

DSM/RAD FieldCal Recalibration Software
for
DSM 3000 Series Systems
DSM 3200 Series Systems
RAD 3200 Series Systems
DSAENCL3000 Systems
DSAENCL3200 Systems

Version 1.00

Installation and Operation

05/2005

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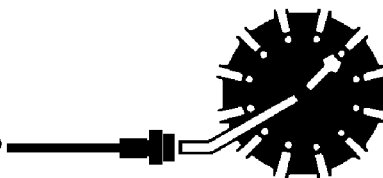
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Introduction

The purpose of this document is to define the operation of DSM/RAD FieldCal re-calibration software. This program operates in Windows 98, 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 module connected to a DSM, DSAENCL, or RAD. 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 DSM/RAD 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 DSM, DSAENCL, or RAD.

A user has the option to calibrate an entire module or a bank of 8 sensors in one module. Systems with multiple modules should be re-calibrated one module at a time. The software may not correct the coefficients for multiple modules. Calibrations may be performed in both the positive and negative planes, the positive plane only, or the negative plane only. For modules with full scale ranges 15 psi and below, the best calibration will be obtained if at least four(4) pressures are applied in the positive and negative planes. For ranges greater than 15 psi, one pressure in the negative plane will be sufficient. A user must apply at least one pressure plus a zero point in the plane, or planes to be calibrated,. Calibrations in the positive plane only will not affect the negative plane. Calibrations in the negative plane only will not affect the positive plane. Calibrations in one eight(8) channel bank of sensors will not affect the other sensor banks. Although it is best to use pressures close to those used during the original calibration, it is not a requirement.

NOTE: All calibrations using this software must be performed in PSI.

The DSM/RAD FieldCal program will perform the following tasks:

1. Acquire the current master coefficient points.
2. Capture the new calibration points.
3. Generate new master coefficient points
4. Upload the new master coefficient points to the DSM or RAD.
5. Issue a Fill command to the DSM or RAD
6. Save the new coefficients.

The DSM/RAD FieldCal program **does not** verify the calibration. That is, it does not have a method to test the accuracy, or validity, of the new coefficients. Scanivalve Corp recommends that the revised coefficients be tested after the calibration is complete.

This manual references the RAD memory and RAD Hard Disk Drive in several of the steps. In each case, the reference is to the RAD System computer. A RAD does not have internal memory. All MPF files associated with a RAD System are stored on the RAD system computer.

Several Files are generated during this calibration:

1. Ixxx.txt Where xxx is the serial number of the module. This file contains the calibration conversion parameters. The parameters are downloaded from the DSM, DSAENCL, or RAD for the module under test.
2. Mbakxxx.txt Where xxx is the serial number of the module. This file contains the current master coefficients. They are downloaded from the DSM, DSAENCL, or RAD module under test.
3. Insert.txt This file contains the new calibration points generated during the calibration. This file will contain the data from all of the modules calibrated.
4. Nzmaster.txt This file is an intermediate calculated file used to generate the new coefficients.
5. Nmxxx.txt Where xxx is the serial number of the module. This file is an intermediate file.
6. Mxxx.mpf Where xxx is the serial number of the module. This file contains the new master coefficients. They will be uploaded to the DSM, DSAENCL, or RAD module under test when the calibration is completed.

These files are stored in the C:\Program Files\DSMFC 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

System Setup

The System Setup requirements will vary from system to system. For more information on the system under test, refer to the applicable Software and Hardware documents.

1. Apply power to the Unit Under Test (UUT) and connect to a host computer. Allow a minimum of 60 minutes for warm-up. The configuration verification can be completed during the warm up time.
2. Establish communications with the UUT using DSMLink, RADLink, or a terminal communications program such as TelNet or HyperTerminal.
3. For DSM3000 and 3200 series systems, go to step 4. For RAD3200 systems, go to step 6. For DSAENCL3000 series systems, go to step 8. For DSAENCL3200 series systems, go to step 10.
4. Verify that the DSM Profile file matches the module installation. The serial numbers listed in the Profile List are used to map the conversion coefficients from the MPF files to the proper memory locations. If this list is not correct, make the necessary corrections and save the changes before continuing with the calibration.
5. When the DSM module configuration is confirmed, the modules to be calibrated must be switched to the CAL Mode.
For a DSM interfaced to ZOC22,23 or 33 modules and a DSMCPM, issue the following commands:
DOUT 1 0
DOUT 2 1
DOUT 3 1
Go to step 12.
6. The RAD will identify the module configuration if the ZOC modules have TEDS chips installed. If the modules connected to a RAD do not have TEDS chips installed, then the module configuration must be verified before proceeding with the calibration.
7. When the RAD module configuration is confirmed, the modules to be calibrated must be switched to the CAL Mode.
For a RAD interfaced to ZOC22,23 or 33 modules and a DSMCPM, issue the following commands:
DOUT 1 0
DOUT 2 1
DOUT 3 1
Go to step 12.

8. Verify that the DSAENCL3000 Profile file matches the module installation. The serial numbers listed in the Profile List are used to map the conversion coefficients from the MPF files to the proper memory locations. If this list is not correct, make the necessary corrections and save the changes before continuing with the calibration
9. When the DSAENCL3000 module configuration is confirmed, the modules to be calibrated must be switched to the CAL Mode. Issue the following commands:
DOUT 6 1
DOUT 7 1
Go to step 12.
10. The DSAENCL3200 will identify the module configuration if the DSA3016 modules have TEDS chips installed. If the modules connected do not have TEDS chips installed, then the module configuration must be verified using the List P command before proceeding with the calibration.
11. When the DSAENCL3200 module configuration is confirmed, the modules to be calibrated must be switched to the CAL Mode. Issue the following commands:
DOUT 6 1
DOUT 7 1
12. Apply a known pressure to the CAL input and verify that all channels respond correctly. The pressure applied should be approximately 20% of the full scale value of the module under test.
13. If all of the sensors in the module to be calibrated respond correctly, proceed with the calibration.

Operation

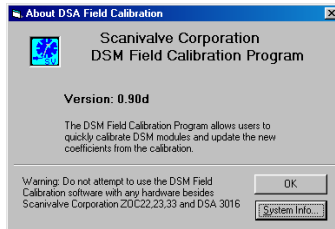
Start the FieldCal program:

Select: **Start**

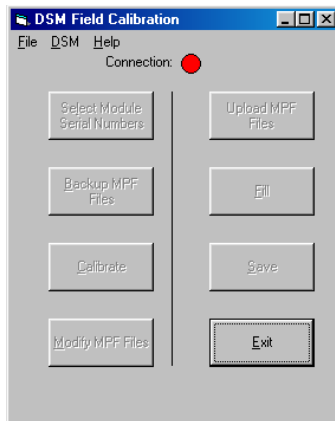
Select: **Programs**

Select: **DSMFC**

The program will open a window:



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

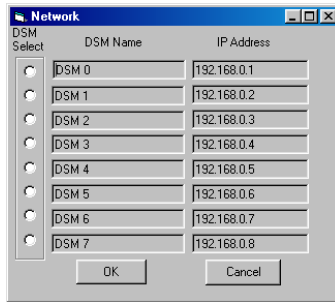


Connect to the DSM or RAD.

Click on **DSM** in the menu bar

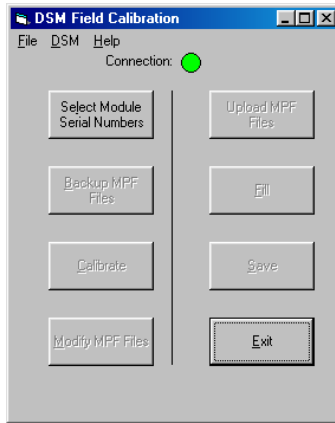
Click on **Connect** in the drop down menu

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



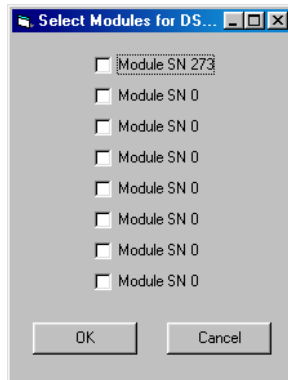
Select the DSM, DSAENCL, or RAD connection by clicking the **DSM Select** radio button that corresponds to the IP address.

If the connection is successful, the connection button will change from red to green. The **Select Module Serial Numbers** button will be activated.

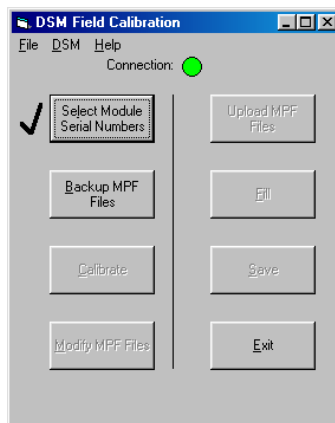


The buttons are arranged in an order starting with the upper left button. Each button represents a step in the calibration. As each step is completed, the button to start the next step will be activated.

Click on the **Select Module Serial Numbers** button to select the serial number of the module to be calibrated. This will open a window with the modules listed as they are in the Profile List. Click the check box opposite the module to be calibrated and then click OK.

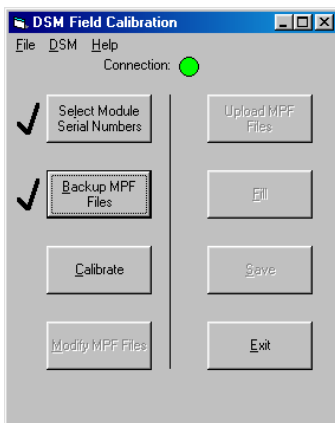


This will activate the **Backup MPF Files** button. When this button is clicked, the FieldCal program will copy the MPF file for the module selected to the **C:\Program Files\DsmFc** folder.

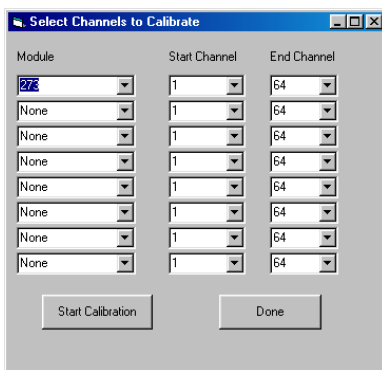


This will activate the **Calibrate** button. Clicking this button start the calibration process. It is recommended that the user:

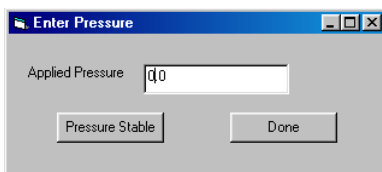
1. Verify that the Calibration Standards are ready.
2. Verify that the module under test has the proper control pressures applied to place the module in the calibrate mode.
3. Verify the pressures to be applied are within the limits of the module under test.



When the **Calibrate** button is clicked, A **Select Channels to Calibrate** window will open. The order of the module(s) to be calibrated may be selected at this time. Also, the channels within each module may be selected for calibration. If a system has multiple modules, the calibration will proceed through each module in the order of entry in this list.



To start the Calibration, Click on **Start Calibration**. The **Enter Pressure** Window will open.



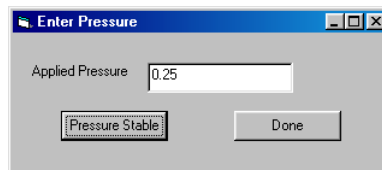
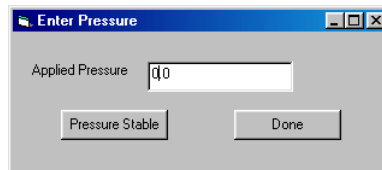
The FieldCal program will only modify the coefficients based on the following:

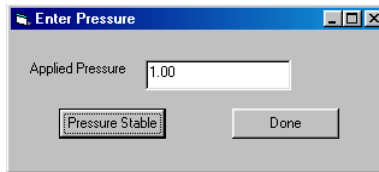
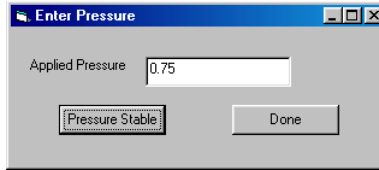
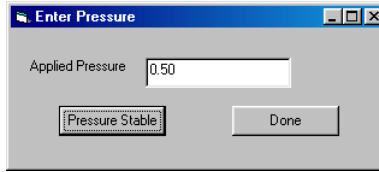
1. A Field Calibration must have a minimum of 2 pressure points, one must be zero. No more than nine pressures should be used, including zero.
2. The number of pressures applied in each plane should not exceed the number of pressures used in the original calibration. For example, if NEGPTS is set to 3, only 3 negative points should be used.
3. If the pressure is applied only in the positive plane, then only the positive coefficients will be updated.
4. If pressure is applied only in the negative plane, then only the negative coefficients will be updated.
5. If pressures are applied in both the positive and the negative planes, then all of the coefficients will be updated.
6. Pressures should be applied from lowest to highest.
7. The lowest pressure (most negative) must not exceed the value of LPRESS.
8. The highest pressure (most positive) must not exceed the value of HPRESS

Enter the value of the first pressure to be applied in the **Applied Pressure** window. Apply the pressure. When the pressure is stable, click on the **Pressure Stable** button. The software will acquire a frame of averaged data from the module and channels selected. The Period and Average used for this process will be determined by the settings of the CALPER and CALAVG Configuration Variables. When the hourglass symbol has cleared and the mouse cursor has been restored, enter the next calibration pressure in the **Applied Pressure** window, apply the next pressure and click Pressure Stable when the pressure is stable.

Repeat this process for all of the pressures for the module under test.

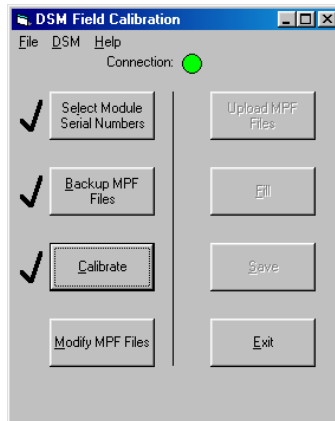
The following windows show examples of a 1 psi calibration on the positive side only.



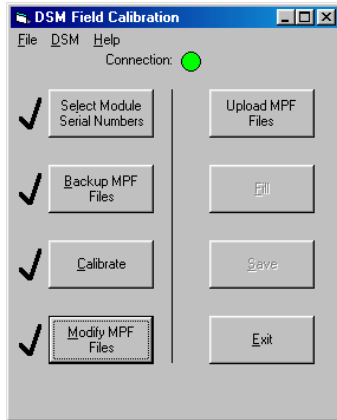


When all of the pressures have been entered, click on **Done**.

This will activate the **Modify MPF Files** button. When this button is clicked, the FieldCal program will recalculate the master points based on this calibration and generate a new MPF file for the module under test.



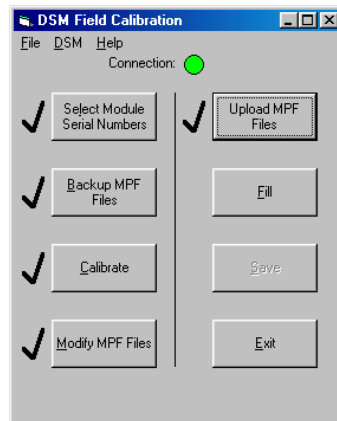
When the **Modify MPF Files** button is clicked, a DOS Console window will briefly flash before the check symbol appears. The **Upload MPF Files** button will be activated.



When the **Upload MPF Files** button is clicked, the updated MPF files will be loaded into the DSM, DSAENCL or RAD memory.

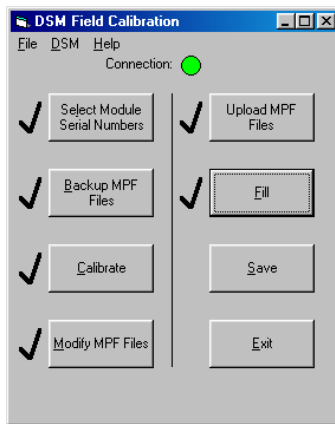
NOTE: Because the RAD does not have internal memory, the revised MPF files will be uploaded to the RAD System computer

When the data upload is complete, the **Fill** button will be activated. At this point, the revised files have not been saved to the DSM, DSAENCL, or RAD System Hard Disk Drive.

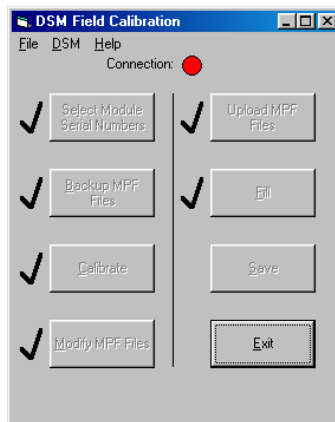


When the **Fill** button is clicked, new Calculated Planes will be generated in the DSM, DSAENCL, or RAD memory based on the new Master Planes. The new calibration coefficient data have not been saved to the DSM, DSAENCL, or RAD System Hard Disk Drive.

When the Fill has been completed, the data may be saved to DSM, DSAENCL, or RAD Hard Disk by clicking **Save**.



To exit the program, Disconnect from the DSM, DSAENCL, or RAD,
Click on **DSM** in the menu bar
Click on **Disconnect** in the drop down menu
The connect light will change to Red.
Click the **Exit** button to exit the program.



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

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