

BARTON®

DPE+ Multi-Variable Transducer

User Manual



Important Safety Information

Symbols used in this manual:



This symbol identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.



This symbol indicates actions or procedures which if not performed correctly may lead to personal injury or incorrect function of the instrument or connected equipment.

Terms used in this manual:

Note	Indicates actions or procedures which may affect instrument operation or may lead to an instrument response which is not planned.
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Introduction

The Barton® DPE+ Multi-Variable Transducer now used in the manufacture of NuFlo Scanner 1140 and 1131 EFM/RTUs is also available for replacing failed DPEs in field installations.

As a one-for-one replacement for the DPE, the DPE+ transducer offers:

- Easy installation with no tubing changes required
- Comparable power consumption ratings
- Accuracy and performance specifications that are several times better than those of the DPE
- Hazardous area certifications for Scanner 1140
 - CSA Intrinsically Safe Class I, Division 1, Groups C and D
 - CSA Non-incendive Class I, Division 2, Groups A, B, C, D
 - ANSI 12.27 Single Seal certified for pressure ranges up to and including 3000 psi
- Hazardous area certifications for Scanner 1131 pending

Performance specifications match those of the Scanner 2000 sensor. They include:

- Accuracy: +/- 0.05% of full scale
- Long-term drift: +/- 0.05% of URL per year over a 5-year period.
- A “draft” range sensor, measuring 0 to 30-in. water column and 0 to 100-psi static pressure
- Static pressure ranges up to 5300 PSI

For a complete list of specifications, see Appendix A, page A-1.



Hardware Modifications

The following modifications may be required for DPE replacement:

- All Scanner 1131s require a new PIC controller (Part No. 9A-1131-0103T).
- All Scanner 1140s in Class I, Division 1 installations require an intrinsically safe barrier adapter (Part No. 9A-30058901) between the Scanner and the DPE+ transducer. The adapter is not required for Class I, Division 2 installations.

See Section 2 for step-by-step hardware installation instructions.

Firmware Upgrade

A firmware upgrade is required for all instruments upgraded with a Barton® DPE+ transducer. See Table 1.1 on page 6 to determine which firmware version is appropriate.

See Section 3 for instructions on upgrading Scanner 1140 firmware.

See Section 4 for instructions on upgrading Scanner 1131 firmware.

To save existing configuration file and report settings and restore them following a firmware upgrade, use the “save configuration” and “restore configuration” functions in ScanWin or ScanPC. If settings are not saved prior to reflashing the Scanner and a superboot is performed, configuration settings will be lost and the Scanner must be reconfigured following the firmware upgrade. Verify that the flow computer is calculating flow and gas day hour is correct.

Table 1.1—Selection Chart for Scanner Firmware Upgrade

<i>If using this model...</i>	<i>...and this firmware</i>	<i>Install this firmware version (or later version)</i>	<i>Configure with this software</i>
Scanner 1131	NFlo version 4.x	NFlo 4.4.0R	ScanWin
	NFlo version 3.x	NFlo 3.2.4R	ScanPC
	NGas version 3.x	NGas 3.1.4R	ScanPC
	NGas version 2.x	NGas 2.7.4R	ScanPC
Scanner 1140	NFlo version 4.x	NFlo 4.4.0F	ScanWin
	NFlo version 3.x	NFlo 3.2.4F	ScanPC
	NGas version 3.x	NGas 3.1.4F	ScanPC
	NGas version 2.x	NGas 2.7.4F	ScanPC

Software Configuration

The DPE+ multi-variable transducer can be configured using either ScanWin or ScanPC interface software. Table 1.1 provides a guide for determining which interface software is required for supporting the firmware version in use.

DPE+ Installation

This section provides step-by-step instructions for replacing a DPE in a Scanner 1140 or Scanner 1131 with a DPE+ transducer.

The upgrade may require the following additional tasks:

- If used in a Class I, Div. 1 intrinsically safe installation, the installation of a barrier adapter
- Upgrade of the PIC micro-controller (Scanner 1131 only)

New Scanner firmware is also required to support communications with the DPE+ transducer. See Sections 3 and 4 for instructions on flashing new firmware to the Scanner.

Replacing the DPE+ Transducer



Explosion Hazard. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.



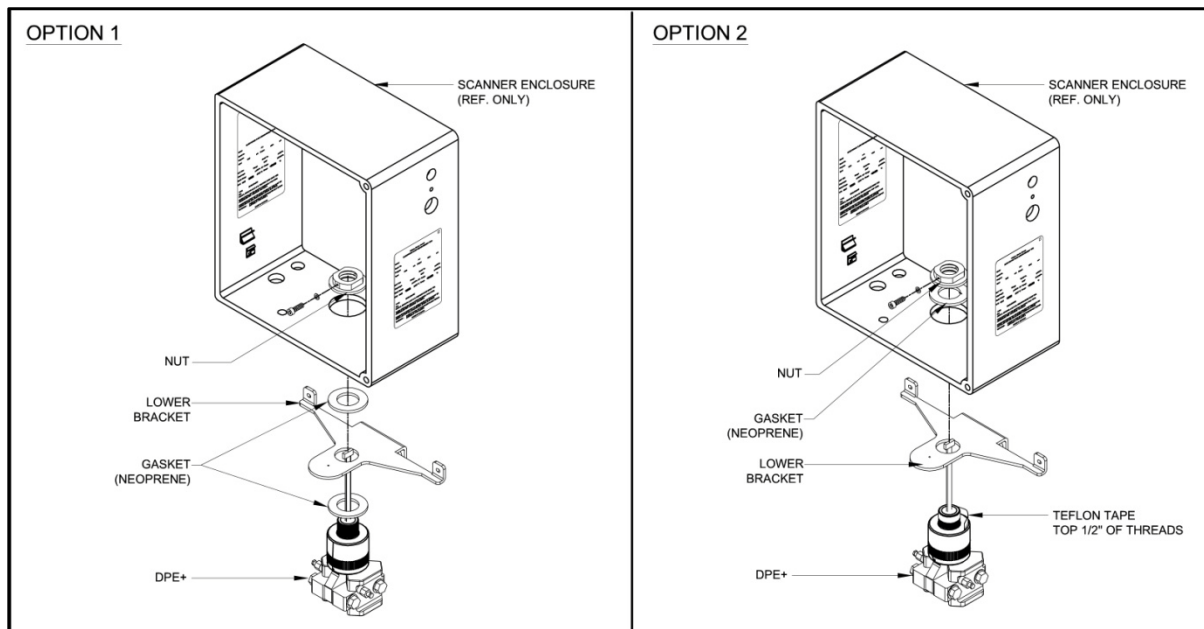
Static electricity can damage the DPE+ transducer. Use proper anti-static techniques to establish an earth ground (such as wearing anti-static wrist strap or touching metal) prior to removing the DPE+ from the anti-static bag.

1. Power down the Scanner.
2. Remove the tubing or manifold from the DPE.
3. Attach a static ground strap to your wrist and a Scanner ground.
4. Remove the ground screw from the DPE nut inside the enclosure.
5. Loosen the DPE nut on the outside of the enclosure.
6. Remove the DPE nut inside the enclosure using a 1¹¹/₁₆-in. or adjustable wrench. It may be necessary to place a wrench on the DPE neck or body for leverage.
7. Unplug the DPE cable from the Scanner board.
8. Remove the DPE from the enclosure.
9. Examine the gaskets and replace as necessary to maintain a weatherproof enclosure. Two gaskets are supplied with each DPE+.

Gasket Options

For metal enclosures, the gasket is installed between the DPE+ and the enclosure.

For fiber-reinforced plastic (FRP) enclosures, see options shown in Figure 2.1, page 8.



Install a gasket between the enclosure and the bottom bracket, and another gasket between the bottom bracket and the DPE+ adapter.

Put 3 wraps of Teflon tape around the top ½ in. of neck threads of the DPE+ adapter. Install the gasket between the inside of the enclosure and the DPE nut.

Figure 2.1—Gasket installation options for fiber-reinforced plastic enclosures

10. Insert the top of the DPE+ transducer through the opening in the Scanner enclosure and secure, using the DPE nut from inside the enclosure (Figure 2.2). Make sure the ground screw is facing the front of the Scanner. The external nut from the original DPE installation is no longer needed and may be discarded.
11. Reconnect the ground wire to the internal DPE nut.



Figure 2.2—Proper positioning of the DPE+ transducer (shown with a Scanner 1140)

12. With the Scanner power turned off, connect the ribbon cable from the DPE+ transducer to the Scanner. If the transducer is being installed while flashing new firmware to the Scanner and the Scanner power is on, wait until the Scanner is powered down to connect the DPE+ ribbon cable to the Scanner.
13. Reconnect the tubing or manifold to the DPE+ transducer.

Installing the Barrier Adapter (for Class I, Div. 1 installations only)



For Class I, Division 1 installations, an intrinsically safe barrier adapter must be installed between the Scanner and the DPE+ transducer. Barrier adapter Part No. 9A-30058901 is suitable for such installations.

To install the barrier adapter, follow the steps below.

1. Ensure power to the Scanner is turned off.
2. Remove the barrier adapter from the packaging.
3. Locate the DPE connector in the bottom right corner of the main board. The “DPE” label on the black decal on the extrusion that covers the main board inside the enclosure shows the correct positioning (Figure 2.3).
4. Plug the female end of the barrier adapter into the connector on the Scanner main board.
5. Plug the ribbon cable from the DPE+ transducer into the connector near the top of the barrier adapter.

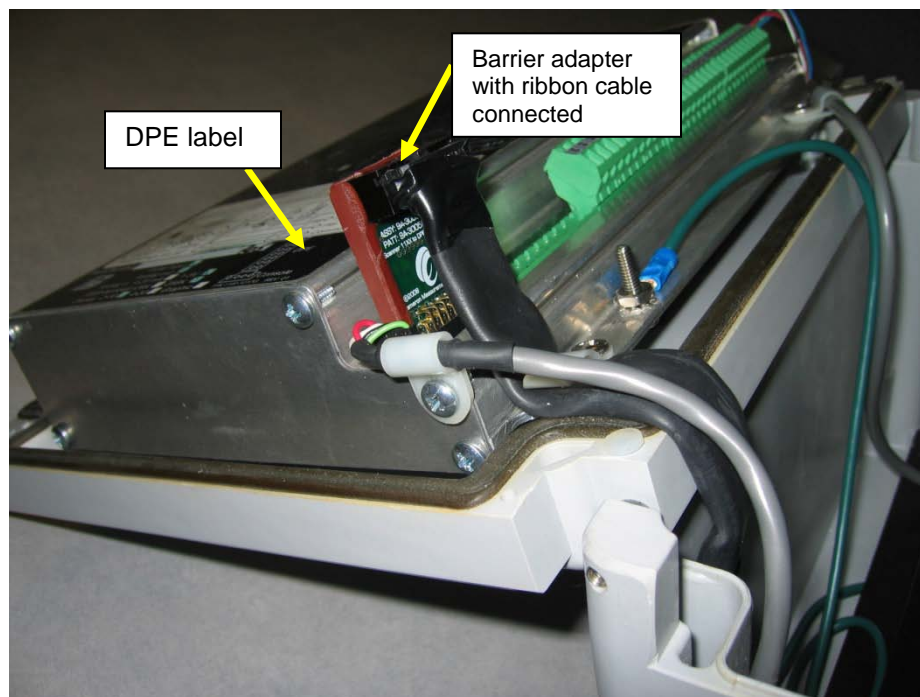


Figure 2.3— Barrier adapter for the DPE+ transducer (required for Class I, Div. 1 installations only)

Installing the Microcontroller (Scanner 1131 only)



The Scanner 1131 PIC microcontroller must be upgraded to Revision 3.5 or higher for use with the Barton DPE+ transducer.

If two transducers are in use, both must be upgraded to DPE+. The microcontroller will operate properly only when both DPEs are the same model (both DPEs or both DPE+).

1. Power down the Scanner by moving the slider switch SW18 to the OFF position. (SW18 is located at top left-hand corner of the main board next to the ½ AA lithium battery.)
2. Remove the two PIC enable jumpers from the main board (Figure 2.4).
 - Jumper CN16 is located below the power switch.
 - Jumper CN11 is located near the PIC.
3. Carefully remove the PIC micro-controller using a special tool or a small screwdriver, taking precautions to avoid cracking the plastic holder around the PIC.
4. Reinstall new PIC.
5. Reinstall jumpers CN16 and CN11.
6. Restore power to the Scanner by moving the slider switch SW18 to the ON position.
7. Start ScanWin/ScanPC and reset the clock.

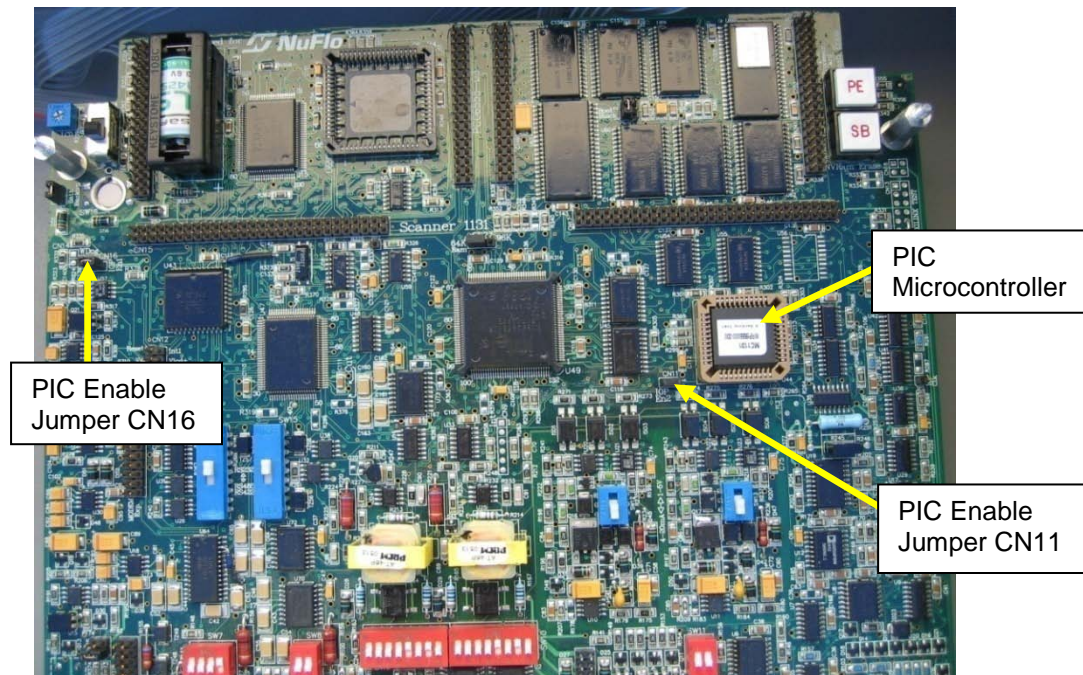


Figure 2.4—Microcontroller jumper locations

Firmware Upgrade for Scanner 1140

Flashing Equipment and Firmware

ScanFLASH version 1.0 or higher is recommended for loading new firmware into the Scanner. Alternatively, Winsload may be used for loading new firmware.

Firmware version 4.0.0 files may be downloaded from the Cameron website (www.c-a-m.com/flo). All other firmware upgrade files are available upon request from the factory.

Flashing Procedure

1. Copy the firmware files to a directory on your computer hard drive. The following directory is recommended, as it is the default directory for the ScanFlash program:
C:\BARTON\BDMS\DATA\FIRMWARE.
2. Start ScanWin or ScanPC and connect to the Scanner 1140.
3. Download all historical data from the Scanner 1140.
4. Save the Scanner configuration settings by selecting the Configuration Report option.
5. Turn the Scanner OFF by moving Switch 1 of SW4 (block of 8 switches furthest from the terminal block) to the “shutdown” position.

Switch block SW4 is shown in Figure 3.1. For a close-up view of all eight switch positions that make up SW4, see Figure 3.2, page 14.

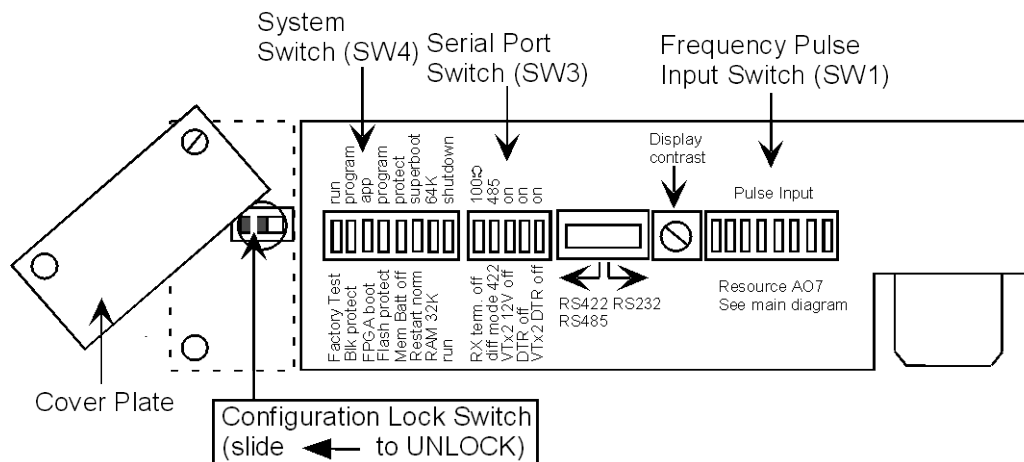


Figure 3.1—Live input readings in ScanWin (Hardware – Details page)

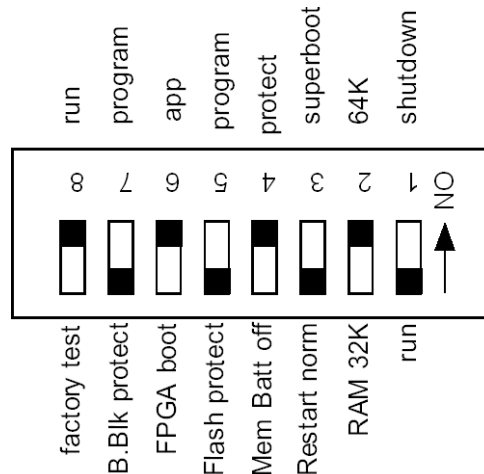


Figure 3.2—Block SW4, switches 1 through 8

6. If a configuration lock switch is installed, ensure it is in the unlocked position.
7. Close ScanWin or ScanPC.
8. Start ScanFLASH or alternatively, Winsload.
9. Move Switch 5 of SW4 to “program”.
10. Move Switch 6 of SW4 to “FPGA boot”.
11. In the ScanFLASH interface, select the following:
 - Scanner Type: 1140
 - Communications port of the PC that is connected to the Scanner
 - Flash file (map to the directory where the firmware files are saved; typically, C:\BARTON\BDMS\DATA\FIRMWARE)
12. In the ScanFLASH interface (Verify File), click “Verify.”
13. In the ScanFLASH interface (Start Download), click “Begin” to start the firmware download.

Important If desired, the DPE+ can be installed while the firmware is being loaded into the Scanner. To do so, disconnect the DPE ribbon cable from the Scanner at this time, while the Scanner power is off. Do not reconnect the DPE+ ribbon cable unless the Scanner power is off. See Section 2 for instructions on installing the DPE+ transducer.

14. Power up the Scanner 1140 by moving Switch 1 of SW4 to the “run” position. This will start the process of erasing the old firmware.

Preparing the Scanner for Operation

1. When the firmware flash is complete, turn off the Scanner power by moving Switch 1 of SW4 to the “shutdown” position.
2. Move Switch 5 of SW4 to “Flash protect”.
3. Move Switch 6 of SW4 to “app”.
4. Make sure the DPE+ ribbon cable is connected to the Scanner.

Important Depending on the version of the firmware that existed prior to the reflashing, the Scanner may or may not require a superboot. The following firmware upgrades **DO NOT** require a superboot:

- Upgrade from NFLo 4.3.4F or higher to NFLo 4.4.0F**
- Upgrade from NFLo 3.2.1F or higher to NFLo 3.2.4F**
- Upgrade from NGas 3.1.3F to NGas 3.1.4F**
- Upgrade from NGas 2.7.3F to NGas 2.7.4F**

5. If desired, superboot the Scanner to clear all settings.
 - a. To superboot the Scanner, set Switch 3 of SW4 to “superboot”.
 - b. Move Switch 1 to the “run” position to restore power and initiate the system reset.
 - c. Login to ScanWin (or ScanPC, if applicable) and reset the clock.
6. Ensure that Switch 3 of SW4 is set to “Restart Norm”.
7. Ensure the NVRAM battery backup Switch 4 of SW4 is set to “Protect”.
8. Verify the accuracy of the live input readings. The DPE+ live values can be found in the Hardware Details page of ScanWin (Figure 3.3). The input/output resources are the same as those established for the original DPE sensor. For example, Static Pressure is A12 and Differential Pressure is A13. Refer to Section 5 of this manual for more information on the DPE+ hardware.

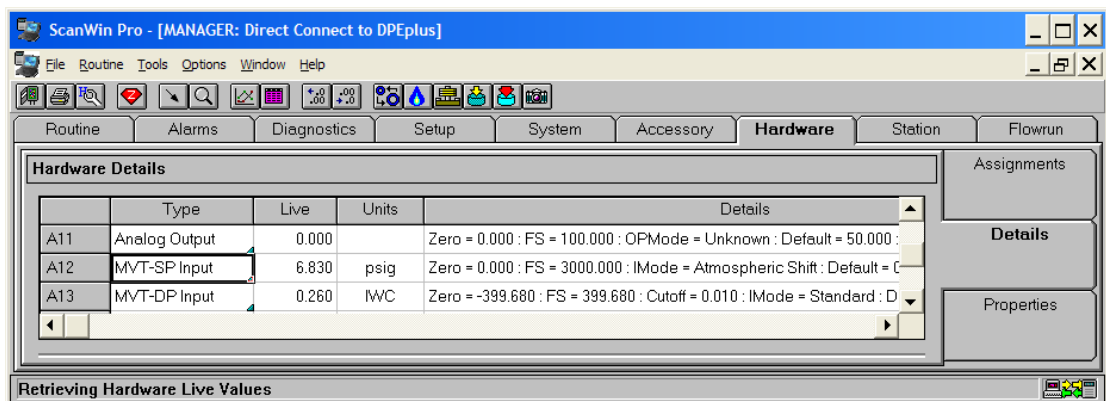


Figure 3.3—Live input readings in ScanWin (Hardware – Details page)

9. If the Scanner was superbooted in step 3, configure the Scanner or use the “restore configuration” function to restore the configuration settings saved at the beginning of the upgrade process.
10. Calibrate the DPE+ transducer using ScanWin (or ScanPC for firmware versions 2.x and 3.x).

Firmware Upgrade for Scanner 1131

Flashing Equipment and Firmware

ScanFLASH version 1.0 or higher is recommended for loading new firmware into the Scanner. Alternatively, Winsload may be used for loading new firmware.

Firmware version 4.0.0 files may be downloaded from the Cameron website (www.c-a-m.com/flo). All other firmware upgrade files are available upon request from the factory.

Flashing Procedure

1. Copy the firmware files to a directory on your computer hard drive. The following directory is recommended, as it is the default directory for the ScanFlash program:
C:\BARTON\BDMS\DATA\FIRMWARE.
2. Start ScanWin or ScanPC and connect to the Scanner 1131.
3. Download all historical data from the Scanner 1131.
4. Save the Scanner configuration settings by selecting the Save Scanner File option.
5. Power down the Scanner by moving the slider switch SW18 to the OFF position. (SW18 is located at top left-hand corner of the main board next to the battery; see Figure 4.1.)
6. If a configuration lock switch is installed, ensure it is in the unlocked position.

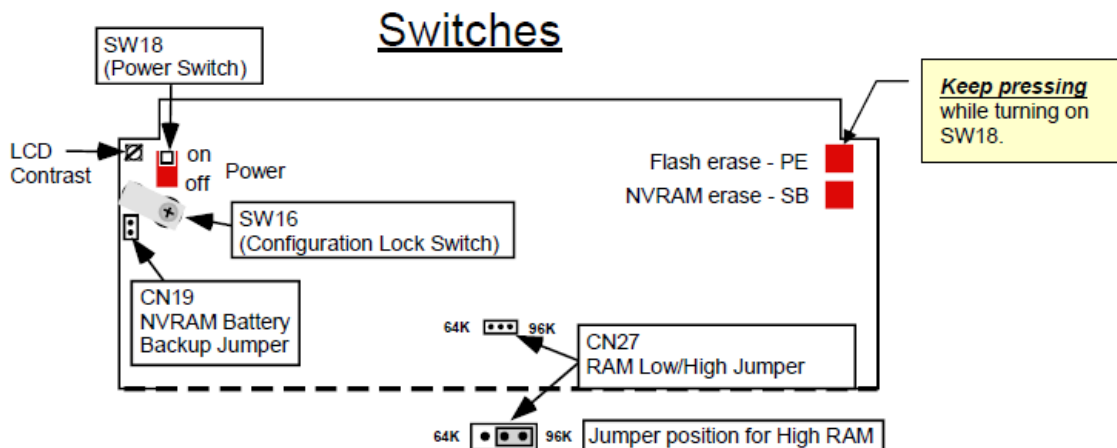


Figure 4.1—Scanner 1131 main board switch locations

7. Close ScanWin or ScanPC.
8. Start ScanFLASH or alternatively, Winsload.

9. In the ScanFLASH interface, select the following:
 - Scanner Type: 1131
 - Communications port of the PC that is connected to the Scanner
 - Flash file (map to the directory where the firmware files are saved; typically, C:\BARTON\BDMS\DATA\FIRMWARE)
10. In the ScanFLASH interface (Verify File), click “Verify.”
11. In the ScanFLASH interface (Start Download), click “Begin” to start the firmware download.

Important **If desired, the DPE+ can be installed while the firmware is being loaded into the Scanner. To do so, disconnect the DPE ribbon cable from the Scanner at this time, while the Scanner power is off. Do not reconnect the DPE+ ribbon cable unless the Scanner power is off. See Section 2 for instructions on installing the DPE+ transducer.**

12. Press and hold the “PE” (Program Erase) button and with the button depressed, turn on the Scanner power by moving SW18 to the ON position. Wait 2 to 3 seconds after the unit is powered on and release the “PE” button.

Preparing the Scanner for Operation

1. When the firmware flash is complete, turn off the Scanner power switch (SW18) and ensure that the configuration lock switch (SW16) is not engaged.
2. Make sure the DPE+ ribbon cable is connected to the Scanner.

Important **Depending on the version of the firmware that existed prior to the reflashing, the Scanner may or may not require a superboot. The following firmware upgrades DO NOT require a superboot:**
Upgrade from NFLo 4.3.4R or higher to NFLo 4.4.0R
Upgrade from NFLo 3.2.1R or higher to NFLo 3.2.4R
Upgrade from NGas 3.1.3R to NGas 3.1.4R
Upgrade from NGas 2.7.3R to NGas 2.7.4R

3. If desired, superboot the Scanner to clear all settings.
 - a. To superboot the Scanner, hold down the “SB” button and with the button still depressed, turn on the Scanner power switch (SW18). Keep holding the SB button for 5 seconds.
 - b. Login to ScanWin (or ScanPC, if applicable) and reset the clock.
4. Verify the accuracy of the live input readings. The DPE+ live values can be found in the Hardware Details page of Scanwin (Figure 4.2). The input/output resources are the same as those established for the original DPE sensor. Refer to Section 5 of this manual for more information on the DPE+ hardware.

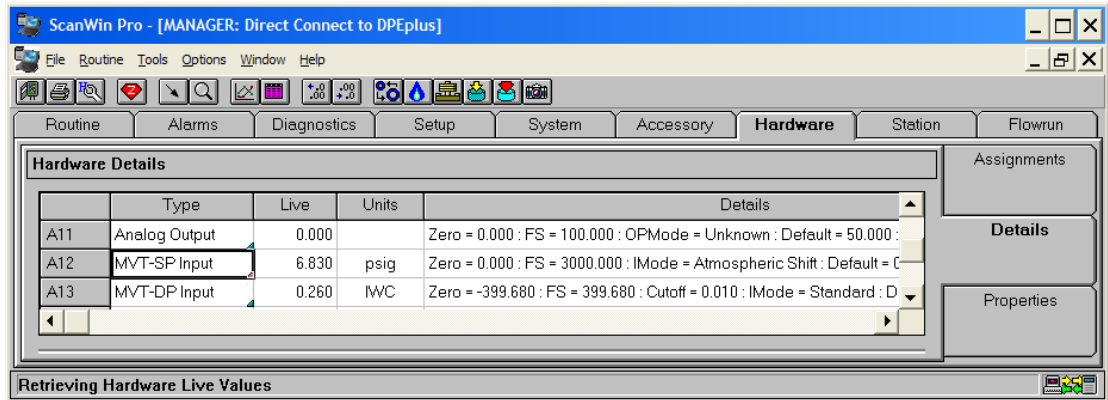


Figure 4.2—Live input readings in ScanWin (Hardware – Details page)

5. If the Scanner was superbooted in step 3, configure the Scanner or use the “restore configuration” function in ScanWin to restore the configuration settings saved at the beginning of the upgrade process.
6. Calibrate the DPE+ transducer using ScanWin (or ScanPC for firmware versions 2.x and 3.x).

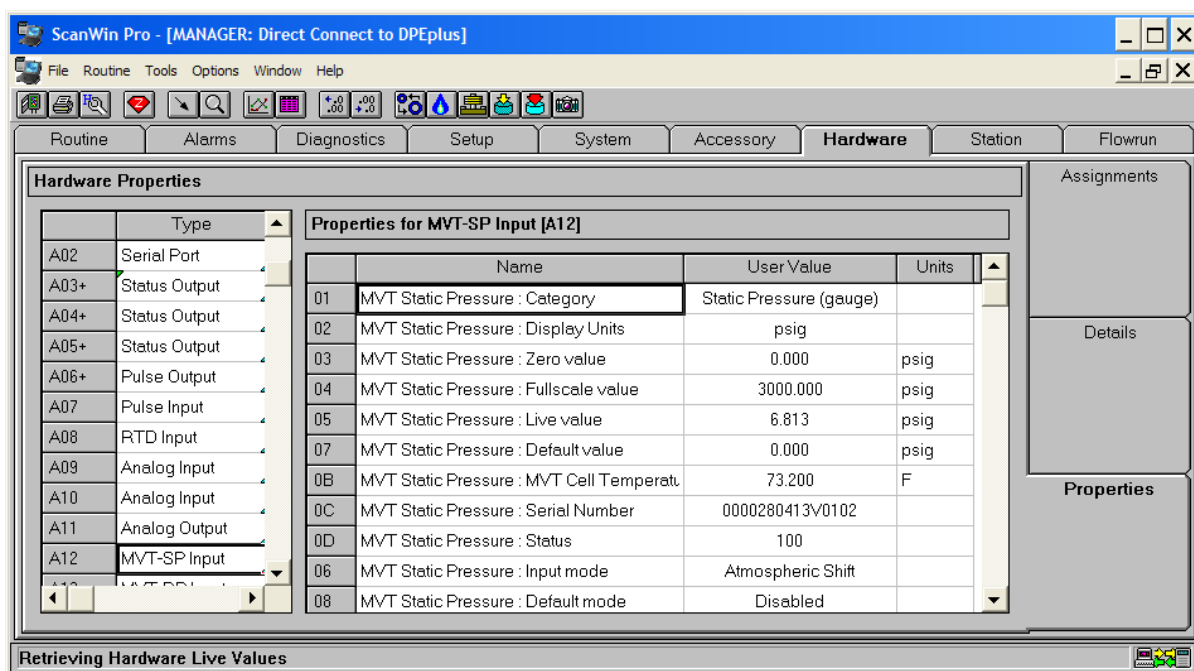
Scanner Configuration via ScanWin Software

Following an upgrade to the DPE+ transducer, Scanners can be configured using any of several versions of ScanWin software. This section discusses some of the differences the operator can expect as a result of the sensor upgrade.

ScanWin B3.1.0W

Scanner firmware version 4.4.0 works best with ScanWin version B3.1.0W.

A Properties tab in the Hardware page will display three DPE+ transducer parameters (MVT Static Pressure parameters) that are not available in the Hardware Details tab. They are MVT cell temperature, serial number, and status.



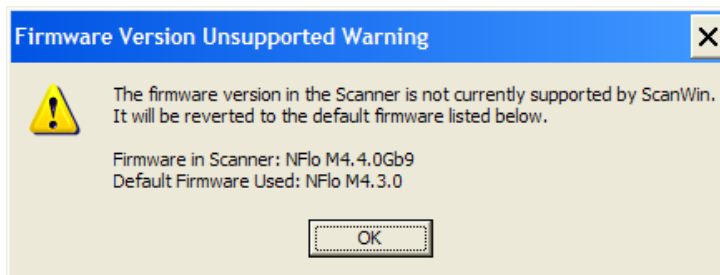
This MVT Static Pressure Field...	Indicates...
MVT Cell Temperature	This is the internal temperature of the DPE+ sensor electronics. This value is live and should always be changing, even though the change may only be in second or third decimal place.
Serial Number	The first 10 digits to the left of the "V" match the numeric values of the serial number stamped on the DPE+ cell. Example MV28C0413B is displayed as 0000280413. The number to the right of the "V" is the DPE+ firmware version.
Status	The status indicates the communication quality in %, between the Scanner EFM/RTU and the DPE+. If there are any missed communications, this value will drop from the normal reading of 100%.

ScanWin B3.0.0W

As with ScanWin B3.1.0W, the Properties tab in the Hardware page will display three DPE+ transducer parameters that are not available in the Hardware Details tab. See the screen capture and table on page 17 for details.

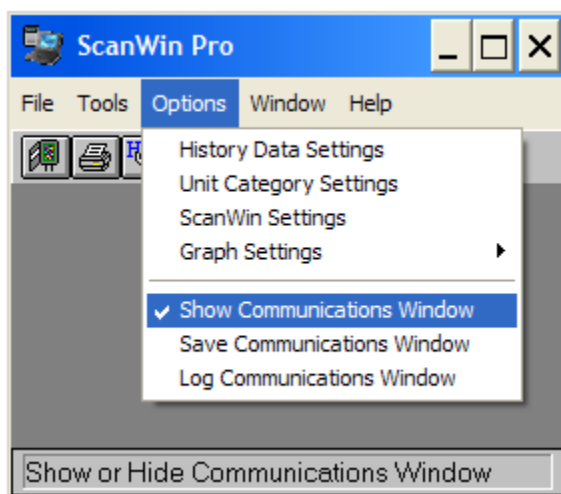
ScanWin B3.0.0W users are not required to upgrade to the latest ScanWin Pro software to communicate with Scanner 1140 units that have been upgraded with the Barton® DPE+ transducer.

Firmware versions 4.4.0R and 4.4.0F can be used with ScanWin version 3.0.0 and older software, however the following message will appear on login:

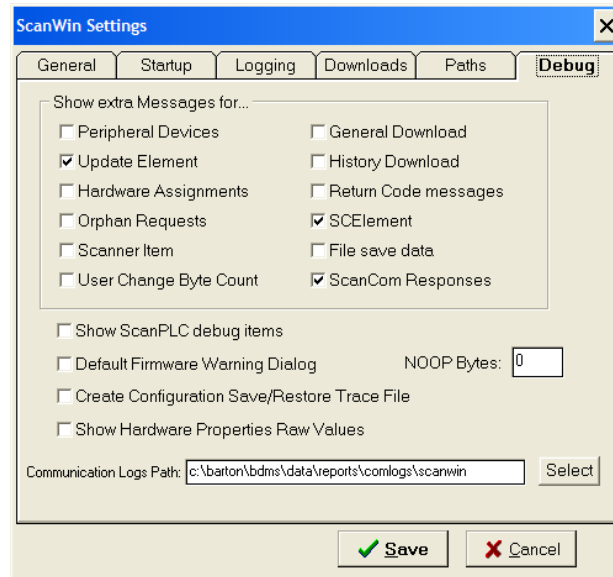


To disable this warning, perform the following steps:

1. Ensure that Options > Show Communications Window has a checkmark beside it.



2. From the Options menu, select ScanWin settings, then click the Debug tab.
3. Ensure there is no checkmark beside "Default Firmware Warning Dialog."
4. Click the Save button. The dialog box will close and the warning will be disabled.



ScanWin B2.2.5W

ScanWin B2.2.5W will work with NFLo M4.4.0 firmware, with a BDMGR.DLL dated 2002 Aug 1 or newer. New data ID's that have been added since NFLo 4.3.0—primarily for ScanPLC , the Scanner 1141, and the Ethernet/Bluetooth accessory board—will not be accessible with ScanWin B2.2.5W. MVT communication status on the MVT SP hardware input is also inaccessible with ScanWin B2.2.5W.

ScanWin Lite

The conversion to the DPE+ transducer can be performed with ScanWin Lite provided no changes to network settings, accessories (other than local display) or hardware details are required; these functions are not supported in the Lite version. In ScanWin Lite, the “save configuration” and “restore configuration” features save and restore all configurable settings including network settings. Any functions that can be performed with ScanWin Lite on NFLo 4.3.0 can be performed on NFLo 4.4.0.

Specifications

General Performance

- Provides linearized digital data
 - Static pressure
 - Differential pressure
- NACE-compliant units also available (See Table A.2, page A-3, for bolt specifications)
- User-adjustable sample time and damping

Environmental

- Operating Temperature: -40°F to +158°F (-40°C to +70°C)
- Process (Cell) Temperature: -40°F to +176°F (-40°C to +80°C)
- Relative Humidity: 0-95%, non-condensing

Electrical Approvals for Scanner 1140 (Pending for Scanner 1131)

- CSA Intrinsically Safe, Class I, Division 1, Groups C & D
- CSA Non-incendive, Class I, Division 2, Groups A, B, C, D
- ANSI 12.27 Single Seal certified for pressure ranges up to and including 3000 psi

Table A.1—Measurement Accuracy

<p>Differential Pressure Accuracy</p>	<p>Stability: Long-term drift is less than $\pm 0.05\%$ of upper range limit (URL) per year over a 5-year period</p> <p>Accuracy (30 In. H₂O)</p> <ul style="list-style-type: none"> $\pm 0.10\%$ for spans $\geq 10\%$ of the sensor URL $\pm(0.010)$ (URL\divSPAN) for spans $< 10\%$ of the sensor URL <p>Accuracy (200 to 840 In. H₂O)</p> <ul style="list-style-type: none"> $\pm 0.05\%$ for spans $\geq 10\%$ of the sensor URL $\pm(0.005)$ (URL\divSPAN) for spans $< 10\%$ of the sensor URL 				
<p>Effect on Differential Pressure for a 100-psi Change in Static Pressure</p>	<p>SP/SWP (PSIA)</p>	<p>DP (IN H₂O)</p>	<p>Max. Overrange Pressure (PSIA)</p>	<p>Zero Shift</p>	<p>Span Shift</p>
	100	30	150	$\pm 0.05\%$ of URL	$\pm 0.01\%$ of reading
	300	200	450	$\pm 0.007\%$ of URL	$\pm 0.01\%$ of reading
	300	840		$\pm 0.002\%$ of URL	$\pm 0.01\%$ of reading
	500	200	750	$\pm 0.010\%$ of URL	$\pm 0.01\%$ of reading
	1500	200	2250	$\pm 0.010\%$ of URL	$\pm 0.01\%$ of reading
	1500	300		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	1500	400		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	1500	840		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	3000	200	4500	$\pm 0.010\%$ of URL	$\pm 0.01\%$ of reading
	300	300		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	3000	400		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	3000	840		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	5300	200	7420	$\pm 0.010\%$ of URL	$\pm 0.01\%$ of reading
	5300	300		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	5300	400		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
	5300	840		$\pm 0.004\%$ of URL	$\pm 0.01\%$ of reading
<p>Static Pressure Accuracy</p>	<p>Accuracy (500 psia)</p> <ul style="list-style-type: none"> $\pm 0.05\%$ for spans $\geq 5\%$ of the sensor URL $\pm(0.0025)$ (URL\divSPAN) for spans $< 5\%$ of the sensor URL <p>Accuracy (300, 1500, 3000 and 5300 psia)</p> <ul style="list-style-type: none"> $\pm 0.05\%$ for spans $\geq 10\%$ of the sensor URL $\pm(0.0025)$ (URL\divSPAN) for spans $< 10\%$ of the sensor URL 				
<p>Temperature Performance</p>	<p>$\pm 0.25\%$ of full scale over full operating temperature range</p>				

Table A.2—MVT Pressure Limits and Bolt Specifications

SP/SWP (PSIA)	DP (IN H2O)	Max. Overrange Pressure (PSIA)	Standard Bolts	Limited NACE Bolts (not for offshore)^a	Full NACE Bolts
100	30	150	B7 or 316 SS (with SS vent plug)	B7M (no vent plug)	B7M (with Hastelloy vent plug)
300	200	450	B7 or 316 SS (with SS vent plug)	B7M (no vent plug)	B7M (with Hastelloy vent plug)
300	840				
500	200	750	B7 or 316 SS (with SS vent plug)	B7M (no vent plug)	B7M (with Hastelloy vent plug)
1500	200	2250	B7 or 316 SS (with SS vent plug)	B7M (no vent plug)	B7M (with Hastelloy vent plug)
1500	300				
1500	400				
1500	840				
3000	200	4500	B7 or 17-4 SS (with SS vent plug)	Inconel (no vent plug)	Inconel (with Hastelloy vent plug)
3000	300				
3000	400				
3000	840				
5300	200	7420	B7 ^b (with SS vent plug)	Inconel ^b (no vent plug)	Inconel ^b (with Hastelloy vent plug)
5300	300				
5300	400				
5300	840				

^a A regular stainless steel plug is substituted for the vent plug in limited NACE units.

^b Not available with Canadian CRN or ANSI 12.27 Single Seal certification.

Appendix B

Part Numbers

Table B.1—Barton® DPE+ Multi-Variable Transducers

DPE+ range	Standard 316SS body / B7 bolts	Standard 316SS body / 316SS bolts
100PSIA,30IN H20	9A-30058041	9A-30058097
300PSIA,200IN H20	9A-30058042	9A-30058098
300PSIA,840IN H20	9A-30058075	9A-30058099
500PSIA,200IN H20	9A-30058076	9A-30058100
1500PSIA,200IN H20	9A-30058043	9A-30058101
1500PSIA,300IN H20	9A-30058077	9A-30058102
1500PSIA,400IN H20	9A-30058078	9A-30058103
1500PSIA,840IN H20	9A-30058079	9A-30058104
3000PSIA,200IN H20	9A-30058044	9A-30058105 ^b
3000PSIA,300IN H20	9A-30058080	9A-30058106 ^b
3000PSIA,400IN H20	9A-30058081	9A-30058107 ^b
3000PSIA,840IN H20	9A-30058082	9A-30058108 ^b
5300PSIA,200IN H20	9A-30058045 ^b	not available
5300PSIA,300IN H20	9A-30058083 ^b	not available
5300PSIA,400IN H20	9A-30058084 ^b	not available
5300PSIA,840IN H20	9A-30058085 ^b	not available
	Limited NACE^a B7M Bolts (not for offshore)	Full NACE B7M Bolts / Hastelloy Vent Plug
100PSIA,30IN H20	9A-30058641	9A-30058046
300PSIA,200IN H20	9A-30058642	9A-30058047
300PSIA,840IN H20	9A-30058675	9A-30058086
500PSIA,200IN H20	9A-30058676	9A-30058087
1500PSIA,200IN H20	9A-30058643	9A-30058048
1500PSIA,300IN H20	9A-30058677	9A-30058088
1500PSIA,400IN H20	9A-30058678	9A-30058089
1500PSIA,840IN H20	9A-30058679	9A-30058090
	Limited NACE^a Inconel Bolts (not for offshore)	Full NACE Inconel Bolts / Hastelloy Vent Plug
3000PSIA,200IN H20	9A-30058644	9A-30058049
3000PSIA,300IN H20	9A-30058680	9A-30058091
3000PSIA,400IN H20	9A-30058681	9A-30058092
3000PSIA,840IN H20	9A-30058682	9A-30058093
5300PSIA,200IN H20	9A-30058645 ^b	9A-30058050 ^b
5300PSIA,300IN H20	9A-30058683 ^b	9A-30058094 ^b
5300PSIA,400IN H20	9A-30058684 ^b	9A-30058095 ^b
5300PSIA,840IN H20	9A-30058685 ^b	9A-30058096 ^b

^a A regular stainless steel plug is substituted for the vent plug in limited NACE units.
^b Not available with Canadian CRN or ANSI 12.27 Single Seal certification.

Table B.2—Scanner Components for DPE Upgrade

Description	Part Number
Intrinsically Safe Barrier Adapter, for CSA-certified Class I, Div. 1, Groups C, D installations (suitable for Scanner 1131 or Scanner 1140)	9A-30058901
Microcontroller, PIC, version 3.5 (required for DPE upgrade of Scanner 1131)	9A-1131-0103T

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