
Particle Analysis and Display System (PADS): Dew Point Hygrometer (Dewpoint) Module

Operator Manual

DOC-0283 A, PADS 3.7.0

Dewpoint Module 3.7.0



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Risks of Installing Additional Software

Instrument computers from DMT are configured to acquire data in a reliable, robust manner. Typically, such instruments are either not connected to a network or are connected to a small, local network that is isolated from the internet, reducing the risk of viruses. Since anti-virus programs can cause erratic behavior when run in the background on data acquisition computers, DMT does not install anti-virus, anti-spam, or anti-malware programs. If you choose to install these programs, you accept the risk associated with them in terms of potential performance degradation of the software installed by DMT.

For similar reasons, DMT recommends that you do not install or run other software on the dedicated instrument computer. Although the installation of some software may be unavoidable, it is particularly important not to run other software while the computer is acquiring data.

CONTENTS

1.0	Introduction	4
2.0	Configuration.....	4
2.1	Configuring the Dewpoint	4
2.1.1	<i>Dewpoint Parameters</i>	5
2.2	Configuring the Dewpoint Display.....	7
3.0	The Dewpoint Window	8
3.1	Sub-Tabs	8
3.1.1	<i>Dewpoint</i>	8
3.1.2	<i>Selectable Chart</i>	8
3.1.3	<i>Tools</i>	9
3.2	Dewpoint Tabular Data and ABC Cycle Button	9
3.3	Selectable Channels.....	10
	Appendix A: Dewpoint Channels	11

List of Figures

Figure 1:	Dewpoint Configuration Editor Window	5
Figure 2:	Dewpoint Display Editor Window	7
Figure 3:	Dewpoint Indicator and ABC Cycle Indicator	9

1.0 Introduction

The Particle Analysis and Display System (PADS) is a software package that interfaces with instruments produced by Droplet Measurement Technologies (DMT) and other leading instruments used in the atmospheric sciences. This manual describes the PADS Dew Point Hygrometer (Dewpoint) module version 3.7.0.

For an explanation of the basic PADS setup and instructions on how to acquire data using PADS, consult the *PADS Overview Manual, DOC-0300*. Definitions and calculations used in the Dewpoint module are also described in the *PADS Overview Manual*.

For information on the Dew Point Hygrometer, consult [EdgeTech](#), which manufactures the instrument.

2.0 Configuration

Using PADS, you can configure both the software settings for the instrument and the instrument's data display in PADS. The following two sections explain how to do this. Configuring the instrument's software and display affects the default settings PADS uses when starting up. Some parameters can also be changed while PADS is running, but doing so affects the current session only.

2.1 Configuring the Dewpoint

Your Dewpoint sensor and data system should arrive preconfigured from DMT. In some cases, however, you may want to change the software configuration for the instrument. To do this, follow the steps below. *Note: Droplet Measurement Technologies STRONGLY recommends that customers contact our office prior to changing any of the parameters in the instrument configuration. Improper changes can result in communication failure and/or changes in PADS computation algorithms, which can compromise data validity.*

1. Click on the “Dewpoint” tab.
2. From the **Configure** menu, select **Configure Instrument**. You will see the following window.

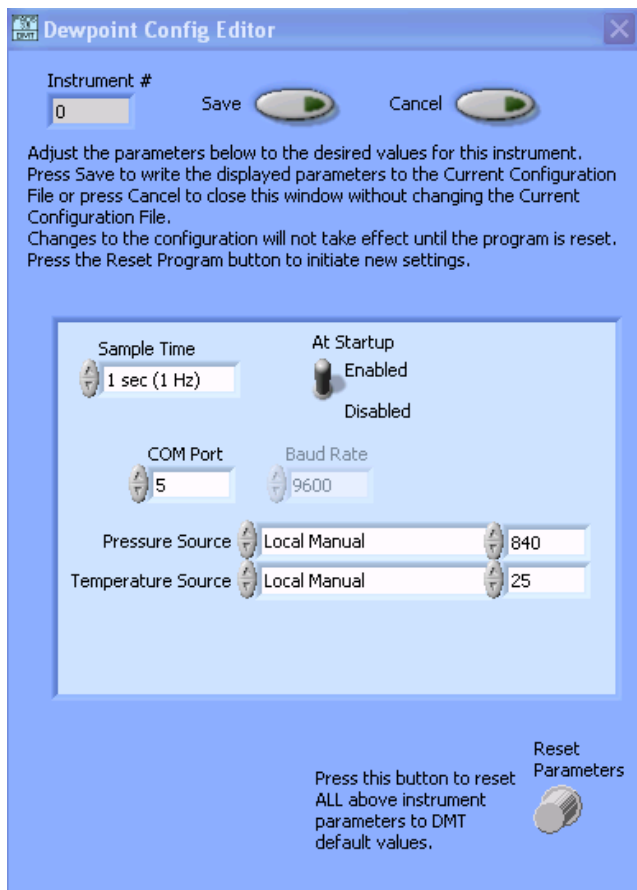


Figure 1: Dewpoint Configuration Editor Window

3. Now you can configure the instrument parameters to your desired specifications. See the definitions below for explanations of individual parameters. If at any time you would like to revert to the previously saved values for the Dewpoint parameters, press **Cancel** to exit the window without saving changes. Pressing **Reset Parameters** reverts parameters to their DMT-supplied default values.
4. When you are done configuring the Dewpoint parameters, press **Save** at the top of the Config editor window. Then press the green **Reset Program** button for the new configuration to take effect. Note that pressing the **Reset Program** button will clear any data currently being displayed.

2.1.1 Dewpoint Parameters

Instrument #: This lists the number corresponding to the instrument you are viewing, in this case the Dewpoint. If your Dewpoint has been assigned instrument number one, you will see “1” in this field. You should not need to modify the instrument number, and in fact you are unable to do so from within PADS.

Sample Time: This parameter shows the time interval between samples. It should normally be set to 1 sec / 1 Hz. If you want to change the sample time, you must reprogram the Dewpoint with a new output interval and set the PADS **Sample Time** to match this interval. Note that you may not be able set the Dewpoint output interval to all of the options listed on the PADS **Sample Time** field. For details, consult [EdgeTech](#) or the Dew Point Hygrometer manual.

At Startup Enabled / Disabled: If you want the Dewpoint to acquire data when PADS begins sampling, make sure this parameter is in the “Enabled” mode. In some cases, such as if the Dewpoint is inoperative, you may want to use this control to disable the probe. Disabling the Dewpoint allows data to transmit from other instruments without interference. Data will still be written to the disabled instrument’s output file, but PADS will write “NaN” to all fields.

COM Port: This is the serial communications port that the Dewpoint uses to connect with the computer. This number should match the computer hardware configuration for the particular computer you are using. If you are not using multiple computers, this number should not be changed.

Baud Rate: The baud rate for the probe is defined at manufacture. This parameter has been grayed out and you should not need to change it. If you reconfigure your hardware, however, the baud rate may change. If this occurs, contact DMT for help in changing your baud rate in PADS.

The **Source controls** allow you to set the source for parameters used in calculating Relative Humidity (RH%). Pressure Source sets the source for static pressure, while Temperature Source sets the source for temperature. If you set the source to “Local Manual,” you will be able to type in the manual value in the field to the right of the source parameter. If you select “Global Manual,” PADS will use the global manual value entered on the **Setup** tab.

Baud Rate: The Baud rate for the probe is defined at manufacture, and you should not need to change it. PADS lists this parameter because some probes can run at different baud rates. So if you reconfigure your hardware, the baud rate may change. In general, a higher baud rate

means that the probe can transmit data more quickly to the computer. However, higher baud rates may not work with some computers and can result in unreliable data transmission.

2.2 Configuring the Dewpoint Display

To configure the Dewpoint display, click on the Dewpoint tab if you have not already done so. Then select **Configure** from the menu bar and click on **Configure Display**. This will bring up the following window.

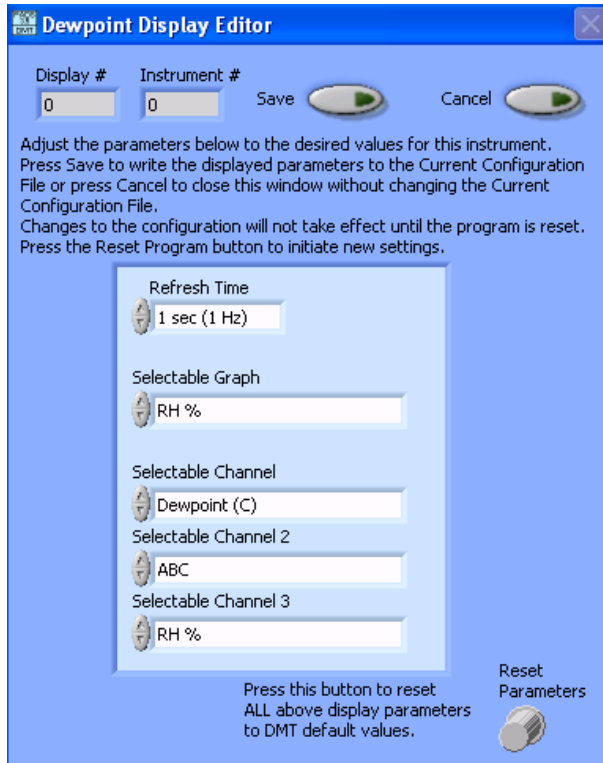


Figure 2: Dewpoint Display Editor Window

You do not need to modify the **Display #** or **Instrument #**.

Changing the **Refresh Time** allows you to set the time intervals for data display during acquisition mode; you can choose any time that is equal to or greater than the sample time. (Choosing a time less than the sample time is not useful, since the same data will be displayed multiple times.)

Changing the **Selectable Graph** setting changes the output channel displayed on the **Selectable Chart** sub-tab.

The **Selectable Channels** parameters allow you to select the tabular channels displayed on the right side of the Dewpoint window. To change these channels, click on the arrow

buttons to scroll between available options for the channels. You can also click on the white fields to bring up a list of all the available options, from which you can then choose the channel you want.

When you are done, click on **Save** to update the configurations or **Cancel** to revert to the previous configuration. After you reset PADS, you will be able to see any changes. Note that clicking **Reset Program** will clear out any data currently being displayed.

Configuring channels in the **Display Editor** will change the display upon start-up. Once PADS has started, you can change many of these settings from within the Dewpoint window.

3.0 The Dewpoint Window

At the top of the main Dewpoint window are the **Enabled** button, **COM Port** indicator, and **Fault/No Fault** button. For explanations of these features, see the “Instrument Tabs” section of the *PADS Overview Manual*.

3.1 Sub-Tabs

The Dewpoint window has three sub-tabs: Dewpoint, Selectable Chart, and Tools.

3.1.1 Dewpoint

The **Dewpoint** tab displays a time-series chart of dewpoint values for the sampling session.

3.1.2 Selectable Chart

The **Selectable Chart** tab displays a time-series chart of a user-selectable channel. You can change this channel by clicking on the white field to the right of the **Selectable Graph** label. You can also use the arrows to click up and down between available channels until you find the one you would like displayed. Changing the channel here affects the current session only; to change the default channel used each time PADS starts up, select **Configure > Configure Display** and modify the setting on the Display Editor. The gray display box in the upper right of the Selectable Chart sub-tab gives the current value for the selected channel.

3.1.3 Tools

The **Tools** tab allows you to change the source for pressure and temperature variables used in calculating relative humidity (RH%). (**Note:** If these controls are grayed out, click the **Press to Enable Source changes** button to activate them.) **Pressure Source** sets the source for static pressure, while **Temperature Source** sets the source for temperature. If you set the source to “Local Manual,” you will be able to type in the manual value in the field to the right of the source parameter. If you select “Global Manual,” PADS will use the global manual value entered on the **Setup** tab.

In the middle of the **Tools** tab is the source-changes access button. If the Pressure and Temperature Source controls are active—i.e., you can modify their values—this button will read **Press to lock Source changes**. Clicking on the button will update PADS so it uses the new source values. It will also gray out the source controls. If the Pressure and Temperature Source controls are inactive, the source-changes button will read **Press to Enable Source changes**. Clicking on the button will activate the source controls so you can modify their values.

Note that any changes made to the Pressure and Temperature source here will only affect the current PADS session. If you wish to make permanent changes, click on **Configure > Configure Instrument** and make the changes in the Config Editor.

3.2 Dewpoint Tabular Data and ABC Cycle Button

To the right of the main chart are the Dewpoint indicator and the ABC Cycle button, as shown in Figure 3. The dewpoint indicator shows the dewpoint reading for the currently selected moment in time. The ABC cycle indicator signifies whether the dewpoint’s Automatic Balance Control (ABC) cycle is on or off. The ABC cycle is useful in calibrating sensor optics, but data are not recorded when the cycle is on. Thus the indicator must read “ABC Cycle Off” for currently displayed data to be valid.

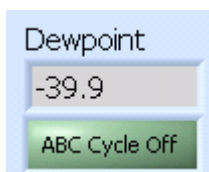


Figure 3: Dewpoint Indicator and ABC Cycle Indicator

When PADS detects that ABC cycle is on, it sets the ABC channel value to 1 and turns the ABC cycle indicator on. It also sets current dewpoint values to NaN, since the instrument is not gathering data. For more information about the ABC cycle, consult EdgeTech’s *Dew Point Hygrometer Operator’s Manual*.

3.3 Selectable Channels

The Selectable Channels fields display current values for three user-selectable channels. You can change a selectable channel by clicking on the white box, which displays a drop-down list of all the available channels. You can also use the arrows to the left of the white box to select the desired channel.

Changing a selectable channel on the main Dewpoint window affects the current PADS session only. To change the default used each time PADS starts, go to the Display Editor by selecting **Configure > Configure Display**. Then select the desired channels.

Appendix A: Dewpoint Channels

A list of Dewpoint channels appears below. The Dewpoint output file will contain data values for each channel for each sampling instance.

For definitions of the channels, consult *Appendix A: Definitions* in the *PADS Overview Manual*.

End Seconds
Day of Year
Year
Status
Probe Date
Probe Seconds
Dewpoint (C)
ABC
Spare 1 – 8
Applied Pressure (mbar)
Applied Temperature (C)
RH %
UTC Seconds
Date
Time

Dewpoint channels fall into several broad categories:

- Time Channels
- Data Channels
- Status Channels