



## Series PD Pro-Data Programmable Data Logger

### Specifications - Installation and Operating Instructions



#### GENERAL

Read, measure, and record temperature, humidity, dew point, pressure, and voltage with the multifunction Series PD Pro-Data Programmable Data Logger. The handheld measuring instrument has the capability to record 4000 day/time stamped samples and store data up to 40 days. The nonvolatile memory will retain recorded information in the absence of power to be recalled later. Recorded data can be viewed on the alphanumeric LCD display, sent directly to a printer, or transferred to an IBM compatible computer for later analysis.

The dual channel logger uses plug-in-sensors to measure the desired parameters. Sensors are available in three different configurations—temperature/humidity/dew point, temperature/pressure, or temperature/voltage. All sensors are field interchangeable for application flexibility and do not require recalibration when changed. Unit features programmable sampling rate, selectable °F or °C, backlit display, and rear panel keyholes for permanent mounting.

In the recording mode, the user has the option of recording information to the nonvolatile memory, printing data as it is collected (Real Time Printing), or to utilize both printing and memory functions simultaneously.

#### SPECIFICATIONS

**Recording Time:** 5 hr, 15 hr, 30 hr, 60 hr, 2 weeks, or 40 days (field selectable).

**Sampling Rates:** Field selectable from 5 seconds to 15 minutes

**Memory Size:** 4,000 samples

**Temperature/Humidity/Dew Point Sensor:** 4" SS submersible temp sensor; Temp. Range: -40 to 170°F (-40 to 75°C), accuracy: ±2°F (±1°C); Humidity Range: 0 to 100% @ 32 to 130°F (0 to 55°C), accuracy: ±2%; Dew Point Range: 32 to 130°F (0 to 55°C).

**Temperature/Pressure Sensor:** 4" SS submersible temp sensor; Temp. Range: -40 to 170°F (-40 to 75°C), accuracy: ±2°F (±1°C); Press. Range: 0 to 500 psi (0 to 35 bar), accuracy: ±1% FS.

**Temperature/Voltage Sensor:** 4" SS submersible temp sensor; Temp. Range: -40 to 170°F (-40 to 75°C), accuracy: ±2°F (±1°C); Voltage Range: 24 to 270 VAC, 24 to 180 VDC.

**Display:** Alphanumeric backlit LCD, 16 characters x 2 lines.

**Cable Length:** All are 6 ft (1.8 m).

**Power:** 115 VAC 50/60 Hz adapter (220 VAC available) or 9V alkaline battery for 24 hr backup power source (not included). External power may be supplied from any 12 VDC source.

**Printer Interface:** Parallel centronics compatible printer port.

**Computer Requirements:** IBM compatible 286 or above and MS-DOS 3.0 or later.

## OPERATION

Regardless of the instrument configuration, there are some general considerations to consider when setting up the data logger:

1. Prior to starting a new recording, make sure the previous recording has been printed out or saved to a computer. Once a new recording has started, the previous data will be lost.
2. Make sure a fresh battery is installed. If the recording requires battery back-up and the battery is not fresh, the recording will terminate when the battery is discharged. The information recorded up to that point will not be lost, but the recorder will not function once the "Low Battery" is displayed.
3. Plan your recording. Exercise caution when setting up sensors and cables so equipment doors or other personnel cannot trip or catch any part of the test setup.
4. Do not expose the interface boxes to environmental extremes. Carefully read all specifications concerning the acceptable temperature, pressure and voltage ranges of the sensors. The interface units are not rated for environmental stress.
5. Become familiar with the menus and instructions associated with the particular sensor being used.
6. Select a sampling rate that best suits the application. Fast sampling rates result in shorter recording times while longer sampling rates permit extended recordings.
7. If using Real Time Printing, remember that while the logger has battery backup, most printers do not. If power falls during a recording and the printer stops working, the logger will indicate a printer problem and stop recording.
8. Keep interface and sensors clean. Accumulated dirt can cause poor electrical contact resulting in poor performance.

## GETTING STARTED

Plug the sensor into the Pro-Data Logger via the phone jack located on the side of the logger. If portable use or battery backup is desired, place a fresh 9V alkaline battery into the unit. Any other type of battery will result in unsatisfactory performance and may cause damage to the instrument. Plug the power adapter into the unit if 110/220 Volt outlet is accessible.

Press the "ON" button. The display will show the instrument name. If display is not visible or is all black, adjust the contrast screw on the front of the unit until lettering is visible.

If a sensor is not connected, or if the sensor is defective, the display will indicate this. The unit will automatically recognize a sensor when plugged in and setup correct menus and displays that sensor.

This is the operating mode display for each of the sensors. The unit will go to this mode after it is turned on.

<b>Dwyer Service Logger Ver.</b>
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<b>Please Connect Sensors</b>
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<b>Temp</b>	<b>RH</b>	<b>Dew</b>
<b>74 F</b>	<b>42%</b>	<b>49 F</b>

<b>Temp</b>	<b>Pressure</b>
<b>74 F</b>	<b>100psi</b>

<b>Temp</b>	<b>Event</b>
<b>74 F</b>	<b>24 VDC</b>

## CHANGING SETTINGS

Every function of the logger can be set through a series of menus. Settings are stored in memory and remain there even without main and backup power sources until altered by the user. Each sensor has settings unique to its function. The logger will select the appropriate menus for each sensor when plugged in.

## CHANGING RECORDING TIME AND SAMPLING RATE

Press and hold the "Menu/Enter" button until the display changes to the recording rate menu. The user may select the sampling rate and recording time. Use the "^/Status" or "v/Record" buttons to change recording and sampling rate according to the table listed below.

**Recording Rate**  
**15HR every 15SEC**

Recording Time    Sampling Rate

40 Days	15 Minutes
2 Weeks	5 Minutes
60 Hours	1 Minute
30 Hours	30 Seconds
15 Hours	15 Seconds
5 Hours	5 Seconds

When the "Menu/Enter" button is pressed 3 more times (to cycle through the remaining functions), the recording time and sampling rate will be saved into memory and return to the operating mode. The unit will also return to the operating mode after 1 minute of no key press and changes will be held in memory.

## CHANGING °F OR °C

Press the "Menu/Enter" button until the display shows temperature set.

**Temperature Set**  
**to Fahrenheit**

Use the "^/Status" or "v/Record" buttons to change the desired scale.

When the "Menu/Enter" button is pressed twice more (to cycle through the remaining functions), the temperature setting will be saved into memory. The unit will also return to the operating mode after 1 minute of no key press and changes will be held in memory.

**Temperature Set**  
**to Celsius**

## RECORDING DATA

The user can choose to print out the stored data, transfer the data to a computer, or review the data on the display. The logger has a memory capacity to store up to 4000 samples of data. The user has the option to store data to the maximum capacity or to terminate recording when sufficient information has been gathered.

Each new recording will erase any previously recorded information. The user must print out or store a previous recording prior to starting a new recording.

To record, select the proper recording time and rate. If a sampling rate of 15 seconds was selected, a measurement will be taken and stored into memory every 15 seconds. No record of information will be made between each sample even though the display will continuously update to current conditions.

The user must select the appropriate recording interval to best fit the application. To set the record information, press and hold the "v/Record" button. To scroll between the recording modes, press "^/Status".

## VIEWING RECORDED DATA

Recorded information may be directly read on the display. The same filtering functions available for printing are available for viewing data on the display. The user can scan recorded data and view information of interest without viewing all 4000 stored samples.

Press and hold "Menu/Enter" until the display at the right appears.

**Recording Rate**  
**XXHR Every XX Sec**

Press "Menu/Enter" again to cycle to the next screen. This is where the viewing function is accessed. Press the "^/Status" or "v/Record" buttons to display options for the unit of measurement to be used (Fahrenheit or Celsius).

**Temperature Set**  
**to Fahrenheit**

Press "Menu/Enter" when desired measurement unit is displayed and to advance to the next print selection. (Repeat the two previous steps to select desired units for pressure measurements).

**Push Menu to Run**  
**Others to Print**

Press the "v/Record" to display recording and data transfer options. Press the "^/Status" or "v/Record" buttons to scroll until desired option is displayed (record to screen, printer, or computer). Press "Menu/Enter" to select and advance to the next screen.

**Read Recorded**  
**Data from Screen**

This is the first filter option. Selecting this will print every recorded data sample.

**Send Out All of**  
**the Temp Data**

Press the "^/Status" to select the temperature filtering function. Use the "^/Status" to scroll and select 1° to 10° of temperature change and press "Menu/Enter" to continue.

**Send Temp On**  
**X Degree Change**

Press "v/Record" to select the other parameter being measured. Use the "v/Record" to scroll and select the change in the other parameter (1-10% RH, 1-10 psi, .1-1 bar) and press "Menu/Enter" to continue.

**Send Out All of**  
**Humidity Data**

**Send Humidity**  
**On X% Change**

This is the first data sample. Press "^/Status" to advance forward through the data samples. Press the "v/Record" button to go backwards through the samples. (The top line indicates the time the sample was recorded).

**WED:14:22:15**  
**73F 42% 48°F**

This indicates the end of recording. Press "^/Status" to return to the beginning, or Press the "v/Record" button to go to the last previous data sample. Press "Menu/Enter" to return to operating mode.

**Reached the End**  
**of Recorded Data**

## RECORDED DATA

An "R" will be displayed in the upper right hand corner of the display when a recording is in progress.

Day	Hour	Min	R
Fri	15	16	

It is possible to check how much memory has been used by pressing and holding the "^/Status" button until the display shows the starting time of the recording and the % memory available. As the recording continues, this number will decrease. The logger will continue to record until the recording is terminated manually or when all available memory has been used. 0% Memory Left will be displayed when available memory is low. This indicates the logger will shortly terminate the recording automatically.

<b>WED:14:22:20</b>
<b>78% Mem. Left</b>

A sample of a typical printout at the beginning of a recording is found below. The time is specified using the format D(days):H(hours):M(minutes):S(seconds) in the 24-hour system. This convention is used in the printout and on the display.

Logger			
Temp (F)	Humi (%)	Dew (F)	Time (D:H:M:S)
75	40	49	WED:14:03:00
75	40	49	WED:14:03:15
75	40	49	WED:14:03:30
75	40	49	WED:14:03:45

## PRINTING RECORDED DATA

The recorded data can be printed to view and analyze the information (several print options are available). The logger can store up to 4000 data points in memory, which may be cumbersome to print all points if measurements remain constant. By filtering, information can be printed out based on a specific amount of change in the parameter being measured. Note: only ONE CHANNEL of data can be filtered.

The logger allows the user to select the incremental change of the parameter that will be printed. Increments from 1 to 10 can be specified. When filtering, the change between data points which are less than the selected incremental change will be ignored during the printing process. However, even if a data point is not printed, the logger must still recall it from memory and compare to the filtered selection. Print outs may take up to 10 minutes to scan all the 4000 data points.

## SENDING DATA TO A PRINTER

Press "Menu/Enter" several times until the display at right appears. The print function can be accessed here.

**Push Menu to Run  
Others to Print**

Press the "^/Status" or "v/Record" buttons to scroll through the print options until the display at right appears.

**Send Recorded  
Data to Printer**

Press "Menu/Enter" to enter the selected print option (print to screen, printer, or computer) and to advance to the next print selection.

**Send Out All of  
the Temp Data**

Press "^/Status" to select a temperature filter function, or press "v/Record" button to select the other parameter such as relative humidity, pressure, or voltage filtering function. Continue to press "^/Status" or "v/Record" until the desired filtering increment is displayed on the screen.

**Send Temp On X  
Degree Change**

**Send Out All of  
Humidity Data**

**Send Humidity  
on X% Change**

Press "Menu/Enter" to continue.

Press "^/Status" to start printing. Flashing dots on the display indicate the unit is printing. When finished, the logger will return to the operating mode.

**Push ^ Start Prt  
Push Menu to Quit**

If "Menu/Enter" is pressed, the logger will return to the operating mode.

**Printing  
Please Wait...**

## PRINTER ERROR MESSAGES

If a printer is not connected and set to operate, an error message will be displayed to alert the user to a printer problem. The user is recommended to consult the owners manual supplied with the printer for specific instructions on setting the printer controls.

Error message when printer is not connected or turned on. Make sure printer cable is attached to both the printer and logger and power is supplied to printer.

**Please Connect  
the Printer**

Error message to alert the user that the printer is out of paper.

**Printer is Out  
of Paper**

Error message to indicate the printer has not been set to ON LINE.

**Printer is Not  
On Line**

1. option stores information to the logger's memory. No printer or computer connection is required for this function.

**2. Record information to a printer.** This option does not store information to the logger's memory, but prints each sample as it is recorded to a printer. This is Real time Printing. A printer must be connected for this function. An error message will be displayed if a printer is not connected, if the printer is offline, or if the printer is out of paper. Switching to this option will terminate recording if the logger was previously set to record.

**3. Record information to memory and printer.** This option stores information to the logger's memory and at the same time each sample is recorded to a printer. A printer connection is required for this function.

**4. Record Off, Real Time Print Off.** If a recording is in progress, this option will terminate all recording functions. This option may be used to cancel recording sessions and return to the operating mode. To terminate a recording, press the "v/Record" button again at this time. Press the "v/Record" button after selecting the recording mode. This will display the starting time of the recording. The display will show the starting time of the last recording and allow the user to enter a new starting time.

The "^/Status" button will advance the item that is flashing. Press and hold the "^/Status" button to scroll this item. Press the "v/Record" button to change to the next item which will begin to flash. This will set the starting time of the recording which will appear on the display or printout after a recording has been made. Note the previous starting time is always displayed when a new recording is started.

Press the "Menu/Enter" button to return to the operating mode and begin recording.

**Record On, Real  
Time Print Off**

**Record Off, Real  
Time Print On**

**Record On, Real  
Time Print On**

**Record Off, Real  
Time Print Off**

Day	Hour	Min
Fri	15	16

## TRANSFERRING DATA TO A COMPUTER

After recording, the data may be downloaded to any IBM PC compatible computer (IBM XT, AT, 286, 386, 486, PS/2, Pentium running Windows 3.1 or higher). Unlike the print and view functions, no filtering options are available in this mode. The entire recording is sent to the computer. The supplied software will convert the data recording to an ASCII file which can then be imported into a variety of data analysis software, word processing, and data base programs. If data is downloaded on a regular basis, it is suggested to copy the transfer program to the users hard disk.

To start the transfer program, insert the diskette supplied in Drive A:. In Windows 95 go to START, select RUN, type A:SETUP and press ENTER. In Windows 3.1 start program manager, select FILE and RUN.

### IMPORTANT

To use this function, the 25 pin cable (DB25 Male-Male) must be connected to the logger and the computer's printer port. Consult the owners manual supplied with the computer to locate printer port.

## DOWNLOADING SOFTWARE

This program is freeware and is included with the Dwyer Pro-Data Logger. Copies may be made provided they are not modified or "patched" in any way, including but not limited to decompiling, disassembling, or otherwise reverse engineering the program. The user acknowledges that Dwyer Instruments, Inc. will not be liable for any data lost or damages whatsoever (including without limitation to damages for loss of business profits, business interruption, loss of business information and the like) arising out of the use or inability to use this product. It is the sole responsibility of the user to determine the usefulness of this software for any intended application.

Once the program is running, follow the screen prompts to download, read, print, or save data. Pressing any key will bring you to the opening menu:

Turn on the logger with the data you want to download. **IMPORTANT:** The logger must have the same sensor attached that was used to make the recorded data. Press the "Menu" button on the logger until the display reads: Menu to Run, others Print Out, then press the "^/Status" button until it displays: Send Recorded Data to Computer. Leave the logger at this display. Connect the cable from the PC printer port to the logger printer port. Click "Download" on the computer (a window will show up asking to connect the cable). Click the OK button to start receiving data and press the "Menu/Event" button on the logger to start sending data. A horizontal bar indicates the data transfer in progress. The length of time will depend on the computer's speed and length of recording.

Once data is finished downloading, the computer will indicate the Save or View menu. Select Save from the computer's pull down menu. A name must be assigned to the data file. Refer to the computer's owner manual or reference materials for explanations of filenames and extensions.

To view the data, open the saved file containing the data of interest. Data can be displayed in TEXT or Graph format depending on the format chosen.