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Dash 18X / Dash 18
Data Acquisition Recorder



QUICK START GUIDE

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Part# 22834480 Version 4.2

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1. INTRODUCTION

Thank you for choosing an Astro-Med data acquisition recorder. This Quick Start Guide was prepared to let you get acquainted with your recorder as quickly as possible. We even include a sample exercise so you can become familiar with the basic operation.

This Quick Start Guide supports two models: The Dash 18X and the Dash 18.
Throughout this guide, both models will be referred to as Dash 18X / Dash 18.

The Dash 18X / Dash 18 is a powerful and versatile data acquisition recording system that provides the capability to display, record, and review waveform data. Universal inputs let you connect almost any signal without using external signal conditioning.
The Dash 18X / Dash 18 can record a wide range of voltages, temperature, DC Bridge and frequency inputs. Each channel can be independently set up.

Data samples from up to eighteen signals can be acquired at rates up to 100,000 samples per second per channel and streamed directly to a high-capacity hard drive. Each channel can be independently set up to trigger a capture.

The Dash 18X / Dash 18 utilizes a touch-screen as the main user interface. Many of the Dash 18X / Dash 18 control buttons are customizable, providing the capability to modify the display based on the needs of the user or application.

2. GETTING STARTED

Voltage Verification: The Dash 18X / Dash 18 has an auto-sensing power supply that operates from 102 - 264 VAC.
The Dash 18X / Dash 18 draws 300 Watts maximum.

Connect AC Power Cord: Connect AC power cord to the side panel, then to an outlet.

Turn On Dash 18X / Dash 18: When you turn on the Dash 18X / Dash 18, the display will show various initialization screens and then load in the last setup it had before it was powered down.

Signal Inputs: The Dash 18X / Dash 18 can record up to eighteen channels of analog signals. Each channel can be configured to record a variety of voltages, temperature, DC Bridge and frequency inputs.

Display: The Dash 18X / Dash 18 has a large touchscreen display. The display is divided into two main areas, the Waveform Display Area (shows the waveform signals typically drawn onto a grid pattern) and the Control Panel (rows of control buttons for operation).

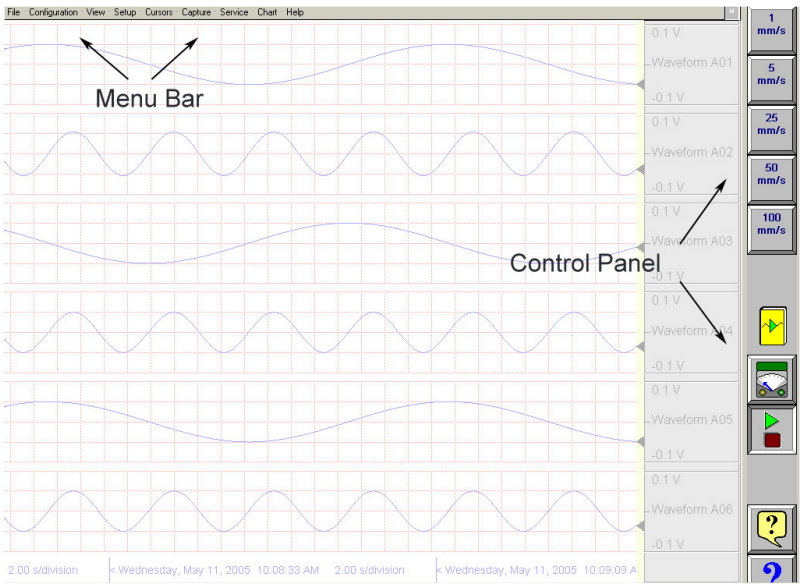
3. HARDWARE OVERVIEW

The following is a summary of the location of the physical components of the Dash 18X / Dash 18.

Front View:	Touch Screen, Carry Handle
Bottom View:	Module Docking Connector (SCR-18 printer or PIM-18 power module)
Right Side View:	Signal Inputs (banana jack inputs, differential inputs), Computer connections (parallel port, USB port, Ethernet port, Mouse port, Keyboard port, Modem slot)
Left Side View:	Power indicator light, Power switch, Power inlet, Utility port, Event port, Zip® Drive (Dash 18 only)

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4. MENUS & BUTTONS



Dash 18X / Dash 18 screen highlighting the Menu Bar and Control Panel

MENU BAR

The menu bar is a group of drop-down menus located across the top of the display. All Dash 18X / Dash 18 modes and features can be accessed from this menu. Options available from the menu bar will vary based on the mode of operation (Realtime, Scope, or Review) used.

If the date and time are visible instead of the menu bar, choose the **M** button in the upper right hand corner, which toggles the display of date/time and menu bar.



File	The File menu is used to save and load your setup files.
Configuration	The Configuration menu is used to select the operation of the Dash 18X / Dash 18.
View	The View menu is used to supplement the graph display of your signals.
Setup	The Setup menu is used to configure the Dash 18X / Dash 18.
Cursors	The Cursors menu is used for time and amplitude measurements.
Capture	The Capture menu is used to setup, arm, manual trigger, and abort data captures.
Service	The Service menu is for less frequently used parameters such as calibration and security settings.
Chart	The Chart menu provides for operation of the optional SCR-18 thermal recorder.
Help	The Help menu provides for on-line assistance.

CONTROL PANEL

The control panel is an array of icon-based buttons located on the right hand side of the display. The icon buttons allow for a single touch to execute a function. The Dash 18X / Dash 18 ships with the control panel displaying icon buttons for speed control, analog set up, meter mode, and run/halt.

The control panel can be customized to add or remove icon buttons to suit your recording needs. Further, the control panel settings can be saved to a file for later recall making test preparation very easy.

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Commonly Used Buttons

The following buttons are commonly used in Dash 18X / Dash 18 windows:



OK saves the information you entered in a window and then closes the window.



Exit cancels the action you were performing in a window and closes the window without saving any changes.



Apply saves the information you modified in a window without closing the window.



Select All selects/highlights all items in a list box.



Clear Selection removes the selections/highlights from all items in a list box.



Copy copies the selected items (or characteristics of selected items) to the clipboard.



Paste pastes the clipboard contents to the selected location.



Save saves current configurations to a file on your disk.



Load loads configurations from a file on your disk.

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5. USING THE DASH 18X / DASH 18

The Dash 18X / Dash 18 has three modes of operation, Realtime, Scope, and Review modes.

Realtime Mode: Realtime mode provides real-time waveform scrolling, monitoring, and data capture capabilities. Additionally, almost all system setup options are accessible from Realtime mode.

Scope Mode: Scope mode acts like a digital storage oscilloscope, providing high time-base resolution for viewing high-frequency signals.

Review Mode: Review mode provides the capability to review and analyze saved data captures and scope captures.

Help: Within the Dash 18X / Dash 18, three forms of help are available:

Context Help	The context help feature provides context sensitive, on-screen help.	
Button Help	The button help feature provides on-screen help for the buttons. A brief description is of the selected button is provided.	
Online Manual	The Adobe Portable Document Format (PDF) version of the manual is available for on-screen viewing. You can access this by clicking on **Help** and then **On-Line Help** from the Realtime, Scope, or Review configuration screens.	

6. SETTING UP THE DISPLAY APPEARANCE

The Dash 18X / Dash 18 gives you total control over chart layout. You can set individual channel widths, channel location, grids ON/OFF, and major/minor division sizing. You are also able to suppress or enable waveform display as well as vary the waveform trace thickness. Further, you can overlap some or all of the channels.

Basic Channel Views: The Dash 18X / Dash 18 provides basic channel views that you can access from the menu bar. These views allow you to choose a fixed number of channels to display. In Realtime mode, choices are Basic 6, 12, or 18 channels. In Scope or Review mode, choose from 1, 2, 6, 12, or 18 channels.

Custom Channel Views: If you don't find a view from the Basic Channel Views described above, you can use the
Chart / Display wizard. The wizard allows you to pick the number of channels to display. You can further customize your chart by overlapping or resizing the channels. You can also add, remove, or replace channels.

7. AMPLIFIER SETTINGS

Each channel has unique amplifier settings. You can choose what type of signal the channel will measure (voltage, temperature, etc.) It addition to setting the span for the channel, you can also adjust the zero volt position. For convenience, amplifier settings can be copied to other channels. Further, user scaling is supported so that your channels can report their values to you in Engineering Units.

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8. SAMPLE EXERCISE

9 Volt Battery Test

Items needed: 9 Volt battery. Signal input leads.

In the following hands-on exercise, you will set up a channel to monitor a 9 Volt battery in Realtime. Next, a data capture will be set up to record when the battery voltage is applied. Finally, the captured data will be reviewed.

In the exercise, every action needed is detailed in a step-by-step fashion to help you quickly become familiar with the operation of the Dash 18X / Dash 18. The **ACTION** on the left-hand side describes what is to be done. The **HOW TO** section provides the detailed steps to take using the pull-down menus of the Menu Bar.

I. Real-time Monitoring: Monitor the voltage of a 9 Volt battery.

Set up the channel so that when there is no signal, the waveform trace will be at the center of the channel and when the 9 Volt signal is applied, the waveform trace will be near the top of the channel.

ACTION	HOW TO (Use the Menu Bar Pull-Down menus)
Verify Menu Bar display	If the date and time are shown at the top of the screen, press the **M** icon in the upper right hand corner to show the Menu Bar.

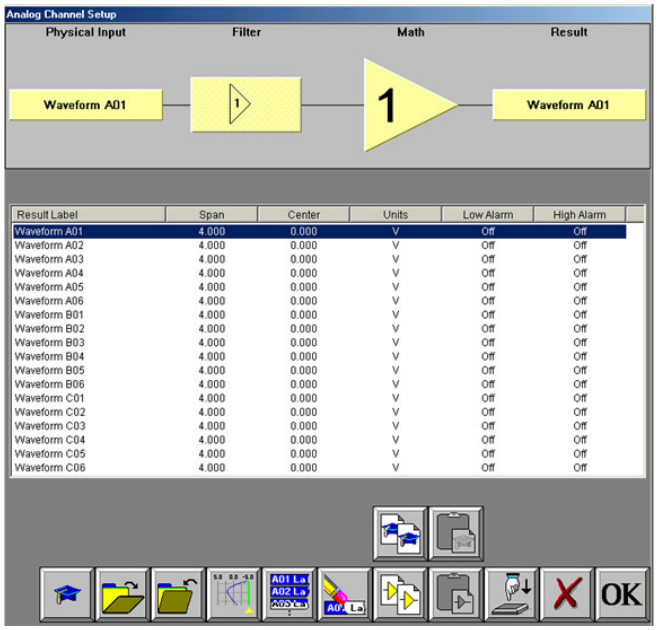


Dash 18X / Dash 18 Menu Bar

Default the Dash 18X / Dash 18	Choose **Configuration > Utilities** from the menu bar to open the Utilities window. Choose **Defaults >> System** from the menu bar to set the recorder to factory defaults. Click **Yes** to accept.
Enter Realtime Mode	Choose **Configuration > Realtime** from the menu bar to enter Realtime Mode.
Select Basic 6 Channel View	Choose **View > Basic 6 Channel** from the menu bar.
Set speed to 5 mm/sec	Press the **[5 mm/s]** button on the control panel.



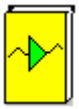
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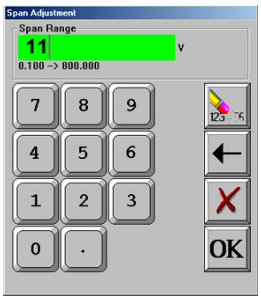


Dash 18X / Dash 18 Amplifier Channel Settings Window

Set Channel #1 to be 11Volts Full Scale

Click on the **Amp Setup** button on the control panel. This will bring you to the Analog Channel Setup window. Highlight Waveform A01, so your screen looks like the one above.





Span adjustment keypad

Press the **Span** column heading. Press the digit "1" twice to set to 11 volts.
Press **OK**.

Next to the Span column is the Center / Bottom column. This will show you the value for the Center or Bottom of the channel depending on which is chosen. Toggle the baseline button (4th button from the left in the row of icons at the bottom) so that the baseline reads **Bottom**.
Press the **Bottom** column. Press the digit "**0**". Press **OK**.
Press **OK** at the lower right hand corner of the menu.



Input battery voltage into Channel #1

Use the banana jack input connection located on the side of the Dash 18X / Dash 18 and input the battery voltage into Channel #1.

Measure the battery voltage using the color display

Click on the **Meter** button to bring up the meter readings on the left hand side.
Observe the battery voltage.
Click on the **Meter** button again to remove the meter.



Remove the battery voltage.

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II. Data Capture Settings:

Add some buttons to your control panel first. **Setup** > **Control Panel Settings** > **Capture** > choose the following buttons



Arm Capture > *This will Arm and start the capture*

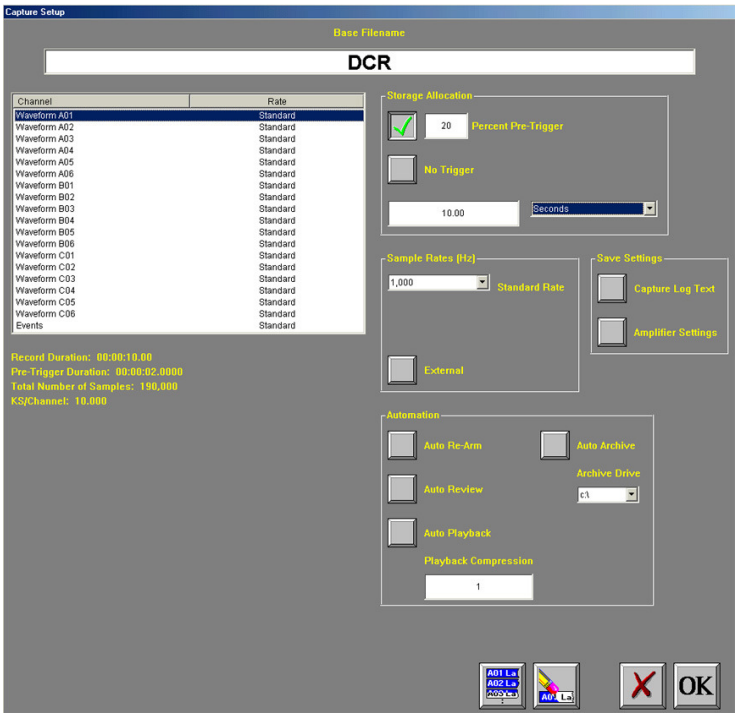


Manual Abort > This will Abort the capture



Trigger Indicator > This will indicate that your trigger condition is set up properly when it is yellow, without actually doing a capture. If the trigger level is passed, this will just flash yellow, If your voltage stays at the trigger level, this will stay yellow.

Set up a single data capture for 10 seconds. Of the total capture time, two seconds of the capture should show what the signal looked like before the battery voltage was applied. The sample rate will be 1,000 samples per second.



Capture Settings Window

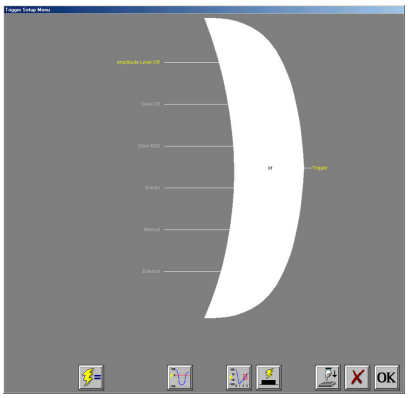
ACTION	HOW TO	(Use the Menu Bar Pull-Down menus)
Enter data capture setup	Choose **Capture > Capture Settings** from the menu bar for data capture setup.	

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Select capture of Channel 1	Highlight Waveform A01. Be sure the **Rate** for Channel 1 is **Standard**. If not, click on the **Rate** menu bar and select **Standard**.
Set sample rate to 1 kHz	In the Sample Rates box, press the down arrow titled **Standard Rate**. Scroll down and press **1,000**.
Set capture for 10 seconds	In the Storage Allocation box, press the units pull-down box and select **Seconds**. *(Other choices are minutes, hours and Ksamples).* Press the value box to open the Seconds Window. Press the digits "**1**" and "**0**". Press **OK**.
Set trigger point at 20%	In the Storage Allocation box, press the **Percent Pre-trigger** box. Press the digits "**2**" and "**0**". Press **OK**. *Be sure there is a green check mark next to the Percent Pre-Trigger.*
Verify time of capture	Below the waveform selection window, in yellow text, the Record Duration should be 10 seconds, the Pre-Trigger Duration should be 2 seconds.
Set capture for one record	In the Automation Box, be sure that both the Auto Re-Arm & Auto Archive are **not** checked. *At this point, your Capture Settings Window should look like the image above.*
Save and exit data capture setup	Press **OK**. *This completes the second part of the exercise, Data Capture Settings*

III. Trigger Setup and Data Capture:

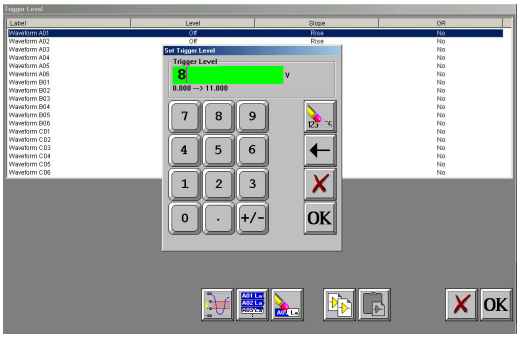
In the Data Capture Settings section above, a ten second capture was set up with two seconds of pre-trigger (data before the trigger). In this section, a trigger level of 8 Volts will be set with a rising slope so that as the signal rises and reaches 8 Volts, the data capture will be triggered.



Trigger Settings Menu

ACTION	**HOW TO (Use the Menu Bar Pull-Down menus)**
Enter Trigger Settings	Choose **Setup > Trigger Settings** from the menu bar to enter Trigger Settings.
Select level triggering	Press **Amplitude Level OR** to highlight in yellow. Be sure all other trigger types (other OR types, AND types, manual, etc.) are **not** highlighted. If so, press them to deselect.

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Trigger Level

Set to trigger when 9 Volts is applied



Press the Trigger Level button (2nd button located in row of buttons at the bottom).
In the Trigger Level window, highlight Waveform A01.
Press **Level**. Then press **New Value**. Press the digit "**8**". Press **OK**.
Press **Slope**. Then press **Rise**.
Press **OR**. Then press **Yes**.
Press **OK** at the lower right hand corner of the menu.
You have just set the trigger to be asserted when the signal input into channel one rises past 8 Volts.

Save and exit trigger setup

Press **OK**. Press **OK**.

Test your trigger setup



Input the 9 volt battery voltage and verify the **Trigger Indicator** flashes yellow as it goes by the 8V set trigger level. If it doesn't, recheck your trigger setup.

Arm for capture

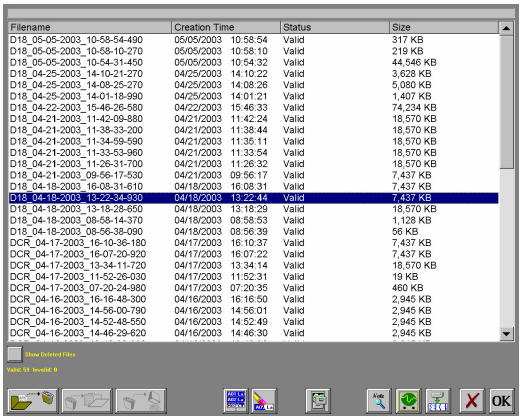
Choose **Capture > Arm** from the menu bar to arm for capture.
The Capture Progress window pops up indicating status.

Input battery voltage into Channel #1

A trigger should be produced and the capture continues to the end. While capturing, you should have seen the waveform for Channel #1 increase from the bottom of the grid to the top of the grid.
This completes the third part of the exercise, Trigger Setup and Data Capture.

IV. Data Review:

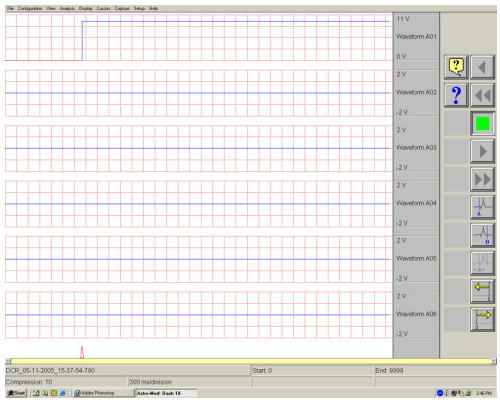
Data capture records can be reviewed on the color display. VCR-like control buttons allow for convenient scrolling through the data. Cursors can be placed on the data for measurements. During review, the time base can be expanded or compressed to give appropriate detail of the signal. From the display, part of or all the data can be saved.



List of data capture records for review

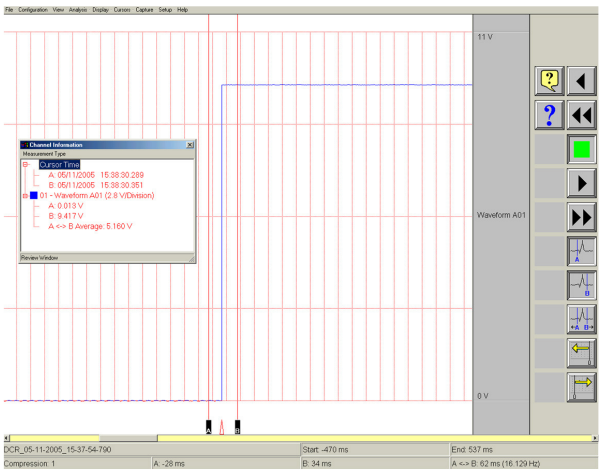
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ACTION	HOW TO (Use the Menu Bar Pull-Down menus)
Enter Review Mode	Choose **Configuration > Review** from the menu bar to enter the Review Mode.
Select file to be reviewed	Click on the top-most file name to highlight the capture. Press **OK**.



Data Capture Review of 9 Volt battery data capture

Show entire capture	Choose **Display > Show All File** from the menu bar to show entire capture. *Note: If the entire file is already shown, a check mark will be next to* **Show All File** *in the Display pull-down menu.*
Show the trigger point	Choose **Display > Show Trigger Line** from the menu bar to show the trigger point. *Note: The trigger line is shown as a red vertical line. If the trigger line is already shown, a check mark will be next to Show Trigger Line in the Display pull-down menu. Be sure the trigger line is shown on the display.*



Using cursors to make measurements

Show only Channel 1	Choose **View > 1 Channel** from the menu bar to show only Channel 1.
Expand the time base	Choose **Display > Compression** from the menu bar. Press the digit "**1**". Press **OK**.

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Scroll through the data	Use **VCR** buttons. You can jog forward or backwards through the data. You can stop at any points of interest. Experiment scrolling forwards and backwards. Continue to scroll and stop the display when you have the trigger point (red vertical line) in the middle of the display.
Cursors	Press the **A** cursor button. Slide the cursor just to the left of the trigger point. Press the **B** cursor button. Slide the cursor just to the right of the trigger point. *Hint: You can move the active cursor (black) by touching anywhere on the display and sliding your finger to where you want the active cursor or use the yellow arrow buttons to fine tune the location of the cursors. You can change the active cursor by clicking on the button below the A & B cursor buttons. This button will toggle between A, B, and AB to change which cursor is active or make both active.*
Time measurements using cursors	Choose **View** > **Status Text Format** > **Relative Time** from the menu bar. Observe the time values shown at the bottom.
Add the Channel Information button	**Setup** > **Control Panel Settings** > **Analysis** > **Channel Information**
Amplitude measurements using cursors	Click on the Blue **I** button to bring up the Channel Information. You can resize by grabbing the lower right hand corner. You can move it by clicking on the heading and dragging it. You can choose measurement type by clicking on the words **Measurement Type,** that are located underneath the Channel Information title bar. Move Cursor **B** by sliding it to the right. As you move the cursor, observe the change in values in the Channel Information window. Press a yellow arrow button to move a cursor. Observe the change in values in the Channel Information window.
Remove the cursors	Press the **A** cursor button and **B** cursor button to remove them.
Show entire capture	Choose **Display** > **Show All File** from the menu bar to show entire capture. *This completes the sample exercise.*

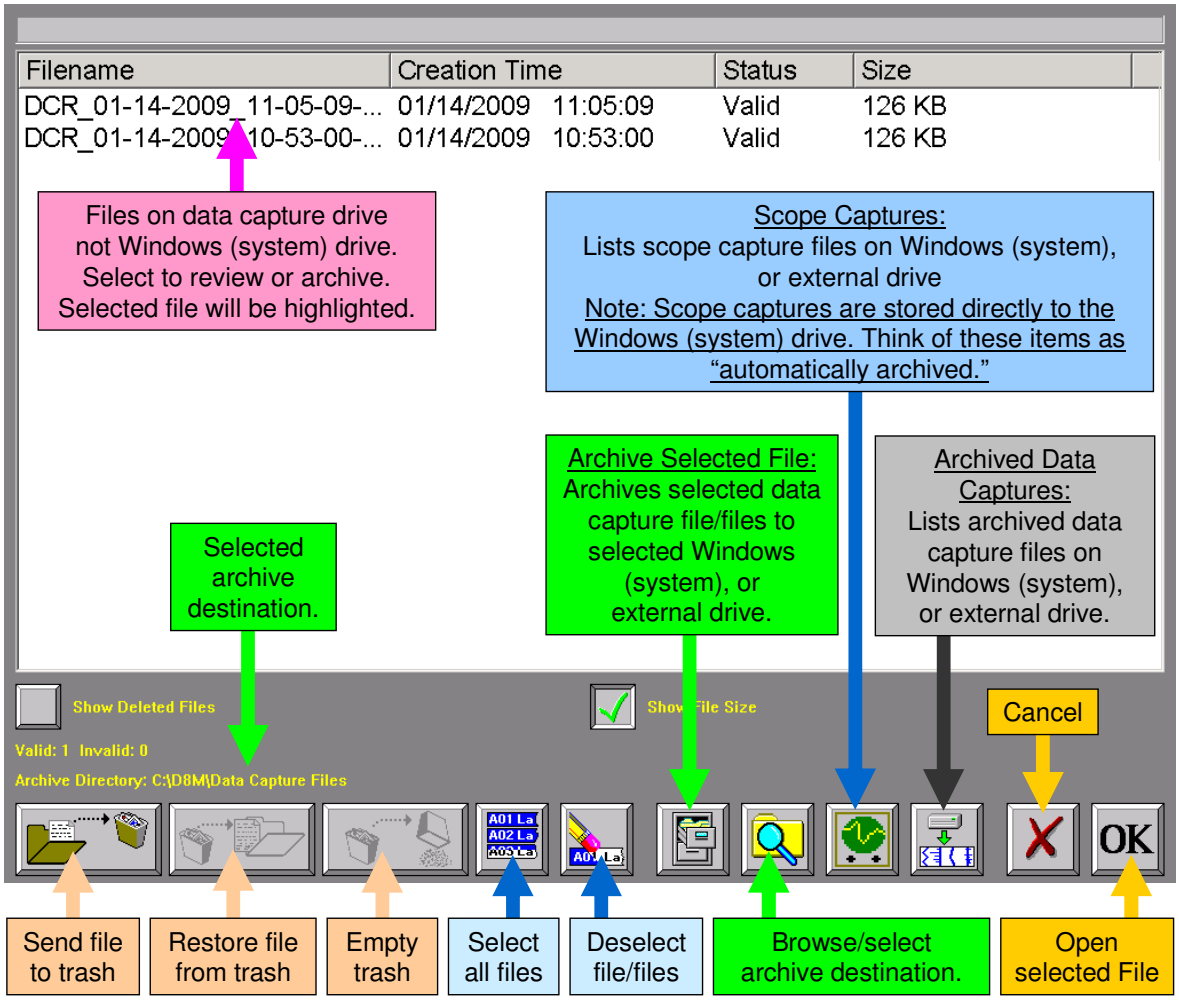
9. ARCHIVING DATA RECORDS

There are two hard drives in the ***Dash 18X / Dash 18***. The first is the Windows (System) drive and the second is the data capture drive. During data capture, the data is streamed to the data capture drive. Once the data capture is complete, the file can be reviewed on the ***Dash 18X / Dash 18***. However, to export the data out of the ***Dash 18X / Dash 18***, the user must archive it from the data capture drive to the Windows (system) drive or directly to an external USB source.

The data capture drive is not accessible through Windows Explorer. The only way to export or archive the data off the capture drive is by using the ***Dash 18X / Dash 18*** software environment. Data is handled this way in order to maintain the integrity of the recording.

ACTION	**HOW TO (Use the Menu Bar Pull-Down menus)**
Enter Review Mode	Choose **Configuration** > **Review** from the menu bar to enter Review Mode.

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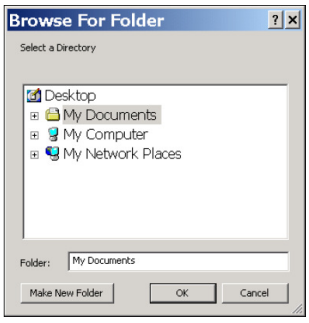
Summary of Review Mode Screen Icons

Choose Archive Directory

By default, the file will be saved on the system drive (C) in the noted location. The path to this location is displayed in yellow text (see above). If necessary, the file can be saved in a different location. To select an alternative file location, the Browse/select archive folder button.



The Browse for Folder window will appear.



Browse for Folder window

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Select File Location

Note: The ***Dash 18x*** / ***Dash 18***, USB port is assigned drive letter D or E depending on whether or not you have a CD/DVD drive or not.

Select File to Archive

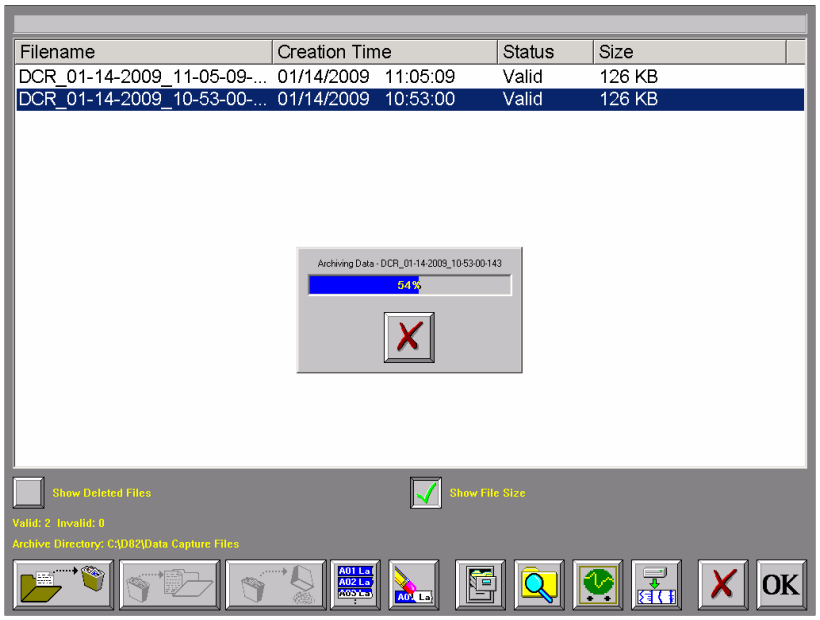
Select a file location and choose the **OK** button on the Browse for Folder window. The path displayed in yellow text will be updated to indicate the new file destination.

Select the file that you wish to archive. The selected file will be highlighted.

Archive File

Select the Archive File button to archive the selected file.
A status pop-up will appear showing the percentage completed.
Once the file has completed archiving, select **OK** to exit the Review mode screen.





Review Mode Screen Showing Archiving file Status

Note: The ***Dash 18X*** / ***Dash 18*** series offers additional methods to archive data.
The user can archive all or part of a file while reviewing along with archiving in ASCII format.
Please see the ***Dash 18X*** / ***Dash 18*** operations manual for additional information.

This concludes the Archiving Data Records section.

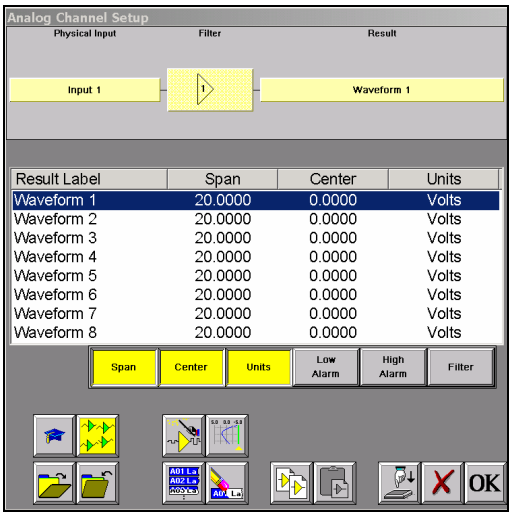
10. ENTERING ENGINEERING UNITS

Engineering units provide the capability to display user-selected units instead of voltage. All signal information enters the ***Dash 18X*** / ***Dash 8X*** as voltage. However, converting the voltage unit to an alternative unit of measure may be desirable in applications that measure current, pressure, strain, or any non-voltage unit.

This allows the ***Dash 8Xe*** / ***Dash 18*** to be compatible with transducers and probes that can provide a voltage output to the ***Dash 18X*** / ***Dash 18***. The relationship between the voltage and the engineering unit is assumed to be linear, characterized by a slope and offset (y = mx + b).

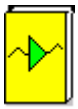
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The following is an example of entering engineering units into the ***Dash 18X*** / ***Dash 18***. For this example, we will assume we are entering the engineering units for a current probe that provides a **10mV**/**A** voltage output to the ***Dash 18X*** / ***Dash 18***.

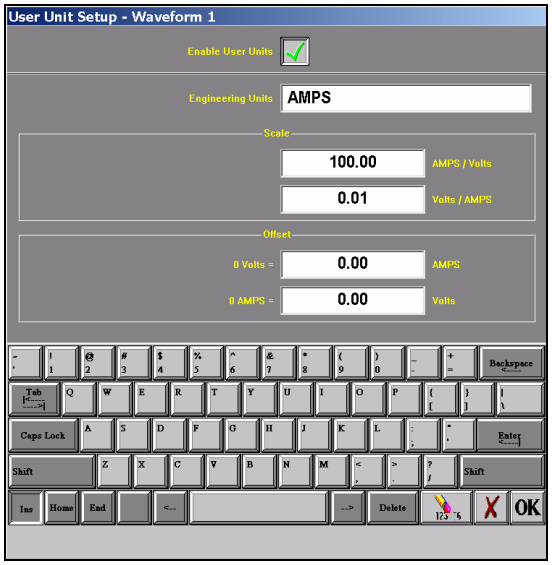


Dash 18X / ***Dash 18*** *Amplifier Channel Settings (Analog Channel Setup) Window*

ACTION	**HOW TO** **(Use the Menu Bar Pull-Down menus)**
Set the engineering units on Channel #1 to be 10mV/A	Click on the **Amp Setup** button on the control panel. Highlight **Waveform 1**.
Open User Units Menu	Click on the gray heading button **Units >> Enter User Units**, the **User Unit Setup – Waveform 1** window will appear.
Enable User Units	Click on the **Enable User Units** box located in the top center of the this window, so there is a green check mark in the box.
Enter User Unit	Click on the **Engineering Units** box under the **Enable User Units** box. A keypad will appear. Erase the unit **Volts** and enter **AMPS.**
Enter Scale	Under the **Engineering Units** box there is a section named **Scale**. Now that you have entered **AMPS**, you can now enter either **AMPS**/**V** or **V**/**AMPS**. Since our probe has a **10mV**/**A** output, we will enter **0.01** into the **V**/ **AMPS** box. Press the **V** / **AMPS** box and enter **0.01** into the **Scale** keypad. Press **OK** on the **Scale** keypad. Press **OK** on the **User Unit Setup – Waveform 1** screen. Press **OK** on the **Analog Channel Setup** window. Waveform (Channel) 1 is now set to measure current using a 10mV/A current probe.



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User Unit Setup – Waveform 1

This concludes the engineering units example.

9. POWERING DOWN

When the power switch is set to the off position or if AC power is lost or removed, the Dash 18X / Dash 18 begins the power down sequence. This is indicated by the green LED next to the power switch that will be on while the power down sequence occurs. Note that the LED will either be a solid green or it may flicker. It is **very important** not to turn the power switch back to the on position during the power down stage. The Dash 18X / Dash 18 must be allowed to complete the power down sequence to insure proper operation.

This completes the Dash 18X / Dash 18 Quick Start Guide. Please note that the Dash 18X / Dash 18 has much more capability than presented in this guide. Please see the Operations Manual for details. Should you require additional assistance, you can contact our Technical Support Department toll-free at 877-867-9783 or by e-mail: techserv@astromed.com

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