Subject: **Programming and Calibrating Pro-Series Bargraphs Using the RS-232 Interface**	Initial Release Date: 5/1/92	Revision Date: 07/08/13	
	Product Group:	Pro-Series Bargraph	

1   Introduction

AMETEK Dixson Pro-Series bargraphs can be calibrated and configured by a computer (or other RS-232 device) by connecting the computer's RS-232 port (COM1, COM2, etc.) to the bargraph's RS-232 input. This is done by placing the bargraph into Mode C operation and using AMETEK Dixson's Programming and Calibration Software kit to send configuration data to the bargraph.

This Product Information Note describes the following:

- How to connect the bargraph to the computer

- How to install and use the AMETEK Dixson Programming and Calibration Software kit

2   Required Equipment

You can program many aspects of the bargraph's operation by using the bargraph's front panel switches and Modes A and B. (These modes are explained in the user guide for your bargraph.) If you have an accurate calibration signal source, you can also calibrate the bargraph using these switches.

However, some parameters (for example, signal averaging, display update rate, input linearization, and front panel switch lockout) cannot be accessed through the front panel switches. You must place the bargraph into Mode C and use a computer and Dixson's "DIXPRO" software to send the configuration data to the bargraph through its RS-232 port.

2.1   AMETEK Dixson Programming and Calibration Software kit

Except for the computer and the calibration signal source, the AMETEK Dixson Programming and Calibration Software kit provides everything you need to fully access and configure any PRO-Series bargraph, even those that do not have front panel switches.

The kit consists of the programming and calibration software (i.e., *DIXPRO*), a calibration and interface fixture, and a serial cable to connect the fixture to the computer. The interface fixture is a convenient way to connect the computer and the calibration signal source to the bargraph, and provides external front panel switches for bargraphs that do not have them.

2.1.1   DIXPRO

DIXPRO is available on a CDROM and runs on Windows 95 and later. DIXPRO is the property of AMETEK Dixson. It is not copy-protected, but please do not redistribute it to any third party. Your use of DIXPRO constitutes an implicit agreement to protect its proprietary nature and to not participate in redistribution.

2.1.2   Calibration and Interface Fixture

The Calibration Interface fixture provides an easy way to program the bargraph. When used with the PC and DIXPRO, it allows full operation of the bargraph on the bench top. The fixture includes a power cord, an RS-232 serial data cable that connects the fixture to the computer, a 9-to-25-pin RS-232 adapter, terminals to which the calibration signal can be connected, and a signal and power cable to

the bargraph. You can use the U, C, and L pushbuttons on the fixture in place of the three switches on the front of bargraph.

2.2 Calibrated Voltage Source

Because DIXPRO forces you to perform a complete calibration, you will also need an accurate, calibrated, signal source to send the lowest and highest input signal values to the bargraph.

2.3 Computer Communication Requirements

Communications occur at 9600 baud, no parity, eight data bits, and one stop bit (9600, n, 8, 1). The operating system can be Windows 95, 98, or 98SE.

3 Procedure

Configuring a bargraph consists of the following steps:

1. Installing DIXPRO if it is not already installed

2. Connecting the hardware

3. Setting up the configuration data

4. Resetting the bargraph and transmitting the configuration data

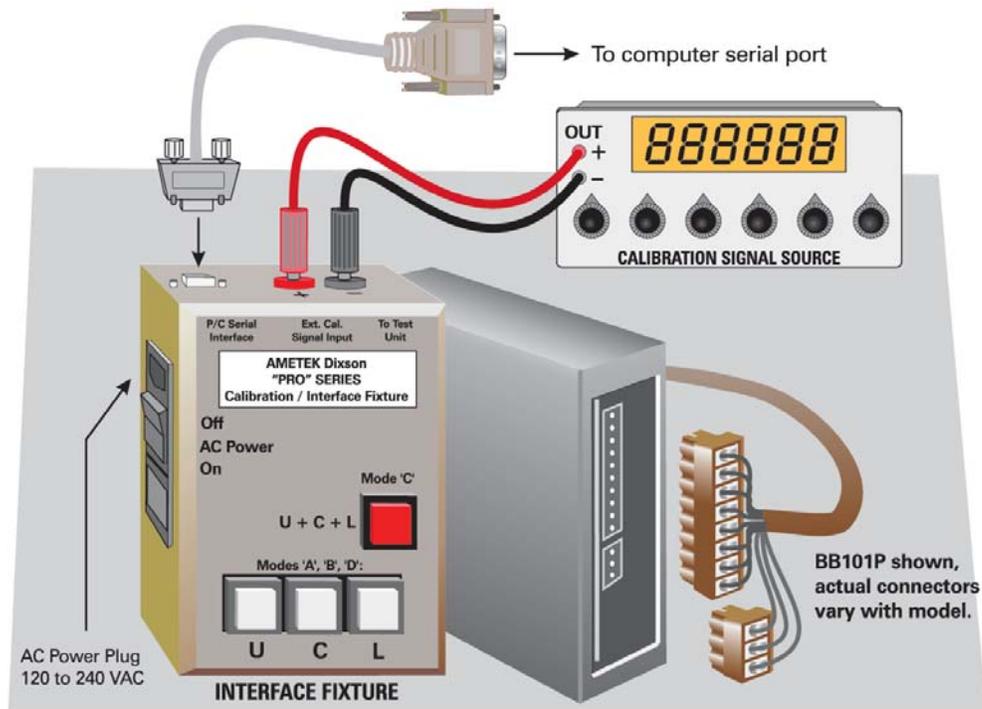Each of these steps is discussed in the following sections.

4 Installing DIXPRO

Directions for installing DIXPRO for Windows are printed on the back of the CDROM jewel case.

5 Connecting the Hardware

5.1 Using the Calibration Fixture (see Figure 1)

1. Turn the power switch on the fixture off and make sure the computer is turned off.

2. With the computer powered off, connect the supplied RS-232 cable to an available serial port on your computer (COM1 through COM4). A 9-to-25-pin adapter is included in case it is required.

3. Connect the other end of the RS-232 cable to the calibration fixture.

4. Connect the signal connector from the calibration fixture to the bargraph.

5. Connect the calibration signal to the + and – terminals on the fixture.

6. Do one of the following:

   a. If your bargraph is AC-powered, use the supplied power cord to connect the fixture to bargraph's AC power source. The switch on the interface fixture controls power to the bargraph.

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To computer serial port

OUT
+
−
888888

CALIBRATION SIGNAL SOURCE

P/C Serial Interface   Ext. Cal. Signal Input   To Test Unit

AMETEK Dixson
"PRO" SERIES
Calibration / Interface Fixture

Off
AC Power
On

Mode 'C'

U + C + L

Modes 'A', 'B', 'D':

U   C   L

AC Power Plug
120 to 240 VAC

INTERFACE FIXTURE

BB101P shown,
actual connectors
vary with model.

Caution Note 1:
If you have a DC-powered bargraph, *do not connect the AC power connector to your unit.* Use a separate DC power supply.

Caution Note 2:
If your fixture has a 3-pin AC power connector and your bargraph is an earlier model with a 2-pin power connector, *you must adapt the 3-pin connector to the bargraph* and not use the Frame/Earth ground wire (white on black).

Figure 1   *Connecting the Bargraph Using the Interface Fixture*

  b. If your bargraph is DC-powered, *do not* connect the fixture to any power source. Instead, connect the bargraph's DC power source to the bargraph Input board power connector through a switch to control the power.

7. Turn the computer and the calibration signal source on but do not apply power to the bargraph at this time.

5.2   Without the Calibration Fixture (see Figure 2)

If you are not using the interface fixture, fabricate a cable as shown below and connect it from your computer to the bargraph.
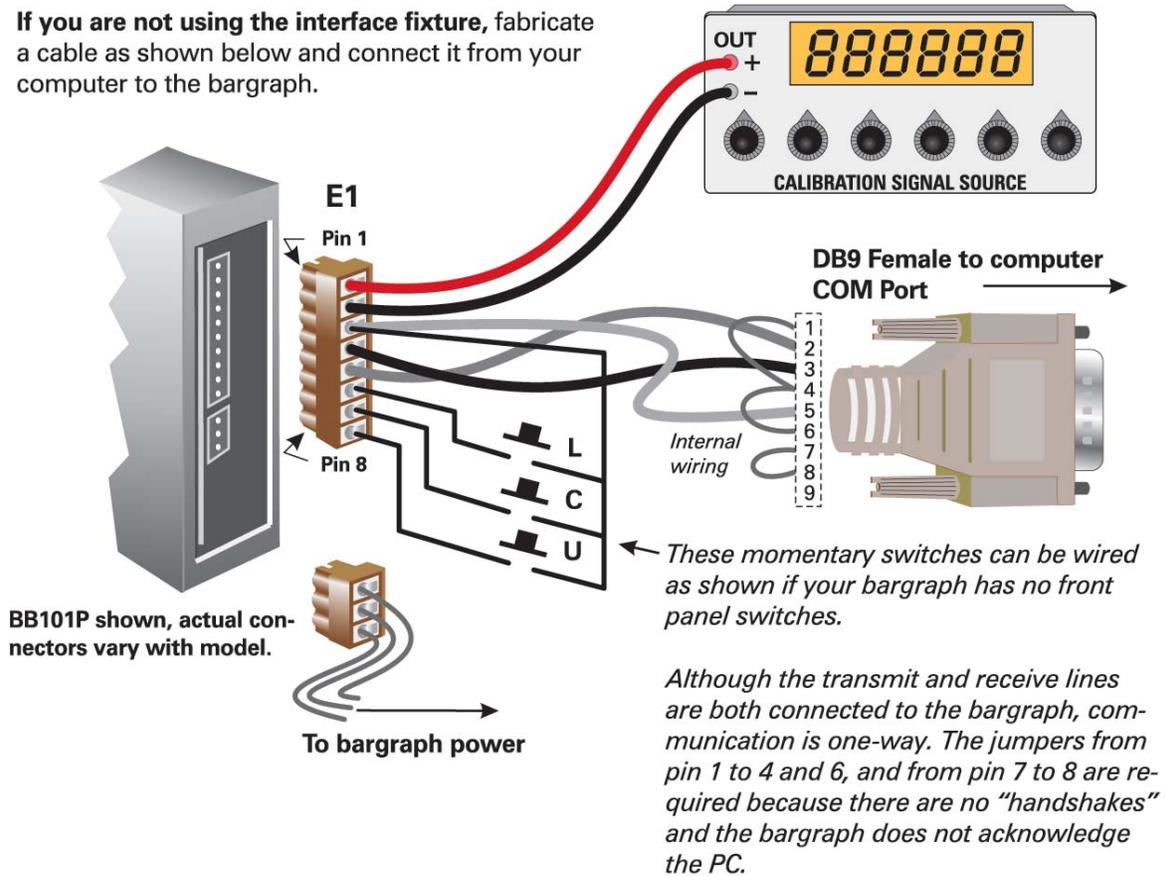
OUT

888888

CALIBRATION SIGNAL SOURCE

E1

Pin 1

Pin 8

DB9 Female to computer COM Port

1
2
3
4
5
6
7
8
9

Internal wiring

L

C

U

BB101P shown, actual connectors vary with model.

To bargraph power

These momentary switches can be wired as shown if your bargraph has no front panel switches.

Although the transmit and receive lines are both connected to the bargraph, communication is one-way. The jumpers from pin 1 to 4 and 6, and from pin 7 to 8 are required because there are no "handshakes" and the bargraph does not acknowledge the PC.

Figure 2   *Connecting the Bargraph with no Calibration Fixture*

Notes –   *On most bargraphs, the signal is applied to Input Board Connector E1 pins 1 and 2. Verify this by checking the installation and user guide that came with your bargraph.*

You must be able to apply power only when instructed to do so. You can either install a switch in the power line, or plug and unplug the power connector as required.

1. Prepare an RS-232 cable as shown in Figure 2 to connect your computer to the bargraph.

2. Connect the RS-232 end of the cable to an available RS-232 serial port on your computer (COM1 through COM4). A 9-to-25-pin adapter is included in case it is required.

3. Plug the other end of the RS-232 cable to the 8-pin signal connector.

4. Plug the power connector into the bargraph's Input board but do not apply power until instructed to do so.

5. Connect the calibrated signal source to the Signal + and Signal – input pins of the bargraph.

6. Turn the computer and the calibration signal source on.

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6   Using DIXPRO

6.1   Procedure

Start DIXPRO as you would any other Windows program. A DIXPRO window like that in Figure 3 should appear.
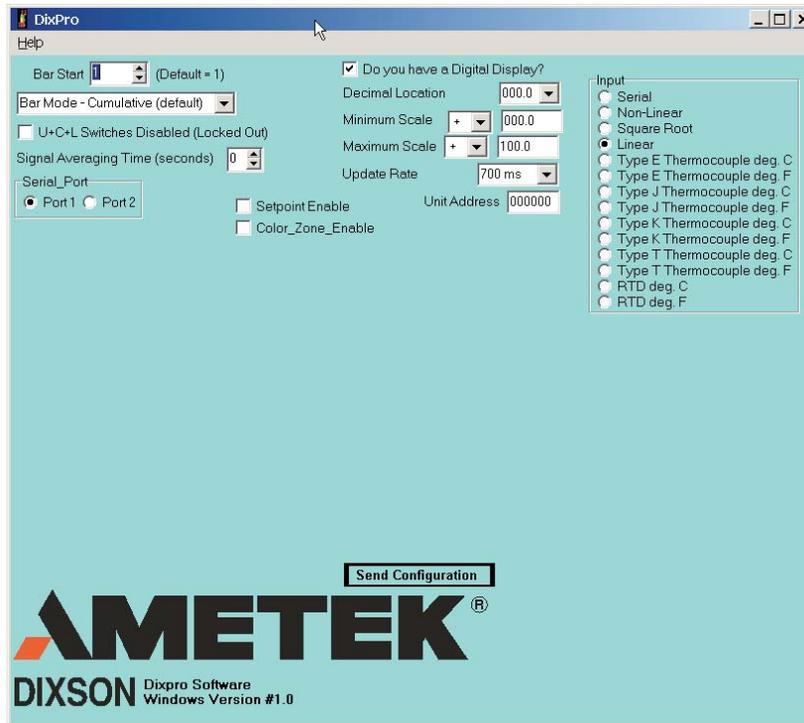

Figure 3   *DIXPRO Window*

Note -   *DIXPRO does not remember the values from one session to the next. Each time you begin DIXPRO, it starts out with the default values shown in Figure 3.*

6.1.1   Define the Desired Configuration

The first thing to do is tell DIXPRO how you would like to configure your bargraph. You do this by checking or setting values in the DIXPRO window. Please refer to your bargraph installation manual for an explanation of each feature:

1. Use the Bar Start thumbwheel at the upper left to tell DIXPRO which bar segment is the starting segment. Valid entries are 1 through 101. For example, if you want your display to start at the bottom and extend up, set this value to "1". If you want your display to start at the top and extend down, set this value to "51" for a 51-segment bargraph, "101" for a 101-segment bargraph, etc.

2. Use the Bar Mode drop-down list to select the type of display you desire. For a varying length bar, select "Cumulative". For a moving dot display, select the size of the dot.

3. If your bargraph has front panel switches and you wish to disable them, place a checkmark in the U+C+L Switches Disabled check box by clicking it. Clear the checkbox to enable front panel switch operation.

4. Use the Signal Averaging Time thumbwheel to select a value from 1 to 8.

5. Use the Serial Port selector to tell DIXPRO which serial port you are using.

6. If your bargraph instrument has a digital display, place a checkmark in the "Do you have a digital display" checkbox and set the desired values in the fields below. If your instrument has no digital display, clear the checkbox.

7. If your bargraph is connected to and uses an RS-422 serial bus, enter the last six digits of the bargraph's serial number in the Unit Address field.

8. Select the appropriate input type in the Input frame at the upper right of the DIXPRO window. If you select Non-Linear, you can enter up to nine coefficients to describe the input.

9. If your instrument is equipped with set points and you wish to enable them, check the Set Point Enable checkbox and enter the desired set point values in the resulting fields. If the Low Set Point numerical location is a minus (-) value and the High Set Point numerical location is a plus (+) value, then after the configuration and calibration data has been sent to the bargraph per 6.1.2, the High Set Point numerical location will be a minus (-) value. To set the High Set Point numerical location to the desired plus (+) value you must do the following:

   Follow instructions per the specific Bargraph User Guide supplied with your bargraph, to access Mode D Procedure by using either the three Front Program Switches of your bargraph (if installed), or if the Interface Fixture lines are still attached to the bargraph use the "U, C, L" switches as displayed on Page 3 at Figure 1 in PIN 07240152. Follow Mode D Procedure to move the High Setpoint numerical location to the desired value and then continue to step through Mode D Procedure and exit properly to store the new numerical location (+) value.

Note: *If your instrument does not have a digital display, set the Low Set Point value to 30, the High Set Point value to 60, and the Alarm Set Point to 90. These values are percentages of full scale.*

10. Set the desired hysteresis to a value from 1 through 7.

11. If you have a tri-color bargraph and you wish to enable the bar's Color Zone display mode, check the Color_Zone_Enable checkbox.

Note: *It is not possible to enable both the Color Zone and the Set Point display modes at the same time.*

12. Describe the color scheme you want the bar to display by selecting the appropriate values in the fields that appear when Color_Zone_Enable is checked.

13. Review the configuration you have chosen and make any changes you desire. When you are satisfied with the configuration, continue with this procedure.

6.1.2 Sending the Configuration and Calibration Data to the Bargraph

1. Click the Send Configuration button at the lower center of the DIXPRO window just above the AMETEK logo.

2. Follow the on-screen instructions.

6.2 Test Procedure

Test the new configuration and calibration either by using the calibration fixture or by connecting the bargraph to your system and performing an on-line test.

7   Programming Kit Part Numbers

Use the following table to determine the correct calibration kit part number for your application.

BARGRAPH MODEL	PART NUMBER
BB101P/BB202P, BW051P, BK051P, BT071P, BTW71	243-11543-000
BG101P/BG202P	243-11573-001
BJ101P/BJ202P, Standard connector	243-11573-002
BJ101P/BJ202P, Military connector	243-11573-003
BS101P/BS202P, Standard connector	243-11573-004
BS101P/BS202P, Barrier strip connector	243-11573-005
BT033P, Barrier strip connector	243-11573-006
BT033P, Standard connector	243-11573-007

Table 1   Programming Kit Part Numbers

8   Technical Support Options

This software is supported by the AMETEK Dixson Bargraph Service Department. The Service Department can be reached at (970) 256-4450, Monday through Friday day from 7:00 a.m. to 3:30 p.m. Mountain Time. You may also leave a message at the following E-mail address: `info.dixson@ametek.com`.

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