PCB Assembly made easy with SmarteSolutions

What does SMARTeSOLUTIONS can do for you in PCB and Electronic assembly?
Everything from quote to shipping except machine programming. We don't make SMT or other machine program and few specialized, expensive, existing software does it very well. Costly SMT machines place about 90% of the today's industry components and this represents 75% to 90%, depending of the level of technology, of the total cost of the products. It's very important but what about the rest of the manufacturing process. SMT represents only about 10% of the processes in the complete PCB manufacturing process. The quantity of involved process increases the complexity and the possibility for defects and errors especially with multiple operator manipulation.

Prodesol SmarteSolutions can handle all manufacturing process including SMT assembly line optimization. It consists of:

- **PLM to handle product information**
- **Modelers to define and optimize manufacturing processes**
- **Electronic workstations for shop floor operators**
- **MES for process and parts traceability.**

PRODeSOL PLM, *SMARTeMANAGER* is a one step tool for creating and managing:

- **Projects, Products and processes**
- **Parts, packages. assembly,**
- **eBOM, engineering bills of material for general and electronic assembly**
- **Documents and standards**
- **Cad data for electronic assembly**
- **Revisions**
- **Engineering changes**
- **CAPA, Corrective and Preventive Actions**
- **Contact management, Users, manufacturers, suppliers, ...**
- **Assembly Process**
- **Tools**
- **Shop Floor Model**

PRODeSOL *SMARTeMODELER-GA* is a one step tool for creating:

- **Quotes, (labor and parts)**
- **Advanced Cost Analysis**
- **mBOM (Manufacturing BOM)**
- **Detailed manufacturing processes**
- **Optimized routing**
- **Assembly Lines with optimization and line balancing tools**
- **Methods (Visual work instructions automatic creation)**

Manufacturing process becomes critical in today's highly competitive market. A good process is essential but an optimized process will produce competitive advantages. PRODeSOL *SMARTeMODELER-GA* is the complete tool for high mix assembly of all levels of complexity. The system will identify bottlenecks before it reaches manufacturing and no details, parts or steps will be left out.

The immediate results are:

- **MAXIMIZED EFFICIENCY**
- **100% QUALITY**
- **REDUCED MANUFACTURING COSTS**
- **INCREASED THROUGHPUT**

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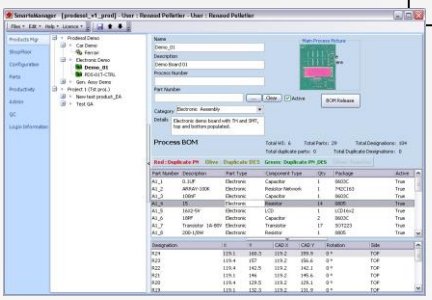
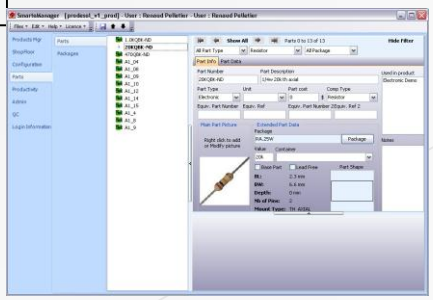
PRODeSOL SMARTeSOLUTIONS

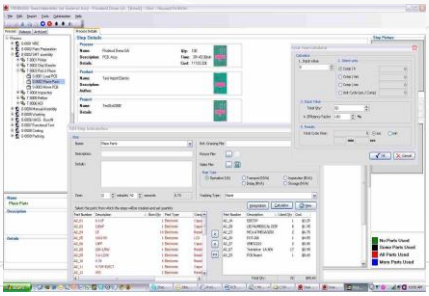
Product Screenshots



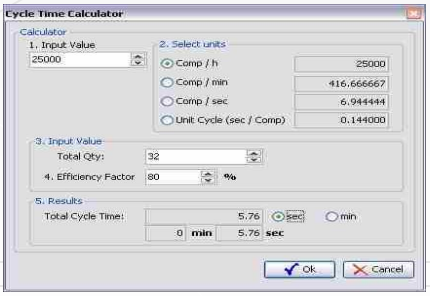
Process eBOM & CAD Data



Parts & assembly



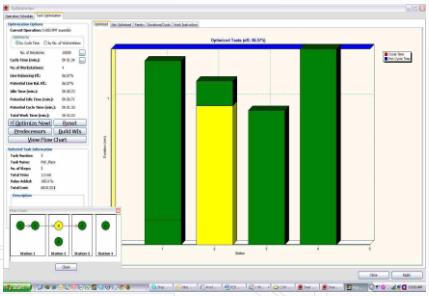
Detailed step definition



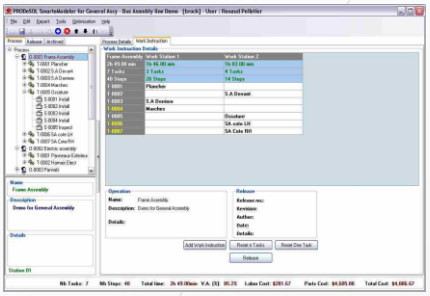
Cycle time calculator

Routing optimization

Cost analysis, labor & parts



Line Balancing



Automated WI creation

The next step after overall process optimization is the creation of specific process for shop floor PCB assembly using Prodesol SmarteModeler-EA. The information will also be available for shop floor workstation and Quality control module.

PLM Benefits:

- ✓ Reduced time to market
- ✓ Improved product quality
- ✓ Reduced prototyping costs
- ✓ Savings through the re-use of original data
- ✓ A framework for product optimization
- ✓ Reduced waste
- ✓ Savings through the complete integration of engineering workflows
- ✓ Server system for real time process update
- ✓ Collaborative work

MODELER-GA Benefits:

- ✓ **Reliable** advanced quote system.
- ✓ Accurate mBOM management.
- ✓ **Maximized work center load**.
- ✓ **Maximized assembly process reliability**.
- ✓ Maximized v**alue** a**dded** a**ctivities**.
- ✓ **Quick and Easy changes** and improvements.
- ✓ Quick Bottlenecks evaluation and reduction.
- ✓ Maximized **workflow**.
- ✓ Error free electronic **work instructions**.
- ✓ Reduce operator training and learning period.

System requirements

MySQL Database server.
PC Pentium P4 or Equivalent
Microsoft Windows XP or Vista
512 MB Ram (minimum)
Super VGA (800 x600) minimum,
1024 x 768, 19" monitor with Higher resolution (recommended) for higher efficiency

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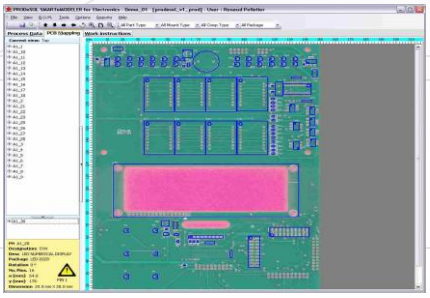
SMARTeMODELER-EA is the module used to define process and work instructions for PCB assembly. It also does PCB manual assembly line optimizations. Packages are defined in SmarteManager,

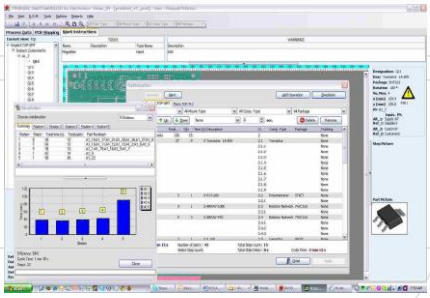
The steps to create work instructions are:

- Select process already defined in SmarteManager.
- Import a PCB picture (scan, pdf, gerber,...).
- Maps automatically (CAD XY required) the parts on the PCB (top, bottom).
- Create work instructions.
- Optimize duration and line balancing
- Release work instructions
- Print or use on SmarteStation

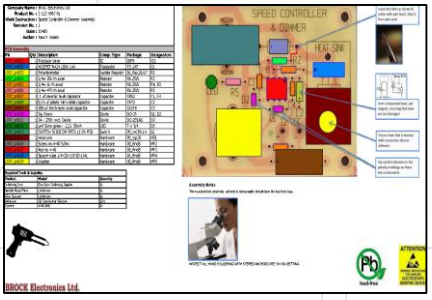
Important: Mapped data is used in SmarteViewer-EA and SmarteQC-EA. It is the PCB detailed parts information necessary if you want to increase quality in PCB manufacturing detailed information.



Parts mapping

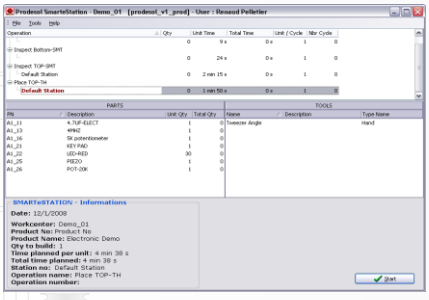


Process optimization

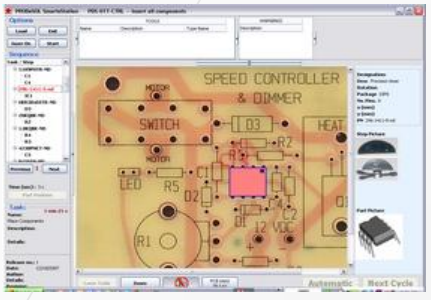


Paper Work Instructions

SMARTeSTATION is the module used by operators on the shop floor. It uses the work instructions created with the SmarteModeler. It includes powerful features that guarantee 100% quality and efficiency. It utilizes graphics, multi-lingual text-to-speech, parts laser pointer and pick-to-light bin rack system, to create a usable intuitive environment. It can be used locally or in remote location (ex. Smartemodeler in Toronto and SmarteStation in Mexico). Updated information in the SmarteModeler-EA is automatically updated in the SmarteStation.



Setup, parts, tools, quantity, etc



Assembly operator interface

Assembly detail is defined in sequential steps. It shows detailed parts and package data and alternate parts.

Visual information is always visible for step and part picture, warning for pin 1 and polarity.

Joystick controller, footswitch, laser positioning system, pick-to-light system and ergonomic bin racks are available to improve operators productivity.

SMARTeVIEWER-EA is is a PCB viewer for the process created with SmarteModeler. It includes powerful parts filters and search functions. The interface is similar to SmarteModeler-EA.

SMARTeQC-EA is an advanced PCB Quality Control Module. It uses the viewer features including the powerful parts filters and search functions. Specifications are defined in SmarteManager.

The main functions are:

Defects tracking

- Inspect each PCB and list all defects. USB microscope 20x to 400x is optional.
- Statistics, Pareto graphs and report are update real time.

Defects repair

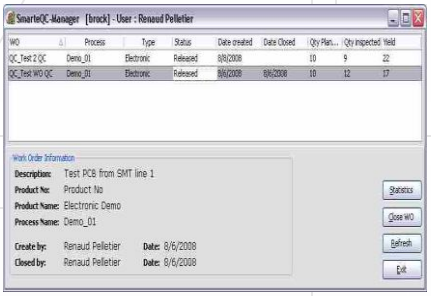
- Repair the defects found in defect tracking. USB microscope 20x to 400x is optional.

First article analysis tool

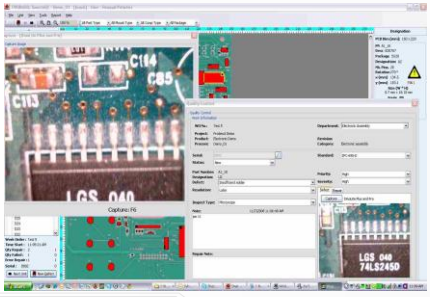
- Inspect first article PCB and list all defects.
- Statistics, Pareto graphs and report available real time to make the necessary corrections without delays.

Steps:

- Select the product and create a Work Order with quantity to inspect.
- Start inspection. Each PCB must have a serial number for tracking.
- Repair defects found
- Close Work Order in SmarteQC-Manager

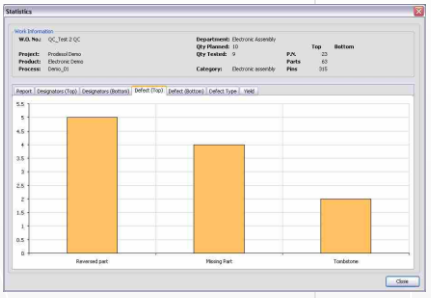


SmarteQC-Manager

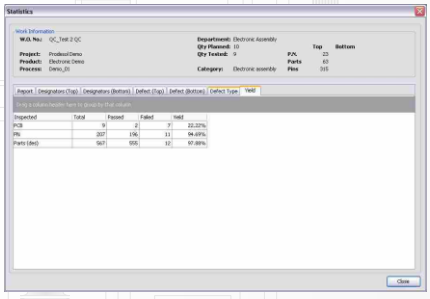


Defect tracking with microscope

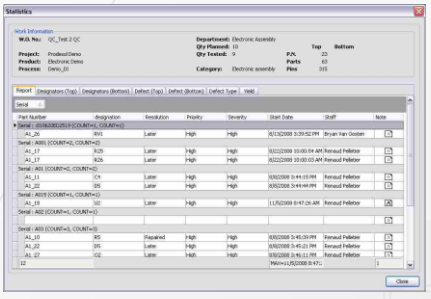
Defects per designator



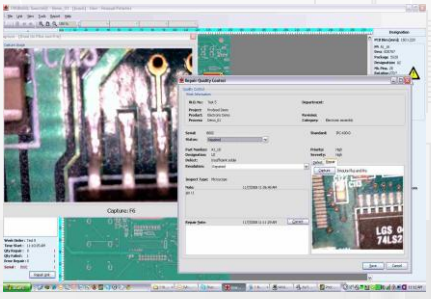
Defect type



Yield for pcb, pn and designators

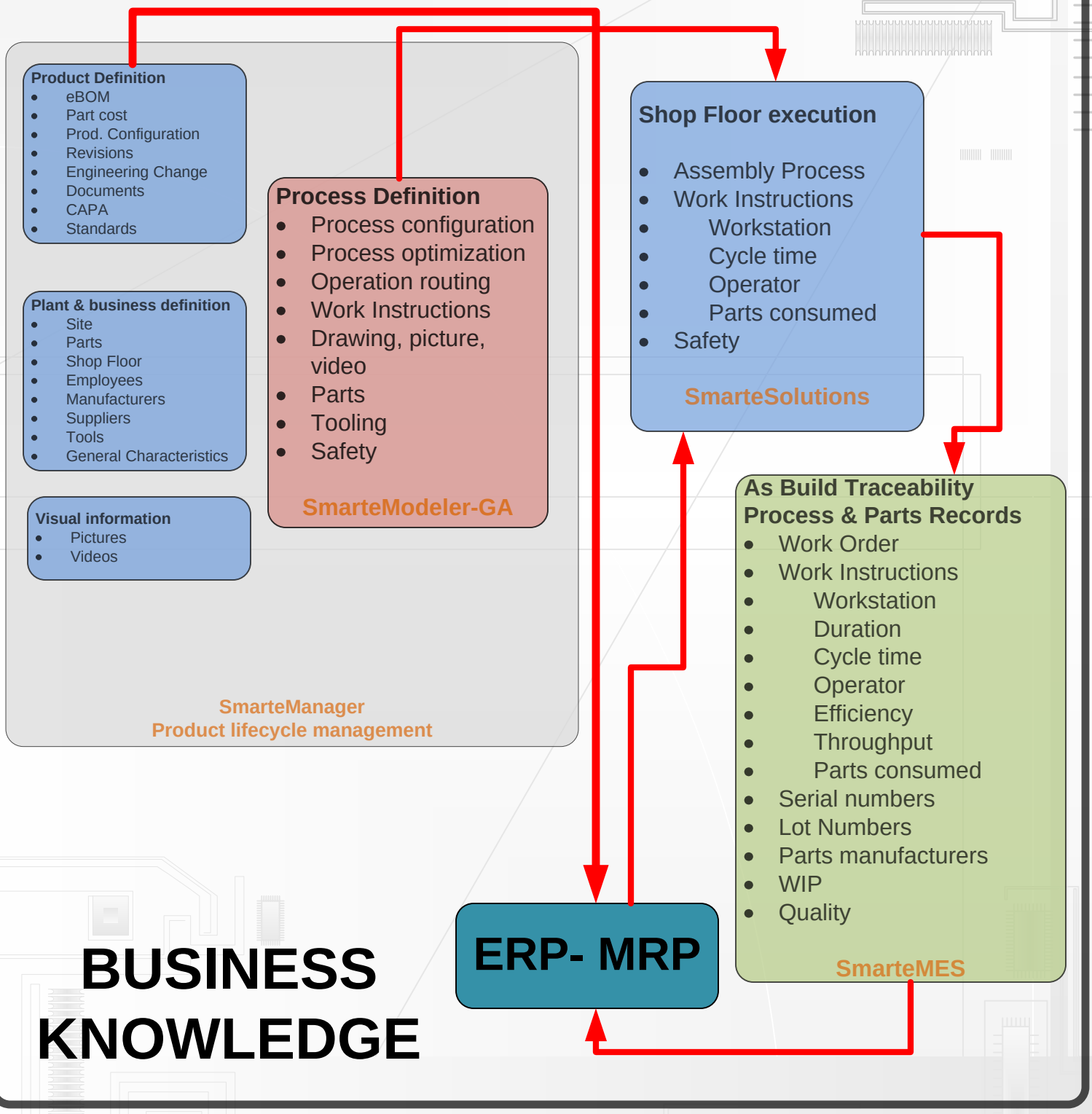


Report



Repair with microscope

Prodesol Products Configuration



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