Application Note #22
Test bench application
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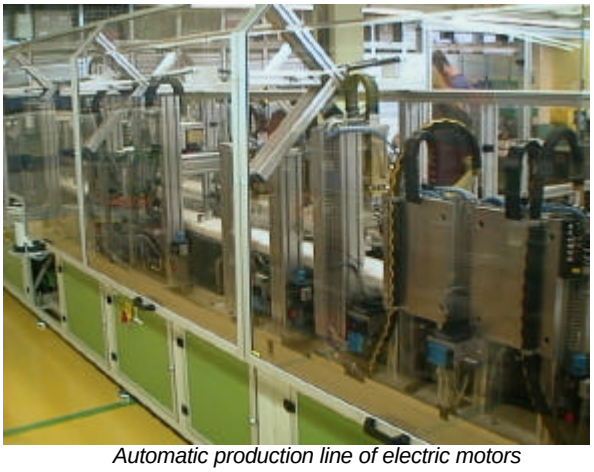
Production Monitoring System

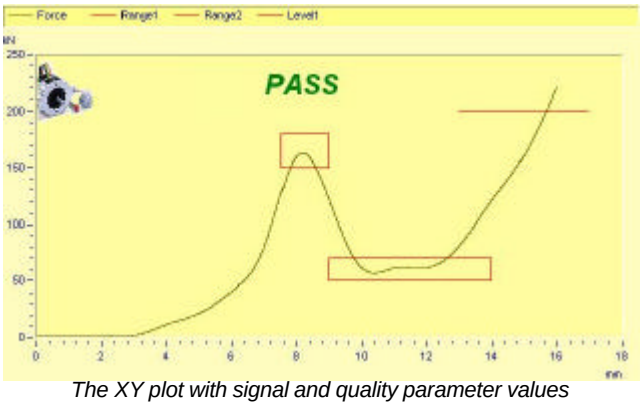
Measurement systems in production facilities usually face totally different tasks than those in development or research applications. Their main job in the production process is monitoring quality parameters, providing notification of quality problems and accumulating data for statistics purposes.

A typical application is the monitoring of force and displacement during mold-in procedures. If possible, force and distance can be used to describe the quality of a pressing process. Curve characteristics can illustrate the process and provide a record of parameters.



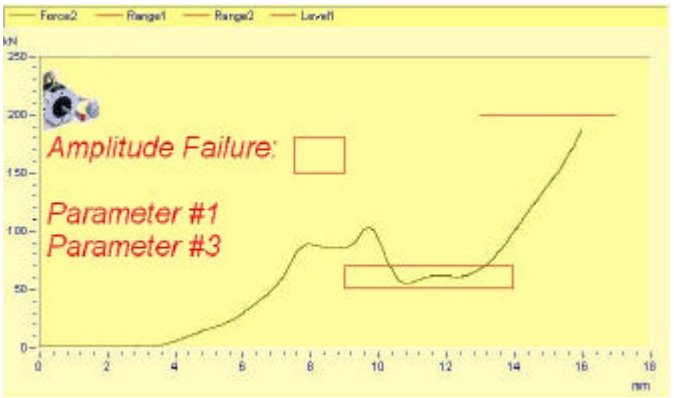
Automatic production line of electric motors

Due to its flexibility, µMUSYCS can be used in a variety of applications connected with such mold-in production processes. Up to 16 different and independent processes can be monitored and assessed by one system. The user has practically unlimited choice in configuring amplitude or time parameters. The figure below shows a possible force-displacement plot with 3 different amplitude parameters.



The XY plot with signal and quality parameter values

But µ-MUSYCS' abilities are not limited to the monitoring and evaluation of up to 16 measured points. With its digital outputs, acoustic or visual signals can be sent out in real time. These signals can provide operators with status information, or the digital outputs can directly intervene in the production line's control mechanism. With a latency time usually below 1ms, even critical processes can be stopped or started.



Due to the clearance between rotor and magnet, the force during the mold-in procedure doesn't reach its required level

In the representative example above, a small electric motor will be assembled by pressing the permanent magnet into the stator. Using a statistical number of examples, the quality department of the motor producer defined 'two-in' parameters as well as an amplitude threshold. The second picture shows two amplitude failures. Apart from such amplitude parameters, time-out values to assess the process can also be set.

To realize this kind of application, µMUSYCS offers two possibilities.

1. 'Online FAMOS' and the standard program, which comes along with the system, provides easy set-up of such parameters. An integrated report generator allows documentation of the results.
2. For extended applications (including automatic data transfer to a data server and automatically generated statistical reports) the imc COM-products are an ideal tool for creating tailored program solutions. Towards that end, imc and its partners also offer the assistance of their programming and applications expertise.

Furthermore, µ-MUSYCS provides the user with all necessary hardware interfaces to connect the systems to force and displacement sensors, which can include a selection of amplifiers, such as strain gauge amplifiers, LVDT amplifiers or charge amplifiers. Details are provided in the system's spec sheet.