Valor Process Preparation

Complete engineering solution for PCB assembly and test

Benefits
- Increases engineering efficiency by using a single tool for all process engineering tasks
- Eliminates preparation work with auto-generation (AG) machine component libraries
- Increases work instruction authoring (documentation) efficiency through automation and use of templates
- Maximizes offline preparation to eliminate online trial-and-error delays
- Preserves manufacturing know-how, including manufacturing best practices, libraries and customer data preparation flows
- Increases product portability by seamlessly moving production between lines and factories using portable production data
- Reduces inspection programming times with comprehensive and accurate component model outputs

Summary
Valor® Process Preparation solution provides manufacturers with everything they need to accurately and efficiently run the manufacturing process while saving costs. Valor Process Preparation offers a unique approach that creates a single, central database of all manufacturing process definitions (MPD) and engineering data, leveraging ODB++ Design and bill of materials (BOM) files. The true client-server application reduces work in process (WIP), increases overall equipment effectiveness (OEE) and enables you to achieve a stream-lined flow in your production process. Surface mount technology (SMT), through-hole technology (THT), stencil design, hand work, box build, electrical test and both optical and X-ray inspections are all supported for maximal advantage. It is easily configured for your specific work-flows, including data preparation, design-for-assembly (DFA) analysis, documentation, SMT programming, test and inspection engineering, and stencil design – all in one seamless, cohesive solution.

Valor Process Preparation helps you improve yield by promoting an error-free manufacturing process. It gives you the flexibility to move between machine vendors and different manufacturing sites and to optimize your SMT programs, which is essential for optimized productivity and manufacturing.
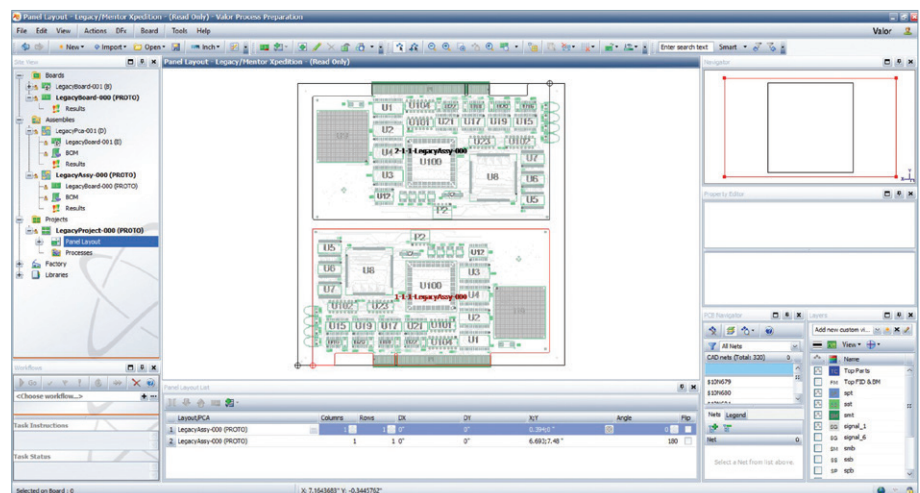
The Valor Process Preparation solution is a complete engineering solution for PCB assembly and test, including upfront critical DFA analysis, BOM validation, workflows for stencil design, SMT programming, test and inspection engineering, documentation and work instructions, and box-build or hand-assembly operations.

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Valor Process Preparation

Valor Process Preparation is part of the Xcelerator™ portfolio of solutions and services from Siemens Digital Industries Software.

A single engineering tool for error-free manufacturing
Valor Process Preparation provides a single environment for all stages of the manufacturing process, including assembly, test and inspection.

Changes you make during these stages are updated in a centralized location to make sure that data is always up-to-date. The change and revision management eliminates the need for manual, error-prone updates, which can cause consistency and reliability issues throughout the manufacturing process.

A single data model for all processes and vendors
Manufacturing mistakes are reduced with a single data model that covers multiple processes and multi-vendor programming support. Built-in error checking, learning library and profiles for each design center make it easy to achieve intelligent hand-off of PCB design with a complete and accurate data model of the PCB assembly that is fully optimized for manufacturing.

Valor Process Preparation also provides a hierarchical view of assemblies, including support for multiple instances. Machine shapes can be generated on demand and customizable workflows allow multiple people to share projects and track their status. All part numbers and attributes are placed in a master part library that supports all manufacturing processes, test and

> *"Valor Process Preparation has significantly reduced the amount of line downtime due to designs with poor manufacturability."*
>
> *Nick Newland*
> *NPI Engineer*
> *IEC Electronics Corp.*

inspection, helping you achieve right first time success.

Design anywhere, build everywhere
The flexibility to move products between different locations is a key requirement for multi-site PCB manufacturers. Technically, this can be done by any manufacturer, but because line configurations are rarely identical, moving the product efficiently and in an error-free process is challenging. Therefore, most PCB manufacturers start the new product introduction (NPI) process from the beginning, increasing time-to-market and setup costs.

An intelligent portable product file (PPF) allows you to share the complete product model data, including PCB data and all related part and package data, for fast transition of products from one location to another. Once a product has been transferred to another location, that data can immediately be imported by the target-site process NPI team to generate new programs and documentation for the new manufacturing environment. Each site maintains its process data, stencil guidelines, assembly machines, inspection machines, test equipment and work instructions. You can switch from a single machine vendor across a company or between different vendors as needed (for example, Juki to Panasonic, ASM to Panasonic, or for test equipment from Teradyne to Keysight).

Preserve knowledge for the future
Valor Process Preparation seamlessly captures knowledge of manufacturing processes to maximize your current and future efficiency. It uses an auto-generation mechanism to capture part and package data to maintain knowledge or to shorten future processes, such as switching manufacturing setups.

Valor Process Preparation also captures experience in the manufacturing industry by creating neutral machine shapes. Managing a single, vendor-specific machine library forces the manufacturer to use that vendor's equipment.

Managing your part data in a neutral manner allows you to move between vendors as needed according to different target formats. This provides greater flexibility to select the most appropriate equipment for each location and need.

Using the advanced capabilities of Valor Process Preparation, information and methods developed by specialists in a single project can later be used by any worker.

Optimized SMT program portability
A single, centralized programming resource, along with a centralized part library for all SMT machines, helps avoid a machine-specific library, which limits the manufacturer's work flexibility and efficiency. Part libraries can be created for each machine directly from the master parts library, and custom parameters can be created or modified to enhance part and shape data.

Native machine programs can also be imported and quickly converted into alternate machine formats that can be optimized with Valor Process Preparation to quickly migrate production across vendors.

Valor Parts Library
The Valor Parts Library (VPL) is ISO 9001-certified, covering over 1 billion part numbers. It is a centralized location of all accurate shape data, pin contact area and component classification based on the JEDEC standard. A neutral assembly shape and specific machine shapes can be automatically derived from VPL to build an accurate and consistent virtual prototype build and help you achieve an error-free manufacturing process.

> *"We now use one tool for the whole manufacturing engineering process instead of many individual tools for SMT, AOI and stencil."*
>
> *Manufacturing Process Engineer in a large enterprise industrial manufacturing company*

Increased efficiency with intelligent line utilization

Valor Process Preparation includes off-line simulation to show how individual machines will place each component, reducing the time taken to prove a new program using virtual sticky tape. Intelligent analysis of the common part numbers across multiple boards also maximizes the number of products that can be manufactured within the same setup, further increasing your efficiency.

CAD orientation – Polarity 180°

Rotation neutralized and corrected
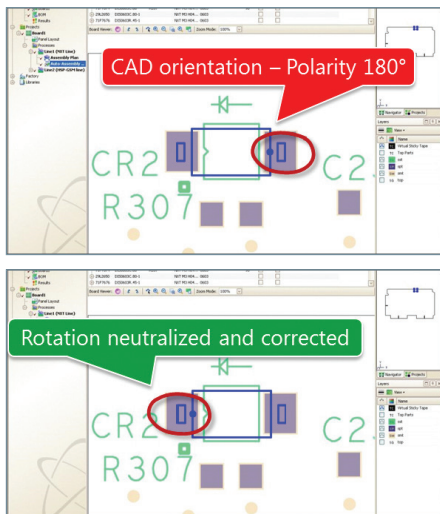
NPI acceleration

PCB assembly lines almost always include machines from multiple vendors once inspection and test stations are included. Therefore, multiple applications are needed to prepare the CAD and CAM data for the respective machines, adding time and costs to your manufacturing process.

With Valor Process Preparation, automated test probe selection and positioning is based on available access to each electrical node. It also includes full reporting of placements such as reason codes for inaccessible points. Programs take into account the location of automated optical and x-ray inspection (AOI/

AXI) machines on the line and components that should be placed up to that point. It is CAD tool-agnostic – all leading industry tester formats are supported. Valor Process Preparation also includes a software development kit (SDK) to create custom scripts needed to further accelerate the NPI phase.

Process documentation guidelines template

Valor Process Preparation dramatically simplifies the creation of documentation using templates for an easy and efficient process. The tight integration with the BOM and automatic change and revision management make certain that every change in the design is automatically updated in the document, preventing consistency issues. Built-in and custom-defined templates for static and interactive documentation are available, and they can include any design, product model, SMT, test or other production information. You can also embed images and files into your documents to preserve and provide access to all information.

Set and maintain DFT guidelines

In a few simple clicks, Valor Process Preparation makes it easy to utilize library information you have on components, board and materials to create an output that can be used for electrical testing.

Design for testing (DFT) guidelines can be captured with test plans for test engineers to use in the future. DFT analysis in Valor Process Preparation includes manufacturing risk analysis such as identification of high-risk areas and provides feedback on inaccessible points, preventing issues later in the process. A graphic user interface enables adjustments to be made quickly and easily, without having to locate specific ASCII files that control comparable capability.

Valor Process Preparation also has the ability to import schematic files and to cross-probe between schematic, layout and the BOM file. This accelerates the test program generation and debug phases by quickly finding the components in the schematic.

Single process engineering solution

Valor Process Preparation is the only complete process engineering solution available for PCB manufacturing. As lot sizes are reduced and the number of unique designs increases, the ability to enable an Industry 4.0 lot-size-one capability is only possible with a single point of truth for all aspects of the process engineering space. It is not possible to achieve best-in-class manufacturing with traditional, separate point solutions in front of each machine. Not only are separate point solutions ineffective, in most cases the data source is different for each machine, creating expensive inconsistencies across your manufacturing line. Contact us for more information on how Valor Process Preparation can solve your PCB assembly challenges.