

# TEST RIG FOR MEMS-ACCELEROMETERS

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## Background

MEMS-accelerometers are rather cheap, small and reliable motion sensors that have found new application areas and are available in a variety of performance. They exist in many different performance, such as single, dual or triple axis, for high- or low-g application, with analog or digital output, different packages and size etc. Their performance parameters also exist in a wide spectrum, like high sensitivity, bandwidth, noise density, temperature range, shock tolerance etc. Moreover, there are a variety of manufacturers that you can choose from. So when it is time to choose sensor, there are many aspects and parameters to take in the consideration of choosing the right accelerometer. If it is possible to managed to choose one sensor above all others, a question arises. How can you be sure that the chosen sensor fulfils its requirement specification?

The company Motion Control AB works as electronic designers engineers, mainly in the areas of embedded systems and sensors. Particular different motion sensors, such as accelerometers and gyroscopes based on the MEMS-technology. Many customers are in the industry and they have hard demands on that the electrical design meet their requirements and has a very high reliability and long lifetime. Therefore it is very important to be able to verify that the sensor meet the necessary requirements before it is possible to use it in an industrial product.

## Result

For helping the engineer to choose sensor and also verify the sensor parameters and function a test rig was developed. The result is a test rig for MEMS-accelerometer that can be used by electronic designers that want to use MEMS-accelerometers in their designs. No special equipment or circumstances is needed for operating the test rig. The test rig is designed to operate in an office environment. It is possible to operate the test rig manually, but for making automatic tests, different standard test programs was developed. A computer controls the test programs and stores the logged data. The data is used for analyze and evaluation of the accelerometers.

## Industrial possibilities

The test rig has been used to evaluate different accelerometers in industrial designs. It has been a good help in decision making in new electronic design. For designs in operating products it is possible to do verification measurements, such as operating life-time testing, aging problem and similar tests. For elder designs or replacements, such as end-of-life problems or obsolete components, the test rig can also be used to verify that the new components have the same performance as the older accelerometer.