TECH NOTE: QuantumX Integration in ZwickRoell Testing Machines

Version: 2021-02-05
Document: TN123
Status: public

Abstract

This Tech Note describes the Integration of QuantumX in ZwickRoell Testing Machines.

Intro

Any QuantumX module can be integrated in a ZwickRoell tensile/compression testing machine, depending on the application. In this example, the QuantumX MX1615B strain gauge amplifier is used to determine the strains of a material or coupon.

HBM strain gauges are attached on the sample and connected to the QuantumX MX1615B. In addition, other sensors, such as a Pt100 sensor for temperature measurement, can be **connected and used without much additional effort**. To enable access from a PC, the QuantumX MX1615B module is connected to the **Ethernet switch**. This is also used to establish a connection to the testing machine in order to synchronize the measurement results.

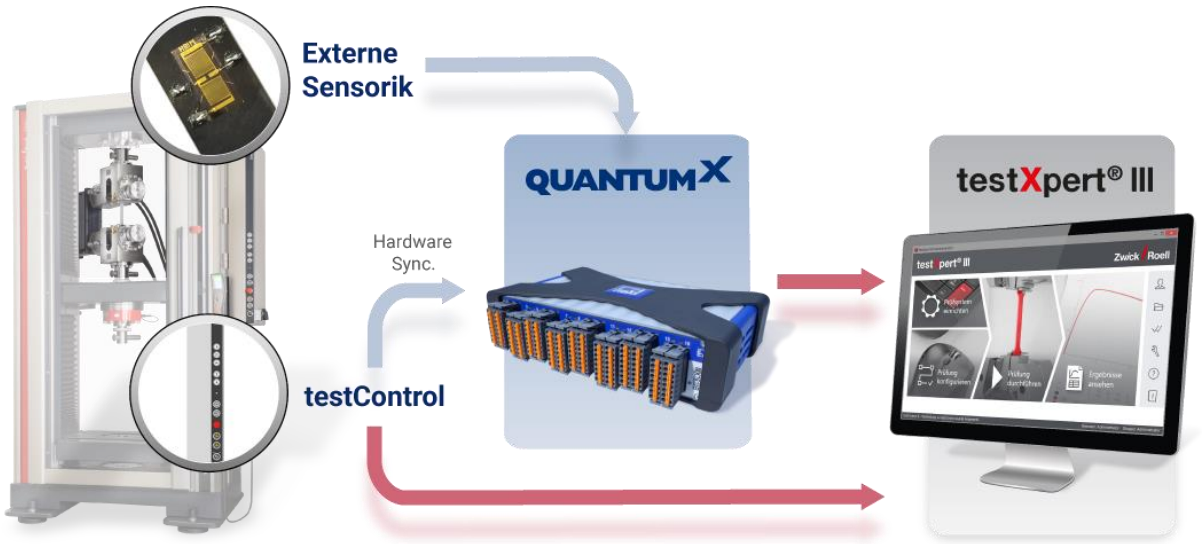


Figure 1: Integration of QuantumX in ZwickRoell Testing Machines

The enabled use of strain gauges in this application example allows for a **more precise and simplified measurement**. The extensometers installed in the testing machine for measuring length changes and strain can mainly only measure standardized samples. However, by integrating the QuantumX MX1615B module, compact strain gauges can be **applied to almost any surface of the sample** and are protected against a large number of external influences by means of appropriate accessories. In addition, strain gauges have the **least influence on a sample** and there is no need for calibration.

Advantages

These are the main advantages of integration QuantumX in ZwickRoell testing machines:

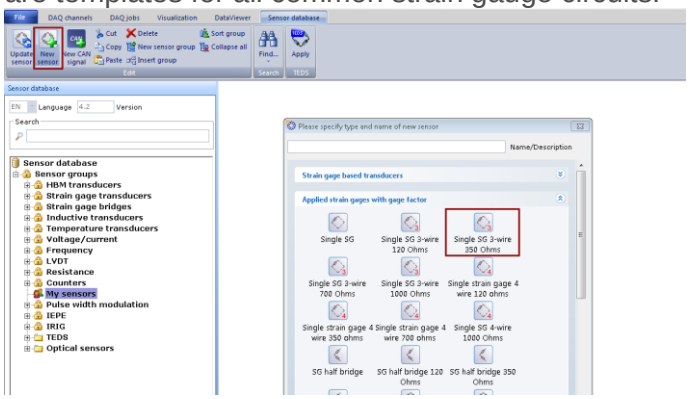
- The use of strain gauges is possible
- Versatile application even in places that are difficult to access
- High flexibility, by simply adding different sensors (for example, Pt100) to the test setup

- High precision, through bridge circuit

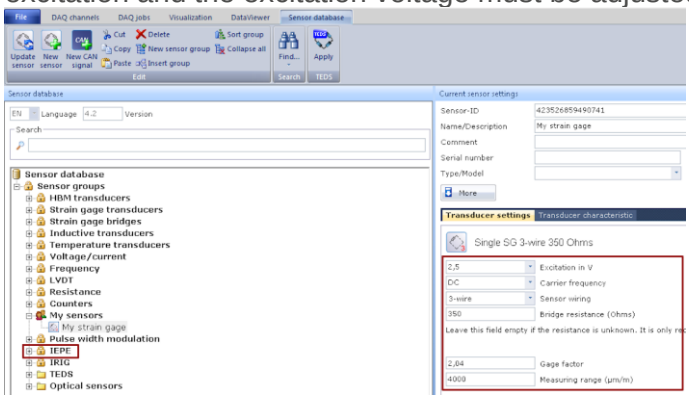
Workflow

The workflow for integrating catman into testXpert®[1] III is shown below exemplarily.

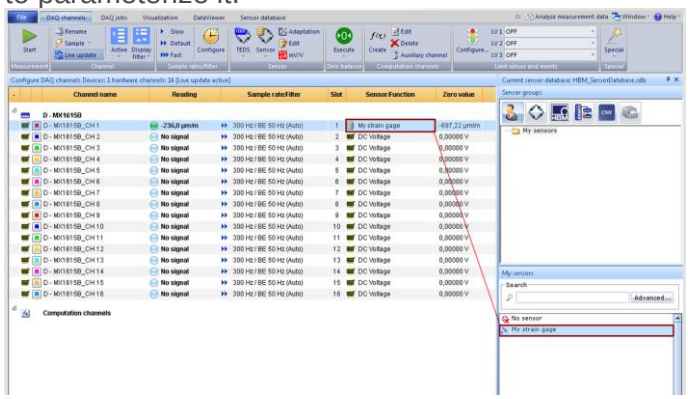
1. **catman Easy: Channel Configuration**
   - To configure a channel, a template from the sensor database is selected. Here, there are templates for all common strain gauge circuits.



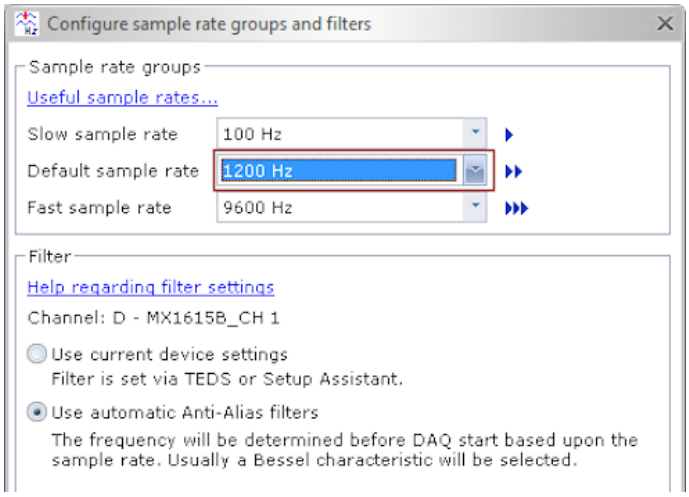
   - After the new strain gauge sensor has been created, the k-factor, the type of excitation and the excitation voltage must be adjusted.



   - The strain gauge sensor can then be dragged and dropped onto the desired channel to parameterize it.

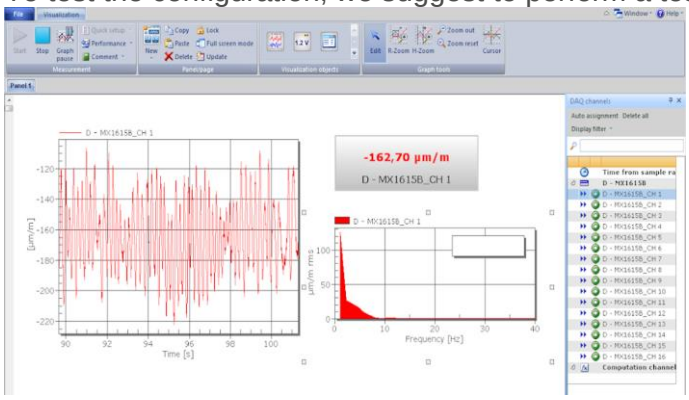


2. **catman Easy: Assign Sample Rate**
   - In testXpert, all channels that are set to the default sample rate will later be visible. The maximum sample rate in conjunction with testXpert is 1200 Hz.



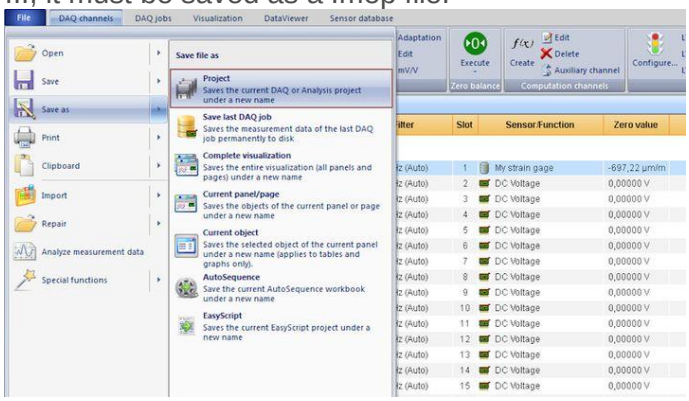
3. catman Easy: Optimal Test Run

- To test the configuration, we suggest to perform a test in catman:



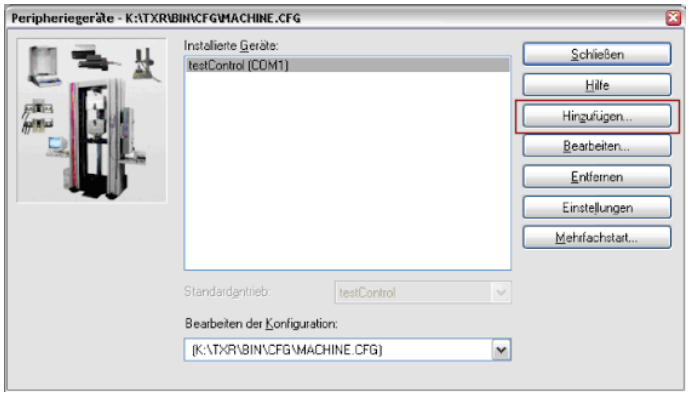
4. catman Easy: Save DAQ Project as .mep File

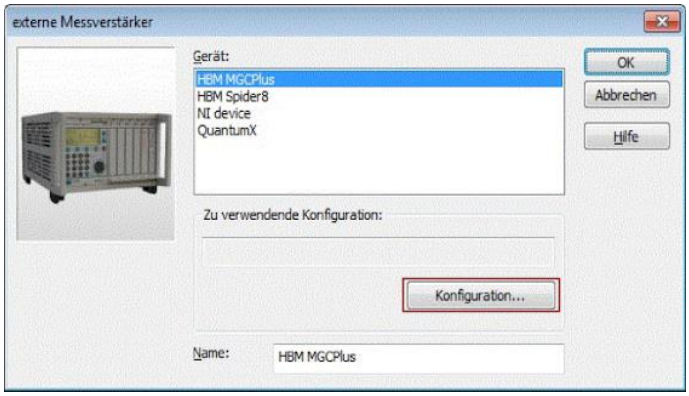
- To use the created measurement configuration of the QuantumX module in testXpert III, it must be saved as a .mep file.



5. testXpert™ III: Go to the Periperhals Menu

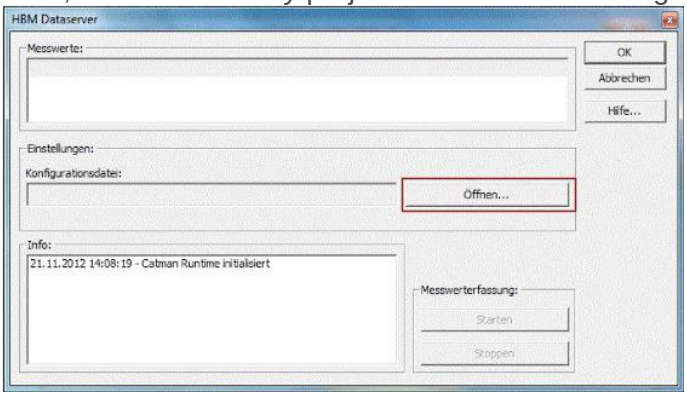
- If the QuantumX module is connected to the PC via Ethernet, it can be added from the peripheral device menu.

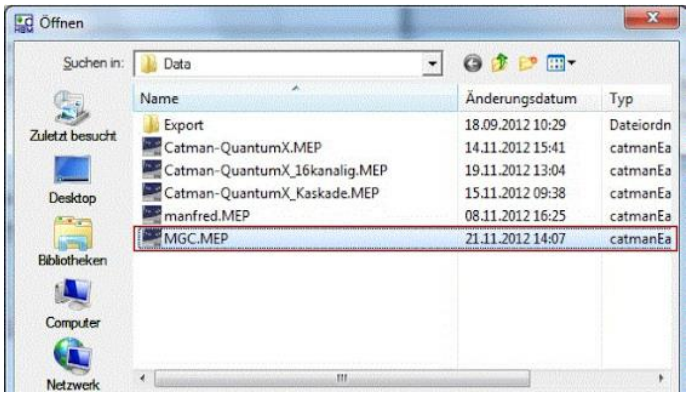




6. testXpert™ III: Load DAQ Project File

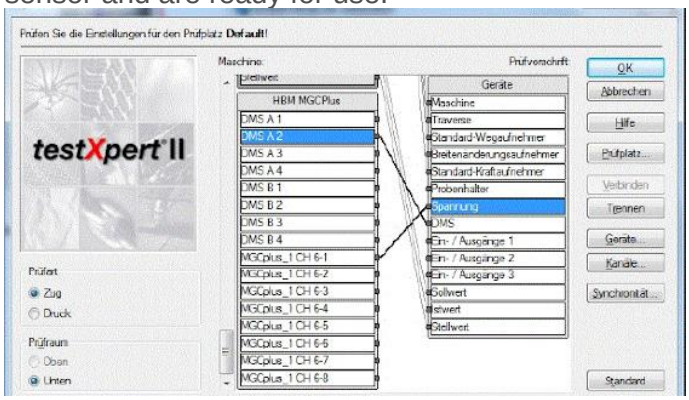
- Next, the catman Easy project is loaded as a configuration file.





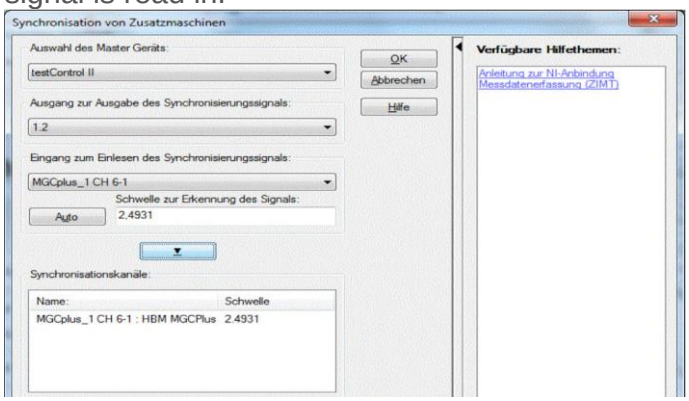
7. testXpert™ III: Integrate Strain Gauge Sensors

- The sensors of the QuantumX module are now listed under 'Machine'. If the channels were also created under 'Test specification', they are linked to the corresponding sensor and are ready for use.



8. testXpert™ III: Adjust the Time Synchronicity

- To ensure that the strain gauge measures synchronously with the other sensors, a 5V signal is sent to an input channel of the QuantumX module and the returning signal is read in.



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