
Particle Analysis and Display System (PADS):

PCASP-X2 Module

Operator's Manual

DOC-0207 A-1; PADS 2.7

PCASP-X2 Module 2.7.2



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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 module for the PCASP-X2.

For an explanation of the basic PADS setup and instructions on how to acquire data using PADS, consult the *PADS Operator Manual*. Definitions and calculations used in the PCASP-X2 module are also described in the *PADS Operator Manual*.

Note: The *PADS Operator Manual* and the manuals for most PADS instruments document PADS version 2.5. Since the PCASP-X2 module was only introduced in PADS 2.7, however, this manual documents PADS version 2.7.

2.0 Configuration

Using PADS, you can configure both the software for the instrument and the instrument's data display in PADS. The following two sections explain how to do this.

Configuring the PCASP-X2

Your PCASP-X2 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 “PCASP-X2” tab.
2. From the **Configure** menu, select **Configure Instrument**. You will see the following window.

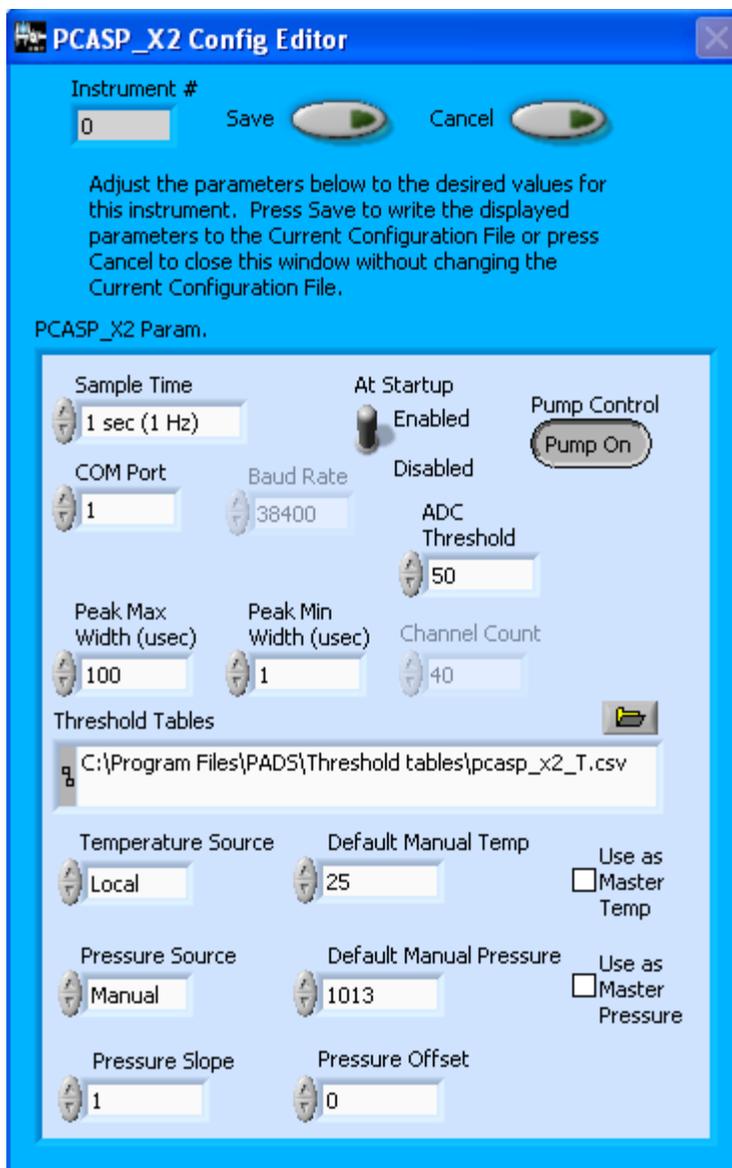


Figure 1: PCASP-X2 Configuration Editor Window

3. Now you can configure the instrument parameters to your desired specifications. You will find a list of the parameters you may want to reconfigure in the two sections below, “Occasionally Reconfigured PCASP-X2 Parameters” and “Rarely Reconfigured PCASP-X2 Parameters.” If at any time you would like to revert to the previously saved values for the PCASP-X2 parameters, press **Cancel** to exit the window without saving changes.
4. When you are done configuring the PCASP-X2 parameters, press **Save** at the top of the Config editor window. (If you would instead like to revert to the previously saved values, click **Cancel**.) 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.

Occasionally Reconfigured PCASP-X2 Parameters

Sample Time: This parameter shows the time interval you'd like between samples. You can have the probe sample at intervals of .1, .2, .5, 1, 2, 5, or 10 seconds (10, 5, 2, 1, 0.5 or 0.1 Hz). A value of one is recommended, as described in the warning below. Note that if you increase the sample time, you will still collect data for the same number of particles. This is because the probe collects data continuously and relays cumulative data at each sampling interval. For example, say you have the sample time set to .5 seconds. You might see four particles of size 25 μm during the first sample, and five particles of this size during the second sample. If you had set your sample time to one second instead of .5 seconds, you would instead get one sample that showed nine particles of size 25 μm .

WARNING: One hertz sampling is currently recommended, as choosing other values will invalidate time-dependent PADS calculations like number concentration, volume concentration, and LWC on optical probes. (ED and MVD are not affected.) This is a known bug in PADS that will be fixed in an upcoming version of the program.

At Startup Enabled / Disabled: If you want the PCASP-X2 to acquire data when PADS begins sampling, make sure this parameter is in the “Enabled” mode. In some cases, such as if the PCASP-X2 is inoperative, you may want to use this control to disable the probe. Disabling the PCASP-X2 allows data to transmit from other instruments without interference.

COM Port: This is the serial communications port that the PCASP-X2 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.

Pump Control: This control specifies whether the PCASP-X2's pump should turn on when PADS starts acquiring data. The default setting is on. In some cases, such as if the PCASP-X2 is being calibrated, the technician may want to use this control to turn off the pump.

You will notice that there are other parameters listed on the **PCASP-X2 Config Editor** window. You should not need to change these, and changing them may compromise your data. If you are curious about these parameters or think you do need to modify them, see the section

titled “Rarely Reconfigured PCASP-X2 Parameters” below or consult with a DMT technical representative.

Rarely Reconfigured PCASP-X2 Parameters

The PCASP-X2 configuration editor displays several parameters that you will rarely need to modify. The following is a list of these parameters and an explanation of what they do.

Instrument #: This lists the number corresponding to the instrument you are viewing, in this case the PCASP-X2. If your PCASP-X2 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.

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.

Channel Count: This number indicates how many sizing bins the PCASP-X2 uses to categorize particles. This number has been grayed out because it is preconfigured for your instrument and should not change.

Threshold Tables: This field lists the path to the threshold table files. These files are used in sizing particles, and the PCASP-X2 has two threshold tables associated with it. (PADS only lists one of these tables in the Threshold Tables field, but both are in the directory.) `PCASP_X2_t.csv` tells PADS the correct sizing bin for a particle given the peak digital value converted from the light scattered by the particle. `PCASP_X2_p.csv` tells PADS the upper size boundary in microns for each sizing bin. Note that the Thresholds Tables field should always be set to the `PCASP_X2_t.csv` file, and PADS finds the `PCASP_X2_p.csv` file automatically using the same path.

While threshold tables may have multiple rows, PADS only uses one row from each table. This data row has been chosen to work with your specific PCASP-X2.

Peak Max Width (usec): This control sets the maximum length of time that a particle can be illuminated in order for it to be sized by the instrument. Resolution is to 0.1 μ s, and a value of 100 is recommended. The Peak Max Width parameter helps ensure data accuracy by rejecting signals that most likely have been generated by particles outside the sample area.

Peak Min Width (usec): This control sets the minimum length of time that a particle must be illuminated in order for it to be sized by the instrument. Resolution is to 0.1 μ s, and a starting value of 1 is recommended for this parameter. If bin 1 shows too much noise, increase this time. If bin 1 seems empty, decrease the Peak Min Width. The Peak Min Width parameter helps ensure data accuracy by rejecting signals that most likely have been generated by electronic noise or particles that pass through the edge of the beam and should not be counted.

Temperature Source: This parameter sets the temperature source used in calculating volumetric flows from mass flows. There are three possible options for this setting:

- 1.) *Local* - This instructs PADS to use the output from the PCASP-X2's temperature sensor for calculations. Local is the default option. It typically results in the most accurate conversion calculation, since it measures temperature at the point where air is flowing into the instrument.
- 2.) *Manual* - This instructs PADS to use a temperature value that the user has entered manually. The default manual value is listed to the right of the Temperature Source parameter on the Configuration Editor screen. The manual option can be useful if the PCASP-X2's sensor is not functioning properly. In this case, the manual value is written to the Block Temp channel in the data file so that there is a permanent record of the value that was used in the calculation.
- 3.) *Global* - This instructs PADS to use the global temperature from the master source specified on the Setup Screen. This setting is rarely used. Note that the global source can be set to PCASP-X2, in which case the temperature values used will be the same as in setting 1. The global source can also be set to manual, which is different than when the Temperature Source parameter is directly set to manual. In the former case, the default manual setting is listed on the Setup tab, not in the PCASP-X2 Configuration Editor screen. The global source can also be another instrument if the system has other instruments besides the PCASP-X2.

Table 1 in the **Channel Data** section compares how these three options affect the Block Temperature channel and the temperature used in the conversion calculations.

Default Manual Temp: This parameter specifies the default value for the manual temperature upon PADS start-up. If you want to change the manual temperature for the current session only, you can do so from the main PCASP-X2 window. *Note:* If Temperature Source is set to global and the Global source in turn is set to manual, the default manual temperature is the one specified on the Setup screen, not in this parameter.

Use as Master Temp: When checked, this box tells PADS to use the PCASP-X2’s ambient temperature measurement as the default master temperature source on the Setup window. While multiple instruments can potentially provide this measurement, only one instrument should be selected as the source.

Pressure Source: This parameter sets the pressure source used in calculating volumetric flows from mass flows. There are three possible options for this setting:

- 1.) *Local* - This instructs PADS to use the output from the PCASP-X2’s pressure sensor for calculations. Local is the default option. It typically results in the most accurate conversion calculation, since it measures pressure at the point where air is flowing into the instrument.
- 2.) *Manual* - This instructs PADS to use a pressure value that the user has entered manually. The default manual value is listed to the right of the Pressure Source parameter on the Configuration Editor screen. The manual option can be useful if the PCASP-X2’s sensor is not functioning properly. In this case, the manual value is written to the Pressure channel in the data file so that there is a permanent record of the value that was used in the calculation.
- 3.) *Global* - This instructs PADS to use the global pressure from the master source specified on the Setup Screen. This setting is rarely used. Note that the global source can be set to PCASP-X2, in which case the pressure values used will be the same as in setting 1. The global source can also be set to manual, which is different than when the Pressure Source parameter is directly set to manual. In the former case, the default manual setting is listed on the Setup tab, not in the PCASP-X2 Configuration Editor screen. The global source can also be another instrument if the system has other instruments besides the PCASP-X2.

Table 2 in the **Channel Data** section compares how these three options affect the Static Pressure channel and the pressure used in the conversion calculations.

Default Manual Pressure: This parameter specifies the default value for the manual pressure upon PADS start-up. If you want to change the manual pressure for the current

session only, you can do so from the main PCASP-X2 window. Note: If Pressure Source is set to Global and the global source in turn is set to manual, the default manual pressure is the one specified on the Setup screen, not in this parameter.

Use as Master Press: When checked, this box tells PADS to use the PCASP-X2's static pressure measurement as the default master source for static pressure. This source appears on the PADS Setup window upon startup. While multiple instruments can potentially provide this measurement, only one instrument should be selected as the source.

Pressure Slope: This is the slope used in the linear function to derive static pressure from the digitized output of the static pressure transducer, as follows:

$$\text{Static Pressure} = (\text{Pressure Slope}) * (\text{Bits}) + \text{Pressure Offset}$$

Pressure Slope is a calibration coefficient provided by the sensor manufacturer. The sensor has a 5-volt range that is converted into a 12-bit binary number from 0 to 4095. Do not change this parameter without consulting DMT first.

Pressure Offset: This is the intercept term used in the linear function to derive static pressure from the digitized output of the static pressure transducer, as follows:

$$\text{Static Pressure} = (\text{Pressure Slope}) * (\text{Bits}) + \text{Pressure Offset}$$

Pressure Offset is a calibration coefficient provided by the sensor manufacturer. The sensor has a 5-volt range that is converted into a 12-bit binary number from 0 to 4095. Do not change this parameter without consulting DMT first.

After making changes in the instrument configuration window, you will need to press the **Save** button and then click the green **Reset Program** to activate these changes. Clicking **Reset Program** will clear any data PADS is currently displaying.

Configuring the PCASP-X2 Display

To configure the PCASP-X2 display, click on the PCASP-X2 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.

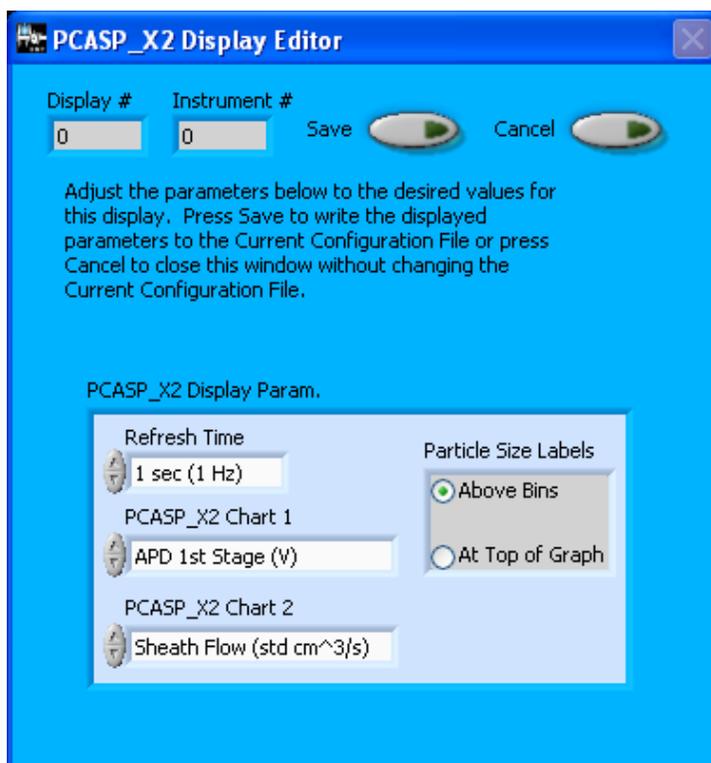


Figure 2: PCASP-X2 Display Editor Window

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.)

The PCASP_X2 Chart 1 and Chart 2 controls allow you to configure the channels on the instrument's two selectable graphs, which are located in the "Selectable Charts" tab. You can 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. For information on specific channels and their definitions, consult *Appendix A: PCASP-X2 Channels* and the *PADS Operator Manual's Appendix A: Definitions*.

The gray box on the right allows you to specify whether particle size labels should appear above each bin or in a straight row at the top of the graph (see Figure 3). The PCASP_X2_p.csv table gives upper size limits for each bin. The lower bin boundary for

each bin equals the upper boundary of the previous bin, except for bin 1's lower boundary, which is 0.09 μm .

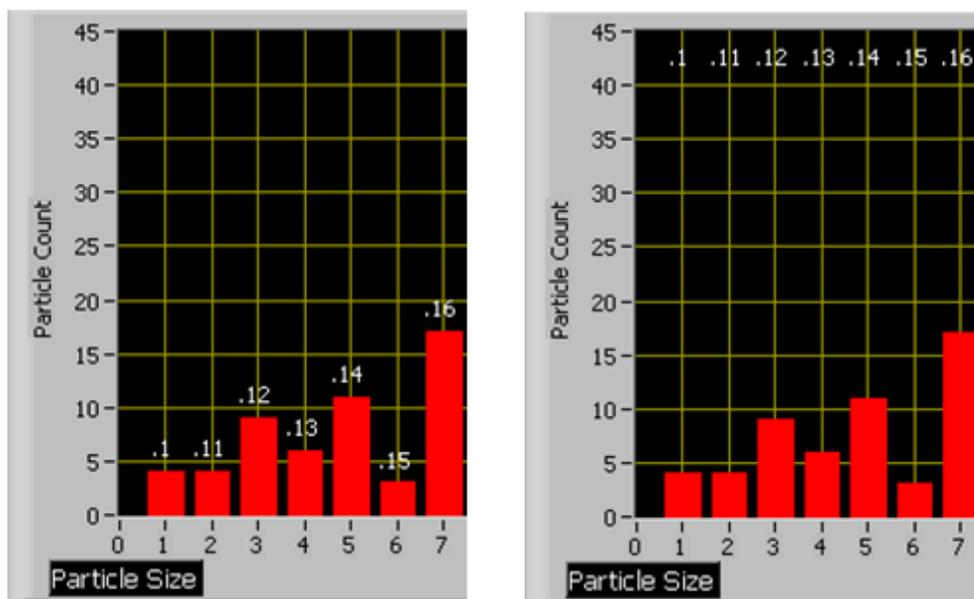


Figure 3: PCASP-X2 Particle Size Display Options: Labels above Bins (Left Image) or above Graph (Right Image)

When you are done setting parameters in the Display Editor, click on **Save** to update the configurations or **Cancel** to revert to the previous configurations. 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 Configuration Display Editor will change the display upon start-up. Once PADS has started, you can select any channels to be displayed. See the “Selectable Charts” heading under the “Chart Displays” section for more information.

3.0 The PCASP-X2 Window

The different parts of the PCASP-X2 Window are discussed below. For explanations of the **Enable** button, **COM Port** indicator, and **Fault/No Fault** button, see the “Instrument Tabs” section of the *PADS Operator Manual*.

The **Pump Control On/Off** buttons at the top left of the screen (Figure 4) allow you to turn the instrument's pump on and off. You can change the default on-off setting for the

pump by going to the **Configure** menu, selecting **Configure Instrument**, and setting the **Pump Control** as desired.

Beneath the **Pump Control** buttons, you will see the Manual Temperature and Pressure Controls (Figure 4) *if* Temperature Source and Pressure Source are set to Manual on the Configuration Editor screen. If only one of the two parameters has been set to Manual, only that control will appear. If neither is set to Manual, you will see only the pump control, as shown in Figure 5.

You can change the manual temperature and pressure values for the current session by pressing on the gray arrows or by typing a new value into the white field.

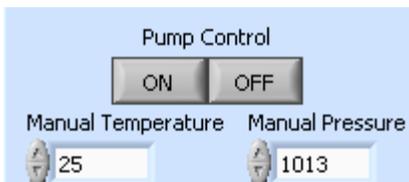


Figure 4: Pump Control Buttons and Manual Temperature and Pressure Controls

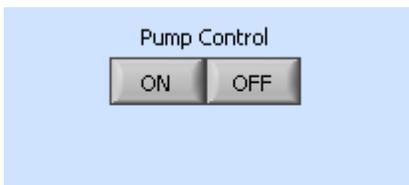


Figure 5: Pump Control Only

Channel Data

The PCASP-X2 channels are displayed in the data window in the left of the PCASP-X2 tab. These data are specific to the time listed in the upper-right of the PADS window.

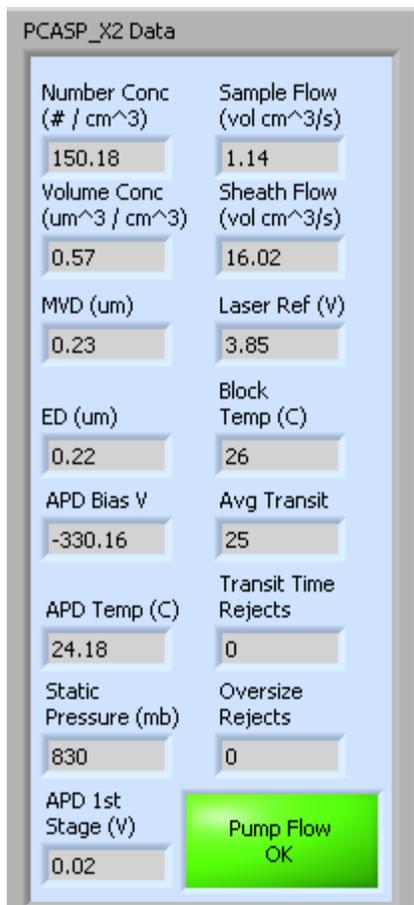


Figure 6: PCASP-X2 Data Window

The PCASP-X2 channels are described in Appendices A and B of the *PADS Operator Manual*.

When air is flowing properly through the PCASP-X2 pump, the indicator at the bottom right of the data window should be green and read “Pump Flow OK,” as shown in Figure 6. When there is a problem with pump flow, this indicator will turn yellow and display “Pump Flow Below Threshold Level.” **Note that PADS only updates the flow status indicator when data are being acquired or when you are in playback mode. If you are in acquisition mode but not sampling data—i.e., the Sample button is off—then the flow status indicator will display an outdated and possibly incorrect value.**

Note that the block temperature listed in the data window can differ from the temperature parameter that PADS uses to convert mass flows to volumetric flows. Likewise, the static pressure listed in the data window can differ from the pressure parameter used in the conversion equation. The tables below provide additional information on this topic.

<i>If Temperature Source Listed on Config Editor Screen is...</i>	<i>Then Block Temp (C) channel is taken from...</i>	<i>And the temp. used in the flow conversion equation is...</i>
<i>Local</i>	PCASP-X2 temp. sensor reading	PCASP-X2 temp. sensor reading
<i>Manual</i>	Manually set temperature (Default set on PCASP-X2 Config Editor Screen, overrides made on main PCASP-X2 tab)	Manually set temperature (Default set on PCASP-X2 Config Editor Screen, overrides made on main PCASP-X2 tab)
<i>Global</i>	PCASP-X2 temp. sensor reading	Global temperature source specified on Setup Screen. If Global Source is in turn set to Manual, the default manual value on the Setup screen (not the PCASP-X2 tab) will be used.

Table 1: Temperature Source Settings in the PCASP-X2

<i>If Pressure Source Listed on Config Editor Screen is...</i>	<i>Then Static Pressure channel is taken from...</i>	<i>And the pressure used in the flow conversion equation is...</i>
<i>Local</i>	PCASP-X2 press. sensor reading	PCASP-X2 press. sensor reading
<i>Manual</i>	Manually set pressure (Default set on PCASP-X2 Config Editor Screen, overrides made on main PCASP-X2 tab)	Manually set pressure (Default set on PCASP-X2 Config Editor Screen, overrides made on main PCASP-X2 tab)
<i>Global</i>	PCASP-X2 press. sensor reading	Global pressure source specified on Setup Screen. If Global Source is in turn set to Manual, the default manual value on the Setup screen (not the PCASP-X2 tab) will be used.

Table 2: Pressure Source Settings in the PCASP-X2

Chart Displays

The PCASP-X2 chart displays consist of a tab with two standard charts and a tab with two selectable charts. You can access any of these charts by selecting the tabs in the upper part of the chart display window. Figure 7 shows these tabs and the standard time-series charts.

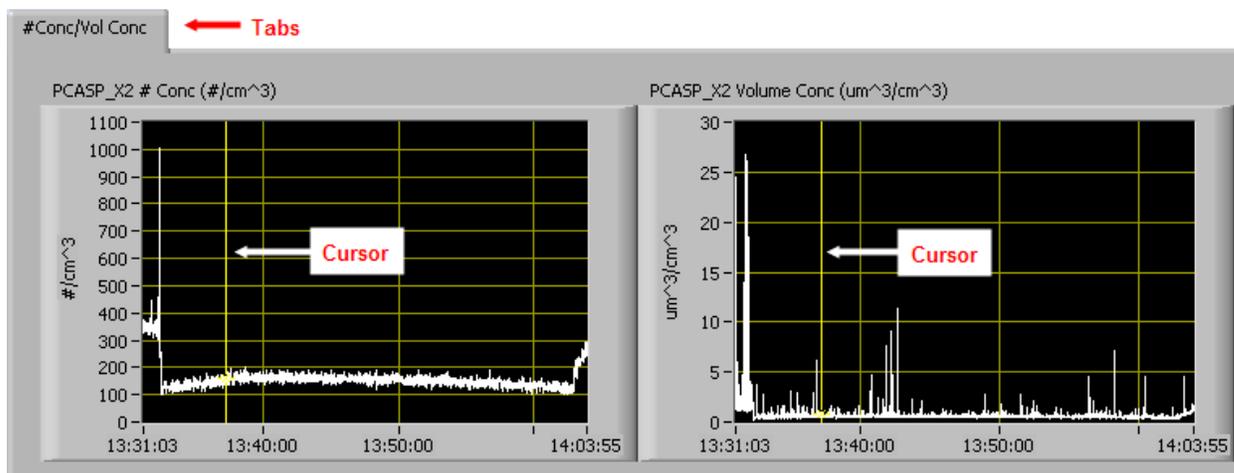


Figure 7: PCASP-X2 Selectable Time-Series Charts

When you access time-series charts in playback mode, the currently selected moment in time is indicated by a yellow cursor, as shown above. The y-axis value for this time is indicated by cross (+) on this cursor. Note that when you display a large range of time-series data, the chart display does not have sufficient resolution to display each individual time point. To increase resolution, zoom in on the data by changing the time interval to a smaller range.

On all the charts with x and y axes, you can change the scale by typing a different number into the starting and ending values on each axis. For instance, if you want to change the time period in one of the graphs above to end at 13:45:00, you simply select the field that currently says 14:03:55, type in 13:45:00, and hit the <Enter> key. In acquisition mode, you must disable autoscaling (see below) before you modify fields in this way.

Many charts also show you options for scaling and copying the data when you right-click on them, which brings up a drop-down menu. These options are as follows:

Autoscale This autoscales the relevant axis. In autoscaling mode, the minimum and maximum values of the axis are set automatically so that all data points can be seen in the display. Note that on charts that have autoscale buttons, like the large histogram chart on some instrument tabs, the buttons override the Autoscale options in the drop-down menu. To see autoscaling options in the drop-down menu, position the cursor over the relevant axis before right-clicking. Note that you may not always be able to autoscale the x-axis.

Copy Data This copies the chart to the clipboard using a screen capture. This chart can then be pasted into other documents like Word or PowerPoint presentations.

Export Simplified Image This copies a simplified image of the data to the clipboard or an output file. You can choose the format you desire—bitmap (.bmp), encapsulated postscript (.eps), or enhanced metafile (.emf). Note that when you select the .eps option, you must copy the data to a file. Unless you specify otherwise, output files will be saved in the time-and-date-specific output file directory for the current session.

Clear Graph This erases the currently displayed data points from the graph.

More information about each of the tabs on the chart displays section is given below.

1. # Conc / Vol Conc

The two graphs on the first tab display particle number concentration ($\#/cm^3$) and volume concentration ($\mu m^3/cm^3$) with respect to time. In playback mode, you can zoom in or out by using the time controls. In acquisition mode, use the “Display Range” control to zoom in or out.

2. Selectable Charts

The **Selectable Charts** tab displays two charts with user-specified channels plotted as a function of time. To change the channels plotted in the selectable charts, you have two options:

- 1.) To change the charts for the current session only, click on the **Selectable Charts** tab and use the control in the upper left of the chart to select the channel you desire. You can either click on the text control to the right, which brings up a selectable list of channels, or you can use the button on the left to scroll between channels.
- 2.) To change the channels shown in the chart’s display when PADS starts, go to the **Configure** menu, select **Configure Display**, and choose the desired channel. Then press the **Reset Changes** button to apply this configuration.

Histogram Data Window

Below the PCASP-X2 chart displays is the histogram display of PCASP-X2-acquired particle data. Like the channel data display, the histogram shows time-specific data.

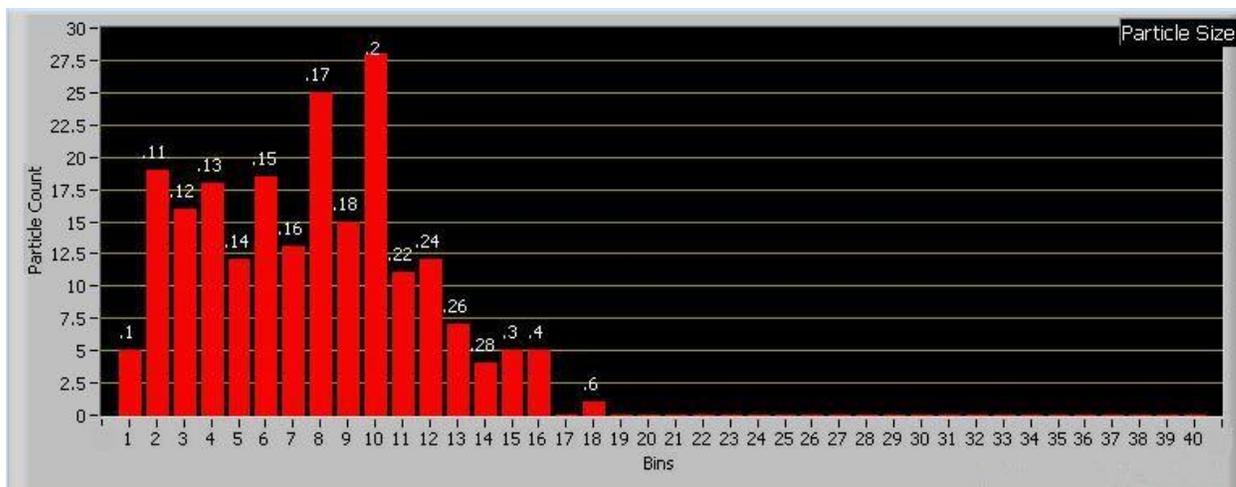


Figure 8: PCASP-X2 Histogram Display

Note: The PCASP-X2 histogram does not label the x-axis with particle sizes. Rather, the x-axis labels display bin numbers, and corresponding particle sizes appear either above the data bars or at the top of the graph (see Figure 3). You can specify which of these two display options you prefer in the **PCASP-X2 Display Editor**.

On a standard PCASP-X2 with forty bins, bins have a width ranging from 0.01 μm for small bins to 1 μm for large bins. This system enables the instrument to detect a wide size range of particles yet still provide nuanced sizing for smaller particles.

As a result of the instrument's uneven bin sizes, the histogram distribution may not be a smooth curve. When the bin range increases, the bins capture many more particles. Figure 8 above, for instance, shows a jump in detected particles starting with bin 10, which has twice the width of the previous bin.

If you want to see a normalized histogram curve, click on the “Normalized” button to the bottom left of the histogram. To normalize the data, PADS divides each bin count by the bin width in microns.

If you enable the **Log-Scale** button to the histogram's bottom left, PADS will display y-axis histogram data logarithmically. The **Autoscale** button can be used to autoscale the y-axis.

Appendix A: PCASP-X2 Channels

A list of output channels for a standard 40-bin PCASP-X2 appears below. The PCASP-X2 output file will contain data values for each channel for each sampling instance. You can also plot each of these channels against time using the PCASP-X2 Selectable Charts tab.

For definitions of the channels, consult *Appendix A: Definitions* in the *PADS Operator Manual*. Note that the “Pressure” channel refers to Static Pressure.

Time	PCASP_X2_OPC_ch19
APD Bias Voltage (V)	PCASP_X2_OPC_ch20
APD Temp (C)	PCASP_X2_OPC_ch21
Block Temp (C)	PCASP_X2_OPC_ch22
APD 1st Stage (V)	PCASP_X2_OPC_ch23
Laser Reference (V)	PCASP_X2_OPC_ch24
Sample Flow (std cm ³ /s)	PCASP_X2_OPC_ch25
Sheath Flow (std cm ³ /s)	PCASP_X2_OPC_ch26
Pressure (mBar)	PCASP_X2_OPC_ch27
Avg Transit Time	PCASP_X2_OPC_ch28
Transit Time Rejects	PCASP_X2_OPC_ch29
Oversize Rejects	PCASP_X2_OPC_ch30
PCASP_X2_OPC_ch0	PCASP_X2_OPC_ch31
PCASP_X2_OPC_ch1	PCASP_X2_OPC_ch32
PCASP_X2_OPC_ch2	PCASP_X2_OPC_ch33
PCASP_X2_OPC_ch3	PCASP_X2_OPC_ch34
PCASP_X2_OPC_ch4	PCASP_X2_OPC_ch35
PCASP_X2_OPC_ch5	PCASP_X2_OPC_ch36
PCASP_X2_OPC_ch6	PCASP_X2_OPC_ch37
PCASP_X2_OPC_ch7	PCASP_X2_OPC_ch38
PCASP_X2_OPC_ch8	PCASP_X2_OPC_ch39
PCASP_X2_OPC_ch9	Number Conc (cts/cm ³)
PCASP_X2_OPC_ch10	Volume Conc (um ³ /cm ³)
PCASP_X2_OPC_ch11	MVD (um)
PCASP_X2_OPC_ch12	ED (um)
PCASP_X2_OPC_ch13	Sample Flow (vol cm ³ /s)
PCASP_X2_OPC_ch14	Sheath Flow (vol cm ³ /s)
PCASP_X2_OPC_ch15	Global Pressure (mb)
PCASP_X2_OPC_ch16	Global Ambient Temp (C)
PCASP_X2_OPC_ch17	Status
PCASP_X2_OPC_ch18	GPS Time

PCASP-X2 channels fall into several broad categories:

Time Channels: The time channels store time data. Time is generated by the PADS computer clock and is the time when the program receives the instrument data. It is given in seconds after midnight on the day the program was started. GPS Time is included in every instrument's list of channels whenever a GPS is included as one of the PADS instruments. GPS Time may be collected from an instrument other than the instrument, even though it appears as a channel in the instrument output file.

Housekeeping Channels: The PCASP-X2's housekeeping channels are depicted in italics in the list above. These channels have a 0-5 V scale measured by a 12-bit A/D converter that gives integer values from 0 to 4095.

Bin Channels: Channels labeled PCASP_X2_OPC_[i] store data on the number of particles of different sizes that the PCASP-X2 has detected. These data are used in the histogram display.

Channels for Other Statistical Data: Avg Transit Time, Transit Rejects and Oversize Rejects store particle statistics collected by the PCASP-X2. Status stores statistical data the PCASP-X2 has gathered on the communication between PADS and the probe.

PCASP-X2 Calculated Channels: Number Conc, Volume Conc, MVD, and ED store the results of calculations PADS has performed on PCASP-X2 particle data. PADS calculates Sample Flow (vol cm³/s) and Sheath Flow (vol cm³/s) from their mass flow equivalents, Sample_Flow(std cm³/s) and Sheath_Flow(std cm³/s), as well as from Ambient Temperature and Pressure.

Global Channels: Global Pressure (mb) and Global Ambient Temp (C) store data from the master pressure and temperature sources specified on the Set-up screen.