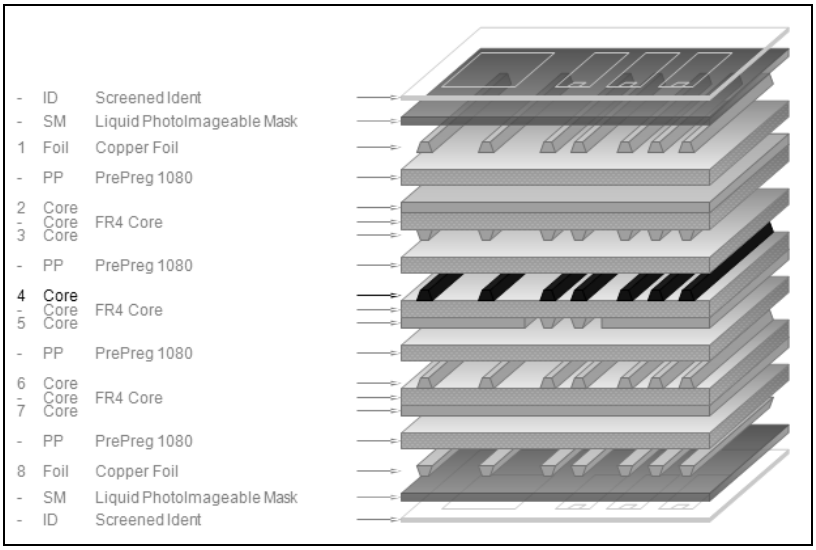
Move the layers to their correct location in the stackup to correct errors. Note that clearing each error may clear other errors in the process.

Adding controlled impedance structures

The SB200 incorporates the facility to add controlled impedance structures to a layer in the stackup. The SB200 is integrated with the Polar Instruments Si8000 Controlled Impedance Field Solver so impedance values for a structure may be calculated at the click of a button.

Structure parameters may be copied to the Si8000 for processing (for example by the Si8000 Goal Seeking function) and calculated values pasted back to the SB200 for insertion into the stackup.

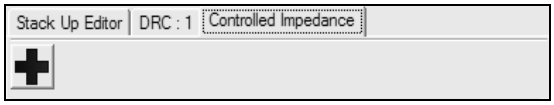
In this example we add a controlled impedance structure to signal layer 4 of the sample stackup below.



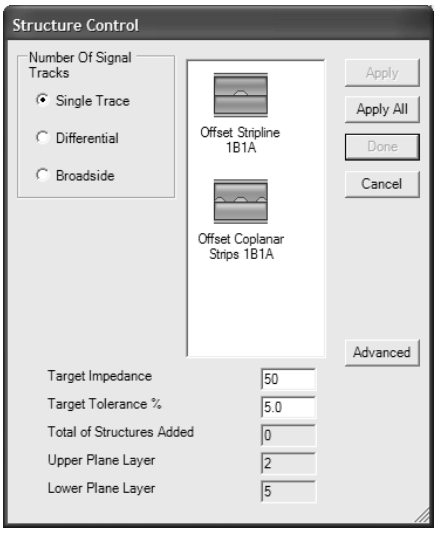
Sample stackup (showing signal layer 4 selected)

Note that in this example layer 5 is a mixed signal/plane layer. Potential reference planes for signal layer 4 are therefore plane layer 2, mixed signal/plane layer 5 and plane layer 7.

With layer 4 selected, click the Controlled Impedance tab. The **Add Structure** button is displayed.



Click the **Add Structure** button, the Structure Control dialog is displayed containing the controlled impedance structures applicable to the selected layer in the stack. Choose values for the target impedance and tolerance. If necessary, resize the Structure Control dialog to view all structures.



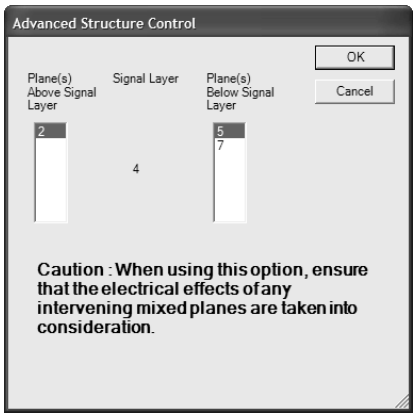
Click the Single Trace, Differential or Broadside option button as appropriate (in this case, we choose Single Trace|Offset Stripline 1B1A).

Note: Broadside only appears as an option where the signal trace is between two reference planes. When selecting Broadside structures it will be necessary to choose the second trace.

Specify the values for Target Impedance and Tolerance.

Choosing reference planes

As there are multiple reference planes available (layers 2, 5 and 7, it will be necessary to specify which planes to use for this structure. Click the **Advanced** button.

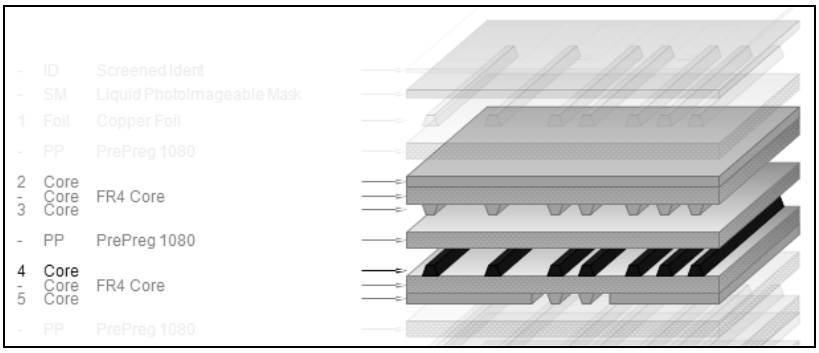


Choose a reference plane from the list of available planes. In the example structure plane layer 2, mixed plane 5 and plane layer 7 are available for reference.

Note: if plane layer 7 is chosen as reference, it will be necessary to take into account the electrical effects of mixed signal/layer plane 5.

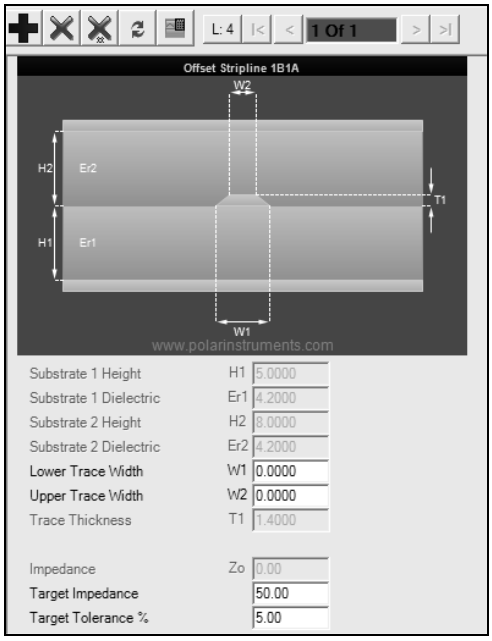
In this example we choose mixed signal/plane layer 5. Press **OK** to confirm.

Repeat for all structures to be added. Click **Apply** for each structure then click **Done** to finish. In this example we choose a single structure.



The stackup window changes to reflect the selected signal layer and its associated reference planes.

The applied structure is displayed in the Controlled Impedance pane



The window displays the parameters of the controlled impedance structure. Fields shown "greyed out" are values derived from the choice of materials in the stackup. For this structure, enter appropriate values for lower and upper trace widths.

Calculate button

Click the **Calculate** button to display the impedance value of the structure with the current parameters. The parameters may then be varied to alter the value of the final impedance. In the example above the user can vary the trace width in order to approach the value of the target

impedance; other parameters are changed by modifying the stackup dimensions (for example, core thickness H1).

Clicking **Apply All** in the Structure Control dialog adds a single instance of all structures matching the stackup layer and the chosen criteria; the user can then choose the structure producing the value nearest the target impedance and delete the structures that are not needed. Controlled impedance operations are performed via the Controlled Impedance toolbar.

Controlled Impedance toolbar

Add controlled impedance structure to current layer

Delete structure from current layer

Clear all structures from current layer

Refresh and calculate impedance

Calculate structure

Display layer and Navigate through structures

Changing parameter values

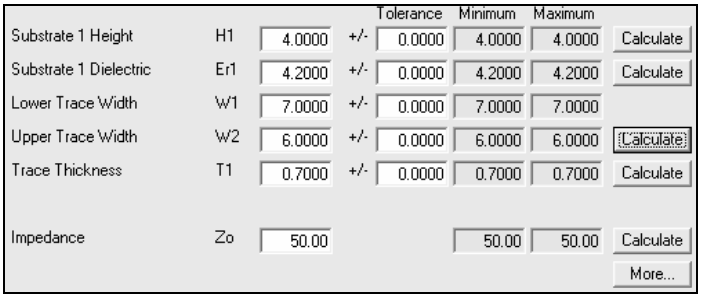
Clicking the Calculate function yields a value for impedance. The user can now vary parameters (for example, the dielectric height) to yield a value for impedance closer to the target impedance. For this example, select the dielectric layer; click the Swap Selected Material button and choose a different core (ensure the same dimensional units are used throughout the structure) and click the Refresh and Calculate Impedance button. The impedance is recalculated to its new value. To arrive at a solution acceptably close to the target impedance, use the goal seeking function of the Si8000 to alter other parameters (in this case, upper and lower trace widths).

Goal seeking with the Si8000 QuickSolver

The SB200 Stackup Design System is fully integrated with the Si8000 Controlled Impedance Quick Solver. The user is able to transfer stackup layer dimensions to the QuickSolver, solve for stackup parameters to produce the target impedance (or calculate that the target impedance is unachievable with the current values) then transfer the solved dimensions back to the SB200.

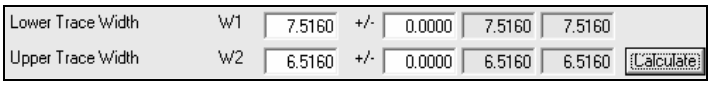
Ensure the Si8000 is running and that the Si8000 units match the SB200 units. With the stackup parameters displayed in the Controlled Impedance window, click the copy to Si8000 button to transfer the current SB200 parameters to the Si8000. Switch to the Si8000 and click the Paste from SB200 button to load the parameters into the associated Si8000 fields.

For the example data below we seek a final value for impedance of 50 Ohms ; H1, Er1 and T1 are fixed.



Si8000 parameter fields with SB200 data loaded

Click the Upper Trace Width Calculate button to goal seek on trace width. The Si8000 returns values for trace width to produce 50 Ohms final impedance.



Solved values for impedance

Click the Copy to SB200 button, switch to the SB200 and click the Paste from Si8000 button to display the solved parameters for the target impedance. It may be necessary to round some dimensions (e.g. dielectric heights) to the nearest practical values and recalculate the impedance.

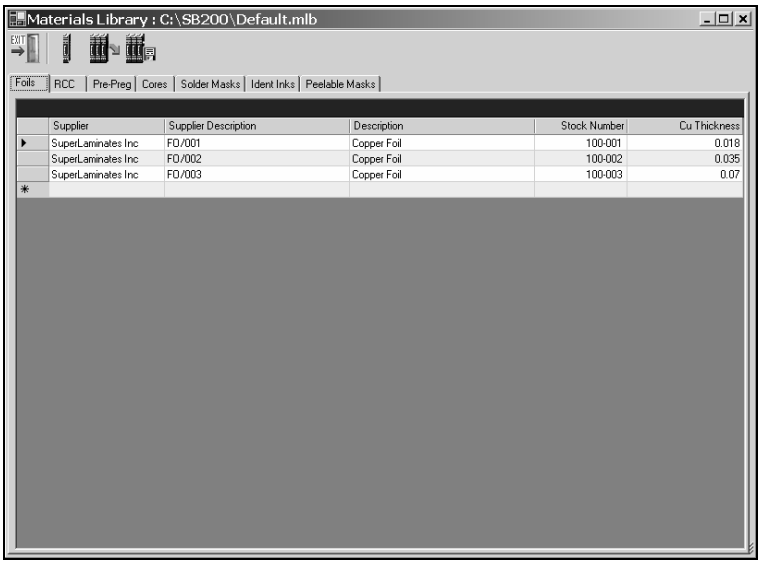
Using the SB200a materials libraries

Materials Library

The materials libraries allow designers to manage their own libraries of board materials.

Click the Materials Library button to display the Materials Library window.

When the SB200a is started the material library specified as the default materials library file (via Configuration Options|File Locations) is opened.



Each library component type is accessible via its associated tab. Click on the Tab to view or edit the component type.

Materials library toolbar

The Materials Library is managed via its toolbar

Clear Materials Library

Open Materials Library

Save Materials Library

Import Material into the Library

Creating a new library

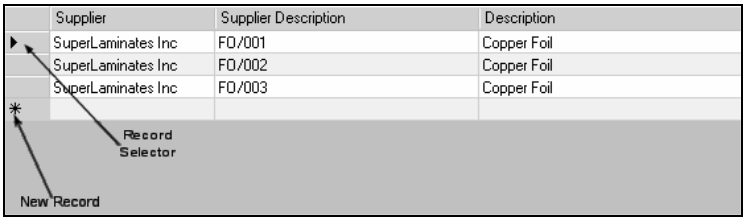
To create a new library click the Clear Materials Library button; the library is removed from the library manager. Click the Save Materials Library button to create the new library. To have the library load as the SB200a starts, specify it as the default materials library file via Configuration Options|File Locations.

Adding material to the library

Caution: Consistency of units

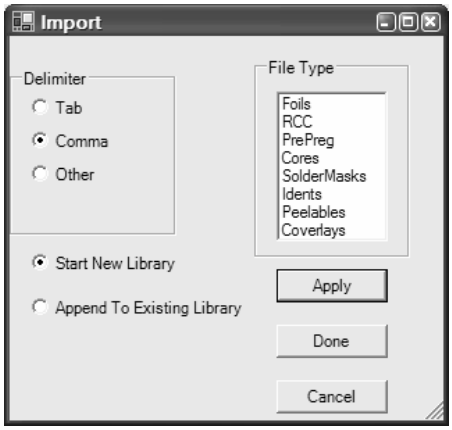
When defining dimensions, e.g. layer thicknesses, for a stackup ensure all measurements are defined using the same units (mils, mm, etc) throughout the structure and its libraries.

Open the library to be modified. To add material types to a library click the associated component type tab; click into the empty record at the bottom of each list and enter the material details. To delete a record, click the record selector and press Delete.



Importing material to the library

The SB200 allows users to add existing material lists to its library; material data must be arranged in the format and order used by the SB200 library. Sample files in comma separated value format and Microsoft Excel spreadsheet and template formats suitable for importing to the SB200 are included in the SB200a|Material Library Import folder. Click the Materials Library button to open the Library, then click the Import button to open the Import dialog.



Library Import dialog

Creating a new materials library

Choose the Start New Library option and choose the field delimiter type. The library import function can accept files in a variety of formats, tab delimited, comma separated and Excel worksheet and template formats. Sections of the sample files included with the SB200 are shown below.

	1	2	3	4	5
1	* Cores				
2	*				
3	*Type	Supplier	Supplier Description	Description	Stock Number
4	FR4	Polar Samples	CO/001	FR4 Core	400-001
5	FR4	Polar Samples	CO/002	FR4 Core	400-002

Sample library file in Microsoft Excel format

```
* Cores,,,,,,,,,,
*,,,,,,,Dielectric,Dielectric,Dielectric,Dielectric,Dielectric
*Type,Supplier,Supplier Description,Description,Stock Number,Upp
Thickness,Dielectric Constant,Resin Content,Tg
FR4,Polar Samples,CO/001,FR4 Core,400-001,0.7,0.7,2,2,4.2,75,180
FR4,Polar Samples,CO/002,FR4 Core,400-002,1.4,1.4,2,2,4.2,75,180
FR4,Polar Samples,CO/003,FR4 Core,400-003,2.8,2.8,2,2,4.2,75,180
FR4,Polar Samples,CO/004,FR4 Core,400-004,0.7,0.7,3,3,4.2,60,180
FR4,Polar Samples,CO/005,FR4 Core,400-005,1.4,1.4,3,3,4.2,60,180
```

Sample library file in comma separated format

Files for importing into the library must be in the above format, with columns in the correct order. Examine the sample files supplied for more information. (It may be helpful to export data files from the current system into Microsoft Excel and save in Microsoft Excel workbook or text file format.)

Specify the delimiter if necessary and choose the file type (Foil, RCC, Prepreg, etc.) and click Apply. Choose the file from the list displayed in the Open dialog and click Open. Repeat the procedure for every file type; Click Done when all file types have been imported. Save the file as a .mlb library file.

Adding material data to an existing library

To add material data to an existing library, open the library and click the Import Material button

FlexLM server-side installation

This document describes a simple FlexLM server-side installation for the Polar SB200a.

Full details of the FlexLM product capabilities are contained in the FlexLM User Manual or on the www.macrovision.com web site.

Note: You will need to be logged into the server with Administrator privileges to perform this installation.

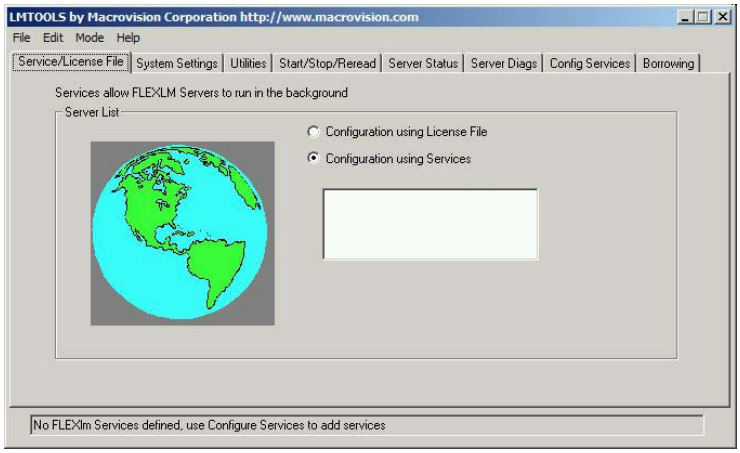
Step 1 – Starting the installer

Insert the installation disk into the CDROM drive of the server. Start the installer via Setup.exe on the supplied disk.

This will create a folder on the server which by default is: *C:\ProgramFiles\FlexLm\V9.2*

Step 2 – Running LMTOOLS

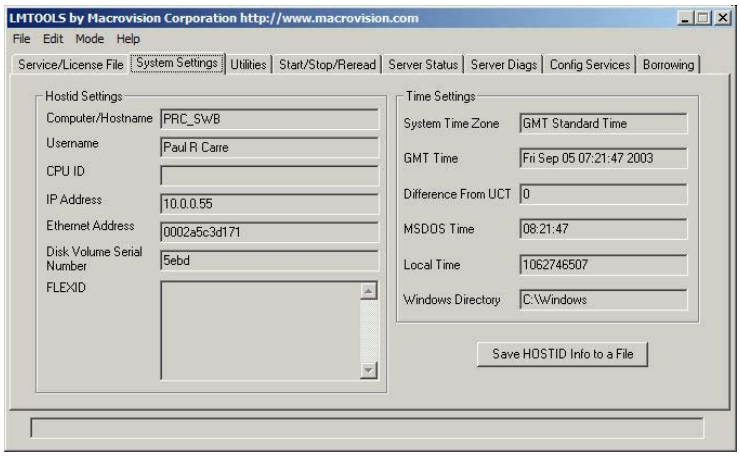
Navigate to the folder created in Step 1 and run the LMTOOLS.exe program.



LMTOOLS dialog box

Step 3 – Creating the HOSTID file

Select the **System Settings** tab.



LMTOOLS System Settings

The System Settings page displays critical information about your selected server machine.

Click the **Save HOSTID Info to a File** button.

This will create a text file that you will need to email to: flexlm.support@polarinstruments.com

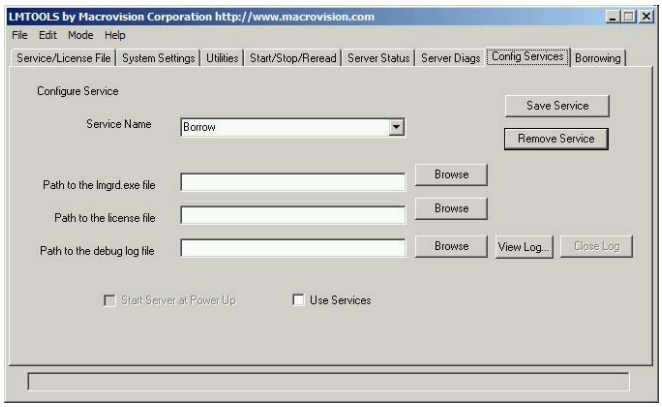
Note: Please also include within the email the Company Name that you would like associated with the licence file. Failure to do this will result in a delay in issuing the licence. Once Polar Instruments has received and processed this information you will be returned a custom licence file by email.

Note: Until the custom licence file is correctly installed on the server machine the SB200a software cannot be used. The custom licence file is allocated to the nominated server machine and cannot be used on any other server.

Step 4 – Configuring the SB200a service

Once you have received your custom licence file from Polar Instruments copy it to the same folder that currently contains LMTOOLS.exe.

Select the **Config Services** tab



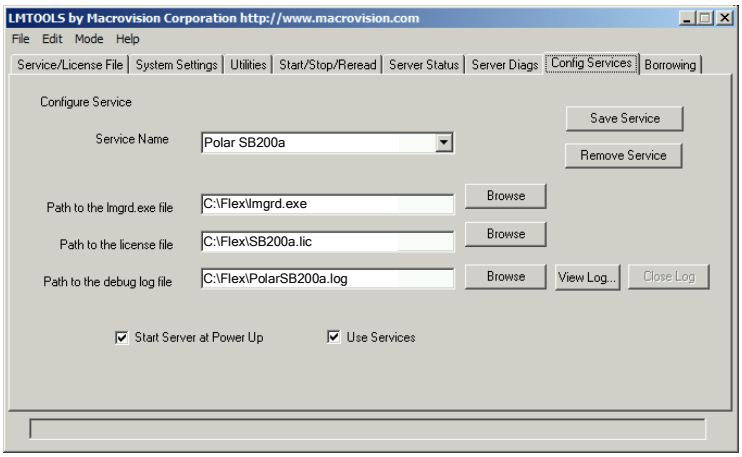
Config Services tab

In the **Service Name** dropdown enter the service name:

Polar SB200a

Use the three **Browse** buttons to select the **lmgrd.exe** file, the **SB200A.lic** file and the Polar **SB200A.log** file.

Select the Use Services and Start Server at Power Up checkboxes.

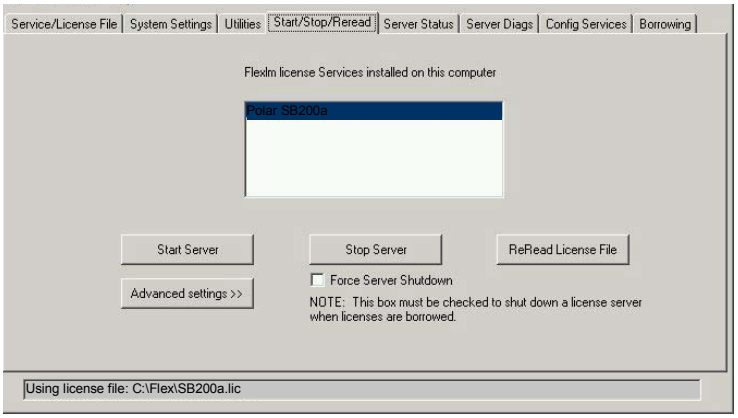


Config Services tab

Before leaving this page select the **Save Service** button to store these settings.

Step 5 – Starting the server

Select the Start/Stop/Reread tab



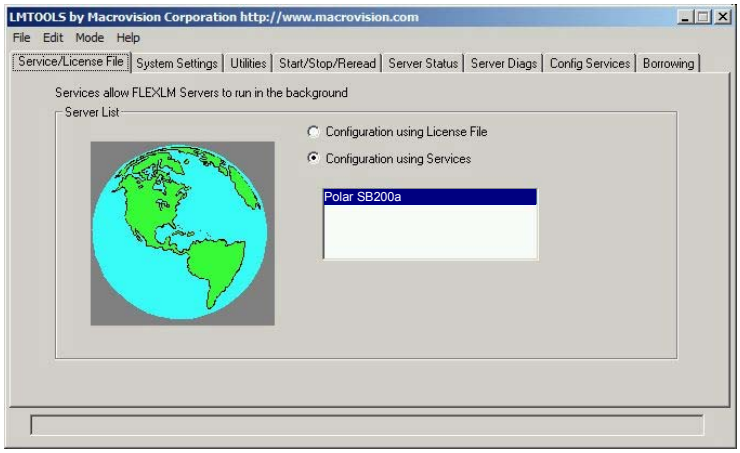
Start/Stop/Reread tab

Select the **Start Server** button; this should be the only time that you are required to do this as this service will be now be run at the time of server start up.

Step 6 – Verifying the SB200a service

Select the Service/Licence File tab

This should now show the Polar SB200a Service.



Service/Licence File tab

This completes the server side installation; please refer to the FlexLM User Manual for additional information.