

QC-CALC[™] Real-Time Data Collection

for use
with

QC-5000[®] for Windows (Versions 2.21 or Higher)

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Quick Reference Sheet

This page of the QC-CALC User's Manual is included for those people who wish to install and use QC-CALC with minimal instructions. Complete details follow.

Modifying a QC-5000 Part Program for QC-CALC

1. Open the part program that you want to send data to QC-CALC.
2. From the QC-5000 menu choose **Windows - Open Template**.
3. Select the **Prolink.5FT** template and click **OK**.
4. The Prolink template shows your inspection results in a report form.
5. Select (or deselect) the inspection features you wish to Export to QC-CALC.
6. Add (record) an Export step into your part program
 - Choose **Export** from the QC-5000 **File** menu
 - Choose **Tab Delimited**
 - Enter the file name (.TDF)
 - Click **OK**
7. **Stop Recording**
8. **Save** and **Run** Part Program
9. See Special instructions for multiple part inspection on page 7.

Running QC-CALC Real-Time

1. Start QC-5000 and start QC-CALC Real-Time.
2. QC-CALC Real-Time reads your results file and processes the data.

Introduction

QC-CALC

QC-CALC[®] is a Windows software program that automatically collects and analyzes inspection data generated by the Metronics QC-5000. This section of the documentation describes the usage of QC-CALC with the QC-5000 software.

The direct interface between the QC-5000 and QC-CALC eliminates creating SPC database files and entering inspection results. Each part routine run on the QC-5000 generates important information used by QC-CALC to automate the creation of SPC files. All nominal, tolerance, control, and related labels needed for real-time data collection and display are passed to QC-CALC via a file transfer.

QC-CALC for Windows is divided into two distinct functions, Real-time data collection, and Historical Analysis. All historical or statistical analysis is performed in the Historical Analysis Section. For details on the statistical analysis portion, please refer to the basic user manual following this QC-5000 section.

Real-Time Inspection

You use real-time inspection to acquire and display QC-5000 inspection results. QC-CALC is capable of storing up to 1250 features per part and presenting up to 500 of these features in live raw data plots. Color is used to enhance the readability of these plots.

Setting Up QC-5000 with QC-CALC

This section explains how to setup QC-CALC to interface with the Metronics QC-5000 software. The setup process is simplified if the QC-5000 software has already been installed into its default directory (C:\QC5000) on the computer that QC-CALC is to be installed on. During the QC-CALC installation process, QC-CALC needs to copy a file called PROLINK.5FT into the QC-5000 template directory. If for some reason QC-CALC was unable to install the PROLINK.5FT file correctly, simply copy the PROLINK.5FT file from the QC-CALC CD-Rom (D:\TechSpt\InspFile\Prolink.5FT) into the QC-5000 directory.

Making QC-5000 Inspection Results Available to QC-CALC

Prolink has created and installed a special QC-5000 report template to ensure the inspection results file is written in a known format for QC-CALC. You will use this template whenever you wish to send inspection results to QC-CALC.

WARNING: Do not modify the PROLINK.5FT template because modifications will cause the QC-5000 output to be unreadable by QC-CALC. If the PROLINK.5FT file becomes corrupt or damaged, copy the PROLINK.5FT file from the QC-CALC CD-Rom (D:\TechSpt\InspFile\Prolink.5FT) into the QC-5000/Templates directory.

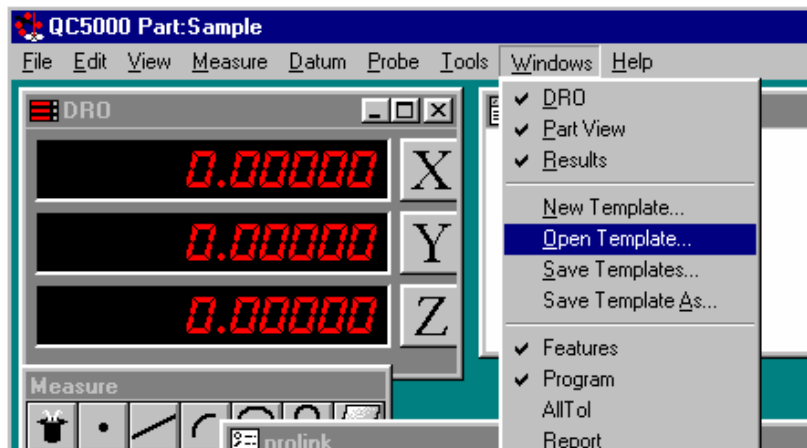
Modifying a QC-5000 Part Program for use with QC-CALC

Select Your Part Program

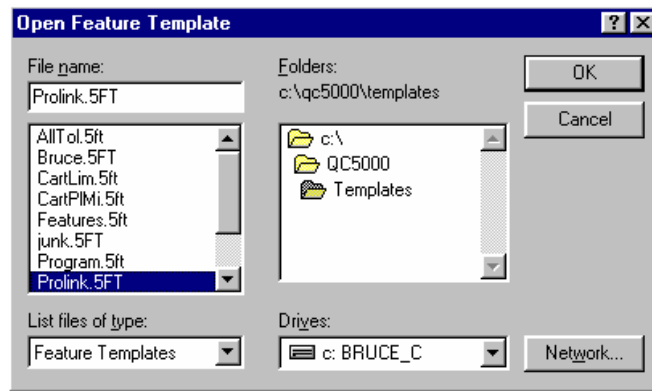
Open the part program that you wish to use to inspect your part by selecting **File – Open** from the QC-5000 main menu. These next steps walk you through the procedure to configure your part program to work with QC-CALC.

Open the Report Template

From the QC-5000 menu choose **Windows - Open Template**, shown below and select the specially created report template supplied by Prolink. This template has been written to ensure your results are saved in a manner that is readable by QC-CALC.



The **Open Feature Template** dialog box shown below is displayed and you select the Prolink.5FT Template. Once you have selected the correct template click **OK**. When using the QC-5000 software with QC-CALC, this is the **only** template that will work.



Viewing Your Results in the Template

Clicking **OK** causes the Prolink template to display your inspection results in a report form as seen below.

Data	Name	ID	Run	Actual	Nominal	Plus	Minus
DATA	Cir Sam (2)	X	10.00000	1.00000	1.00000	0.01000	0.01000
	Cir Sam (2)	Y		2.00000	2.00000	0.01000	0.01000
	Cir Sam (2)	Z		3.00000	3.00000	0.01000	0.01000
	Cir Sam (2)	r		1.50000	1.50000	0.01000	0.01000
DATA	Line 2 (2)	X	10.00000	2.00000	2.00000	0.01000	0.01000
	Line 2 (2)	Y		2.50000	2.50000	0.01000	0.01000
	Line 2 (2)	Z		3.00000	3.00000	0.01000	0.01000

Select the Items to Output

Select the inspected features you wish to Export to QC-CALC. Use the typical Windows Block select (click the first result with the mouse and then hold the SHIFT key and click the last one). Now hold the CTRL key down while clicking the features you wish to turn ON/OFF. Below we show Steps 1, 2, & 4 selected to be sent to QC-CALC.

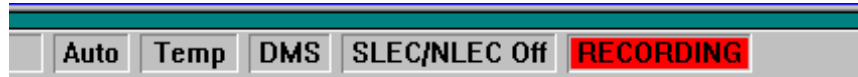
Data	Step	Name	Actual	Nominal/Zone	Hi Lim	Lo Lim	
DATA	1	Bruce Cir	1.00000	X	1.00000	1.01000	0.99000
			2.00000	Y	2.00000	2.01000	1.99000
			3.00000	Z	3.00000	3.01000	2.99000
			1.50000	Sz	1.50000	1.51000	1.49000
DATA	2	Line 2	2.00000	X	2.00000	2.01000	1.99000
			2.50000	Y	2.50000	2.51000	2.49000
			3.00000	Z	3.00000	3.01000	2.99000
DATA	3	Point 3	0.00000	TP	0.03000	0.03000	0.00000
DATA	4	Sphere 4	4.00000	X	4.00000	4.01000	3.99000
			5.00000	Y	5.00000	5.01000	4.99000
			6.00000	Z	6.00000	6.01000	5.99000
			1.00000	Sz	1.00000	1.01000	0.99000

Record the Export Step

To save the results each time the part program is run, you must add an Export step to the part program. To add an Export step to the part program you must record the step into your program by pressing the green **Record** button in the **Program** group shown below.



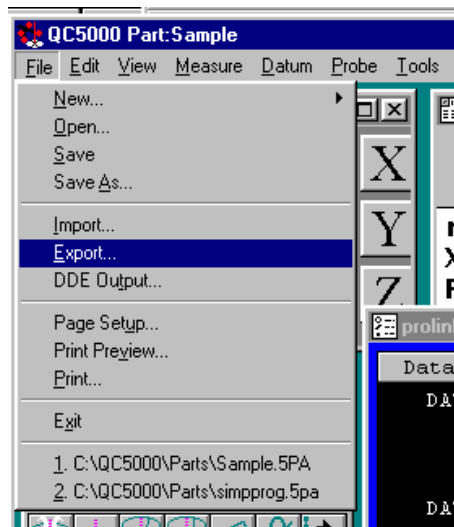
Once the red **RECORDING** indicator is seen at the bottom of the screen, you perform the Export step from the file menu as described next.



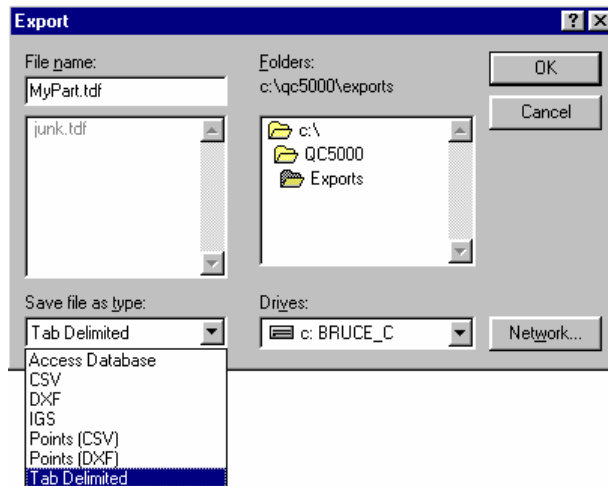
You can click on the word **editing** which is the text seen in the same place as **RECORDING** when you are editing instead of recording.



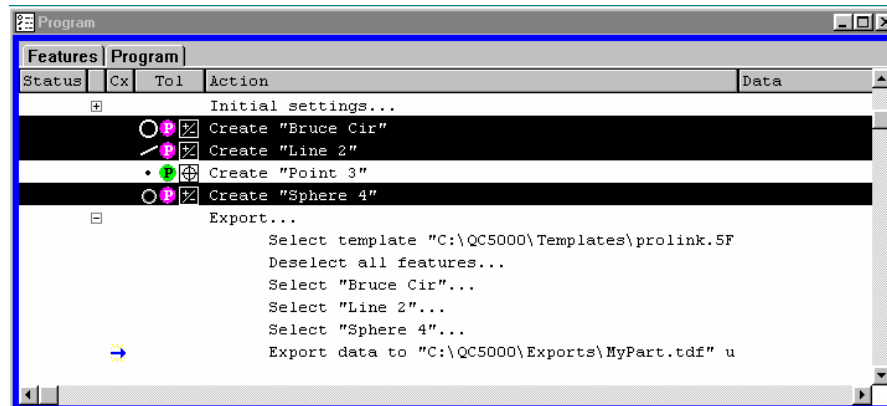
Now that Recording is active, choose **Export** from the QC-5000 **File** menu and the file dialog box appears.



In the **Save file as type** drop-down list box select **Tab Delimited** and type the file name where your results will be saved. QC-CALC uses this name to create its database name. The .TDF is replaced with .QCC. In our example, QC-CALC will read MyPart.TDF and create and save the results into MyPart.QCC. Be sure the **Folder** is set to **C:\QC5000\Exports** since this is where QC-CALC looks for all .TDF files.



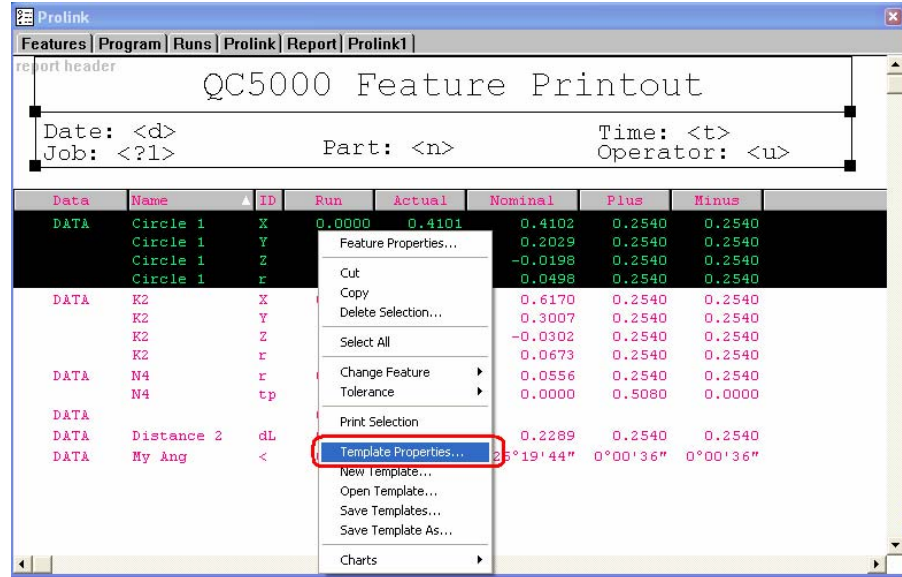
When you complete this Export you can turn-off the Recording by pressing the **Stop** button or clicking the red **RECORDING** label. The **Program** window shows the results of adding the Export step. Double click the **Export** line to see the details of the Export step. Below shows the template in use, the 3 selected features we chose, and the output file name the results will be written.



If this is the first time this particular part name is being run, QC-CALC will automatically create a new .QCC database using the file name that you supplied. Whenever you run your saved QC-5000 part program, QC-CALC will automatically collect the data generated by the report template, save the data to the corresponding QC-CALC database, and display the data in QC-CALC Real-Time. It is important that you add the Export step to your part program so it generates the same result file name and content during each inspection.

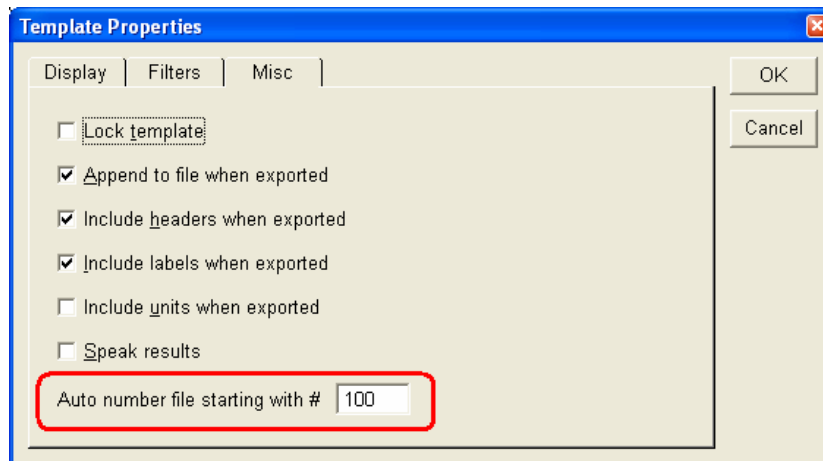
File Numbering

QC5000 saves your results in a file format QC-CALC can read based on the Prolink template shipped with the software. The properties of the default template (PROLINK.5FT) also contains a setting that causes output file name to contain an incrementing number.



If you right-click on the template and select the **Template Properties** menu you see the Template Properties window below. By default, the template adds a 3-digit number to the name of every file saved. This is done to ensure each part is saved in a separate file with a different name. e.g. if your file name is MyPart and you measure three parts, the following 3 files are created by QC5000:

MyPart100.TDF
 MyPart101.TDF
 MyPart102.TDF



QC-CALC strips the extra three digits and creates a database with the rest of the name. e.g. MyPart.QCC. Be sure the Auto Number is starts at 100 or above since QC-CALC requires three complete digits to be added.

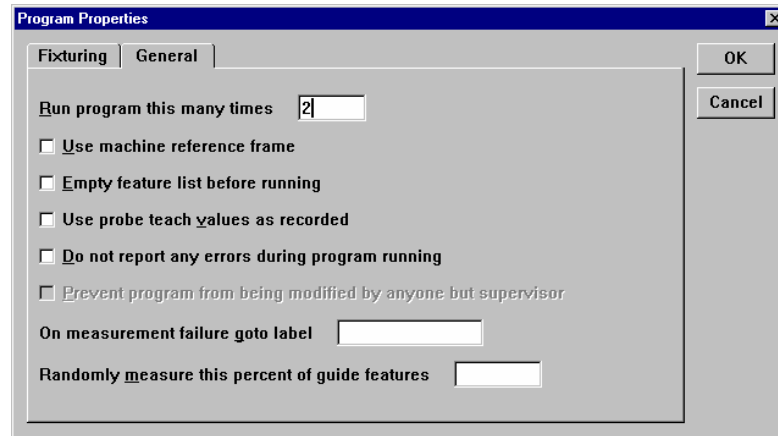
Multiple Part Inspection

A very important function of QC-5000 is its ability to repeat the inspection of multiple parts. There are two methods you can use to inspect multiple parts which is discussed next.

- Change the Program Properties
- Add a Palletize Step to your program

Program Properties

The simplest method of repeating a part program is by changing the program's properties. Double click the **Program Properties..** step in your part program and a dialog box appears as seen. This is usually the first step. Here we entered a 2 for the number of times to run the program.

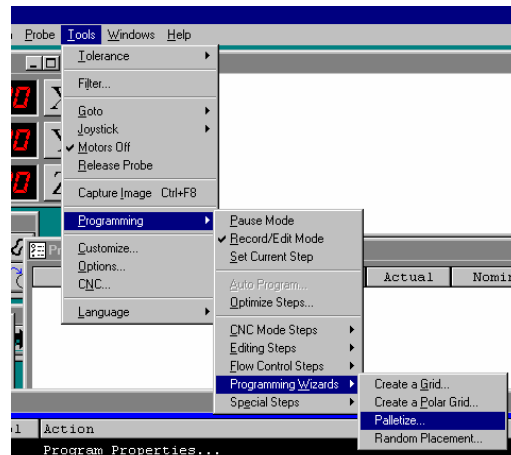


Since the part program will loop immediately to the beginning, you should add a **User Message** at the top of the program. This pauses the program giving the operator time to load and unload parts. Otherwise you might inspect the same part twice.

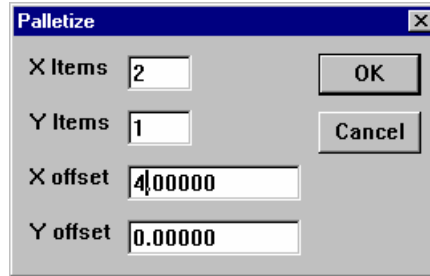
Palletize Step

The palletize step is used for inspection of multiple parts. If you have 5 parts on a custom fixture and want to use the same part program for each part, add a palletize step.

Before choosing this step be sure to enter the **Record** mode, and select the section of the part program you want to repeat. For example, you might highlight all program steps after the **Initial Settings** step since you do not need to re-initialize the part program.



Now that your program steps are highlighted, choose QC-5000 menus **Tools – Programming – Programming Wizards – Palletize** and the Palletize dialog box is displayed.

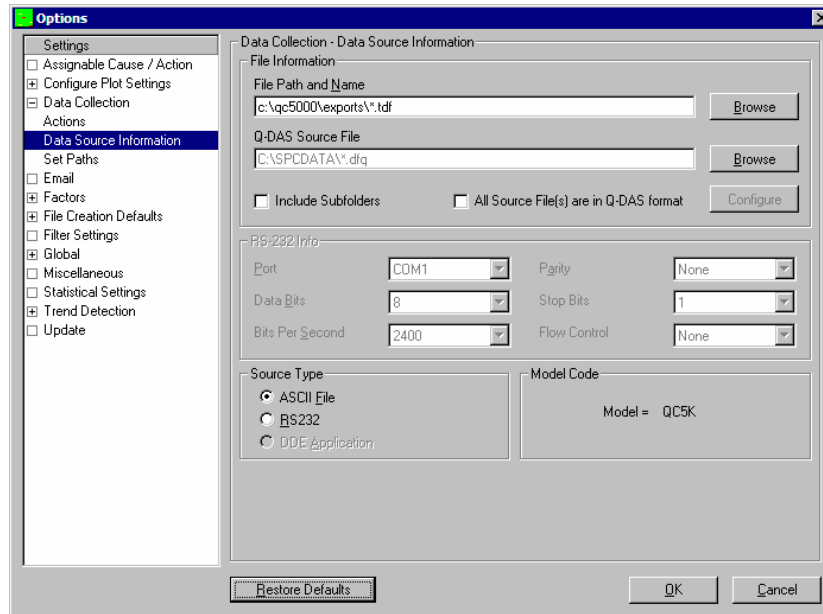


The Palletize dialog box asks for the number of items in X and Y and their offsets. This tells QC-5000 where to move to find the next part. We show a 2 for the number of X-axis items with an offset of 4 inches. The part program will inspect the first part, move 4 inches in X, and inspect the second part. After each part inspection is complete, QC-CALC shows the live graphic results if it is running during inspection.

QC-CALC Settings

Select Data Source

QC-CALC Real-Time reads data from the inspection results file saved by QC-5000. This is the normal method of using QC-CALC with QC-5000. If for some reason the data source is set incorrectly, data collection will fail. To check, select **Tools – Options – Data Collection – Data Source Information**, choose **ASCII File** in the **Source Type** area, and verify the **File Path and Name**.



File Path and Name

Because QC-CALC is obtaining the inspection results through the use of a file transfer from the QC-5000, QC-CALC needs to know where you configured the QC-5000 to save your data. The QC-5000 default drive and path is:

C:\QC5000\Exports*.TDF

The Stats file name can be any name you choose. In fact, you **must** use a different name for every part routine you write. This way QC-CALC will correctly save your data in the correct database without asking any questions.

Auto-Start QC-CALC Real-Time

If you wish start QC-CALC each time Windows reboots, you can press the **Set** button in the same **Tools – Options – Global – Startup** area.

Updating Old Database Nominal/Tolerance Values

When a QC-5000 part program is running it automatically stores everything QC-CALC needs in a file. If a matching QC-CALC database does not exist, it creates one and uses the new nominal and tolerance information. Once the database is created QC-CALC uses only the inspection results and saves them in the next available QC-CALC record. If changes are made to the nominal and tolerances of your part program, you can use the QC-CALC editor to change the stored values to match your part program. You can also have QC-CALC automatically update all nominals and tolerances by setting **Tools – Options – Data Collection – Actions – Update Nominals to Always**.

When Your Part Program Changes

There are 5 data collection options to deal with the problem of mismatched dimensions. QC-CALC creates its .QCC file based on the first time you run your program and expects the same results thereafter. Should your part program be shutdown early and report a partial file (less dimensions) or you change your part program and add or remove dimensions, QC-CALC can adapt to these changes. Please read the **Tools – Options – Data Collection – Actions** section in the QC-CALC Real-Time section of the QC-CALC manual and select the appropriate action so QC-CALC can automatically adapt to your changes.

--- End of the QC-5000 Section ---