QUAD®

Electronic Assembly Repair & Quality Management System

The electronics industry has undergone immense changes over the past few years that has ultimately driven down costs, whilst maintaining improved quality. To achieve this, companies must strive to become smarter by ensuring that their processes operate as streamlined as possible.

Improve Product Yield & Quality

Improving product yield does not simply mean better product quality at a lower cost, but acquiring a deeper understanding of the whole manufacturing process by making full use of manufacturing information to; improve product reliability, prevent re-occurrence of defects, improve future product designs and increase competitiveness.

Processes must be monitored before they can be controlled, which often means collecting data from a number of often incompatible sources. The secret is to accurately retrieve data and convert it into meaningful information that can be used to fine tune the manufacturing process.

QUAD (*QUality ADvisor)* is a flexible modular software tool built around a centralized and open architecture database, based on any commercially available DBMS such as Oracle and Ms SQL, for providing traceability of any PCB electronic production data.

It has been designed to be used either as a stand alone system or to be easily integrated into any existing production environment. It offers a powerful support for PCB fault diagnosis and provides access to detailed information in real-time that can be presented clearly and precisely using advanced reporting.

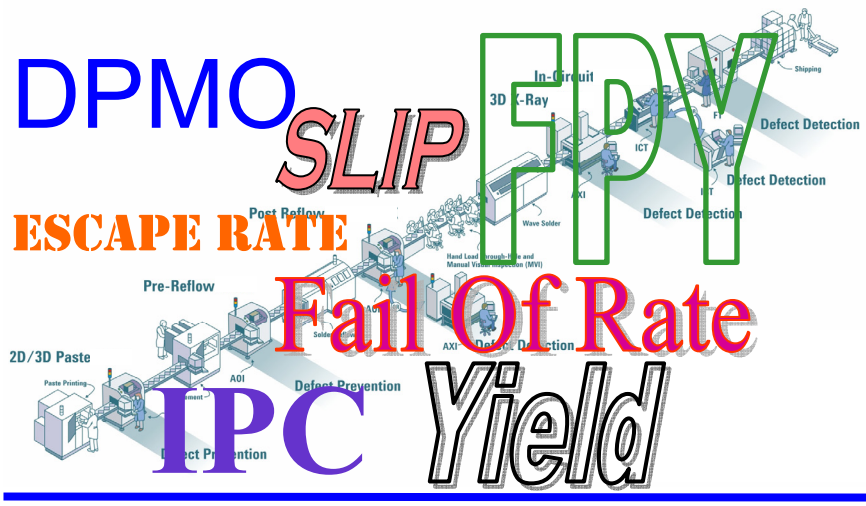
QUAD has been developed to optimize and streamline the collaboration between different disciplines that complement the production process. By providing an open data viewing software environment, it provides an insight for OEM's, CEM's, design service bureaus and other suppliers for monitoring manufacturing issues and problems.

It also supports links to Enterprise Resource Planning (ERP) systems, finite capacity scheduling, SPQ/SPC modules, and can handle complex bills of materials (BOMs) as well as engineering change orders (ECOs).

Strategic Benefits of QUAD

The strategic benefits that the manufacture can expect include:

- Cycle-time reduction.
- Scrap and cost reductions.
- Time-to-market improvement.
- Quality, productivity, and yield improvements.
- Complete product/component traceability.
- Improved data accuracy
- Global visualization with specific local site control.



Key product benefits:

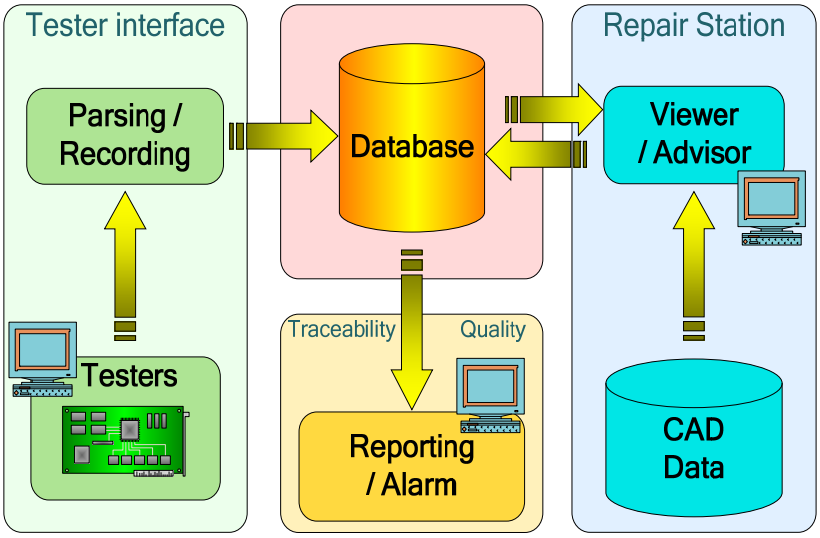
- **Ease of Use**
  Flexible modular software application that is easily integrated into an existing quality system organization, or used as a stand alone application.
- **Empower continuous improvement**
  By maintaining a history of all product defects, users share their knowledge and experiences in resolving problems and participate in continuous quality improvement, maximizing customer satisfaction.
- **Based on Industry Standards**
  Interfaces with industry standard database environments, such as Oracle, MS-SQL, Access .. etc.
- **Maximize performance**
  A high level of performance is achieved by adopting innovative programming technology to optimise database access.
- **Paperless repair powered by QuadView**
  Intuitive GUI provides hyperlinked interaction between fault ticket, schematic/ layout viewers & defect advisor panel for ease of diagnosis and repair.
- **Clear and precise reporting**
  Quality management information and reports provided on demand, clear and precise using advanced reporting software.
- **WEB reporting**
  XML compatible for web presentation of quality report and repair data, available anytime and anywhere via the internet.
- **Real-time process alarms**
  Real-time alarms to quickly identify process problems and immediately alert staff to allow quick and remedial action.
- **Product history and tracking**
  Access to a complete history of product manufacture and test processes allows historical problems to be quickly identified.
- **Immediate cost savings**
  Increase revenue by improving team productivity by eliminating non-value added tasks, simplifying administrative procedures and automating the workflow.
- **Ease of maintenance**
  Networking contribution is minimised in order to allow ease of maintenance.

QUAD comprises of 3 main modules:

① **QuadRecorder**, part of tester interface, is a generic data logger that allows automatic access to all test and diagnostic results generated by Automatic Test Equipment.

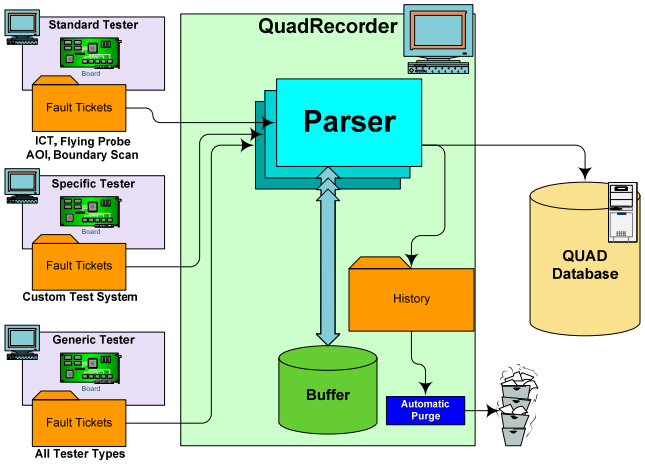
② **QuadStation**, part of repair, analyses the data presented to the repair and diagnostic station, to allow the operator to quickly fix the detected fault and graphically input repair data into the QUAD database.

③ **QuadReports** produces advanced quality management information and reports in real-time and can be delivered by e-mail or provide automatically a web site.



TESTER INTERFACE

QuadRecorder is a generic data logger that captures data from any test system connected to the database host.



QuadRecorder

The main features are:

- Intelligent parsing of fault tickets for different test systems (AOI, AXI, ICT, Boundary-Scan, Flying probe and other dedicated systems).
- Customizable data input scenarios i.e. RETEST, known false defect …etc.
- Immediate data transfers from tester to database using innovative programming technology
- Original fault ticket filing management.
- Powerful and secure mechanism, prevents the loss of data in case of network or server breakdown.

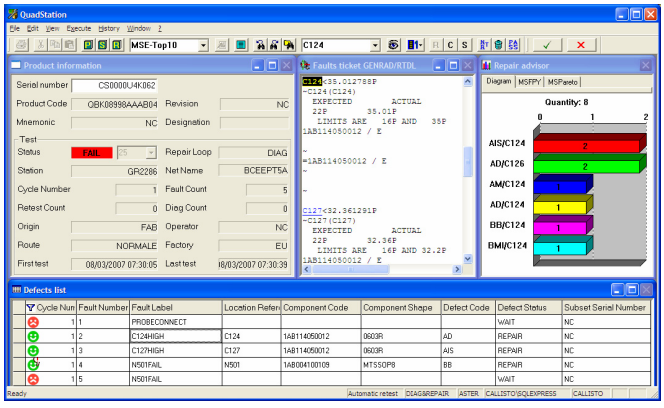
REPAIR STATION

QuadStation provides the user with a complete traceability and history of the product so that when PCBs have failed the test stage, relevant information can be either extracted or added to the database, such as:

- Test result retrieval.
- Diagnostic assistance.
- Recording of quality data.

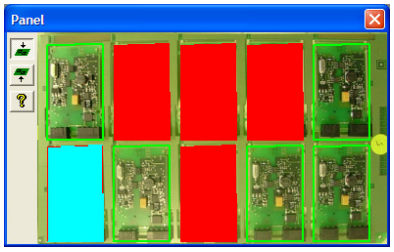
A simplified version of the QuadStation named **QuadTest** allows the operator to graphically input a manual test result and repair data into the QUAD database when no fault ticket is available.

PCBs can be viewed as a single board, or as a panel where each individual board can be separately identified. Selection of failed boards within a panel is achieved by either clicking the board with the mouse or by clicking on the tab in the grid of the desired board.

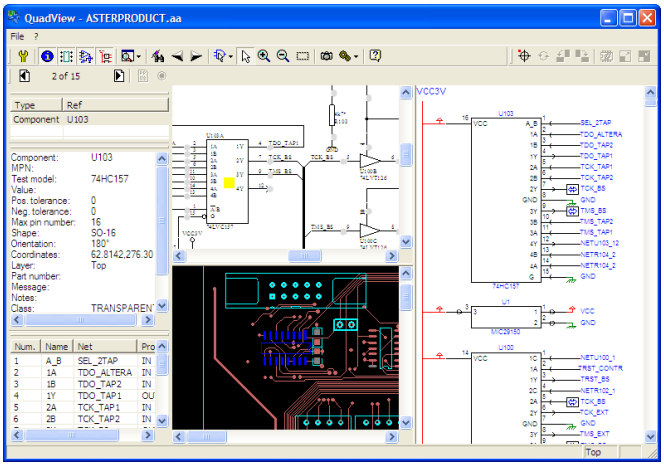


QuadStation

QuadStation offers a graphic environment for the repair of the panel. This allows operators to find quickly the failed board and avoids errors of repair.

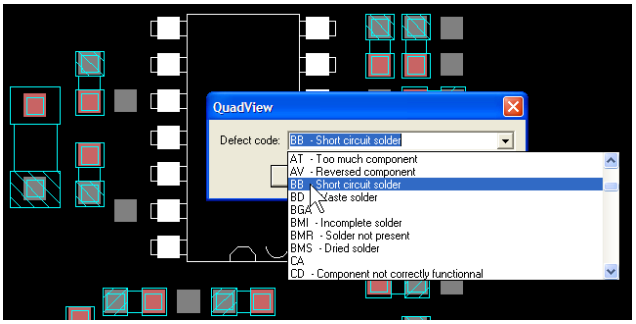


The Graphical User Interface (GUI) for both defect entry and Paperless Repair, uses the powerful viewing features of the QuadView® schematic and layout viewer from ASTER Technologies.



Using the Paperless Repair screen, the user can select the fault to be repaired and allocate the appropriate repair code. It also allows the user full access to repair information, by providing:

- Total interactivity between electrical schematic view, layout view, netlist navigator, the tester fault ticket and the defects advisor bar graph.
- Visualization of the physical layout allows repair technicians to quickly identify components, pins and PCB tracks, resulting in significantly reduced diagnosis and repair time.
- Visualisation of nails information at the electrical schematic level.
- Multi-lingual user interface in English, French and German.
- Fully automated graphical fault code collection.



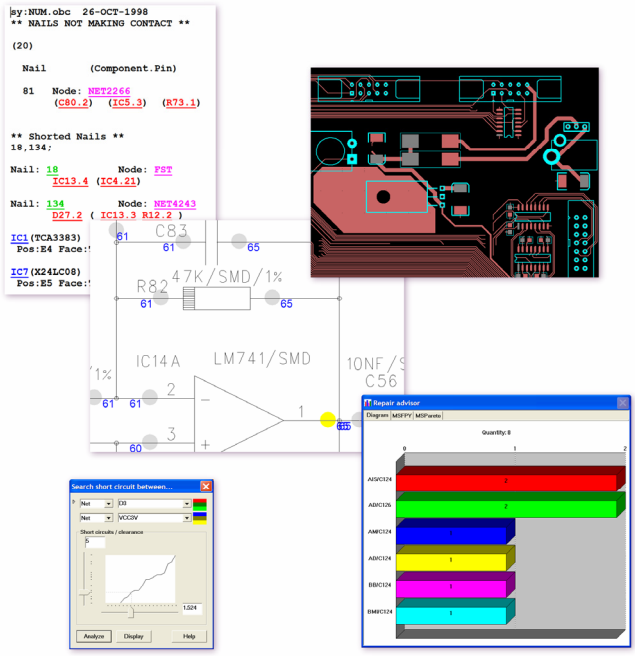
Graphical automated fault code collection

QuadStation provides a multi-lingual graphical management and powerful diagnostic assistance tools such as:

- Defects advisor facility to allow the operator to have access to statistical fault repartition data that has been previously recorded for the PCB under repair.
- Repair data is updated in real-time.
- Historical reporting of all the repair activities that have been either performed on a specific PCB or on a specific repair station.
- Data can be logged from various stages in the manufacturing process to allow users to visualize the current status.

A paperless repair environment supports the reworking of faulty units with the aid of:

- When any new repair action is taken, **QuadStation** allows authorised operators to add cause or repair code information to the database for subsequent retrieval and analysis.
- Once the repaired board passes re-test, the successful repair is noted and stored in the database to provide operators with historical data and a list of possible repair actions should the same fault occur at a later stage.
- In conjunction with the paperless repair environment the 'WEB Navigator' style interface allows users to interactively view the fault location on the schematic and layout viewers along with statistical representation of repair activity.



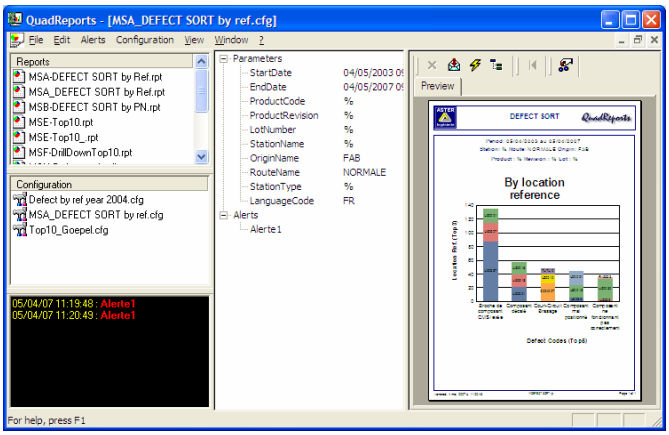
Diagnostics assistance

TRACEABILITY & QUALITY

QuadReports allows interactive or automatic report generation using the de-facto standard Crystal Reports™ tool. These textual and graphical reports are fully customizable and can exported in PDF or XML format to be easily distributed via email. The Web reporting is also available for presentation of quality report and repair data, available anytime and anywhere.

A Crystal Report™ license can be supplied either as an option to this module or ASTER can develop reports to customer specifications.

This module also supports user programmable alarm generation to indicate critical changes to the manufacturing process that require immediate remedial action to be taken.

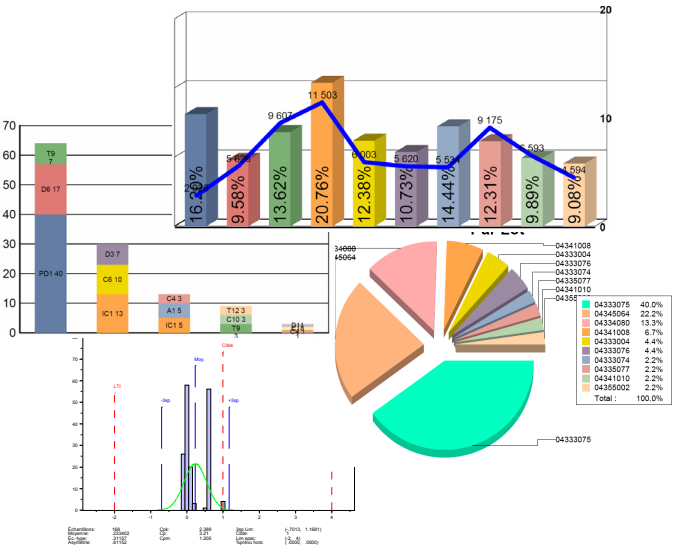


QuadReports

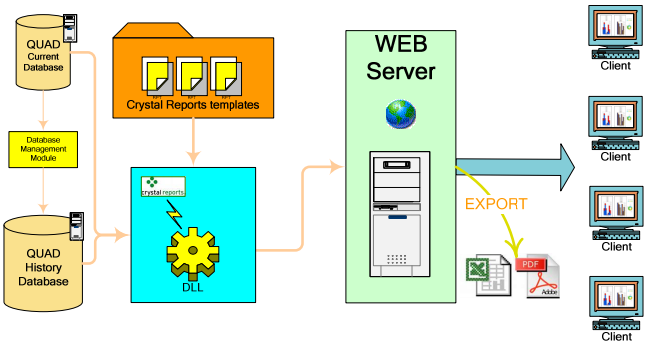
The reports can encompass data captured over any given timeframe that include:

- Production status
- Production trends
- Test failure analysis
- Test result spread
- Overall test time
- Repair code analysis
- Repaired component analysis
- Repair performance
- Repair performance trends
- Repair time analysis

Some examples of a typical advanced reports are detailed below:



Reports can be created in any user specified format i.e. bar, column, pie and Pareto charts as shown above for visualizing any type of data. It is particularly useful for Statistical Process Control (SPC) analysis, for representing First Pass Yield (FPY) and DPMO information etc.



Web Reporting

All reports can be produced in XML format for remote access through an internet connection to a centralised web server and downloaded to any client application running on a PC, laptop or PDA.

This particularly useful when you are working remotely to the manufacturing facility and it is necessary to obtain real-time data at anytime and anywhere.

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