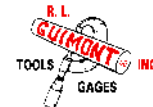




# MeasureFit Programming Guide for MeasureMind 3D

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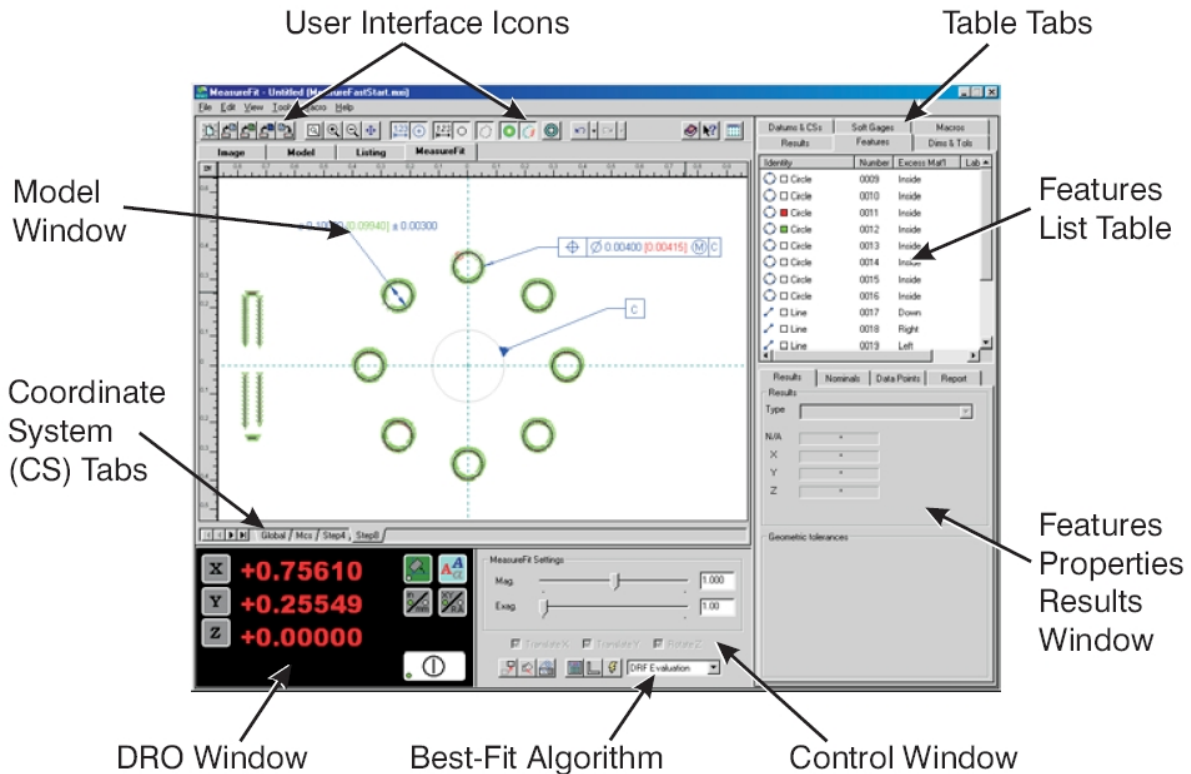


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## MeasureFit Screen Layout



### 1. MeasureFit Project File

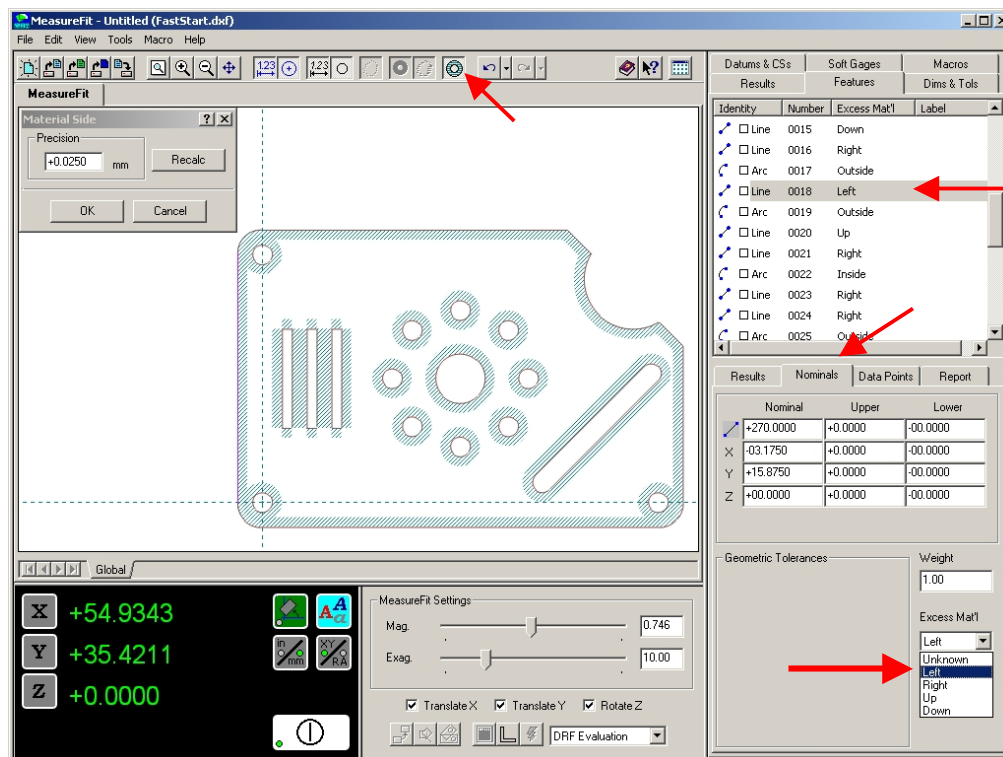
The first step to integrating MeasureFit with MeasureMind into a measurement sequence is to create a MeasureFit Project file. This file will contain all the nominal and tolerance information that you want to inspect on the part. Creating this file ahead of time allows programs to run faster and allows for ease of editing in the future. The steps for creating a project file are below.

1. **Create a new MeasureFit Project.**  
Open MeasureFit by double-clicking the icon on the desktop. If necessary, select File→New to start with a clean project.
2. **Read the DXF File (CAD File)**  
Select File→Import Nominal Geometry and open the DXF file that contains the nominal data for the part you are working on. The DXF file should be stripped down to just the geometry that you will be evaluating including datums. Use the control key and click on or drag a box around extra features in the dxf file to select them. They can be deleted using the delete key.

### 3. Material Identification

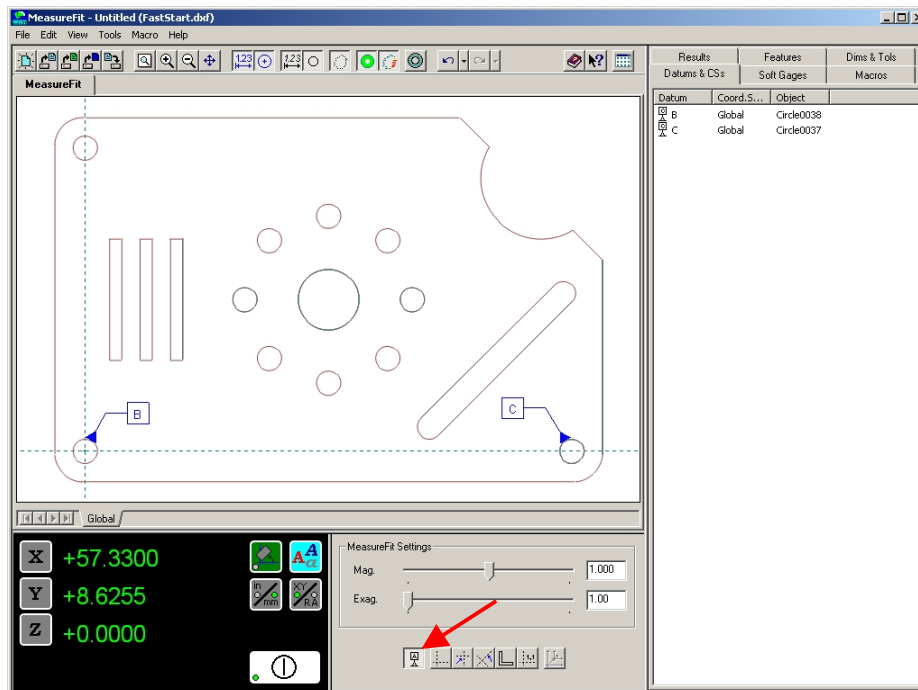
MeasureFit uses the material side to determine where positive and negative deviations (too much or little material) occur. Select Tools→Features→Transformations→Automatic Material Identification. Click the area of the model where the material is located. MeasureFit will attempt to identify the material side of each feature. If the material side is not identified or identified incorrectly, you can increase the precision and click Recalc to have the system re-analyze the DXF file. Click OK to accept the material identification or Cancel to reset.

If necessary, you may have to manually change the material condition for some features. To do this, select the feature, switch to the nominal tab, and set the material condition (see below). Note that the model screen shows where the material is and the feature asks you to set the excess material side. It can be helpful to display the material side when manually editing features.



#### 4. Define Datums

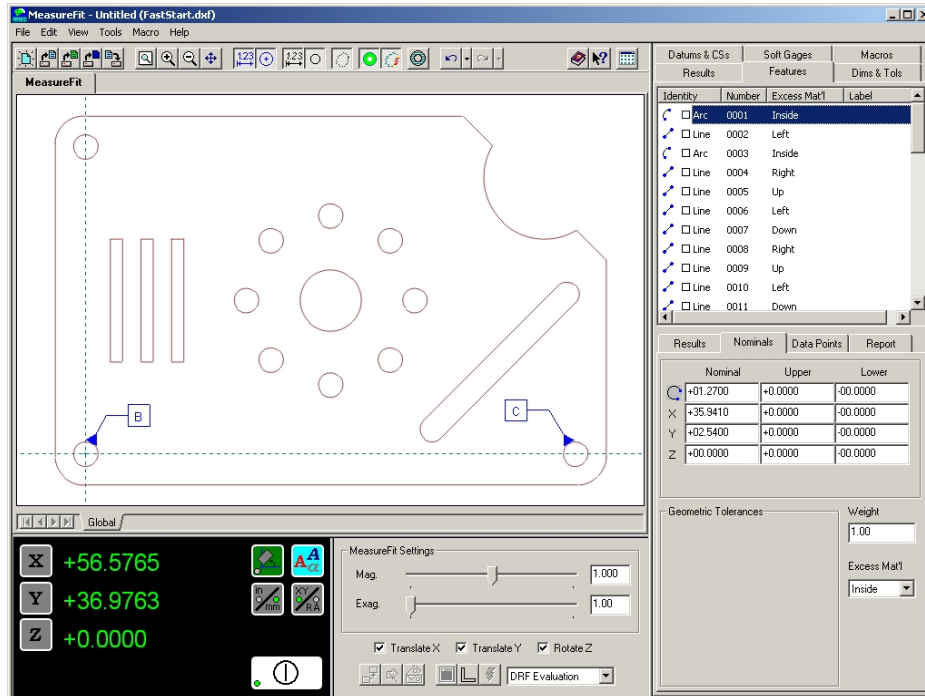
Click on the Datums & CS tab on the right in the MeasureFit Window. Then click the Datum icon in the toolbox next to the Digital Readout. Click on the features you want to use as datums. The first one you click will be A, the next B, and so on. The letter P is reserved for the plane you are working in (XY plane, this is typically datum A).



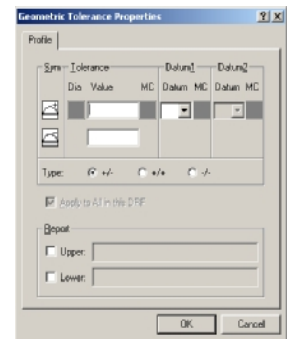
*Tip: If Datum A is the plane you are working in and B and C are the datums you need to define, select any feature (other than a datum) first which will become A then set B and C. You can then select A from the Datum list and delete it which will leave the model screen only showing B and C.*

## 5. Assign Tolerances and Characteristics

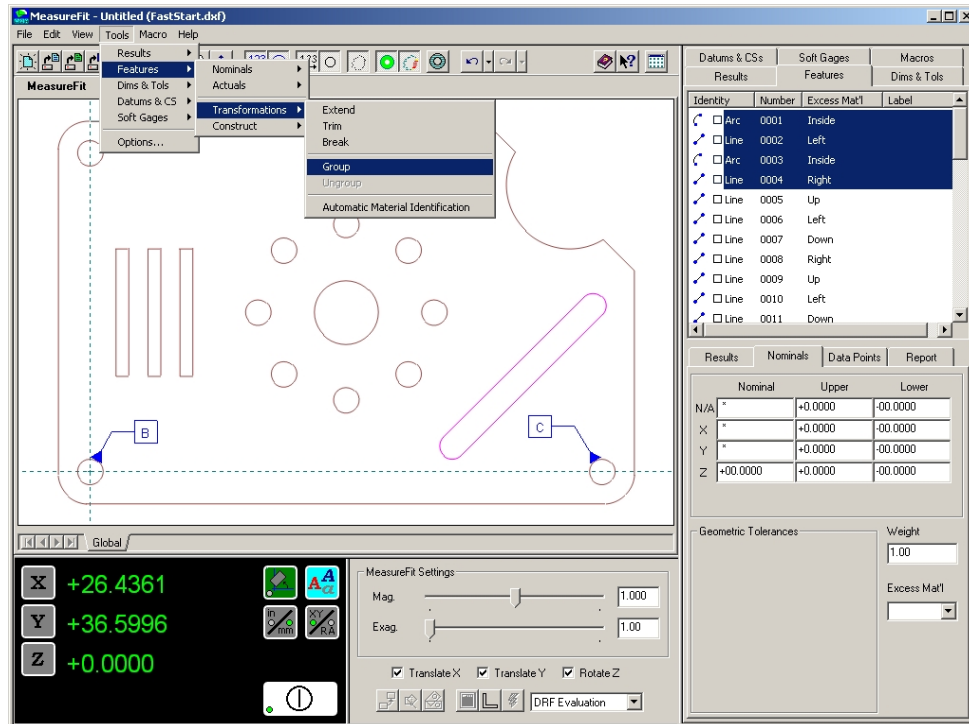
To create size and location (X,Y,Z) tolerances, select the feature and enter tolerances for the dimensions you are interested in. After tabbing out of each field, you will see the model screen update with the new characteristics (clicking from one field to another will not keep any changes you make). Click the Report tab to enter a name for the characteristic. Click the Save button after making any changes to the report names. By using Shift+Click or Ctrl+Click you can select multiple features and tolerance similar characteristics at once.



To create GD&T characteristics, click the Dims & Tols tab on the right in the MeasureFit Window. Then click the icon for the characteristic you want to create in the toolbox next to the Digital Readout. Next click on the features you want to assign that characteristic. MeasureFit will then display a dialog to enter the tolerance, datums, and report options. If the feature or datum is a feature of size (i.e. circle), the box under MC will become active to enter a material condition (M, L, S) if that feature already has a size tolerance. If the box is inactive you must first enter a size tolerance on the feature and/or datum then create the GD&T characteristic.



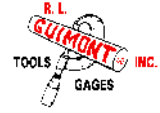
To create a profile tolerance around multiple feature the features must be grouped. To create a group, select the features using the CTRL key in the model or feature list then select Tools→Features→Transformations→Group. You can then place a profile on the entire group.



To rearrange the model window, with no features selected right-click and select Edit Dimensions. You can then move the location of each dimension in the model.

## 6. Save Project

Select File→Save As and save your work as a MeasureFit Project File (\*.mfp).



## 2. Writing the MeasureMind Routine

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The second step in the process of using MeasureMind and MeasureFit is to create the MeasureMind routine. This routine will collect all the data points that will be used for the evaluation with MeasureFit in the third step.

1. **Completely set up the origin and alignment for the part.**  
This should be close to the origin and alignment of the DXF file used to create the MeasureFit project file. The origin is optional; however, having the same orientation will greatly reduce the chances of getting an incorrect fit.
2. **Measure the features that you want to analyze with MeasureFit.**  
On the nominals page for each step that you want to send data to MeasureFit, check the "Data Stream" box. This checkmark will cause MeasureMind to create a data file containing all the measured points for the step. All steps send data points to the same file. This file will later be imported into MeasureFit.

After clicking OK to the first step with data stream active you will be prompted to enter a name for the data stream file. **This file must be stored in the C:\Partrn directory.** A good practice for naming this file is to use the same name as the MeasureFit project file created in section 1 using a ".dat" file extension.

You can also measure features and report any characteristics that are not part of the MeasureFit project file. These features can also be part of the data stream.

3. **Set up Configurations.**  
Select Part Setup→Run Overrides. Click on the Data Stream button. Make sure that default is selected and check the box next to "Keep same file name each time"; the path and name you entered in step 2 above should already be listed. Verify the name and ensure it is being stored in the C:\Partrn directory. Finally select the Setup 0 (SCS) option under select coordinate system. This will ensure that all the data points are imported into MeasureFit in the same coordinate system regardless of how origins were set and/or manipulated in your MeasureMind program.
4. **Save the MeasureMind Routine**  
A suggestion is to name the MeasureMind routine the same as the MeasureFit project file you created.
5. **Run the Routine**  
Run the routine to generate the dat file for use in creating the MeasureFit macro in the next section.

### 3. MeasureFit Macro Programming

The final step to using MeasureMind and MeasureFit in combination is to create a macro in MeasureFit. This macro will automate analysis of the part. The following sequence of steps is a typical method for evaluating a part. The process may be modified to fit particular situations.

#### 1. Start Macro

Click on the Macro Tab in MeasureFit. Next click the record button in the toolbox next to the Digital Readout or select Macro→Record New Macro from the pulldown menus. From here everything you do inside MeasureFit will be recorded to a macro. You can pause the macro recording by clicking the pause button on the macro toolbar.



#### 2. Select File→New.

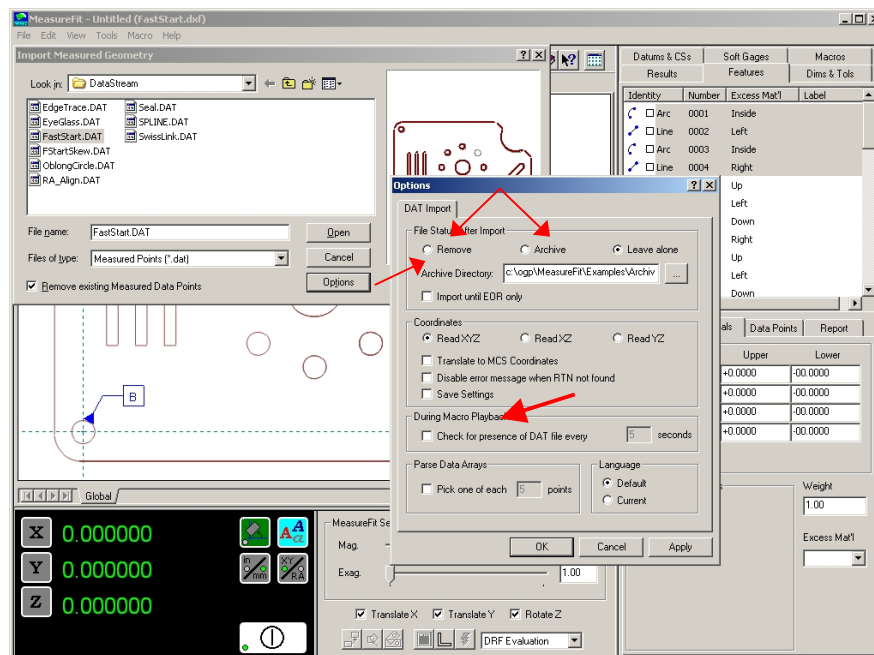
Don't save changes to current file if prompted. This will clear out anything that was open.

#### 3. Select File→Open.


Open the MeasureFit project file. This is the nominal information.

#### 4. Select File→Import Measured Geometry.

Open the data stream file which contains the measured points (you might need to change the file type to Measured Points). Click the options button and select either Remove or Archive. This will ensure that each time the analysis is performed it is done with the most recent measured data set. Also check the box for Check for presence of DAT file every... 5 seconds is a good interval.

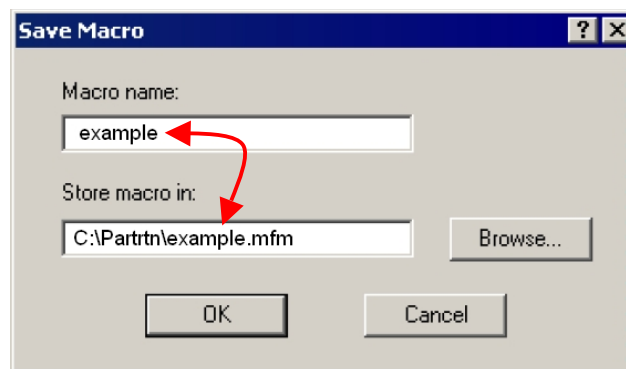


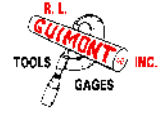


5. Perform Quick Align fitting.   
Click the Features or Results Tab. Click the quick align icon in the control window next to the digital readout. This rough aligns the data with the nominals.
6. Perform required fitting method.  
Use the pull down box to select the fitting method. DRF (Datum Reference Frame) Evaluation is the only fitting method that will work if there are any GD&T characteristics in the project file. If there is not GD&T any fitting method can be chose with Least Squares being the most common. Click the lightening bolt icon to execute the fit. It is a good idea to execute the fit a second time. This ensures that the fit is as good as it can be. Results for the characteristics are now available.



7. Setup display.  
Edit the placement of dimensions and turn on/off the view filters. Each move you make will add a step to the macro and be replayed when the macro is executed. This is an optional step.
8. Output Results.  
Select File→Report. On the General Tab, click the box next to Generate if you want to create a report. Also specify the report type and template. If you want a picture on the report, click the Picture Tab and click the Generate check box. On the Headers and User Input Tabs, add any information you want to appear on the report and/or in the database. When you click OK, a report and/or database will be generated and SmartReport will be active. Once complete, click the MeasureFit Tab from SmartReport.
9. End Macro.  
Click the stop button on the macro recording toolbar. Enter a name for the Macro. **The name of the macro must be the same as the dat file and be stored in the C:\Parttrn directory.**





## **4. Measuring Parts**

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1. Make sure MeasureMind, MeasureFit, and SmartReport are all running.
2. Run the MeasureMind routine created in section 2.
3. When the routine completes, switch to MeasureFit and to view the running macro. If the macro does not automatically run check that Macros → Search for DAT and Macro is checked.
4. When the macro is complete, your report will be generated with the measured dimensions for the part.

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