

Verification of inspection results: local - central - global ?

Typical situations in electronics production

Inspection systems (AOI, AXI, SPI) are now a firm part of every electronics production. Depending on the production size and throughput these are implemented directly in the line or as an isolated solution with automated or manual loading.

However, it is not only the implementation of the actual test tasks that is crucial for an efficient use, but also the meaningful inclusion of the internal company process and data structure. Peripheral modules, such as verification and repair stations, play an important role in this.

The fault verification classic: directly after the AOI system

Even if inspection systems should no longer be foregone, a necessary evil is attached to them: because of the unavoidable pseudo faults and due to the detailed fault classification, verification stations are necessary for classification after AOI or AXI systems.

Within production lines, verification of detected faults is typically undertaken by inline workstations, equipped with a PC, monitor, software and corresponding licences. Their main task is often the "dismissing" of pseudo faults by the operator. Depending on the cycle time of the line and occurring pseudo faults, the employee is only utilised at this verification station for a part of their working time.



Fig. 1: Part of a production line with AXI system and inline verification station

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Efficiency through centralisation: mutual verification for numerous inspection systems

If numerous inspection systems are available in electronic production, then the logical next step is also to have this employee undertake the verification of results from other inspection systems. Depending on the spatial arrangement of the systems (into one or more lines), this does mean that a part of the working time has to be allocated for the distances to the individual verification stations. To assess the faults recognised by the AOI system there is often additional, helpful information available (e.g. comparison pictures of a good PCB or angled-views of the respective part). This ensures that a skilful operator is able to undertake an assessment in most cases without having to view the objective PCB.

Verification with greater security: use of all test results

This is possible with the PILOT Verify verification software, which is a part of the inspection systems by GÖPEL electronic. For example, alongside the actual AOI fault image, here the respective angled-view images can also be displayed from a horizontal angle of 45° or 90°, comparison images of a good PCB or the 3D view of the PCB or solder joint.

If further inspection systems of other technologies (SPI, AXI) are integrated into the production process, then these results, measurements and images are also available for assessment.

All of these functions give the manual verification process additional security. The inspection systems by GÖPEL electronic also offer a further, special opportunity: the display of data and images from inspection systems is not only limited to systems by GÖPEL electronic. Systems by other providers, such as may already be integrated into the production line, can be integrated via the PILOT Connect software module and their results can be presented at the verification station. This is available for SPI, AXI and AOI systems.

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PILOTVERIFY

Fig. 2: Verification station software PILOT Verify with AOI and AXI fault images

PILOT Supervisor: central verification for numerous production lines

These opportunities shown make it possible to competently assess the detected errors remotely. But how does the technical implementation for central verification take place in a production with numerous inspection systems or numerous lines? A simple solution would be the remote control of existing inline verification stations, e.g. via a remote desktop connection. However, the entire equipment of such a workstation at the respective position in the production line would be required for this, made up of a PC, interface card to the belt module as well as software licences. Both costs and required space for the inline workstation are impacted here.

PILOT Supervisor by GÖPEL electronic offers an efficient solution for this: the transfer of the classification result (PASS or FAIL) to the line, e.g. for sorting the PCB into the corresponding hopper, takes place via Ethernet communication – either directly with the belt module or via a conversion into potential-free outputs. This ensures the verification of inspected PCBs (by AOI, AXI or SPI) is possible both for numerous lines and for various systems from a central station. In the age of globalisation and worldwide networking, this can even be done from a remote company location.

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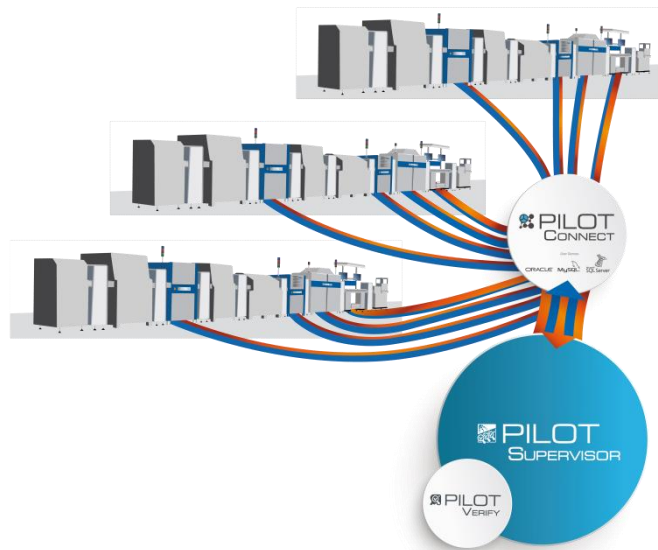


Fig. 3: Central verification for numerous production lines with PILOT Supervisor

Always in control: the command centre for inspection systems

Alongside the central verification of inspection results, PILOT Supervisor also offers many other things: the systems are clearly shown in a schematic diagram for the operator in their respective production lines as well as the currently tested PCB. In addition, there is a display of the pending data sets, which can be selected for verification with the click of a mouse.

Furthermore, information about the current throughput as well as the throughput development is permanently available to the respective inspection systems.

In order to be able to react to possible changes in the production process (e.g. increased number of PCBs to be verified), a flexible assignment of employees to the respective inspection systems by the administrator is possible from a central workstation.

The user of PILOT Supervisor therefore has a powerful programme package at their disposal. In conjunction with the PILOT Connect data administration software, alongside a central verification of numerous lines, a comprehensive presentation of inspection results is also possible.

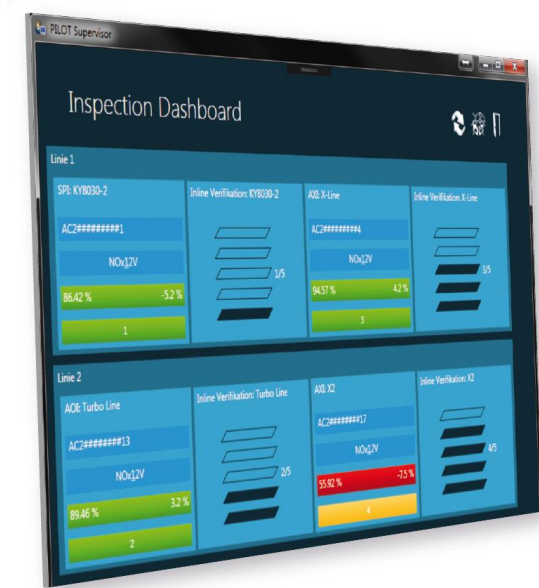
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PILOT SUPERVISOR

Fig. 4: Cross-line diagram of PCBs to be verified

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