

FieldCal Recalibration Software
for
DSA 3000 Series Modules

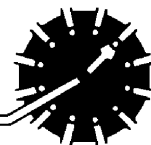
Version 1.02

Operation and Installation

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The purpose of this document is to define the procedure to operate the FieldCal re-calibration software. This program is a Visual; Basic program that calls a DOS console program. This program operates in Windows NT, Windows 2000, or Windows XP. The software will permit a user to introduce one or more calibration pressures plus a zero pressure to a DSA module. The software will use this data from the calibration to generate a correction that will be used to trim the existing calibration coefficients in order to bring the module into specification across the entire operating temperature range.

The FieldCal program compares the existing coefficients to the test points generated in the software to develop a series of correction factors. The correction factors are generated for each leg of the existing coefficients. A new set of master coefficients are generated which may be uploaded to the DSA module.

A user has the option to calibrate an entire module, a bank of 8 sensors, or an individual channel. Calibrations may be performed in both the positive and negative planes, the positive plane only, or the negative plane only. The best calibration will be obtained if a full calibration is performed. A user must apply at least one pressure in the plane, or planes to be calibrated, plus a zero point. Calibrations in the positive plane will not affect the negative plane nor will negative calibrations affect the positive plane. Although it is best to use pressures close to those used during the original calibration, it is not a requirement.

The Field Cal program will perform the following tasks:

1. Acquire the current conversion parameters
2. Acquire the current master coefficient points.
3. Capture the new calibration points.
4. Generate new master coefficient points
5. Upload the new master coefficient points to the module.
6. Issue a Fill command to the module
7. Save the new coefficients.

Several Files are generated during this calibration:

- | | | |
|----|---------------|---|
| 1. | ListC.txt | This file contains the calibration conversion parameters. The parameters are downloaded from the DSA module under test. |
| 2. | Master.txt | This file contains the current master coefficients. They are downloaded from the DSA module under test. |
| 3. | Insert.txt | This file contains the new calibration points. They are generated during the calibration. |
| 4. | Nzmaster.txt | This file is an intermediate calculated file used to generate the new coefficients. |
| 5. | Fc.log | This file is a log file to assist in troubleshooting if problems occur. |
| 6. | Newmaster.txt | This file contains the new master coefficients. They will be uploaded to the DSA module under test when the calibration is completed. |

These files are stored in the \ProgramFiles\DSA Field Calibration\Files Folder.

NOTE: When a calibration is completed, these files should be copied to another folder or to a floppy disk and stored in a safe place. The files in this folder will be overwritten during the next calibration.

Installation

The FieldCal software is shipped on a CD-ROM. To install the software, place the CD-ROM in a drive and

Select: **Start**
Select: **Run**
Enter: **x:\Setup.exe** Where x is the designator of the CD-ROM Drive
Click: **OK** Follow the installation instructions

FieldCal Operation

Apply power to the module and connect to a host computer. Allow a minimum of 60 minutes for warm-up.

Start the FieldCal program:

Select: **Start**
Select: **Programs**
Select: **DSA Field Calibration**

The program will open a window:

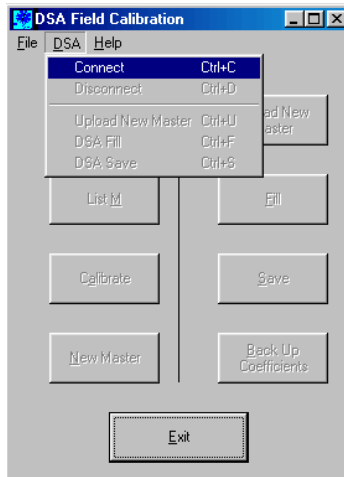


Click **OK** to continue the program operation.
The main program window will open.

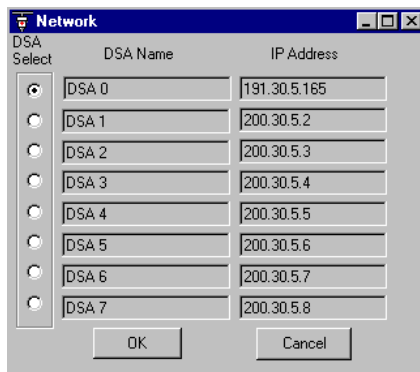


Connect to the DSA module.

Click on DSA in the menu bar The DSA menu will drop down
Click on Connect

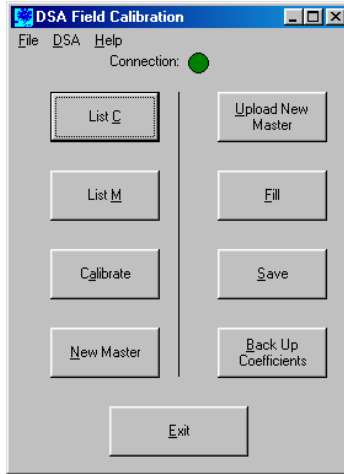


The Network connection window will open. Up to 10 DSA IP addresses may be logged in this menu. But, the program can only connect to one DSA module at a time. If the address of the DSA is not listed, enter it after one of the DSA names.

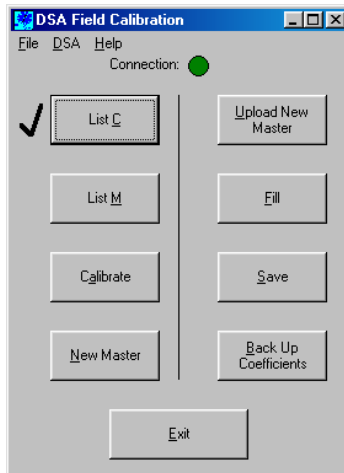


Select the DSA connection by clicking the DSA Select radio button that corresponds to the DSA IP address.

If the connection is successful, the connection button will change from red to green. All program buttons will be activated.



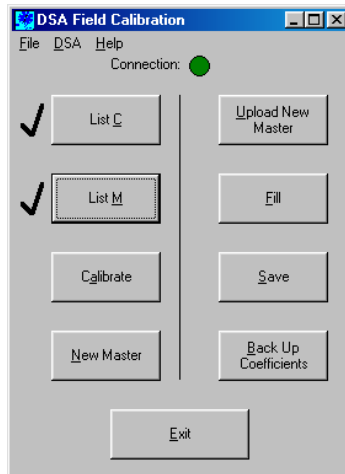
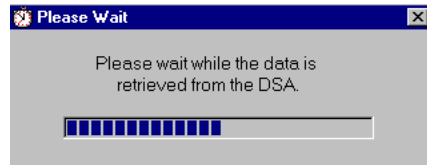
The buttons are arranged in an order starting with the upper left button. Each button represents a step in the calibration.



Generate the ListC.txt file by clicking the List C button. When the process is complete, a check mark will be added to the window.

The ListC.txt file will be written to the \\ProgramFiles\\DSA Field Calibration\\Files Folder

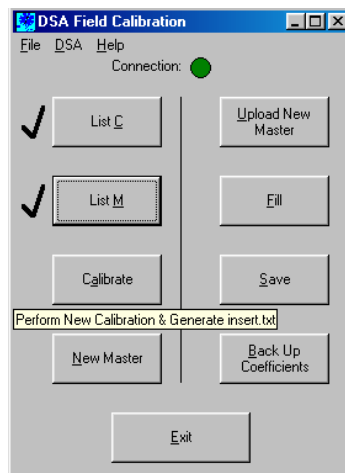
Click on the List M button to retrieve the Master coefficients. This could take several minutes. During this time a progress window will be displayed over the main program window.

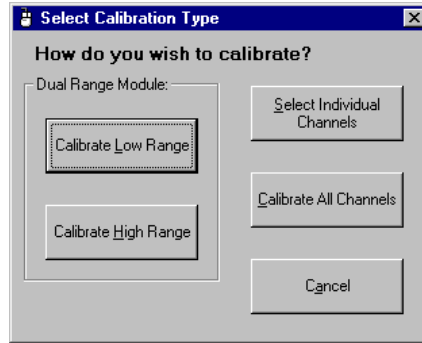


When the download is complete, a check mark will be added by the List M button.

The ListM.text file will be written to the \ProgramFiles\DSA Field Calibration\Files Folder.

Click the Calibrate button to start the calibration process.





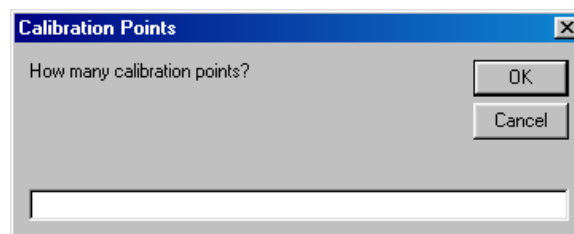
A new window will open with several calibration choices. A user has several options:

1. Channels 1- 8 by selecting: Calibrate Low Range
2. Channels 9-16 by selecting: Calibrate High Range
3. An individual channel by selecting: Select Individual Channels
4. Channels 1-16 by selecting: Calibrate All Channels

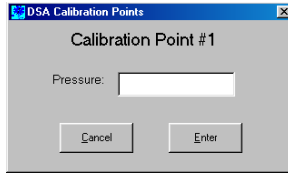
The procedure for entering calibration points is the same for each of these options. The FieldCal program will only modify the coefficients based on the following:

1. A re-calibration must have a minimum of 2 pressure points, one must be zero. No more than nine pressures should be used, including zero.
2. It is recommended that the pressures used in this calibration be as close to the original values as possible.
3. The number of pressures applied in each plane should not exceed the number of pressures used in the original calibration. That is, if NEGPTS is set to 3, only 3 negative points should be used.
4. If the pressure is applied only in the positive plane, then only the positive coefficients will be updated.
5. If pressure is applied only in the negative plane, then only the negative coefficients will be updated.
6. If pressures are applied in both the positive and the negative planes, then all of the coefficients will be updated.
7. Pressures should be applied from lowest to highest.

When the type of calibration has been selected, the user will be prompted to enter the number of points that will be used in the calibration.



The software will ask for the value of the first calibration pressure

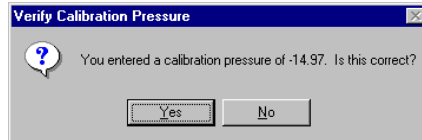


Apply the first pressure. Enter the value in the window and wait until the pressure is stable.

When the pressure is stable, Click Enter

NOTE: It is very important to make sure that the applied calibration pressure is stable before Clicking Yes.

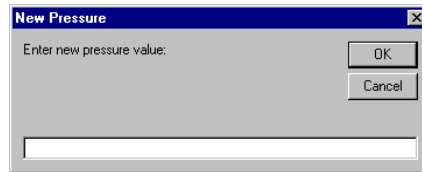
A window will open that will show the value entered.



If the value is correct, Click Yes

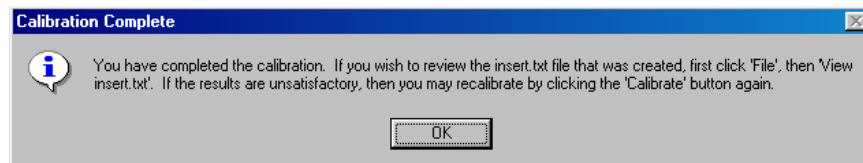
The DSA will read all of the sensors and create a series of INSERT commands with Channel number, pressure, and pressure counts. These data will be captured by the FieldCal program.

If the value is not correct, Click No. Another window will open to allow the user to enter the correct value.



The FieldCal program will continue to prompt the user for calibration pressures. It cannot be stressed enough to make sure that the applied pressures are stable at each point before Clicking Enter.

When the calibration is complete, the user will be prompted to view the file before proceeding.

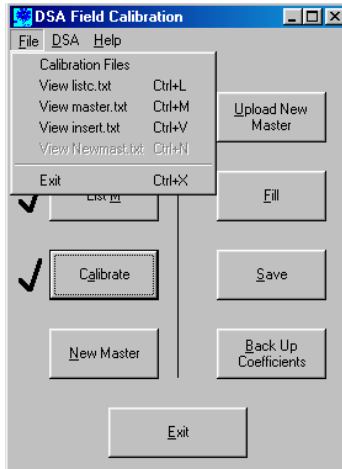


To view the files,

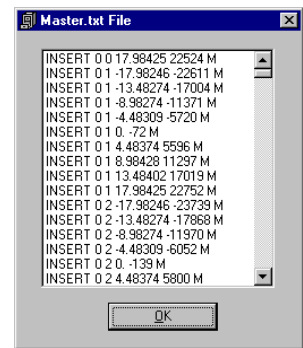
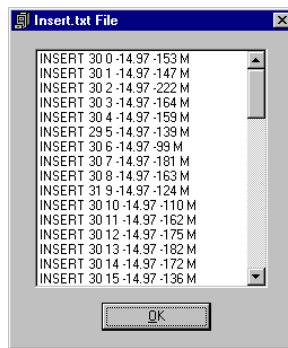
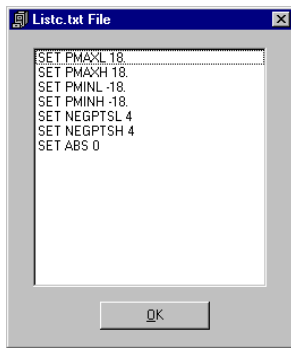
Click on File

Click on View xxx

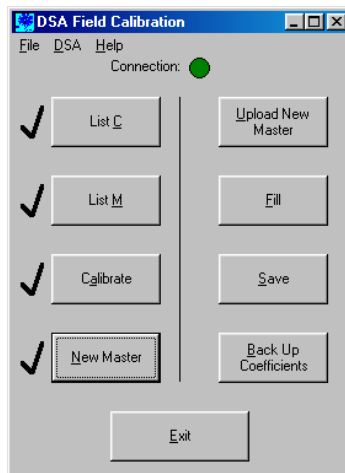
Where xxx is the file to be viewed



Examples of the files are shown below



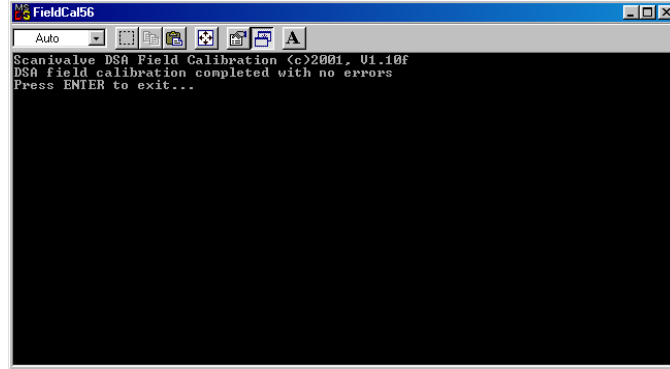
If the data in the files are correct, Generate the new master file by clicking the New Master Button



A DOS window will open that will show the progress of the calculation of the New Master points.

The software will report the successful completion of the process.

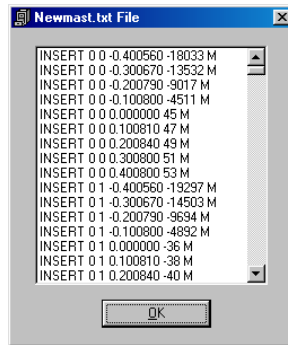
Press <Enter> to close the window and exit that routine



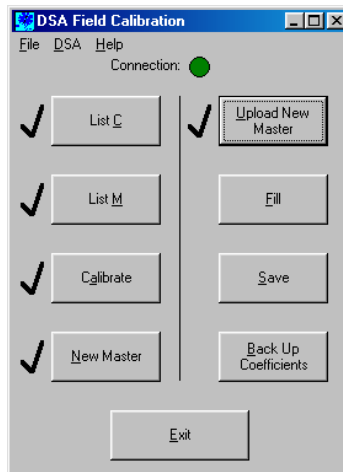
To view the NewMaster file:

Click on File

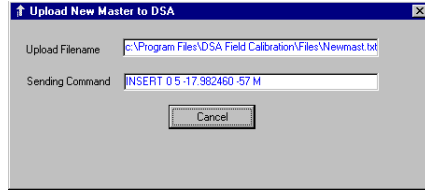
Click on View Newmast.txt



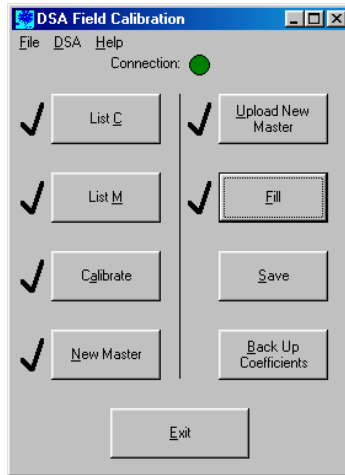
Click on Upload New Master to load the revised coefficients into the DSA module.



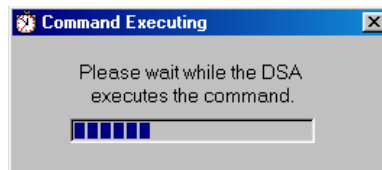
A window will open so progress can be monitored. This process could require several minutes.



When the upload is complete, generate the calculated planes by clicking the Fill Button



A progress monitor window will remain open while the DSA is executing the Fill command.



When the Fill is complete, apply a few pressures to verify that the calibration was valid. If the verification pressures indicate that the module is in specification.

Refer to the table on the next page for module accuracy specifications.

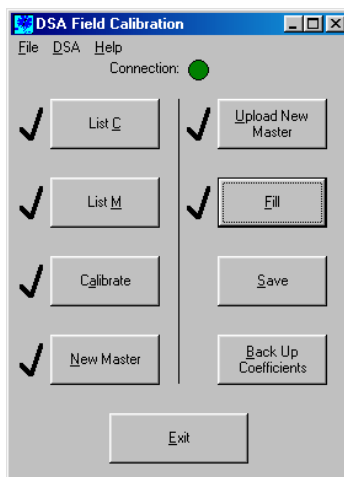
Range	Accuracy DSA 3017/18 DSA 3217/3218	Accuracy DSA 3007 DSA 3207
10 lnH2O	±0.2% FS	NA
1 psid	±0.12% FS	NA
2.5 psid	±0.12% FS	±0.2% FS
5 psid	±0.05% FS	±0.2% FS
15 psid	±0.05% FS	±0.12% FS
30 psid	±0.05% FS	±0.12% FS
50 psid	±0.05% FS	±0.12% FS
100 psid	±0.05% FS	±0.12% FS
250 psid	±0.05% FS	±0.12% FS
500 psid	±0.05% FS	±0.12% FS
600 psid	±0.08% FS	±0.12% FS
750 psid	±0.08% FS	±0.12% FS
1000 psid	NA	±0.12% FS

If the module is within specification, Save the coefficients by clicking the Save Button.

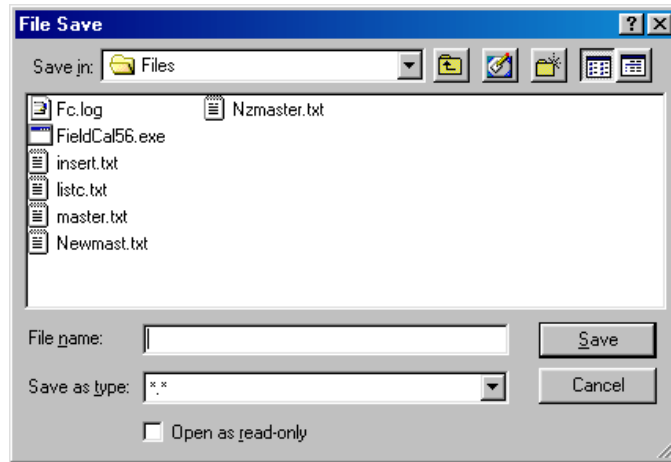
The calibration could be repeated if the module is not in specification

It is recommended that the files generated during the calibration be archived. If the files are not archived, the data will be overwritten during the next calibration.

Click on Back up Coefficients



A window will open to prompt the user to name the folder where the files will be backed up



To exit the program, Click Exit



For help with problems or if you have questions, contact:

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