

NX PCB.xchange: ECAD/MCAD design interface

Benefits

- Promotes design collaboration through sharing of engineering information
- Helps eliminate errors
- Shortens design time; improves overall efficiency
- Eliminates tedious work for mechanical designers

Features

- Integrates mechanical and electrical design processes
- Provides associative bidirectional sharing of flexible printed circuits (FPCs) and rigid PCB designs between ECAD systems and NX software
- Provides for the preview of IDF files and visualization of data exchange process
- Provides rule-based filtering of components and features
- Allows user to generate web HTML reports of PCB assembly
- Tracks and manages changes with Compare and Update feature
- Can be used in concert with Teamcenter software where parts are automatically created or retrieved from the Teamcenter parts database

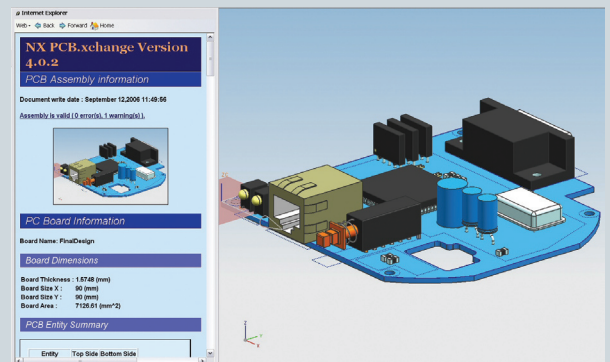
Summary

The PCB.xchange ECAD/MCAD design interface provides associative bidirectional data exchange of flexible printed circuits or rigid printed circuit board (PCB) layout between all ECAD software and the NX™ digital product development applications. It is used to directly generate NX 3D assembly models of the flexible printed circuits or rigid PC boards and components. PCB.xchange is an invaluable tool for integrating the mechanical and electrical design processes.

Flexible printed circuits and rigid PCBs 3D data definition and associative bidirectional exchange between NX and ECAD design systems

PCB.xchange allows for the modeling of a PC board within the NX digital product development system. The resulting data is exported, using the IDF standard ECAD/MCAD file format, to the ECAD design systems. Once an NX assembly has been created, it is accessible by all NX applications for design review, assembly, tolerance checks and simulation.

The PCB design process is typically initiated in NX using the PCB.xchange modeler toolbar. A user then exports the initial PCB layout and key component locations, as well as holes and restriction areas to an ECAD design software package. Because the translator directly uses existing PCB layout data, the task of interpreting and re-entering information is eliminated. The use of the NX PCB.xchange module results in fewer errors, faster turnaround time and elimination of tedious work for mechanical designers.



PCB.xchange contains facilities for validation of the printed circuit board structure.

NX

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ECAD requirements

PCB.xchange uses the IDF2, IDF3 and IDF4 standard file format for data exchange. Most ECAD vendors support IDF2 or IDF3 for data exchange. Both PCB.xchange and an ECAD IDF translator are required to complete the bidirectional transfer of PCB data between systems. ECAD PCB layout systems that support IDF include Mentor Graphics, Cadence, Zuken-Redac, OrCAD, PADS, Accel-PCAD and Incases

Prerequisites

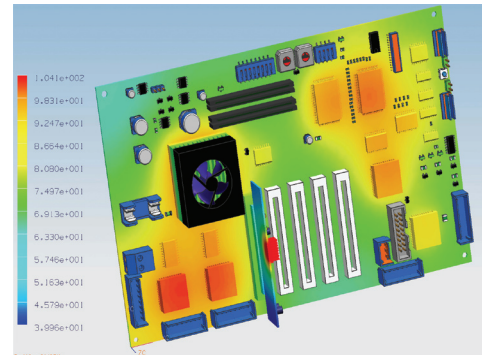
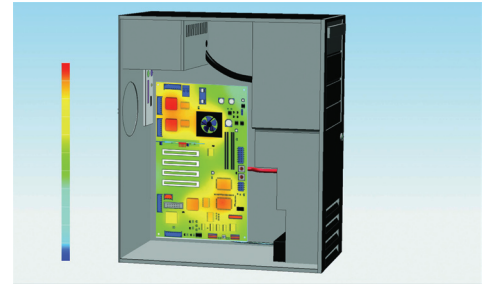
- NX modeling and assembly design
- PCB IDF translator from ECAD vendor

Within NX a mechanical designer can define board shape, specify important keep-in and keep-out areas and preplace critical components such as connectors, switches, displays and LEDs using the assembly design capabilities within NX and PCB.xchange modeler tools. The preliminary PCB design is then transferred to an ECAD system for the PCB designer to use as the basis for the board design. After placing the remaining components in the ECAD system, the updated board can be passed back to NX. The mechanical designer ensures the board assembly fits into the final product package. Multiple iterations of this basic design data flow between ECAD and MCAD systems typically occur during the product design phase. PCB.xchange makes it easy to transfer complex PCB assembly data between NX and ECAD packages.

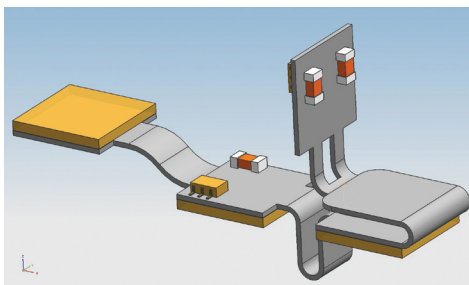
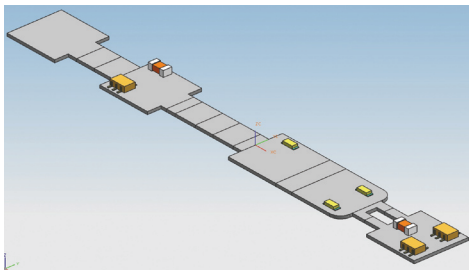
In addition, the PCB design in NX can be used to generate manufacturing and product documentation. The PCB assembly can also be used to perform detailed thermo-fluid cooling, thermal and structural analyses using the NX Advanced Simulation module featuring the NX Flow, NX Thermal and NX Nastran powerful analysis solvers.

PCB.xchange facilitates the following engineering tasks:

- Online design reviews to verify manufacturability
- Tolerance analysis
- Interference checks
- Component-level thermal simulation
- Assembly-level cooling simulation and heat sinks sizing
- Sheet metal part design and flat pattern development
- Board and system-level structural and thermal analysis
- Vibration and impact analysis
- Numerical control toolpath creation
- Plastic part and mold analysis
- Drafting and technical documentation



Using PCB.xchange allows you to interface with other NX services such as thermal and flow analysis.



New capabilities added to PCB.xchange allow it to work with the new Flexible Printed Circuit Design product in NX.

Modeling PC boards in NX

PCB.xchange tools and NX assembly design applications make it easy to model flexible or rigid printed circuit assemblies. Boards and components are modeled using standard part modeling practices with NX. An assembly of the board and components is created within the NX application, and the PCB.xchange toolbar helps identify additional board and component information for exchange with the ECAD system. PCB.xchange provides the tools to identify board components, drilled holes, restriction (keep-in and keep-out) areas; and, it checks your PCB assembly and generates HTML web reports that are loaded automatically within the browser tab of the NX resource bar workspace.

Component libraries

An essential part of the PCB data exchange process is coordinating component part information information between NX and the ECAD system. PCB.xchange provides simple methods to help match and filter component data between NX and the ECAD system.

- Component mapping – allows for maintenance of different component part names and numbers between the two systems
- Filtering – allows for the removal of small components or small board features, such as pinholes, for more efficient assembly modeling

PCB.xchange allows a user to interactively preview IDF files and visualize the data exchange process. When IDF files are imported from ECAD, PCB.xchange will automatically create extruded component footprints to create 3D parts and correctly position instances of these parts on the board assembly. It can also use detailed components available in Teamcenter part folders to create PCB assemblies.

Teamcenter® is a software solution family from Siemens that enables enterprises to

capture, manage, access, integrate and leverage diverse types of product information in a web-native environment.

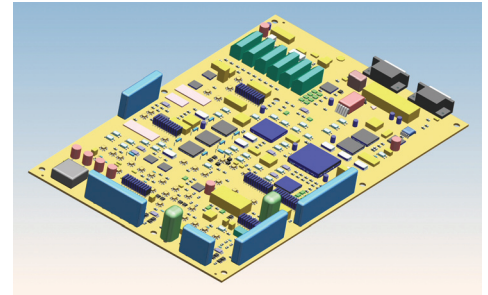
Data exchange capabilities

PCB.xchange allows for the bidirectional sharing of PCB design data between the ECAD system and NX, including:

- Board layout with cutouts and thickness
- Component footprint, height and layout including board side and offsets
- Drilled holes and hole properties
- Restriction areas (keep-ins and keep-outs)
- Component reference designators
- Component or package name/number
- Rule-based filtering of component and board features
- Web (HTML) based reports of IDF contents and the PCB assembly

PCB.xchange also supports the following:

- Automatically substitutes NX parts for the board assembly
- Compares NX and IDF models
- Allows for selective updating of NX models
- Imports and exports previewing of data exchange



Printed circuits with thousands of components can be effortlessly moved between NX and your ECAD system.

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