

MEASUREMENT TIPS

Volume 3, Number 2

Efficient use of Data Logging and Decision Making with Multiple Scan Lists

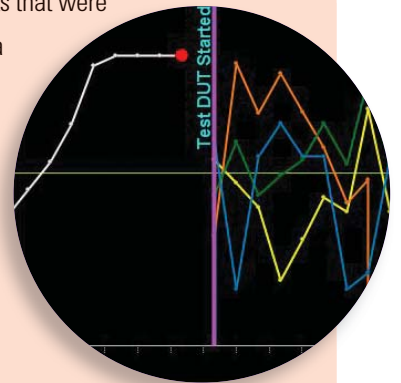


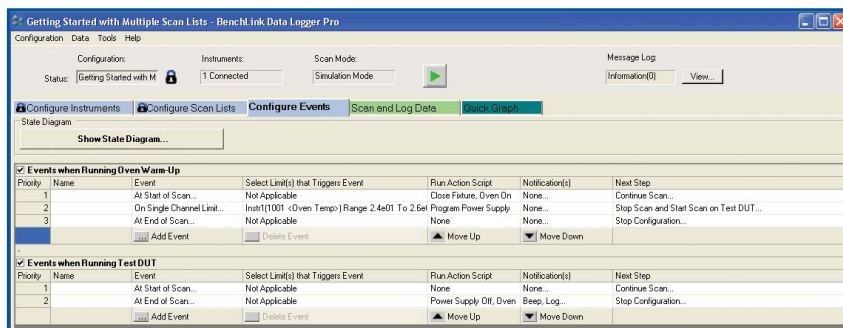
MULTIPLE SCAN LISTS

Snapshot: Verifying a Compressor Design

Basic data logging allows you to configure different measurements across multiple channels, then record the data. Data logging can be very straightforward for applications that require only one set of measurements. However, most applications require more than a single series of measurements. It is more likely that you need to monitor one set of information until an event occurs, such as a failure or a correct temperature, then change the rate of the scan or the type of measurements you are making to provide a more meaningful set of data for the new conditions. You can create multiple scan lists by writing a program or using software such as Agilent's BenchLink Data Logger Pro. Multiple scan lists allow you to monitor your measurements, and once an event occurs, decide what needs to happen next: stop the scan, log an event, continue the scan, perform a custom action or switch to an entirely different scan list.

During design verification, a manufacturer of air-handling equipment wanted to create a measurement baseline for a new compressor while it was not running, then compare it to the performance of the compressor under maximum load. The designer configured the test system to log data at the maximum rate to capture as much detail as possible when the compressor was being stressed. With this setup, the test system captured a large amount of baseline data, which required the designer to pare down the data before beginning the analysis. To help customize the test and take only the measurements that were needed, the designer used Agilent BenchLink Data Logger Pro software to set up multiple scan lists. Using the scan lists, the designer began by taking baseline measurements at a slower rate, then switched to a faster scan for a more detailed view once the software detected the compressor was turned on. This process gave the designer the right data for the analysis.





Creating multiple scan lists

When you create multiple scan lists, it is a good idea to configure all channels prior to running the tests. Preconfiguring the channels places the majority of the set-up time at the beginning of the program and saves time when switching between scans, when you only need to redefine the list of channels in the scan.

To redefine the list of channels to be included in the scan list using SCPI (standard commands for programmable instrumentation), use the ROUTe:SCAN command. If you are making minor changes to the scan list, use the ROUTe:SCAN:ADD or ROUTe:SCAN:REMOVe commands to make changes to individual channels rather than redefining the entire list.

Agilent's BenchLink Data Logger Pro software can make it easier to set up and configure multiple scan lists. After defining the base scan, select "Create Additional Scan List..." and choose whether to start with a copy of the current scan list or to start from scratch. You can name your scan lists for easier identification.

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Use your program or Agilent's BenchLink Data Logger Pro software to add math to your scan lists. This can be useful in situations such as when you need to determine when the temperature inside a product exceeds the ambient temperature. By including both temperature probes in your scan list, you can use your program to calculate the difference. Agilent's BenchLink Data Logger Pro allows you to add computed channels to your scan list and treats them the same as the hardware channels.

Using events to move between scan lists

Once you have preconfigured the channels, you need to select the events you will use to move between the scan lists and include these in your program. Some examples:

- The completion of a specified number of scans
- At a certain time of day
- After a specified amount of time has elapsed
- When a limit has been reached

When you use Agilent's BenchLink Data Logger Pro software, the Configure Events tab allows you to select what action should be taken upon each event. For example, you can run a base scan, then jump to a different list once a limit has been reached. In addition, you can choose to log the event, run a script, enable an audible alarm (a beep), or even run an external program.

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Using limits with multiple scan lists is a great way to introduce decision making into data acquisition. You can set up limits to test when an oven has reached the right temperature, then switch to a more complex scan list to measure the device under test. Or run the test as you normally would and include limits to check for a failure. When a failure occurs, you can switch to a set of measurements to help diagnose the failure or even abort the test early for better optimization of your test time.

Summary

Using multiple scan lists can help you use your time more efficiently. You make only the measurements you need, then switch to a different set of measurements or a different scan rate when an event happens during your testing. We have reviewed how to create multiple scan lists, the types of events that can be used to move between scan lists, and how Agilent's BenchLink Data Logger Pro provides an easy way to configure actions for each event without programming.

See how easy it is to collect and analyze your data with no programming required. View these short videos:

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Learn more about the 34970A data acquisition switch unit (TOP LEFT)

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Learn more about the 34980A multifunction switch measure unit (LOWER RIGHT)

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Printed in USA, October 30, 2008
5989-8467EN