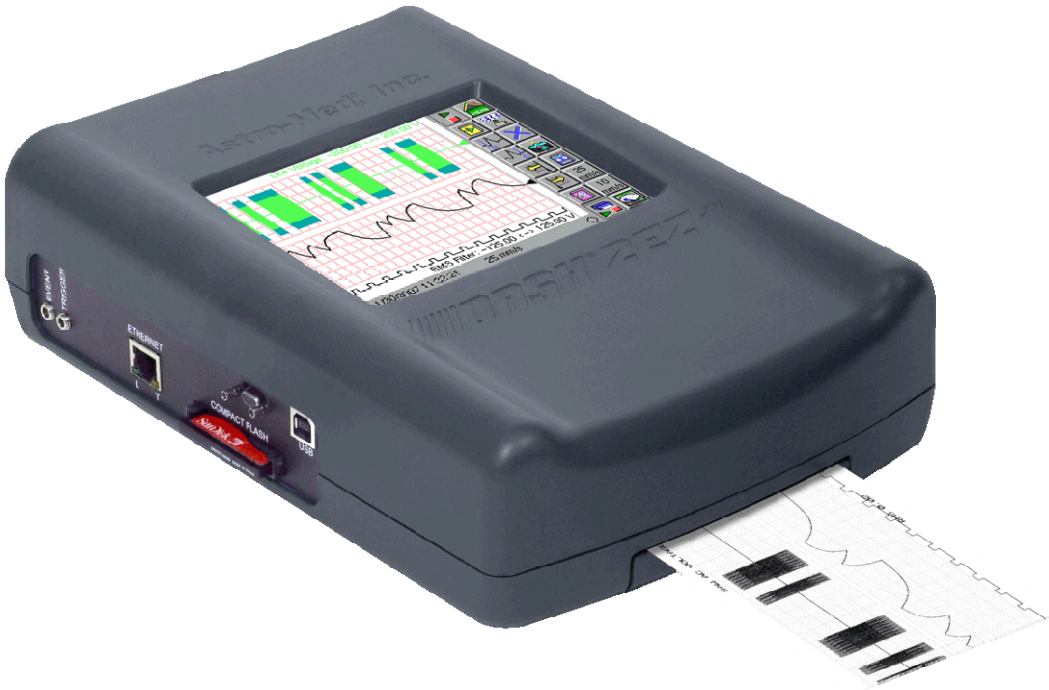




Hand-Held Data Acquisition Recorder



QUICK START GUIDE

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1. INTRODUCTION

Thank you for choosing an Astro-Med data acquisition recorder. This Quick Start Guide was prepared to help you become acquainted with your **Dash 2EZ+** recorder as quickly as possible. We include sample examples and exercises throughout this Quickstart guide so you can become familiar with the basic operation of the unit.

The **Dash 2EZ+** is a powerful and versatile hand-held data acquisition system with integrated chart recorder that provides the capability to display, record, review and print waveform data.

Data samples can be acquired at rates up to 40,000 samples per second per channel and streamed directly to a CompactFlash® card (2 GB maximum).

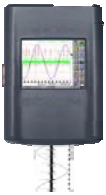
The **Dash 2EZ+** utilizes a touch-screen as the main user interface. Many of the **Dash 2EZ+** control icons are customizable, providing the capability to modify the display based on the needs of the user or application.

Please note that the **Dash 2EZ+** has much more capability than presented in this Quickstart guide. The **Dash 2EZ+ Operations Manual** (Part Number 22834552) can provide additional details.

2. HARDWARE OVERVIEW

The following is a summary of the location of the physical components of the **Dash 2EZ+**.

Front View:



Touch-screen: The touch-screen serves as the user interface for the **Dash 2EZ+**. On-screen menus and icons can be selected by touching the display. Alternatively, a stylus may be used to select on-screen menus and icons.

Serial port: The serial port is not currently used.

USB 2.0 port: The USB 2.0 port is used to transfer data capture files to a PC. For more information, refer to **Analyzing data capture files on a PC with AstroVIEW X** in the **Dash 2EZ+ Operations Manual** Chapter 8.

Left Side View:



Event phone jack input: The event phone jack input provides the capability to mark an event using an outside signal. Event signals have a high state (switch open) and a low state (switch closed), and are TTL and switch closure compatible.

Trigger phone jack input: The trigger phone jack input provides the capability to invoke a trigger using an outside signal. A falling edge or switch closure on this line will cause an external trigger.

Ethernet port (10/100 Mbps): The 10/100 Mbps Ethernet port is used to transfer data capture files to a PC. For more information, refer to **Analyzing data capture files on a PC with AstroVIEW X** in the **Dash 2EZ+ Operations Manual** Chapter 8.

CompactFlash drive: CompactFlash cards (2 MB maximum) are used to accomplish the saving and loading of setup files along with the recording (capturing) and reviewing of data capture files.

You can insert and remove CompactFlash cards while the **Dash 2EZ+** power is on or off. To insert a CompactFlash card, slide the card into the CompactFlash drive slot. Gently press the card to set it into place. To remove the card, gently pull it out from the CompactFlash drive slot.

Note: Before the **Dash 2EZ+** can save data or setup files, the CompactFlash card must be formatted. Instructions on formatting the CompactFlash card are presented in the Sample Exercise section 13 of this Quick Start guide.

Continued...

Power switch: The power switch is used to power-up and power-down the *Dash 2EZ+*. The power-up sequence requires less than one minute.

Right Side View: Power inlet: The power input is used to connect the power cord to the *Dash 2EZ+*.

Power indicator light: The power indicator light is used to visually indicate the power status of the *Dash 2EZ+*. When the unit is operating, this indicator will remain lit.

Stylus: The stylus can be used to select on-screen menus and icons. To remove the stylus, slide it out of the built-in holder.

Back Side View Paper door: The paper door provides access to the strip chart recorder paper.

3. GETTING STARTED

Voltage Verification: The *Dash 2EZ+* comes with an external power supply that operates from 102 – 264 VAC at 50 or 60 Hz. You do not have to set up any fuse block arrangement.

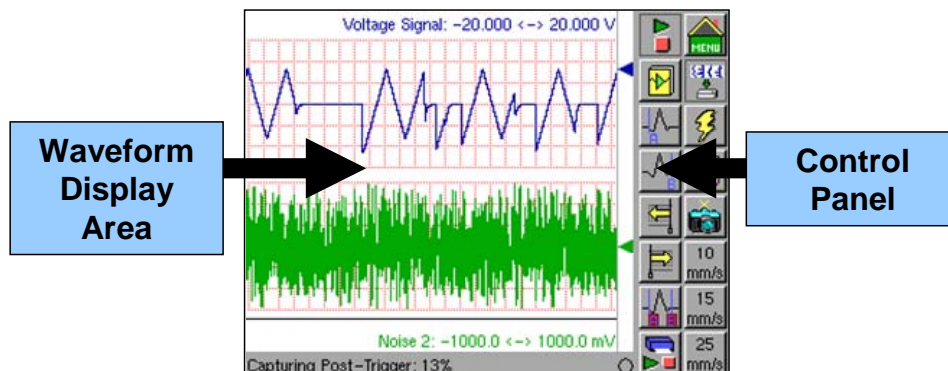
Connect AC Power Cord: Connect AC power cord to the side panel, then to an outlet. The *Dash 2EZ+* has an internal rechargeable Lithium Ion battery; it takes four hours to completely charge the battery. The battery provides approximately 1.5 hours of use; this may vary based on the functions used. For example, constant printing will use more battery power than viewing data. The unit will operate from AC power when plugged in. The unit does not need to be powered on to charge the battery.

BATTERY POWER	
Battery Type	Lithium Ion (rechargeable)
Charge Time	4 hours
Battery Life	1.5 hours (capturing to CF card) 60 min (printing at 5 mm/s)
POWER	
Input Voltage Range	9-24 VDC (> 14 VDC required for battery charging)
Power Consumption	35 W Max (15 W typ with chart halted)

Load Chart Recorder Paper: Please see *Chapter 2* of the *Dash 2EZ+ Operations Manual* for detailed instructions on loading *Dash 2EZ+* chart paper.

Turn On the *Dash 2EZ+*: When you turn on the *Dash 2EZ+* using the power switch located on the right hand side of the unit, the display will show various initialization screens and then load the default setup programmed on the unit.

Display: The *Dash 2EZ+* has a 5.7" 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 icons for operation).



Dash 2EZ+ Screen with waveforms and Control Panel

4. CONTROL PANEL ICONS

CONTROL PANEL

The **Control Panel** is a customizable group of icons located on the right side of the display. It can provide immediate access to virtually any function with one touch. Each mode of operation (**Realtime** and **Review**) utilizes its own customizable control panel.

The **ACTION** on the left-hand side describes the function.

The **HOW TO** section provides the detailed steps to take using the Dash 2EZ+ **Control Panel** and **Menu**.

ACTION

HOW TO (Customize the Control Panel)

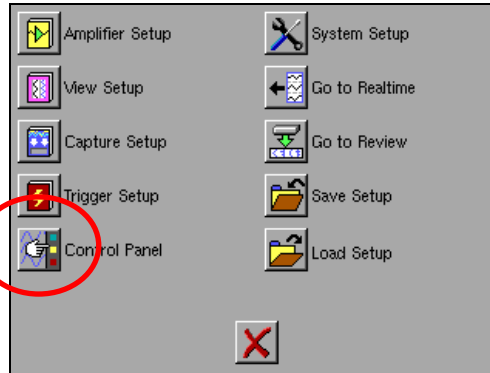
Add and Remove icons to/from the Control Panel

To customize the control panel:

1. Choose the **Menu** icon. The **Menu** icon is located at the top right hand side of the **D2EZ+** touchscreen. The main **Menu** screen will open.



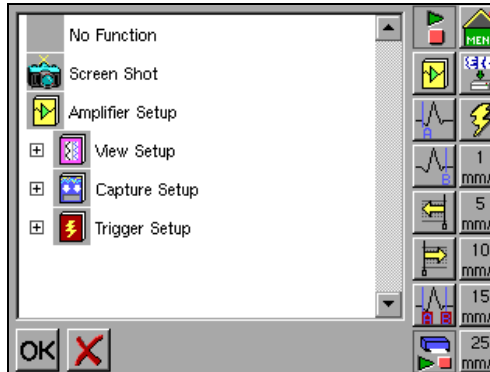
Menu Icon



Choose the **Control Panel** icon is located on the bottom left hand side of the **Menu** screen. The **Control Panel Setup** screen will open.



Control Panel Icon



The icon list on the left provides functions that can be added to the **Control Panel**. The columns on the right display the layout of the control panel. There are **16 icon slots** in the **Control Panel**. You can customize up to 15 of these icons; the upper-right icon slot is reserved for the **Menu** icon.

2. To add icons, select a function from the icon list on the left. Then choose a control panel icon slot. An icon for the chosen function will appear in the selected control panel location. If the location previously contained an icon, the icon will be replaced.

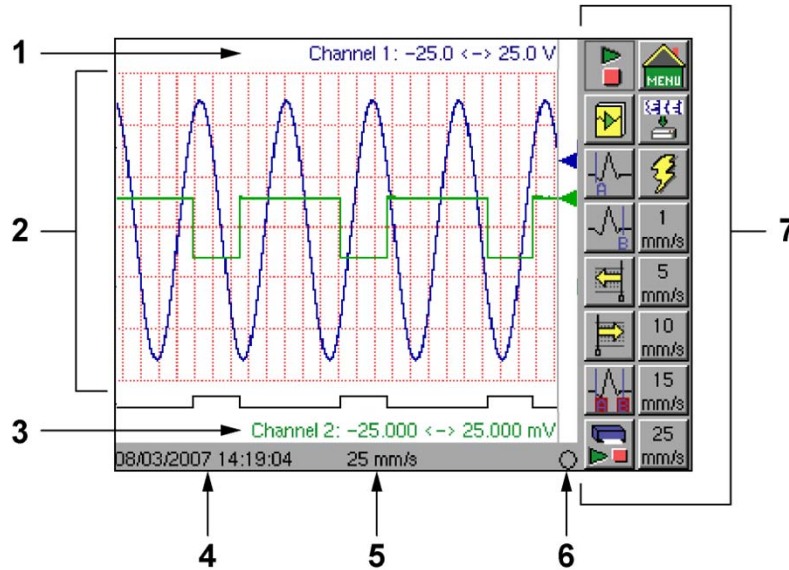
3. To remove icons, select the **No Function** block from the icon list on the left. Then choose a **Control Panel** icon slot. **Note:** The **Menu** icon cannot be removed or replaced.

4. Choose **OK** to complete the **Control Panel** customization.

5. USING THE DASH 2EZ+

The **Dash 2EZ+** has two modes of operation, **Realtime**, and **Review** modes.

Realtime Mode: The **Dash 2EZ+ Realtime** mode is the default mode for the **Dash 2EZ+**. **Realtime** mode provides real-time waveform scrolling, monitoring, and data capture capabilities. The following illustration displays a typical screen during **Realtime** recording. Screen appearances will vary based on icon configurations and other selected options.



Layout of the **Dash 2EZ+ Realtime Mode** Screen

- (1) Channel 1 Status Area or Cursor Information or Meter Reading
- (2) Waveform Display Area
- (3) Channel 2 Status Area or Cursor Information or Meter Reading
- (4) Date and Time Indicator
- (5) Chart Speed Indicator
- (6) Trigger Indicator
- (7) Customizable Control Panel (16 Icons Max)

The **ACTION** on the left-hand side describes the function.

The **HOW TO** section provides the detailed steps to take using the Dash 2EZ+ **Control Panel** and **Menu**.

ACTION
Enter
Realtime
Mode

HOW TO (Enter Realtime Mode from the Main Menu)

The following are instructions to enter **Realtime** mode from the main **Menu**. These instructions also apply to accessing the **Amplifier Setup**, **View Setup**, **Capture Setup**, **Trigger Setup**, **Control Panel**, **System Setup**, **Go to Realtime**, **Go to Review**, **Save** and **Load Setup** menus from the main **Menu**.



Menu Icon

1) Choose the **Menu** icon. The **Menu** icon is located at the top right hand side of the **D2EZ+** touchscreen. The **Menu** screen will open.

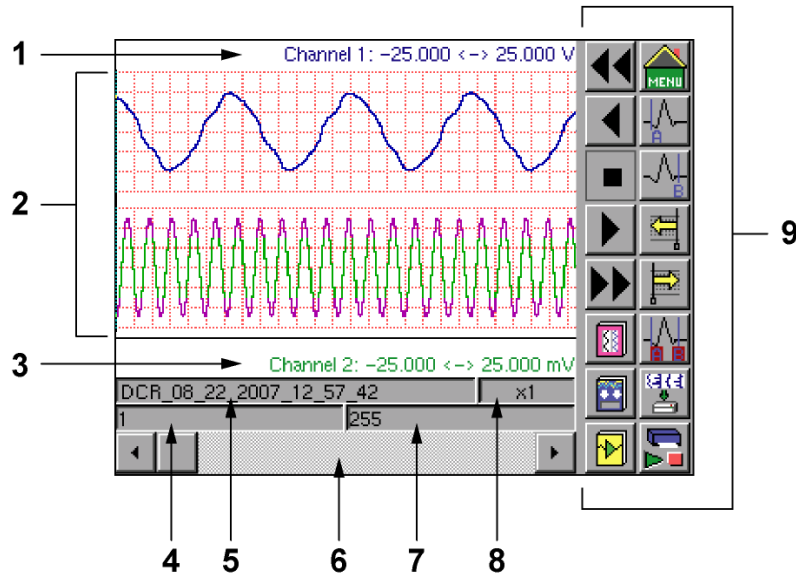


Go to
Realtime
Icon

2) Choose the **Go to Realtime** icon located in the top right hand corner of the Main **Menu** under the System Setup icon. **Realtime** mode will open.

Continued...

Review Mode: The *Dash 2EZ+* data capture **Review** mode provides the capability to review and analyze saved data captures. The following illustration displays a typical screen during review. Screen appearances will vary based on icon configurations and other selected options.



Layout of the *Dash 2EZ+* Review Mode Screen

- (1) Channel 1 Status Area or Cursor Information or Meter Reading
- (2) Waveform Display Area
- (3) Channel 2 Status Area, Cursor Information or Meter Reading
- (4) Cursor or Left side Measurement
- (5) View data capture name, time/division, or print menu
- (6) Scroll Bar
- (7) Cursor or Right side Measurement
- (8) Compression / Expansion
- (9) Customizable Control Panel (16 icons max)

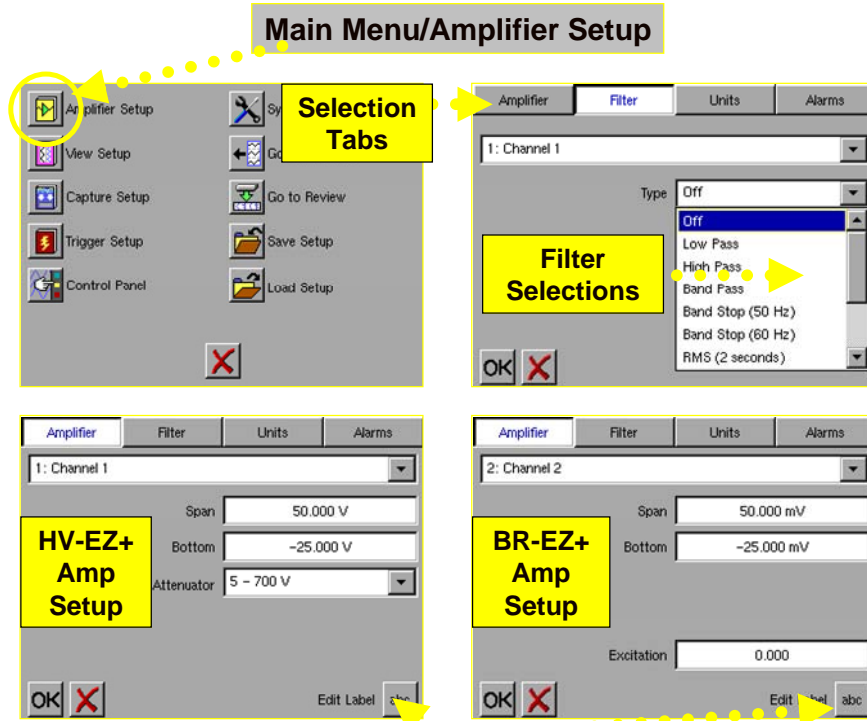
Note: A basic hands-on Review Mode lesson is part of the Sample Exercise covered in section 13 of this QuickStart Guide.

6. AMPLIFIER SETUP

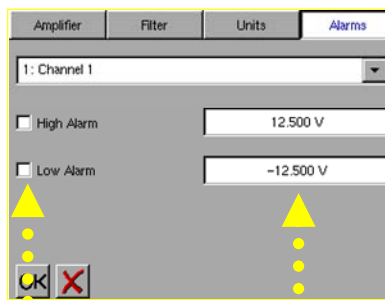
The **Amplifier Setup** menu allows the user to set the span for the channel and to adjust the zero volt position. Each factory installed module type (**HV-EZ+, Isolated Voltage module and/or BR-EZ+ Isolated Differential Voltage Bridge Module**) have unique amplifier settings. The **BR-EZ+** module also provides up to 10V excitation for bridge sensors. Excitation for the **BR-EZ+** is set in the **Amplifier** tab of the **Amplifier Setup** menu.

The **Dash 2EZ+** can be purchased with either two factory installed **HV-EZ+, Isolated Voltage modules, two BR-EZ+ Isolated Differential Voltage Bridge Module** or one of each.

The **Dash 2EZ+** Amplifier setup also contains signal **Filter** selections. Further, user scaling is supported on the **Dash 2EZ+** so that your channels can report their values to you in Engineering **Units**. **Alarms** can be set that will change the color of the displayed waveform (screen only) when it passes through a pre-defined level. The selection tabs at the top of the **Amplifier Setup** menu allow the user easy access to all of the **Amplifier Setup** features.



User Defined Channel Labels



High and Low alarms can be enabled and set for Channels 1 & 2. Alarm colors are defined in the "View" menu.

The **Filter, Amplifier and Alarms** sections of the **Dash 2EZ+ Amplifier Setup** Menu

Note: A basic hands-on Amplifier Setup lesson is part of the Sample Exercise covered in section 13 of this QuickStart Guide. An example of entering Engineering Units is presented in section 12.

7. VIEW SETUP

The **View Setup** menu allows the user to set the grid and waveform display. The **Format** tab gives the user the ability to customize the **Grid** and **Event** styles along with the chart **Speed** (Chart speed icons can be placed on the **Control Panel**). The **Colors** tab is used to assign waveform colors and alarm conditions. The **Measure** tab gives **Realtime** and **Review** cursor measurements (**Maximum-Minimum, Average, Peak to Peak, Slope, RMS, Samples, Absolute Time and Relative Time**).

Main Menu/View Setup

Selection Tabs

Format | Colors | Measure | Text

2 Grid

Grid Divisions

1: Channel 1 6

2: Channel 2 6

Time (mm) 5

Minors

Meter

OK X

Pen Lift

1: Channel 1

2: Channel 2

Speed

25 mm/s

Event Style

Standard

Screen Halt

Print Halt

User selectable colors (display only) for waveforms, alarms and over range conditions.

Format | **Colors** | Measure | Text

Item

1: Channel 1 - Base

Color

Blue

Print Darkness

OK X

User selectable grid setup allows grid overlap for quick signal comparison and customizable grid layout

Print Darkness Adjustment

Format | Colors | **Measure** | Text

Type Maximum - Minimum

Time Samples

Show Cursor A

Show Cursor B

OK X

Format | Colors | Measure | **Text**

System

1: Channel 1

2: Channel 2

OK X

User Selectable Cursor & Time Measurements

Maximum - Minimum

Average

Peak to Peak

Slope

Root Mean Square

Samples

Absolute Time

Relative Time

System Text and Channel Text Buffers (Prints on Chart Paper Only!)

The **Format, Colors, Measure and Text** sections of the **Dash 2EZ+ View Menu**

8. CAPTURE SETUP

The **Dash 2EZ+ Capture Setup** allows the user to customize the recording of data to fit various applications. The **Channel Enable** section provides the interface to enable or disable **Channel 1**, **Channel 2** or the **Event** channel in the recording. The **Base Filename** of the record can be assigned along with the **data capture length** and **Sample Rate**.

The user can **Arm** and **Abort** data captures from the **Capture Setup** menu. The capture **Arm** and **Abort** icons can also be placed on the **Dash 2EZ+ Control Panel**.

Note: Before the user can input Capture Setup functions or capture data, a formatted CompactFlash card must be inserted. A basic data capture setup along with instructions on formatting the CompactFlash card are presented in the Sample Exercise section 13 of this Quick Start guide.

The diagram illustrates the **Main Menu/Capture Setup** interface. The main menu includes options for Amplifier Setup, System Setup, View Setup, Go to Realtime, Capture Setup (highlighted with a blue circle), Go to Review, Trigger Setup, Save Setup, Control Panel, and Load Setup. Below this, the **Capture Setup** dialog box is shown with several fields and options:

- Base Filename:** DCR (User Defined Data Capture file name)
- Channel Enable:**
 - 1: Channel 1
 - 2: Channel 2
 - Event
- Sample Rate:** 40000 (Sample Rate selection pull down menu)
- Length:** 10000 (Data Capture length pull down menu)
- Pre-Trigger:** 0
- Available:** 4710829
- Records:** 0
- Buttons:** OK, Arm (red lightning bolt), Abort (blue X), and a red X button.
- Options:**
 - No Trigger
 - Auto Rarm
 - Auto Review

Callouts provide additional information:

- Add/Remove Channel from Data Capture:** Points to the Channel Enable section.
- Data Capture length pull down menu:** Points to the length field.
- Arm and Abort Data Capture:** Points to the Arm and Abort buttons. *Note: Both of these icons can be placed on the Control Panel.*
- User Defined Data Capture file name:** Points to the Base Filename field.
- Sample Rate selection pull down menu:** Points to the Sample Rate field.
- Enable/Disable Software/Hardware Triggering:** Points to the No Trigger, Auto Rarm, and Auto Review options.
- Automatically Rarm or Review data capture after completion of capture:** Points to the Auto Rarm and Auto Review options.

The **Dash 2EZ+ Capture Setup** Menu

Note: A basic data capture setup is presented in the Sample Exercise found in section 13 of this QuickStart Guide.

9. TRIGGER SETUP

Triggers are user-defined events that initiate the post-trigger data capture process. The **Dash 2EZ+ Trigger Setup** menu provides various **Analog** and **Clock** trigger types.

Analog Channel Triggers

Manual - **Manual** is a commonly used method that allows the operator to initiate a trigger manually via the control panel.

External - **External** uses an external signal via the trigger phone jack to produce a trigger. The external signal is a switch closure to ground or TTL low to produce a trigger. Process control signals can be used to produce this trigger.

Rising - **Rising** produces a trigger when signals cross above a user-defined level.

Falling - **Falling** produces a trigger when signals cross below a user-defined level.

Rising or Falling - **Rising or Falling** produces a trigger when signals cross above or below a user-defined level.

Above - **Above** produces a trigger when signals are above a user-defined level. The trigger condition is in place as long as the signal stays above the level.

Below - **Below** produces a trigger when signals are above a user-defined level. The trigger condition is in place as long as the signal stays above the level.

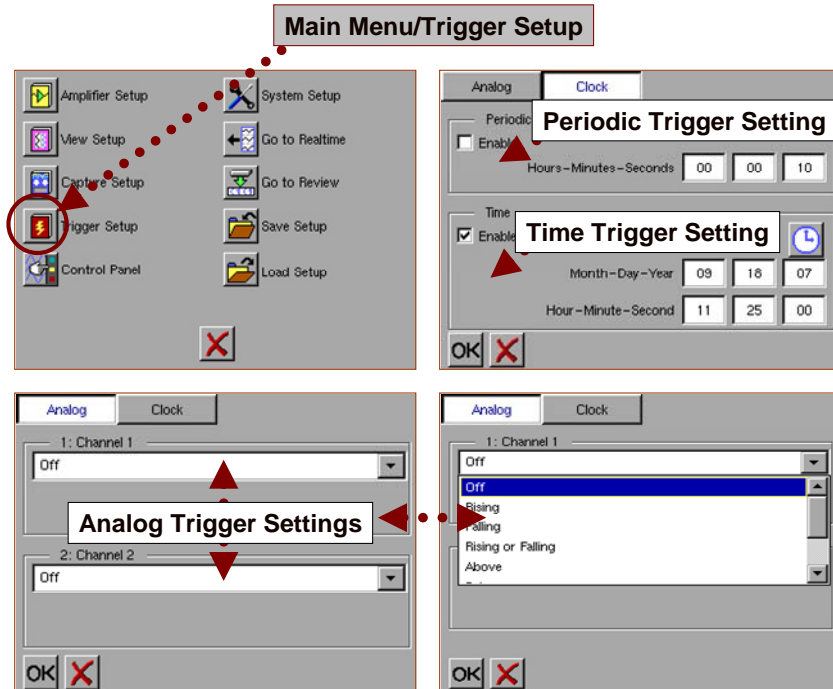
Outside - **Outside** produces a trigger while signals are outside of the user-defined high and low window limits. This method is exclusive of high and low settings.

Inside - **Inside** produces a trigger while signals are inside of the user-defined high and low window limits. This method is inclusive of high and low settings.

Clock Triggers

Periodic - **Periodic** produces a trigger after a specific amount of elapsed time. When the trigger occurs, this process will be repeated.

Time - **Time** produces a trigger at a specific date and time.



The **Dash 2EZ+ Trigger Setup** Menu

Note: A basic analog trigger setup is presented in the Sample Exercise found in section 13 of this QuickStart Guide

10. SAVING / LOADING SYSTEM SETTINGS

The **Dash 2EZ+** can save user configured setup files for **Realtime, Control Panel, Trigger and Capture** settings. These setting can be saved separately or together as one **Global** file.

Global setting files contain all system setup information that can be saved for later recall. These files can be considered a "complete setup" that can be saved and loaded as needed.

The **Dash 2EZ+** does not automatically save the latest setup when the unit is powered down.

When the **Dash 2EZ+** is powered up it will load any global file setup named "**defaults**" saved in the system memory. The user can save their favorite setup as "**defaults**" and the system will load it each time the **Dash 2EZ+** is powered on.

The user can also **Save** and **Load** many different user setups on the **CompactFlash®** card and/or in **System** memory.

ACTION HOW TO (Save Global Settings Files)

Save Global Settings File Choose the **Menu** icon. The **Menu** screen will open.

Select the **Save Setup** icon. The **Save Setup** file screen will open.

Select **Global Settings Files** from the file type list.

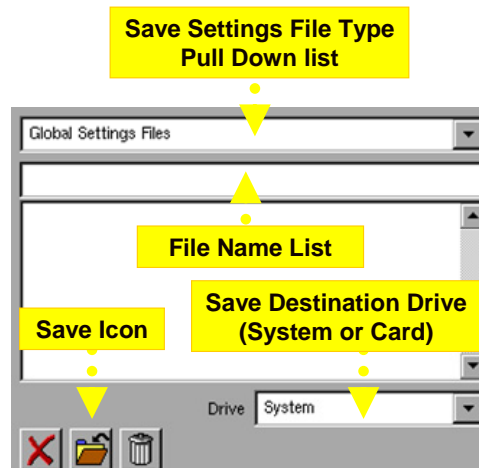
Select a destination drive for the file.

- To save the file to the system drive, select the System option.
- To save the file to the CompactFlash card, select the Card option.

Note: Before the Dash 2EZ+ can save setup files to the Compact Flash card, a formatted CompactFlash card must be inserted. Instructions on formatting the CompactFlash card are presented in the Sample Exercise section 13 of this Quick Start guide.



Save Setup
and Save
Icon



Dash 2EZ+ Save Settings File Menu

Choose the file name field above the file list. A keypad will appear.

Enter a name for the file and choose the **OK** button. The specified file name will appear in the field.

Choose the **Save** button. The global settings file will be saved. **Global** settings files are saved with the **“.GBL”** file extension. Press **X** to exit the **Save Setup** menu.

Caution: While a file is being saved, the message "**Writing File**" will be displayed below the drive list. Do not remove the CompactFlash card or turn the power off while this message is displayed. Turning the power off or removing the card while data is being written to it may result in data loss.

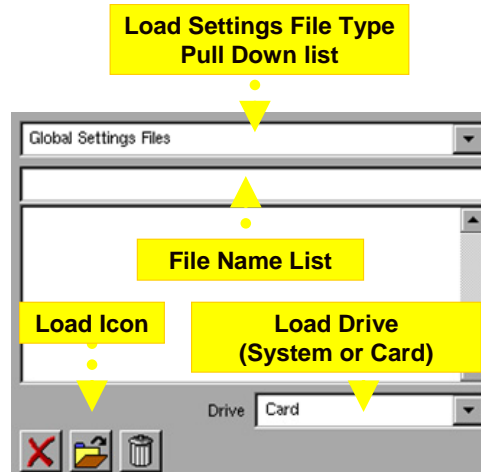
Continued...

ACTION **HOW TO** **(Load Global Settings Files)**

**Load
Global
Settings
File**

Choose the **Menu** icon. The **Menu** screen will open.

Select the **Load Setup** icon. The **Load Setup** file screen will open.



Dash 2EZ+ Load Settings File Menu

Select **Global Settings Files** from the file type list.

Select the drive that contains the file.

- To load the file from the system drive, select the System option.
- To load the file from the CompactFlash card, select the Card option.

Select a file from the file list.

Choose the **Load** button.

The **Global Settings File** will be loaded. Press **X** to exit the **Load Setup** menu.

11. INTEGRATED CHART RECORDER

The high-resolution strip chart recorder can print **Realtime** or **Review** (captured) waveforms. The printed waveforms will correspond to the waveforms on the display. If the frequency of a waveform is too high for the printer to print effectively, the waveform will print as a light gray band.

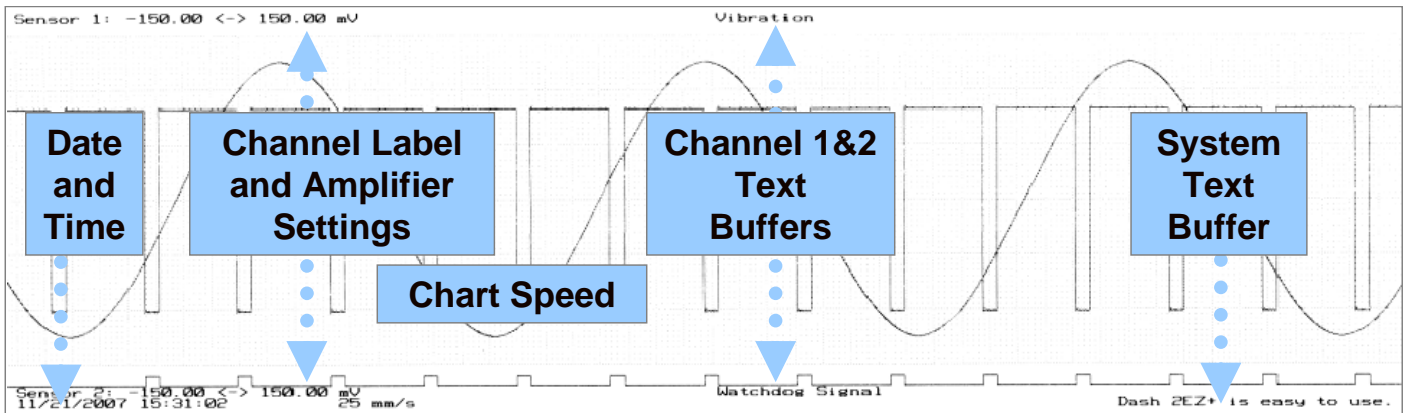
ACTION **HOW TO** **(Run and Halt the Printed Chart)**

Run/Halt the Integrated Chart Recorder Press the **Chart Run/Halt** icon in either **Realtime** or **Review** mode to run/halt the chart. If the **Chart/Halt icon** is not in your control panel, please see section 4 of this Quickstart guide for instructions on adding icons to the **Dash 2EZ+** control panel.



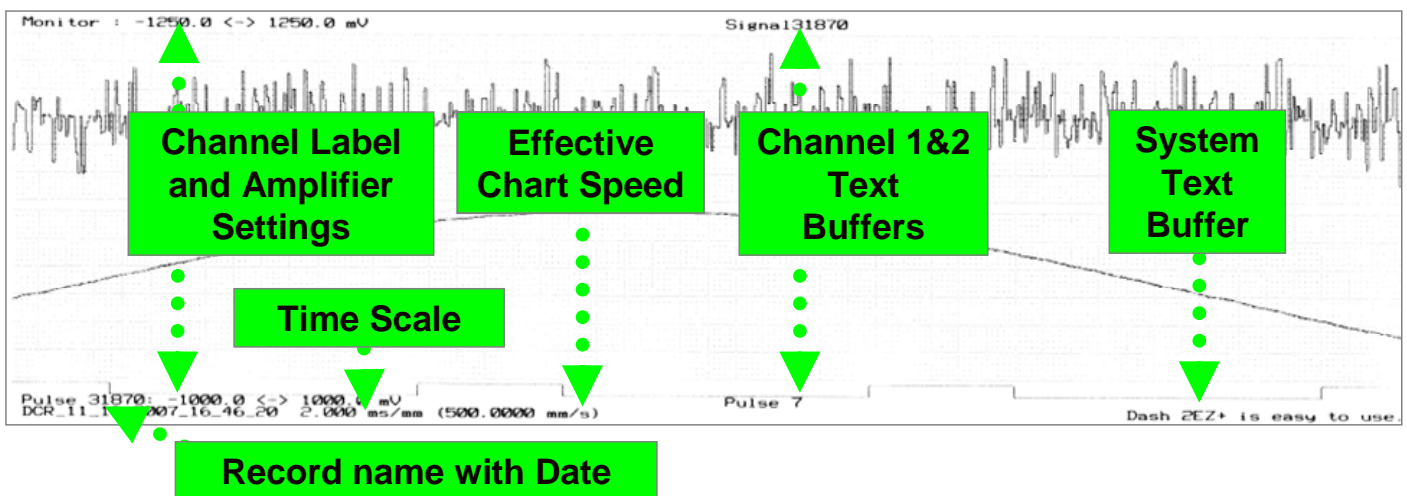
Chart Run/Halt Icon

The **Realtime** mode chart prints channel labels and text buffers as defined by the user. The chart also prints the date, time and real-time chart speed.



Dash 2EZ+ Example of Realtime Mode Chart

The **Review Mode** chart prints the same information as defined by the user in Realtime Mode with one convenient addition. The **Review Mode** chart provides the user with a printout of the effective chart speed. The effective chart speed predicts the equivalent Realtime speed of the printed chart to achieve the time scale. The effective chart speed is also the reciprocal of the time scale.



Dash 2EZ+ Example of Review Mode Chart

12. ENTERING ENGINEERING UNITS

Engineering **Units** provide the capability to display user-selected units instead of voltage. All signal information enters the **Dash 2EZ+** 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 2EZ+** to be compatible with transducers and probes that can provide a voltage output to the **Dash 2EZ+**. The relationship between the voltage and the engineering unit is assumed to be linear, characterized by a slope and offset ($y = mx + b$).

The following is an example of entering engineering units into the **Dash 2EZ+**. For this example, we will assume we are entering the engineering units for a current probe that provides a **100mV/A** voltage output to the **Dash 2EZ+**.

The **ACTION** on the left-hand side describes the function. The **HOW TO** section provides the detailed steps to take using the **Control Panel** and **Amplifier Setup** menu.

ACTION	HOW TO	(Enter Engineering Units)
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<p>Enter the Amplifier Setup Menu</p>	<p>Choose the Menu icon. The Menu icon is located at the top right hand side of the D2EZ+ touchscreen. The Menu screen will open.</p>
--	---

	<p>Choose the Amplifier Setup icon located in top left hand corner of the main Menu. The Amplifier Setup menu will open. Choose the Units tab to display engineering units options.</p>
--	---

<p>Select Channel and Enable Units</p>	<p>Select the Channel to set up from the channel pull down list.</p> <p>Check the Enable option located at the bottom of the Units tab to enable engineering units for the selected channel.</p>
---	---

	<p>Choose the Precision field. A number pad will appear. Enter a Precision value for the engineering units to indicate the number of decimal places that will be used. You can specify up to six decimal places. For this example, enter “3”.</p>
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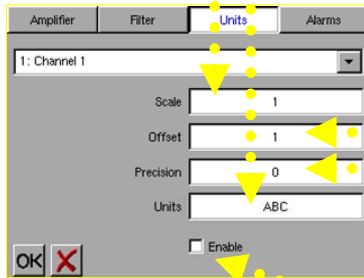
<p>Set Precision, Scale, Units and Offset</p>	<p>Choose the Scale field. A number pad will appear. Enter the waveform change in engineering units that is equal to one module unit. Then choose the OK button.</p>
--	---

	<p>Choose the Units field. A keypad will appear. Enter a name (display label) for the units. For our example, AMPS would be an appropriate label denoting current. Then choose the OK button.</p>
--	---

	<p>Choose the Offset field. A number pad will appear. Enter the number of module units that is equal to zero engineering units. For this example, Offset is not needed. Choose the “X” button to exit the Offset menu.</p>
--	---

	<p>Choose the OK button to complete the engineering unit setup process. Select the Goto Realtime icon to return to the Realtime screen.</p>
--	---

The Scale equals one engineering unit per one module unit.
 For example: Current probe MN255 (accessory part number 24661300) has a 100mV/A setting for the 20A measurement range.
 Using the HV-EZ+ isolated voltage module the scale would be 10 (10V per AMP) and the units would be entered as AMPS.



The user can set an offset on the measurement if required.

The user can set the number of decimal places to be used (up to six).

The user must check the “Enable” box to activate the Engineering unit settings entered.

The **Units** section of the **Dash 2EZ+ Amplifier Setup Menu**

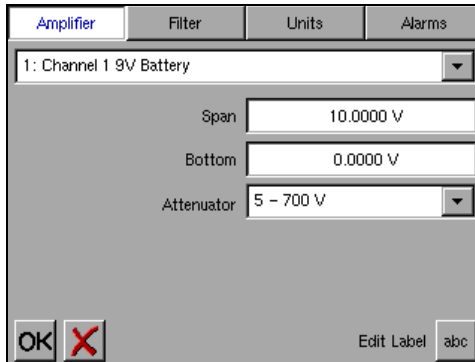
13. SAMPLE EXERCISE

In the following hands-on exercise, you will set up a channel to monitor a 9 Volt battery in Realtime. Next, a data **capture** initiated with an **Analog trigger** will be set up to record when the battery voltage is applied. Finally, the captured data will be **reviewed** and a portion will be **printed** using the **integrated chart recorder**.

Items Needed: 9 Volt battery. Signal input leads and a **Dash 2EZ+** with at least one HV-EZ+ module. For this example we will assume Channel 1 is installed with an **HV-EZ+** module.

The **ACTION** on the left-hand side describes what is to. The **HOW TO** section provides the detailed steps to take using the **Control Panel** and various setup menus.

ACTION	HOW TO (Set the Channel 1 Amplifier Setup for this Exercise)
Turn On the Dash 2EZ+	Turn on the power switch located on the right hand side of the Dash 2EZ+ .
Enter the Amplifier Setup Menu	Enter the main Menu by selecting the Menu icon located at the top right hand corner of the Control Panel . Enter the Amplifier Setup menu by selecting the Amplifier Setup Icon on the main Menu screen. The Amplifier Setup screen will open.
Disable engineering units	Select the Units tab on the top of the Amplifier Setup screen. Make sure the Enable box at the bottom of the Units tab is not selected (no check mark). We do not want engineering units enabled . Engineering Units will be covered in section 12 of this quick start guide.
Disable Filters	Select the Filters tab on the top of the Amplifier Setup screen. Make sure the Filter type for Channel 1 is Off .
Select Channel 1	Select the Amplifier tab on the top of the Amplifier Setup screen. Select Channel 1 from the Channel pull down list.
Choose Attenuator	Select the 5 – 700 V attenuator from the Attenuator pull down list.
Set Channel 1 Span & Bottom	Select the Span and enter " 10 ". Select the Bottom and enter " 0 ".
Edit Channel Label	Select the Edit Label icon located in the bottom right hand corner of the Amplifier tab of the Amplifier Setup menu. Enter Channel 1 9V Battery and press OK .



Example of **the Amplifier Menu / Amplifier** tab for this Sample Exercise

Return to main Menu Press the **OK** icon located in the bottom left hand corner of the **Amplifier** Tab of the **Amplifier Setup** menu to return to the **Realtime** screen.

Continued...

ACTION **HOW TO** **(Set the Channel 1 View Setup for this Exercise)**

Enter the Format tab of the View Setup Menu

Enter the main **Menu** by selecting the Menu icon located at the top right hand corner of the **Control Panel**. Enter the **View Setup** by selecting the **View Setup** Icon on the main **Menu** screen. The **View Setup** screen will open. Select the **Format** tab on the top of the **View Setup** screen.

Set Channel 1 View

Select **1 Grid** from the grid pull down menu. The grid pull down menu is located under the **Format** tab. Under **Grid Divisions** enter “**6**” for Channel 1, we will not use Channel 2 in this exercise. Enable the Grid **Minors** by selecting **Minors**. The **Minors** selection box should have a check mark once selected.

Remove Channel 2 (Note: Channel 2 is not used in this exercise)

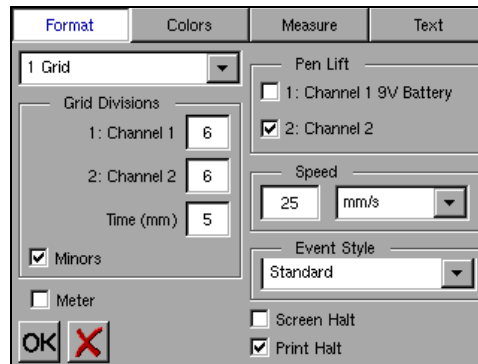
Under **Pen Lift** select **Channel 2** to enable the **Pen Lift** on Channel 2. The Channel 2 **Pen Lift** selection box should have a check mark once selected. We are lifting the pen on Channel 2 because we will not use Channel 2 in this sample exercise. **Channel 1 Pen Lift should not be selected.**

Set Chart Speed

In the **Speed** section enter “**25**” in the number section and select mm/s from the **Speed Unit Pull down** menu.

Enable Print Halt

In the bottom left hand side of the **Format** tab, select **Print Halt**. The **Print Halt** option selection box should have a check mark once selected. The **Screen Halt** option is located above the **Print Halt** selection. **The Screen Halt option should not be selected.**



Enter the Colors tab of the View Setup Menu

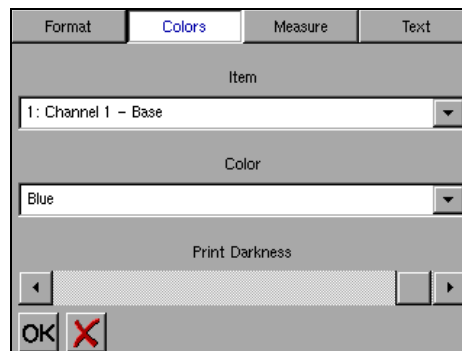
Example of **View Menu / Format** tab for this Sample Exercise

Set Channel Colors

Select the **Colors** tab on the top of the **View Setup** screen. Under the Item pull down list choose **Channel 1**. Under the **Color** pull down list choose **Blue**.

Set Print Darkness

The **Print Darkness** slide bar is located at the bottom of the **Colors** tab. Slide the **Print Darkness** slide bar all the way to the right.



Example of **View Menu / Colors** tab for this Sample Exercise

Exit View Setup Menu

Press **OK** in the bottom left hand corner of the **Colors** tab to return to the main **Menu**.

Continued...

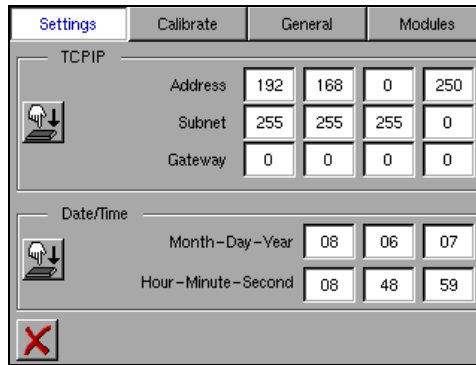
ACTION **HOW TO** (*Format the Compact Flash card*)

Before the user can input Capture Setup functions or capture data, a formatted CompactFlash card must be inserted. The following are instruction to format a Compact Flash card for use with the Dash 2EZ+

Format Compact Flash Card

Insert a Compact Flash card into the Compact Flash port located on the left hand side of the **Dash 2EZ+**.

Enter the **System Setup** by selecting the **System Setup** Icon on the main **Menu** screen. The **System Setup** screen will open. Select the **General** tab on the top of the **System Setup** screen.



Example of the **System Setup Menu** tab for this Sample Exercise

Select the **General** tab found at the top of the **System Setup** menu.

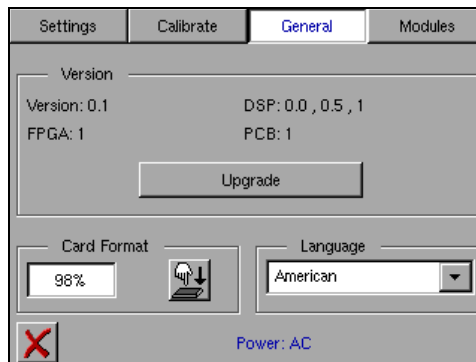
On the **General** tab input **“98”** into the percentage field located in the Card Format section of the General tab. We are setting 98% of the card to be designated for capturing data. The other 2% can be used to save setup files.

WARNING: Formatting the CompactFlash card will erase all current data on the CompactFlash card.

Press the **Apply** icon located to the right of the percentage field in the **Card Format** section of the **System Setup / General** tab. A dialog box labeled **“Card Format”** will appear asking **“Are you Sure?”**. Press OK on the Card Format dialog box. You will see the text **“Format in Progress”** at the bottom of the General tab until the card has completed the format. This should take a few seconds.



Apply Icon



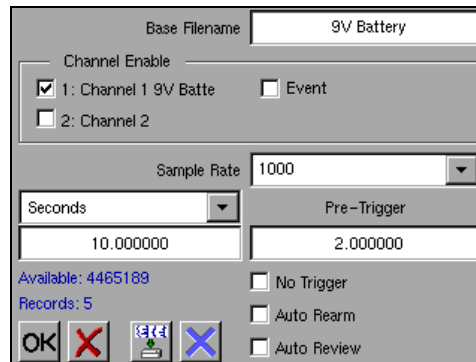
Example of the **System Setup / General** tab for this Sample Exercise

Exit System Setup Menu

When the CompactFlash card has completed formatting, press the **X** in the left hand corner of the **General** tab to return to the main **Menu**.

Continued...

ACTION	HOW TO (Set a 10 second <i>Capture</i> with 2 seconds of <i>Pre-trigger</i> for this Exercise)
Enter the Capture Setup Menu	Enter the Capture Setup menu by selecting the Capture Setup Icon on the Menu screen. The Capture Setup screen will open.
Enter a Capture Base Filename	Select the Base Filename section located at the top of the Capture Setup menu. A keypad will appear. Enter " 9V Battery " on the keypad and press OK . The Base Filename " 9V Battery " should be seen in the Base Filename area.
Enable Channel 1 to be captured	Under the Channel Enable section of the Capture Setup menu, enable Channel 1 by selecting it. The box to the left of Channel 1 should be checked . Deselect Channel 2 and the Event . The box to the left of Channel 2 and the Event should not be checked .
Set the Sample Rate	Select 1000 from the Sample Rate pull down list.
Set the Capture length	Select Seconds from the Data Capture length pull down list. Select the box under the Data Capture Length pull down list. A keypad will appear with Seconds listed at the top. Enter " 10 " into the keypad and press OK .
Set the Pre-Trigger length	Select the box under the Pre-Trigger section. A keypad will appear with Pre-Trigger listed at the top. Enter " 2 " into the keypad and press OK . The No Trigger , Auto Rearm and Auto Review boxes located under the Pre-Trigger box should not be checked .



Example of the **Capture Setup menu** for this Sample Exercise

The **Dash 2EZ+** is now set to record a capture once a trigger has been applied. The capture length will be **10** seconds of which **2** seconds will be pre-trigger data.

Exit Capture Setup Menu Press **OK** to enter the main **Menu**.

Continued...

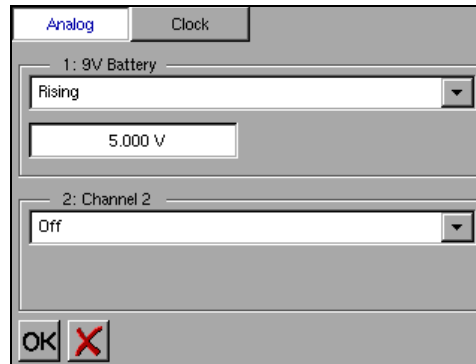
ACTION**HOW TO****(Set an Analog Trigger and prepare final steps for data capture)**

Enter the **Trigger Setup** Menu / Analog tab

Enter the **Trigger Setup** menu by selecting the **Trigger Setup** Icon on the **Menu** screen. The **Trigger Setup** screen will open. Select the **Analog** tab at the top of the **Trigger Setup** menu.

Select **Trigger Type** and **Level**

Select **Rising** from the **Channel 1** trigger pull down list. Once **Rising** is selected a **Level** box will appear below the **Channel 1** trigger pull down list. Select the **Level** box, a keypad will appear with **Level** listed at the top. Enter "5" and press **OK** on the **Level** keypad.



Example of the **Trigger Setup / Analog** tab for this Sample Exercise

Exit **Trigger Setup** Menu

Press the **OK** icon located at the bottom left hand side of the **Analog** tab of the **Trigger Setup** menu. The unit will return to the main **Menu**.

Add "Arm Capture" icon to the **Control Panel**

Using the **Control Panel** instructions found in **section 4** of this quick start guide, add the **Arm Capture** icon to the **Control Panel** of the **Dash 2EZ+ Realtime** screen. Place the **Arm Capture** icon under the **Menu** icon.



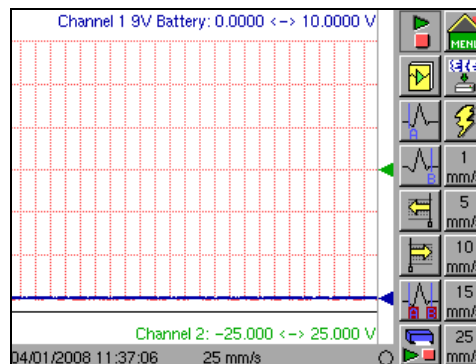
Arm Capture icon

Save system settings

Using the instructions found in **section 10** of this quick start guide, save your system settings to the **Compact Flash** card. Name your settings **9V Battery**.

Enter **Realtime** mode

Enter **Realtime** mode through the main **Menu**. Your **Dash 2EZ+** screen should look like the example below.



Realtime screen for this Sample Exercise

Continued...

We now have the **Dash 2EZ+** set to record **10 seconds** of data (**2 seconds** of pre-trigger, **8 seconds** of post-trigger) once the **9V Battery** is connected to **Channel 1**. We will now **Arm** the capture, connect the 9V Battery and activate our **post capture trigger**.

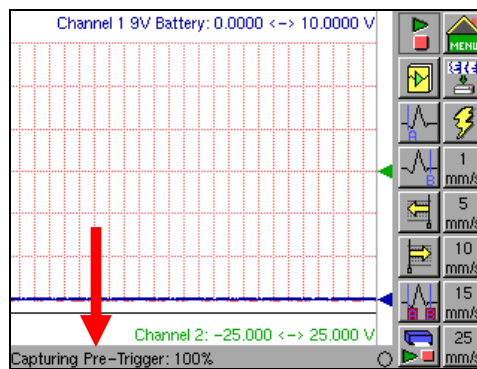
ACTION **HOW TO** **(Arm the capture and record the 9V Battery)**

Connect the test leads. Connect the test leads to **Channel 1**. **Do not** connect the **9V battery** at this time.

Arm the data capture Press the **Arm Capture** icon that was added to the **Control Panel** in the previous section. The text **Capturing Pre-Trigger** will appear for **2 seconds** at the bottom of the **Realtime** screen.



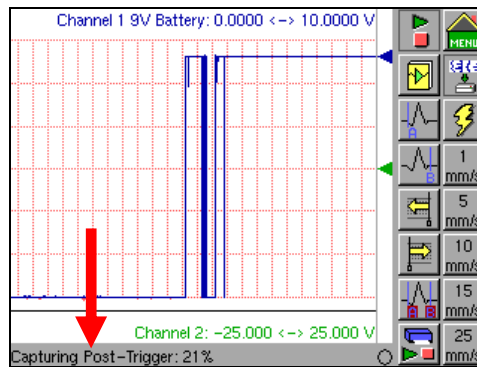
Arm Capture icon



Realtime screen with “**Capturing Pre-Trigger**” text for this Sample Exercise

The unit is now using the circular buffer to capture the **2 seconds** of **Pre-trigger**, the unit is now waiting for **Channel 1** to pass above **5V** to initiate the software trigger set in this exercise for post capture recording.

Connect the 9V Battery to start the post trigger capture Connect the **9V Battery** to the test leads. The post capture will now begin. The text **Capturing Post-Trigger** will appear for 8 seconds at the bottom of the **Realtime** screen.



Realtime screen with “**Capturing Post-Trigger**” text for this Sample Exercise

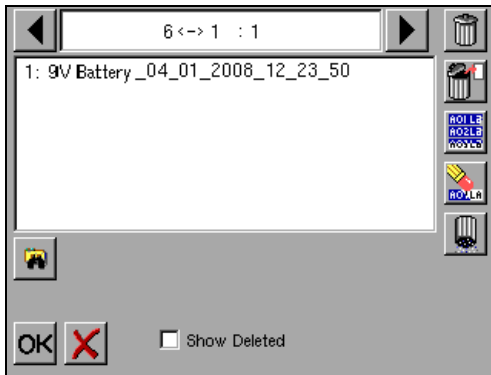
Continued...

We will now **Review** the **9V Battery** capture we just recorded.

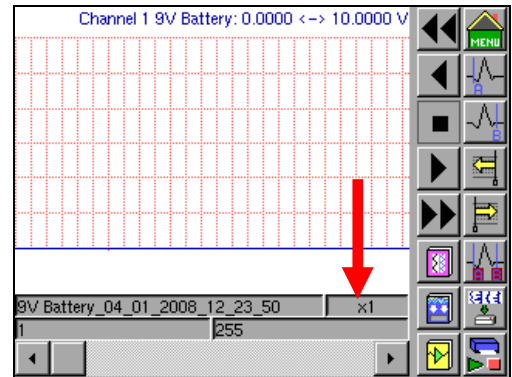
ACTION **HOW TO** **(Review 9V Battery Capture)**

Enter Review Mode Enter the **Review** mode by selecting the **Go to Review** icon on the **Menu** screen. The **Review** mode file selection screen will open.

Select Review File Highlight the **9V Battery** file and press the **OK** icon in the lower left hand corner of the **Review** mode file selection screen. The **9V Battery** capture will load and display the record.



Review Mode file selection screen

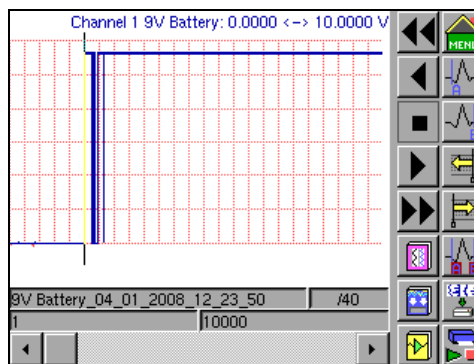


Review Mode screen with **9V Battery** record

Compress Data to screen

Dash 2EZ+ Review mode files load at full **expansion**. To **compress** the file, select the **Compression/Expansion** button (**x1** button), the **Compression/Expansion** keypad will appear.

Select **Set Compression** and then select **OK** on the **Compression/Expansion** keypad. The **Compression** keypad will open. Enter **40** in the **Compression** keypad and then press **OK**. **This file is small enough to be compressed to the Dash 2EZ+ screen (as shown below).**



9V Battery record with x40 Compression

Continued...

ACTION **HOW TO** **(Make Cursor Measurements in the 9V Battery Capture)**

Make Cursor Measurement Enter the **View** mode by selecting the **View** icon on the **Menu** screen. The **View** mode file selection screen will open. Select the Measure tab.

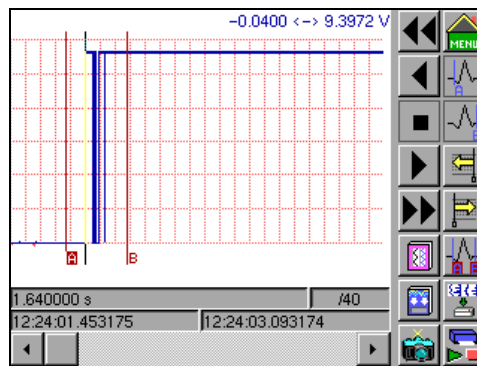
Enable Cursors Enable Cursor A and B by selecting the box to the left of the Cursor A and Cursor B text on the View / Measure tab. The box will be checked once enabled.

Note: A faster method of showing the cursors involves adding the Cursor A and Cursor B buttons to the control panel. This will provide the capability to quickly show/hide cursors without leaving the waveform display screen.

Select Measurement and Time type for the Cursors Select Maximum-Minimum from the Type pull down menu, select Absolute Time from the Time pull down menu.

Press OK in the lower corner of the View / Measure tab, you will be returned to the same review screen you left when you entered the View menu.

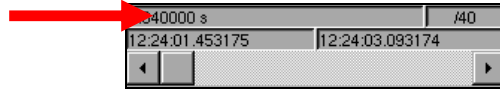
Place Cursors and observe measurement Drag and place **Cursor A** to the left of the 0-9V transition and then drag and place **Cursor B** to the right of the 0-9V transition as shown below. Note the **Maximum-Minimum** measurement in the top right hand corner of the waveform viewing area, the **Absolute Time** and **time difference** below the waveform viewing area.



9V Battery record with cursor measurements

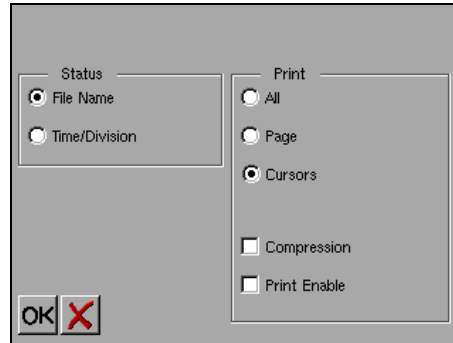
ACTION **HOW TO** **(Print 9V Battery Capture)**

Print record 1. Choose the status text area. This area is indicated in the following illustration.



Status Text Area

The print options will appear.



Dash 2EZ+ Review Mode Print Options

If necessary, use the Print Enable option to enable/disable the printer.

2. Select the print options.

- To print the entire data capture file when the printer is enabled, select the **All** option.
- To print the page currently on the display when the printer is enabled, select the **Page** option.
- To print the area between **Cursors A and B** when the printer is enabled, select the **Cursors** option.

3. To print the chart using the current **compression/expansion**, check the

Compression option. Uncheck this option to print the standard size (x1 without Compress).

4. Choose the **OK** button to complete the printing setup process.

14. POWERING DOWN

When the power switch is set to the off position, the **Dash 2EZ+** begins the power down sequence. The power down sequence is indicated by the green LED found on the right hand side of the unit next to the power switch. The LED 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 2EZ+** recorder must be allowed to complete the power down sequence to insure proper operation.

This completes the **Dash 2EZ+** Quick Start Guide. Please note that the **Dash 2EZ+** has much more capability than presented in this guide. Please see the **Dash 2EZ+ Operations Manual** (Part Number 22834552) for additional 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