

Achieving Full Traceability In Volume Manufacturing

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Exact traceability is rapidly emerging as a mainstream demand in volume manufacturing, and is expected to be a key element in Manufacturing Execution Systems (MES) investments in the future.

The Danish electronics firm Bang & Olufsen and the German automotive systems company, Continental Temic, are two global organizations who have deployed Valor's TraceXpert software solutions in their manufacturing environments in order to achieve full traceability of the components used in their end-products. By implementing TraceXpert technology, they have seen an increase in end-product quality, production up-time, and profits; plus a reduction in machine set-up time; and optimized stock audit and traceability processes (Figure 1).

The strength of the TraceXpert technology lies in its wide range of robust, error-proof real-time assembly line machine-interfaces. These interfaces meet the traceability requirements of the most demanding segments of the electronics market such as medical, military and automotive. But they are also broadening into additional high-volume segments such as telecommunications, networking, and consumer electronics.

TraceXpert products trace component usage to their actual placement position so that only defective

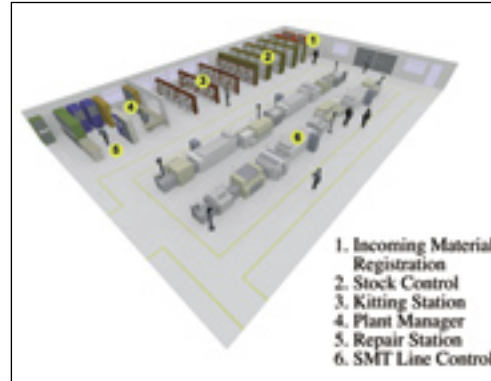


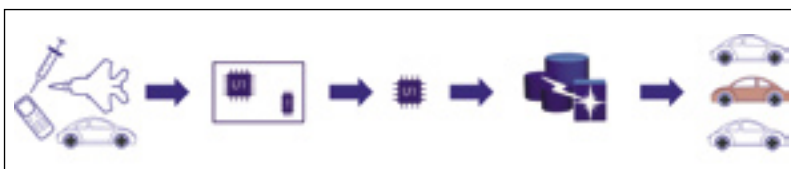
Figure 1 - Valor TraceXpert: a factory-wide Manufacturing Execution System (MES)

products ever need to be recalled. Production processes from incoming material registration to production completion are monitored and controlled, including storage, verification, and dry component management.

Continental Temic

Continental Temic (part of Continental Automotive Systems, a division of Continental AG), has employed TraceXpert in its Nürnberg factory since 1999 for manufacturing automotive power train, safety and body electronics. The software is used with six Fuji surface mount production lines that between them place around four million components per day. Continental Temic invested in TraceXpert in order to minimize call-backs, prevent false placement with the wrong devices, and to provide detailed information about production performance.

Figure 2 - Traceability data is captured in one centralized database enabling exact traceability down to the component level



The main objective was to solve traceability issues. If the SMT department has a problem with a component from a supplier and the electronic device ends up in a car, it needs to ensure the call-back involves the smallest possible number of vehicles. But the department was also interested in production monitoring, material control, and part verification.

Accurate traceability and performance monitoring

TraceXpert can be used for both traceability and for controlling the quality performance of component suppliers. The system provides exact traceability, so that trace data can be related to each single component (reference designator). This is the only way to ensure minimum recall.

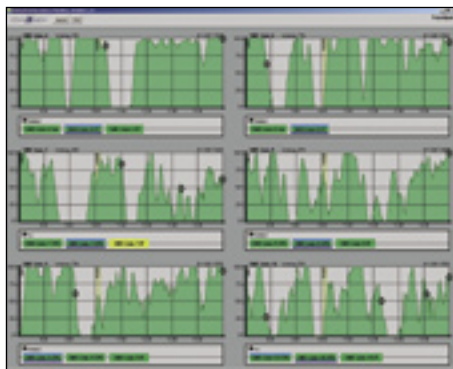
Continental Temic is using the advanced tracing system, which provides tracing for products made within a user-defined time period, or with a common lot number. The system can store data relating to each PCB panel, such as the feeders and component reels used, associated lot numbers, along with the operator responsible for their use in production. It also has the ability to trace PCB panels and associated PCB boards/blocks on which a component has been used via the PCB's barcode, which is stored in the TraceXpert database (Figure 2).

In addition to the tracing system, Continental Temic is using TraceXpert's Realtime Feeder and Performance Monitor; Part Verifi-

cation; Feeder Maintenance; Low Level Warning; Kitting Area Optimisation; and Dry Component Administration modules.

The Global Performance Monitor provides a performance overview of all SMD machines and production using a Windows-based graphical user interface. It identifies the feeders that generate most errors as well as the actual error types. The Realtime Feeder Check ensures that the correct components are loaded and used on the machine by verifying the correct component at each pick-up. Feeder Maintenance provides an automatic operator alert on maintenance schedules, and offers user defined maintenance schedules. Low Level Warning alerts the operator before a reel becomes empty and ensures that components and feeders are prepared before the machine stops. The Dry Component module ensures the correct dry components handling and alerts the operator before the open time has expired. The Kitting module is a tool for preparing the next production

Figure 3 - Valor TraceXpert – Global Performance Monitor: visualizing real-time production performance across multi-vendor assembly lines



orders and to simplify feeder handling (Figure 3).

Higher yields, fewer line stops

Prior to using TraceXpert, Continental Temic did not employ specific tools to monitor production performance. The process was essentially manual, and involved looking at the production records

by hand. Now it is possible to see how many components per hour/day/month have been placed, and also to see the online utilization of each line. Information about the downtimes of the line are given as well as information regarding which product was on the line during and prior to the moment the line went down. The cycle time of each production lot of the last year can also be known. The final result is that the new software has improved the utilization of SMD lines, yields are higher and there are fewer line stops.

Bang & Olufsen

Well known for its high-end, design-oriented, and technologically innovative home entertainment and communication systems, Danish firm Bang & Olufsen has used TraceXpert since 1997. It is employing the software on nine Fuji surface mount production lines at its Skive site where it manufactures TV, audio, telephone and medical equipment.

Bang & Olufsen is using the same TraceXpert modules as Continental Temic but without Kitting Optimization and with the addition of Automatic Program Selection, a module that helps to reduce errors caused by manual program selection. By reading the barcodes on the PCBs, the Automatic Program Selection module can automatically handle program changes without emptying the SMD line. If PCBs from different orders have been mixed, the system will also detect and handle this.

Bang & Olufsen's initial impetus in making the investment in TraceXpert was to ensure that the correct production line set-ups and programs were always used. According to the company, the new software system was chosen for problems

with serial defects when machine operators put a wrong component on the pick and place machine. It used to happen once or twice a month before installation of the TraceXpert system. Today the pick and place machine will stop if there is a wrong set-up on the machine (Figure 4).

The ability to monitor production processes and achieve better material control was vital in the decision

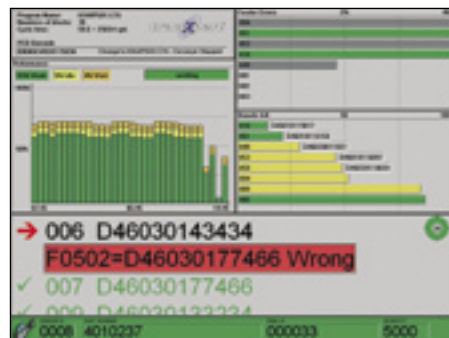


Figure 4 - Automatic detection of wrong component reel on wrong feeder: initializing machine stop

to use TraceXpert. If a problem is found with a component for some reason after it has been mounted on a PCB, it is important to be able to find other PCBs where the same type of component has been used.

From component tracking to product lifecycle management

TraceXpert provides a standard enterprise-wide solution that can be applied to assembly lines from multiple machine-vendors. It allows real-time production monitoring, machine control, stock management and exact data traceability, based on a variety of machine-specific and data-rich interfaces developed specifically for the electronics manufacturing market.

With over 15 years experience, Valor offers a broad PLM (Product Lifecycle Management) solution based on the TraceXpert's real-time assembly monitoring technologies integrated with Valor's upstream pre-production and process optimization engineering system (Trilogy 5000).