

# **DASH IV RECORDER**

## **QUICK START GUIDE**

part number 22834-140

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## 1. INTRODUCTION

Thank you for purchasing the Astro-Med DASH IV chart recorder. It is important that you read the enclosed operations manual. You simply will not get the most out of your DASH IV unless you do. However, it is human nature for you to want to get started right away. We understand this, and have prepared a Quick Start Manual to let you get acquainted with the DASH IV as quickly as possible. We hope you enjoy it - and your new recorder. But then please read the real manual - you'll be glad you did.

## 2. GETTING STARTED

- VOLTAGE VERIFICATION** Verify that the voltage selection cylinder through the window on the fuse block is set to the voltage that you will be using.
- CONNECT AC POWER** Connect the AC power cord to the DASH IV rear panel, then to an outlet.
- LOAD CHART PAPER** Locate the free roll of paper included with your recorder. Open the box and remove the paper. Open the paper chamber door by pressing the paper chamber door release. Place the paper in the chamber and ensure that it is inserted so that it unwinds from the bottom of the roll. Allow a few inches of paper to extend out of the chamber. Close the paper chamber door.
- TURN ON DASH IV** When you turn on the DASH IV, the vacuum fluorescent display will read DASH IV Initialization, then the recorder will display the menu that appeared when it was last powered down (Real-Time or Mode menu). The Real-Time menu indicates the chart number, time, date, speed and the state of the recorder (realtime or halted).
- START RECORDING** Signal connectors are not supplied with the DASH IV. You must supply the signal input connectors. Using standard banana jack connectors, bring your signals into the recorder at the front panel input connectors. Press the [RUN/HALT] key. The DASH IV will begin recording. Look at the left edge of the chart - the System Log repeatedly prints the time, date, chart speed and time scale. Reference the Operations manual to change the time and date.
- HALT** Experiment stopping the chart by pressing the [RUN/HALT] key.
- CHANGE SPEEDS** A group of keys in the lower section of the front panel controls the chart speed. Dedicated keys provide a means for quickly setting the common charts speeds. Non standard speeds can be set easily also.
- DEDICATED SPEED KEYS** There are six dedicated speed keys on the front panel labeled [1], [5], [25], [50], [100] & [200]. They are programmed at 1, 5, 25, 50, 100 & 200 mm/sec respectively, while the chart is running.
- Press [100] and watch the chart speed change to 100 mm/sec.
  - Press [5] and watch the chart speed change to 5 mm/sec.
  - Press the [MIN] key to change to mm/min.
  - Press the [SEC] key to change back to mm/sec.

Practice changing chart speeds using the Dedicated Speed and the [MIN] & [SEC] keys.

## NONSTANDARD SPEEDS

Non standard speeds can be set easily by pressing the [SPD] key and entering the desired speed using the encoder wheel. You may enter speeds in any integer from 1 to 200 in two ranges: mm/sec & mm/min. Let's try!

- Press the [SPD] key. The SPD menu will appear.

### SPD MENU

: mm/s	: mm/m	:	:	:	: ACCEPT	:
CHART SPEED: 25 mm/sec						
: CHART	: INSTA	: MOTOR	: DLOGGER	: EXIT	:	:
: SPEED	: SPEED	: SOURCE	: SPEED	:	:	:

- Turn the encoder wheel until the "CHART SPEED" reads 10 mm/sec.
- Press the soft key above "ACCEPT".

You can also change from mm/sec and mm/min by pressing the soft key above "mm/sec" and "mm/min", and then by pressing the soft key above "ACCEPT". The DASH IV will return to the Real-time menu after pressing the soft key above "ACCEPT".

## ABC INSTA SPEEDS

There are three insta-speed keys [A], [B], & [C] that can be programmed using the same SPD menu. They are currently programmed to 10, 75 & 150 mm/sec, but you can change them. Let's reprogram [C].

- Press the [SPD] key. The SPD menu will appear.
- Press the soft key under "INSTA SPEED". The INSTA SPEED menu will appear.

### INSTA SPEED MENU

: SET A	:	: SET B	:	: SET C	:
A = 10 mm/s		B = 75 mm/s		C = 150 mm/s	
: CHART	: INSTA	: MOTOR	: DLOGGER	: EXIT	:
: SPEED	: SPEED	: SOURCE	: SPEED	:	:

- Press the soft key above "SET C". The top half of the INSTA SPEED menu will change (only the speed for C will be displayed).
- Turn the encoder wheel until 37 mm/sec is entered on the display.
- Press the soft key above "ACCEPT".

Now you have reprogrammed the [C] insta speed key to 37 mm/sec. Run the chart and then press [C] and watch the reaction. Return to the Real-time menu by pressing the soft key below "EXIT".

## HELP KEY

When the front panel [HELP] key is pressed, the menu that results provides the following selections:

- General Help - provides an overview of some of the DASH IV's operating features.
- Channel Status - provides information on pen status, grid status, grid size, major grid divisions, minor grid divisions, grid location, buffer status, buffer location, text in buffer, voltage range, zero position, zero suppression, channel mode and filter status settings.
- System Status - provides information on event, trigger, data capture, playback, insta speed, dual speed, timer mode, RS232 and GPIB settings.

When the soft key above each menu selection is pressed, the DASH IV will print the associated report. Try pressing the soft key above each menu selection in order to become familiar with each type of report.

## 3. SETTING UP CHARTS AND GRIDS

The DASH IV gives you total control over chart layout. You can set individual channel locations, grid on/off and major and minor division sizing. You are also able to suppress or enable the printing of waveforms as well as vary the waveform trace thickness.

### DEFAULT CHARTS

The DASH IV has four programmable chart keys. The programmable Chart keys are currently programmed according to the four preset chart layouts. For more information see the Default Chart section of the Operations Manual. To run these charts:

- Press the [MODE] key. The MODE menu will appear.

#### MODE MENU

: RUN	: RUN	: RUN	: RUN	:
: CHART 1	: CHART 2	: CHART 3	: CHART 4	:
: DATA :	DUAL :	TIMER :	DATA :	DATA :
: LOGGER:	SPEED :	START :	PLAYBACK :	ANALYSIS:

- Press the soft key above either "CHART 1", "CHART 2", "CHART 3" or "CHART 4".

Chart 1 - provides a 100mm wide grid with four channels.

Chart 2 - provides two 50mm wide grids each with two channels.

Chart 3 - provides four 25mm wide grids each with one channel.

Chart 4 - provides a 80mm grid with four channels and events.

- Press the [RUN/HALT] key to halt the chart.

We'll learn later how to change these programmable Chart keys so that they contain customized charts.

*Set*

## CHANGE GRID

The DASH IV allows you to design exactly the grid you want. Let's try to design a grid.

- Press the [SYS] key. The SYS menu will appear.

### SYS MENU

: MODIFY	: SETUP: SETUP	: SYSTEM	: DISK	:
: CHART	: CAPTURE	: TRIGGER	: I/O	: I/O :
				: EXIT:

- Press the soft key above "MODIFY CHART". The MODIFY CHART menu will appear.
- Press the soft key above "CHANGE GRID". The CHANGE GRID menu will appear.
- Press the soft key above "NEXT" or "PREV" to change between standard and t-based grids.
  - standard -grids are printed in standard 5mm increments and are not synchronized with the recorders timing marks.
  - t-based - grids are time-based grids printed with divisions that are synchronized to the recorder's timing marks.
- Press the soft key above "LAYOUT GRIDS". The LAYOUT GRIDS menu will appear.

### LAYOUT GRIDS MENU

: INC	: DEC	: NEXT	: PREV	: STATUS	:
Channel:	Position:				
Major Divisions:		Spacing:			
: MINORS	:	<<<	>>>	: EXIT	:

By pressing the soft keys above/below each menu selection, and turning the encoder wheel to get the desired settings, you can customize your grids. Let's practice setting up grid.

- Press the soft key above "INC" or "DEC" in order to increase or decrease the channel. Select channel 2.
- Press the soft key above "STATUS" until it reads ON. Make sure that channel 2 is the only channel where the "STATUS" is ON.
- Press the soft key below "MINORS" / "MAJORS" until the "Major Divisions" parameter appears in the menu.
- Turn the encoder wheel until 10 is selected. This changes the grid so that there are 10 major divisions.
- Press the soft key below the right arrow >>> in order to change the spacing parameter.
- Turn the encoder wheel until 5mm is selected. As a result, you now have a grid that will have 10 major divisions spaced 5mm apart (50mm grid).

- Press the soft key below "MINORS".
- Turn the encoder wheel to change the spacing of the minor divisions to 1mm. As a result, there will be 5 minor divisions between each major division. If you wanted more minor divisions you would decrease the minor division spacing.
- Press the soft key above "NEXT" or "PREV" in order to change the grid position. Let's change the grid position to 41mm.

Congratulations! You have now made a custom grid for channel 2. Press the [RUN/HALT] key to start the chart.

## STORING CHARTS AND SETUPS

It is important to understand that there is a difference between charts and modes. Basically, a chart is the way information is presented on the paper, such as: text location, event location, wave location, waveform width and grid on/off.

A setup consists of the specific parameters used in a recording setup, as well as the soft key chart settings. These parameters include: zero and gain settings, speed settings, edit settings and trigger settings. Setups are saved to floppy disk. (See the Operations Manual for information on how to save modes)

Let's demonstrate how charts are saved to soft keys.

- Press the [RUN/HALT] key to halt the chart.
- Press the [MODE] key. The MODE menu will appear.
- Press the soft key above "CHART 2". The default chart "CHART 2" saved under this soft key will be running. Notice the layout of the chart.
- Press the [RUN/HALT] key to halt the chart.
- Press the [SYS] key. The SYS menu will appear.
- Press the soft key above "MODIFY CHART". The MODIFY CHART menu will appear
- Press the soft key above "CHANGE GRID". The CHANGE GRID menu will appear.
- Press the soft key above "LAYOUT GRIDS". The LAYOUT GRIDS menu will appear.
- Change the status of channels 3 & 4 to "off" by increasing or decreasing the channels and pressing the soft key above "STATUS". Channels 1 & 2 should have the status set to "on".
- Press the [MODE] key. The MODE menu will appear.
- Press the soft key above "CHART 2". Notice that now the grid for channels 3 & 4 is off.
- Press the [RUN/HALT] key to halt the chart.

The DASH IV automatically saves the chart to the soft key that you were previously running.

## 4. SETTING UP ZERO AND GAIN

The [Z/G] key (zero and gain) is used to set a variety of parameters such as; selecting a voltage sensitivity for a channel, selecting a location for the zero baseline of the waveform input signal, suppressing up to 250 VDC of the waveform input, choosing between rms and peak to peak recording modes, grounding the input signal, selecting filters, calibrating each channel and scaling waveform data to engineering units of your choice.

- Press the [Z/G] key. The Z/G menu will appear.

### Z/G MENU

:	INC	:	DEC	:	DC/GND	:	Y- SCALE	:	more:	
:	Channel	:	dc	:		:		:		
:	ZERO	:	SENS	:	ZS	:	CS/FN	:	EXIT	:

In order to change channels, press the soft key above "INC" or "DEC".

### DC/GND

- Press the soft key above the "DC/GND" to toggle between dc and gnd.

### SENSITIVITY

In the new generation DASH IV recorder there is no reference to full scale voltage. Instead, a sensitivity value in units (i.e., volts, psi) per centimeter of distance across the chart is chosen for each channel. Since signal size is independent of grid size, by adjusting channel sensitivity a finer or coarser view of the signal data can be obtained.

- Press the soft key below "SENS".
- Turn the encoder wheel to adjust the sensitivity for the selected channel. Sensitivity is expressed as either mV/cm or V/cm.
- Press the soft key below "CS/FN" to select coarse or fine adjustment for the sensitivity.

### ZERO POSITION

The DASH IV has the zero parameter which enables the zero baseline to be positioned.

- Press the soft key below "ZERO". The zero position parameter will appear in the menu.
- Turn the encoder wheel to select a position for the zero baseline. The position that you specify is the distance from the center of the grid. Positive values shift the zero baseline toward the top edge of the chart and negative values shift the zero baseline toward the bottom edge of the chart.

### ZERO SUPPRESSION

When a waveform input signal contains an unwanted direct current (DC) component, zero suppression can be used to remove up to 250V, depending on the channels range. See the Operations Manual for more information.

- Press the soft key below "ZS". The zero suppression parameter will appear in the display.
- Turn the encoder wheel to select a voltage.

### MORE...

The soft key marked "more" scrolls to the next menu selections for the zero and gain.

- Press the soft key below "more". The following menu will appear.



## Z/G MENU\*

: INC	: DEC	: MODE	: USER	: more	:
: Channel	: dc	: SCALING	:		:
Filter/DSP:					
: TYPE	:	: ACCEPT	: EXIT	:	:

### **MODE**

The DASH IV can record data either using the peak to peak recording method or the root mean square method.

- Press the soft key above "MODE" to toggle between pk-pk and rms.

### **FILTER**

The DASH IV is equipped with four filter types as well as having the capacity to perform integration and differentiation. The four types of filters are:

notch (50Hz) - Filters the 50Hz frequency component out of the input signal.  
notch (60Hz) - Filters the 60Hz frequency component out of the input signal.  
low pass - Filters out frequencies above a user selected cutoff frequency between 1Hz and 1000Hz.  
mean - Outputs the mathematical mean amplitude of the input signal.

- Press the soft key below "TYPE" to select a filter. (See Operations Manual for information on integration and differentiation.)
- Turn the encoder wheel (only if the low pass filter is selected) to select a cutoff frequency, then press the soft key below accept.

For information on how to use User Scaling see the Operations Manual.

## **5. ENTERING TEXT ANNOTATION**

The DASH IV is equipped with four 128 character channel annotation buffers, one 128 character on demand annotation buffer and one system log buffer. The four 128 character annotation buffers and the on demand buffer can be moved to any of the 127 positions across the chart.

### **CHANGING BUFFERS AND LOCATION**

Text annotation is easy to enter. Press the front panel [EDIT] key. The EDIT menu will appear. Press the soft key above "INC" or "DEC" in order to select a buffer. Notice that there is one Syslog buffer, 4 channel buffers labeled 1 - 4 and one Demand buffer.

- Press the soft key above "INC" until 3 appears next to "BUFFER".
- Press the soft key above "STATUS". This toggles the buffer status between ON and OFF. If the "STATUS" is OFF the buffer WILL NOT print.
- Turn the encoder wheel to change the location of BUFFER 3.

### **ENTERING TEXT**

Let's try to enter some custom text.

- Press the [RUN/HALT] key to stop the chart.

You should still be in the EDIT menu, if not press [EDIT] and make sure that you are in BUFFER 3.

- Press the soft key above “EDIT”. The text “Channel #3 - Y vs T” will appear in BUFFER 3.
  - If you want to type in upper case letters press the soft key below “CASE” until \*CAPS\* appears on the display.
  - Using the alphanumeric keypad press the ( key until the blinking cursor is 2 spaces past the text “Channel #3 - ”.
  - Type the letters “TEST”. Press the “DEL” key a few times to delete any extra alphanumeric characters.
  - Press the soft key below “ACCEPT”.
  - Press the [RUN/HALT] key.
- Notice that BUFFER 3 now reads “Channel #3 TEST” on the chart.

Congratulations! You now know how to edit/add text as well as change the location.

## 6. SETTING UP DATA CAPTURE AND PLAYBACK

If you have purchased the DASH IV with the data capture option (DC-65), you have the facility to capture and replay 128 kilosamples of data per channel. In order to complete a data capture you must have the data capture memory and software, define and turn on triggers and arm the system to respond to triggers.

A number of parameters have to be defined in order to setup a data capture, such as:

Sample Rate  
 Trigger Position  
 Record Size  
 Capture Control

First, Let's go into the Setup Capture menu.

- Press the [SYS] key. The SYS menu will appear.
- Press the soft key above “SETUP CAPTURE”. The SETUP CAPTURE menu will appear.

### SETUP CAPTURE MENU

: RECORD	: SET	: SET	: SET	: CAPTURE	:
: STATUS	: RATE	: TRIGGER	: WINDOW	: CONTROL	:
:	: NEXT	: PREV	:	: EXIT	:

The Record status menu selection gives you information about the number of records captured and the amount of kilosamples that are free.

- Press the soft key above “RECORD STATUS”. If there are records captured press the soft key below “DELETE” in order to delete the records.

- Press the soft key below “BEGIN”.
- Repeat in order to delete all the records.
- Press the soft key below “EXIT” to return to the SETUP CAPTURE menu.

Next you can select one of three data capture methods. The data capture methods are:

Single acquisitions without automatic record playback  
 Single acquisitions with automatic record playback.  
 Multi-stacked acquisitions with optional auto-triggering and auto-rearming.

- Press the soft key above “CAPTURE CONTROL”.
- Press the soft key below “NEXT” or “PREV” to select the data capture method of your choice. Select single capture.

Next you can select the record size. Record size indicates the total amount of data capture memory allocated to the next data capture.

- Press the soft key above “SET WINDOW”.
- Press the soft key below “NEXT” or “PREV” to see the different record sizes. There are four different record size choices. For example, a record size of 128Ks x 4 indicates that 4 channels and events are being captured to a record containing 128 kilosamples for each channel. The record size that is displayed on your recorder depends on what the value was when your machine was powered down.

You are able to change the location of the trigger within the window of the data capture. This enables you to control the amount of pretrigger and post-trigger data that is captured. For example, if you want 50% of the data that you capture to be pretrigger data and 50% of the data to be post-trigger data, then you would set the Trigger/Window to “center”. Let's try this.

- Press the soft key above “SET TRIGGER”.
- Press the soft key below “NEXT” or “PREV” until “center” appears next to the Trigger/Window parameter on the display.
- Press the soft key below “ON/OFF” until “off” appears next to the Autotrig parameter on the display.

The DASH IV enables you to select a playback sample rate. This is done by selecting a playback timebase instead of selecting a playback sample rate. The timebase is expressed as time per millimeter and the DASH IV has fourteen data -capture playback time-base selections. In most cases, sampling data at a rate of approximately 10 times faster than the highest waveform frequency provides excellent playback resolution.

- Press the soft key above “SET RATE”.
- Press the soft key below “NEXT” or “PREV” until 100us/mm is selected.

Now, we are going to try a simple capture using the manual trigger.

- Press the [SYS] key. The SYS menu will appear.
- Press the soft key above "SETUP TRIGGER". The SETUP TRIGGER menu will appear.

#### SETUP TRIGGER MENU

: MANUAL	: HOST	: WAVE	: EXTERN	:
: on	: off	: on	: off	:
: SETUP	:	:	:	:
: WAVE	:	:	: EXIT	:

- Turn the manual trigger to on by pressing the soft key above "MANUAL" until "on" is displayed.
- Turn the other triggers - Host and External - to "off" by pressing the soft key above "HOST" and "EXTERNAL" until "off" is displayed.
- Press the [ARM] Key. The recorder is now armed and is in the pretrigger phase.
- Press the [TRIG] key in order to cause the recorder to trigger and complete the data capture. CAPTURE COMPLETED is displayed when the capture is finished.

Congratulations! You have just completed a data capture. Now Let's play the capture back.

- Press the [MODE] key. The MODE menu will appear.
- Press the soft key below "DATA PLAYBACK". The DATA PLAYBACK menu will appear.
- Press the soft key below "SETUP PLAYBACK". The SETUP PLAYBACK menu will appear.
- Press the soft key above "SET DEVICE".
- Turn the encoder wheel to select the different output device options. Select the "display & chart" option.
- Press the soft key above "SET FORMAT".
- Press the soft key below "NEXT" or "PREV" until the "Output format:" is set to chart 1. The data will now be played back according to the chart format saved under the CHART 1 soft key in the MODE menu.
- Press the soft key below "EXIT". You should now be back in the DATA PLAYBACK menu.
- Press the soft key below "RUN PLAYBACK".

You have just completed playing back the data you captured to the display and to the chart.

Once again we would like to thank you for purchasing the Astro-Med DASH IV. We hope this Quick Start Manual was useful, however we do encourage you to read the Operations Manual in order to get the most out of your DASH IV.







