

Scenes and Sets

Making the most of QS-Pro's Batch View and Measurement Sets to pause a measurement sequence and tailor the display feature by feature.

Background

When using Cadar QS-Pro to make a single measurement of a part using a hand held tool such as a caliper or micrometer, you can see the result straight away, and continue to see it until you remove the part from the measuring tool. But what if the part or the measurement is more complex? Is it still possible to see the results for a complete part before you move on to the next? And is there a way to continue to see the previous results until you actually start to measure the next part?

The answer to both questions is 'YES', but before looking at how this is achieved let's recap some QS-Pro features that you'll need to make use of...

A *Measurement Set* is a way of grouping together features that are measured together – with one data entry signal to record all of them. Often this means you're using a gauge or fixture of some sort to make the measurements - you drop the part in and, using a number of probes or scales, measure everything at once. Features that are not collected together into a measurement set are measured individually by QS-Pro and each one requires its own data entry signal. In effect each feature is then effectively in its own private set. But measurement sets do not *have to* contain any features. Empty sets provide a neat way to make QS-Pro stop at any point in a measurement sequence and wait for you to hit a key or click a button to move on.

QS-Pro's *Batch View* is the window in which you see the results of your measurements – both straight measurements and statistical results, and in numbers and charts. The View can be split into a number of pages (or 'scenes') so that complex measurements can be broken down into stages. Often you will arrange things so that one page shows the measured results while others show statistics – charts, histograms etc. Sometimes the measurements themselves are split over several pages and QS-Pro shows you the page that corresponds to the set or feature you are currently measuring. As soon as you enter the measurements for that set QS-Pro moves on to the next and shows the corresponding page.

Usually the batch view pages are opaque and the top pages hide those underneath. If your batch view is arranged without a little thought the effect can be disconcerting – as soon as you make a measurement it disappears, to be replaced by the next one to be made. But you can make pages transparent, and transparent pages allow you to play some cute tricks with the batch view.

Empty Sets

Suppose you are measuring three features, the length, diameter and bore of a hollow shaft, and are using a caliper for all of these. You create a QS-Pro batch with three independent features so that, first, you measure the length, enter that, and then measure the diameter, then the bore. After measuring the bore you're ready for length again, for the next part.

Feature	Value	Rdg No.	Value
Length	18.712	1	18.090
		2	18.568
Diameter	12.344	1	13.424
		2	12.344
Bore	8.526	1	8.621
		2	8.526

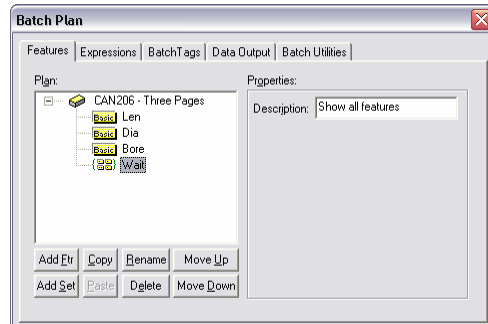
So that the measured length remains visible while you're measuring diameter, and both stay put while you're measuring the bore, you could arrange the controls for the three features on the same page, as shown here. When you have measured length, QS-Pro freezes (and dims) the controls for length at the entered value and activates the controls for diameter. That's OK, but when you have measured the bore it freezes the bore controls and re-activates the length ones losing, in the process, the previous length value. Is there a way to keep the old length value a while so you can see the whole result before moving on to the next part?

If you add a measurement set to the batch as shown in the batch plan opposite, then QS-Pro will jump to this after measuring Bore, instead of going back to the Length feature. None of the features are measured in this set so the controls will remain disabled and showing the last measured values, ie. those just entered.

When you have seen enough for these and are ready to move on to the next part you press F4, the data entry key, and QS-Pro will move back to the Length feature and activate the Length controls again.

Note that the set, when you first add it, will be called 'Set1' but renaming it to something like 'Wait' will help you (or others) to remember why you put it there!

In most cases the dimmed controls will still be readable but you can make them easier to read if necessary – see below.



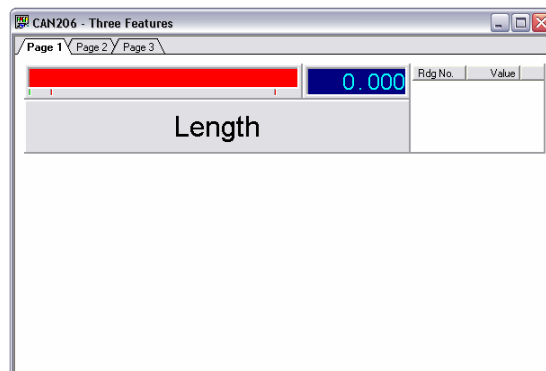
Transparent Pages

The example above works well enough (apart from the difficulty of reading the dimmed controls) but, particularly with more features, you can make it much easier to see what is going on and exactly where you have got to in measuring a complex part. If, in the batch above, you place the controls for each feature on their own page then QS-Pro will show the controls for that feature when they are needed and will hide the rest.

In Design Mode right click the page tab and choose Insert from the small menu to create another page. Cut and paste the controls for Diameter from Page 1 to Page 2. Do the same for Page 3 and place controls for the Bore feature there.

QS-Pro uses a simple method to decide which page to display. Starting at the topmost page (the rightmost page tab), it looks at each page in turn until it finds one with a control (cursor, chart etc) belonging to the current feature (or to a feature in the current measurement set). That is the page it displays. When you enter data and move on to the next feature/set QS-Pro repeats this procedure and may display a different page.

This of course brings us back to square one in terms of seeing the part as a whole – but if we make the new pages transparent the picture changes significantly.



In Design Mode, right click the tab for Page 2 and choose Properties from the small menu. Check the Transparent box and then click OK. Repeat this for Page 3. Now, as you make measurements, QS-Pro displays different pages for different features, but you can still see the pages below. While you're measuring Length you see only the Length controls. When you move on to Diameter you see Diameter and Length. Effectively the picture builds up as you measure the part and, at the end, you can see all the measured results together. The empty set trick still works as QS-Pro will display Page 3, the topmost page (rightmost tab) for the empty set.



Brightening Dim Controls

This trick makes use of the empty set trick and the transparent page trick and introduces a cunning trick with intermediate variables.

In the example above you have a complete picture of the part you just measured as soon as the final measurement is entered. But the controls are dimmed and difficult to read. To get bright controls you need somehow to get them to be associated with the empty 'Wait' set that QS-Pro goes to at the end of the measurement sequence. The controls used to display the measurements as you make them can't be in two sets at once tho, so you will have to cheat and create some new ones...

In Design Mode, create another page, "Page 4" in the batch view and make it transparent..

Next, in the Batch Plan dialog, open the Expressions tab and click the Next or Prev button until the Wait set appears.

In the expressions edit box enter the following lines...

```
Bright1=Len
Bright2=Dia
Bright3=Bore
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The terms to the right of the equals signs must be the (short) names of your three features – as they appear in the Batch Plan tree diagram. They may simply be Ftr1, Ftr2 and Ftr3 if you didn't change them when you created the features. The terms to the left are three new intermediate variables that QS-Pro will create in the Wait set.

Now, add three mimic controls to Page 4 in the Batch View and place them directly over the mimics already visible for the three features.

Attach the top one to Bright1 (you may have



to clear the Features Only check box in the Attach dialog to see the three Bright... variables), the second to Bright2 and the bottom one to Bright3.

What you have just done is to create three new mimic controls that will be active and visible only in the Wait set. These will show the values just entered for the three features Len, Dia and Bore. As you measure each feature it's controls will activate and the others will dim. When you reach the Wait set the controls for all three features will dim but the three mimics you just added will be active and therefore bright, and, placed over the three feature mimics they will hide them.

You can use similar tricks with transparent pages to place label controls contain instructions that appear in a particular set and are replaced either by active controls in the next set or by another label control containing new instructions for that set.. You can create as many empty sets and instruction/label controls as you need with the operator having to press a key or click a button after each stage to confirm that he has carried out the instructions.

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