

Chapter 5 - Configuring the Sonoclot Analyzer

Overview

The Sonoclot Analyzer is factory configured for general purpose hemostasis analysis and normally does not require any user customization. However, the Sonoclot Analyzer can be configured in several ways to support different applications. This chapter describes how to perform this custom configuration and is intended to be used only by the person with responsibility for initial setup or an experienced user. Before configuring your Sonoclot Analyzer, please first read this entire chapter.

The available configuration features of the Sonoclot Analyzer are controlled by the firmware program within the instrument. Since revisions to the firmware program may be made in the future, it is important that you follow the configuration instructions for the specific firmware version within your Sonoclot Analyzer. Check that your Sonoclot Analyzer has firmware revision 3.1, which is easily found on the heading of each Sonoclot Signature. Below is an example of this heading.

SIENCO Sonoclot[®] Coagulation & Platelet Function Analyzer
Firmware Version 3.1.6 Copyright 1992-1996 Serial Number 0639
Board Rev 3.6 Scale: 0-120 Auto Temperature Setpoint: 37.00
Automatic shutoff after 60 minutes

If the Firmware Version on the Sonoclot Analyzer you have is not 3.1, then contact Sienco for assistance.

For firmware versions 3.1.x, the following features are user configurable.

Auto Stop Time: Allows you to set the time at which the printer will discontinue printing.

Graph Time Scale: The Sonoclot Analyzer supports two time scales for the Sonoclot Signature: 0.33 cm per minute and 0.50 cm per minute. **We recommend the 0.33 cm per minute scale.**

Clot Signal Scale: The Clot Signal full scale for the Sonoclot Signature can be adjusted for any of eight different settings ranging from **0-25** to **0-200**. There are also two settings that allow automatic rescaling so that information is not lost when the Clot Signal moves outside the full scale range setting.

Connecting to a Computer: The Sonoclot Analyzer can be configured so that the Clot Signal data can be sent to a computer. In this configuration, the Printer is not used.

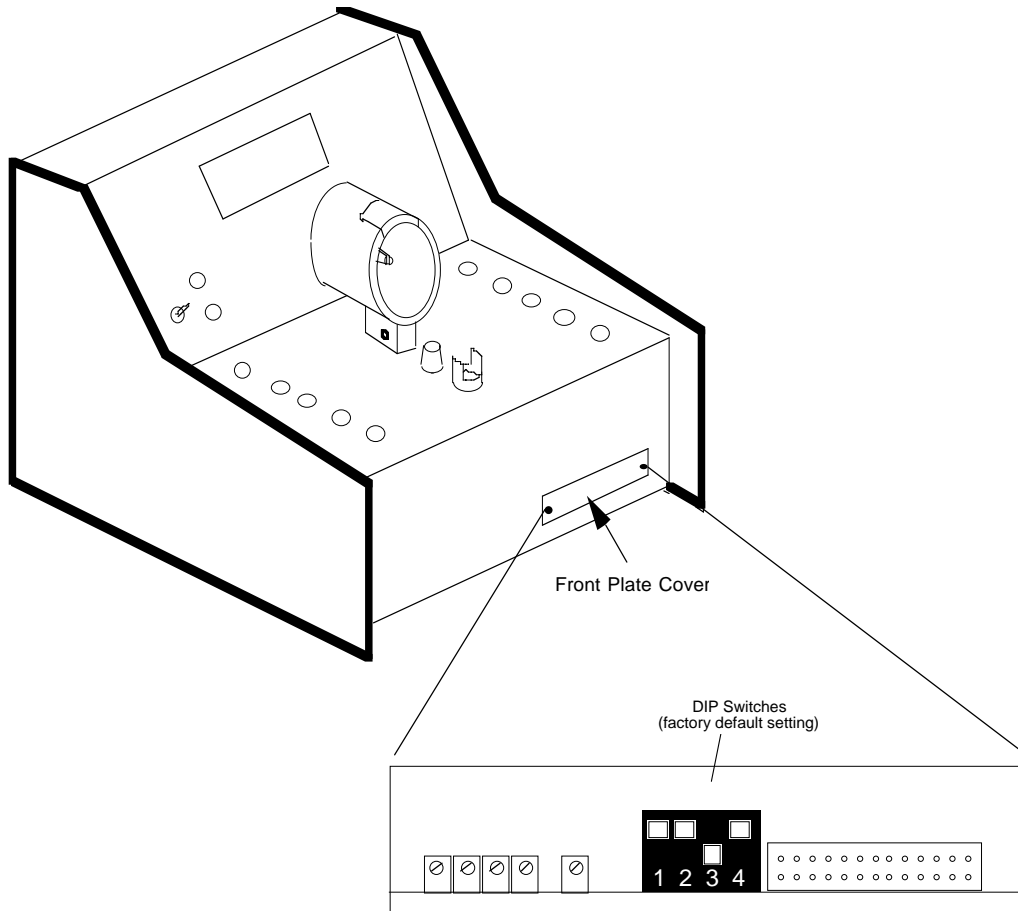
Using a Strip Chart Recorder: A strip chart recorder can be used as an alternative to the Printer. This configuration provides backward compatibility with previous Sonoclot Analyzers and is often convenient when the Sonoclot Analyzer is connected to a computer.

Dip Switch Settings

Two features on the Sonoclot Analyzer are configured through dip switches located behind the front cover plate on the Sonoclot Analyzer. These features are:

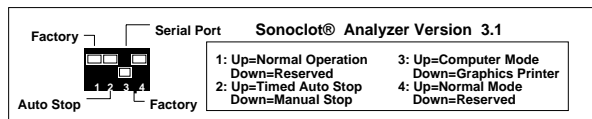
- Enabling/disabling the autostop time for an analysis
- Selecting the serial port for either the Printer or ASCII text

This section only describes how to access the dip switches and identifies the default settings. Details for how to determine what dip switch settings are appropriate for a specific configuration are provided in later sections of this chapter.



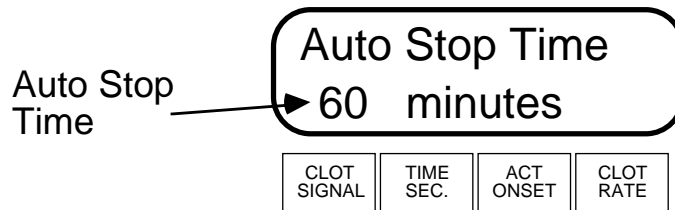
To access dip switches, remove the front panel with a 1/16 Allen wrench.

With regards to the dip switches, switches 1 and 4 should always be set to the UP position. If you want the printer to automatically stop printing a Signature after a certain amount of time, set switch 2 in the UP position. To keep printing until the STOP switch is raised, set switch 2 in the DOWN position.



Changing the Auto Stop Time

The Auto Stop Time feature allows you to set the time at which the printer will graph the Sonoclot Signature during a test analysis. You can inspect or modify the Auto Stop Time through use of the START/STOP switch. To do this first make sure that the Sonoclot Analyzer displays the **Ready** message in the upper line of the LCD display¹. Next, hold the START/STOP switch in the STOP position for three seconds. When the display shows:



release the switch. The Auto Stop Time can be adjusted from 10 minutes up to 100 minutes. To change the time, lower the START switch until you have reached the desired setting. To return to normal operation or the next option, momentarily raise the START/STOP switch to the STOP position.

NOTE: The Auto Shut-off feature is only available if **DIP Switch #2** is in the **UP** position (Factory Setting is **UP**). If the LCD does not display Auto Stop Time after holding the STOP switch up for several seconds, then this feature is disabled. Refer to the section on setting the dip switches to enable this feature.

Changing the Graph Time Scale

The Sonoclot Analyzer supports two time scales for the Sonoclot Signature: 0.33 cm per minute and 0.50 cm per minute. The 0.33 cm per minute setting is recommended for most applications because the Sonoclot Signatures are shorter, making handling more convenient. The 0.50 cm setting is provided for compatibility with Sienco's earlier 10 cm strip chart recorder which used a time scale of 0.50 cm per minute.

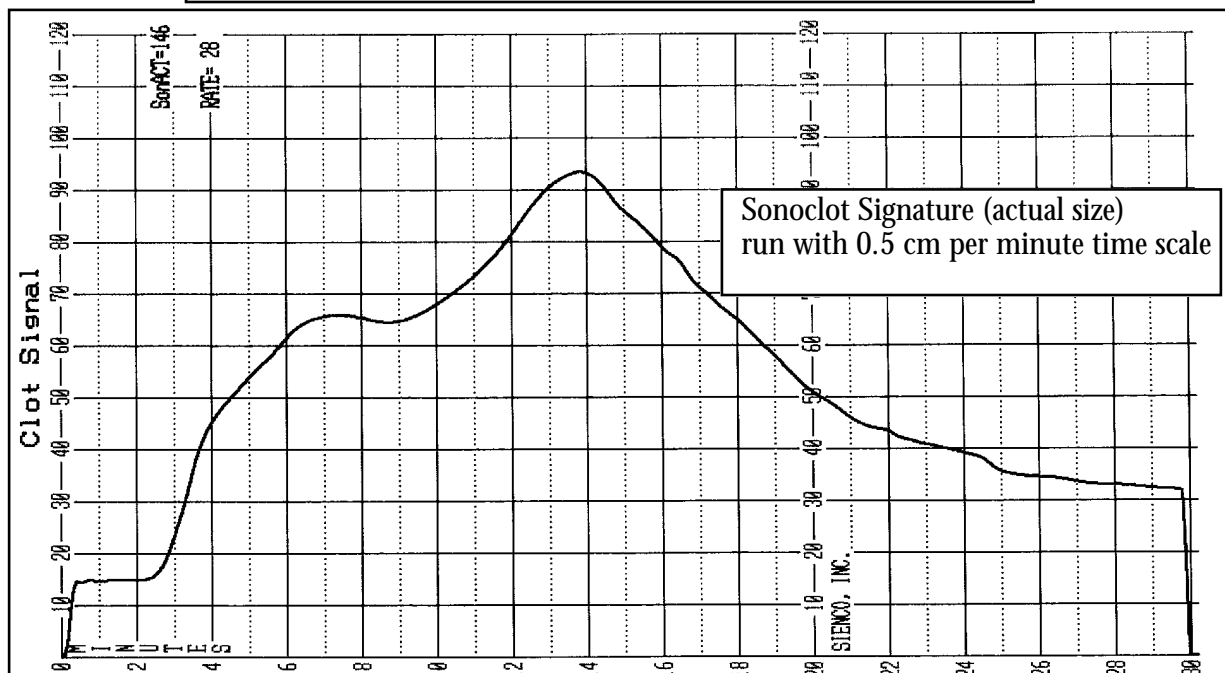
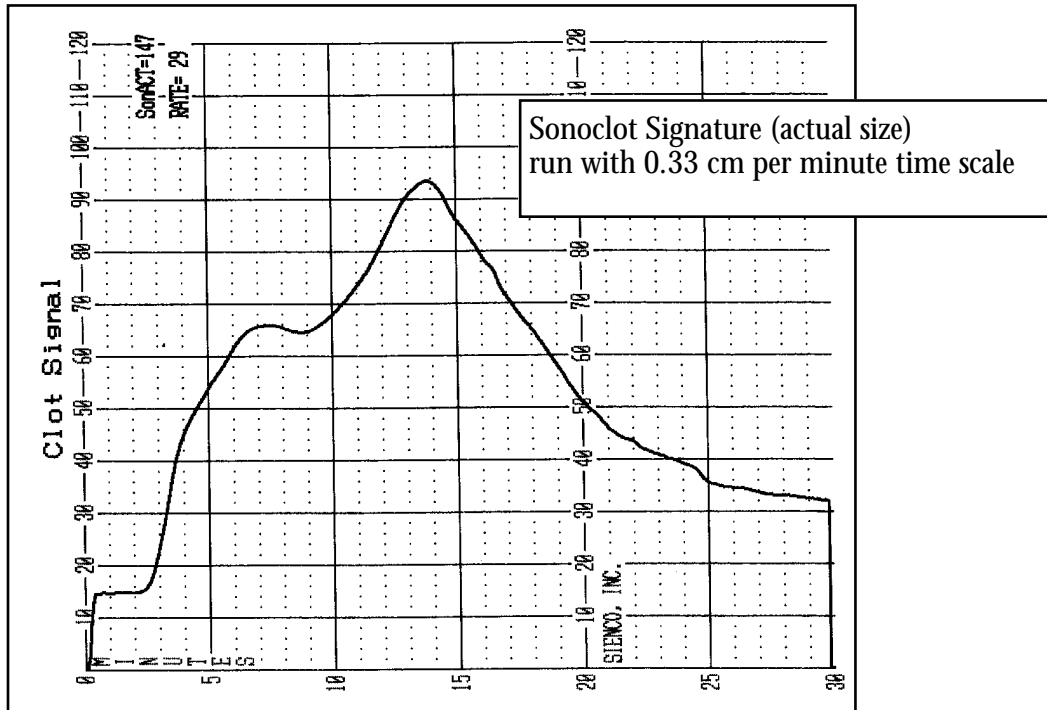
You can inspect or modify the Graph Time Scale through use of the START/STOP switch. To do this first make sure that the Sonoclot Analyzer displays the **Ready** message in the upper line of the LCD display. Next, hold the START/STOP switch in the STOP position for three seconds. If any user configurable options are enabled, the display will indicate the first enabled option. Release the START/STOP switch. If the LCD does not display "Graph Time Scale", momentarily raise the START/STOP switch to advance to the next enabled option. When the display shows "Graph Time Scale" in the upper line on the LCD, the selected time scale is displayed on the lower line of the LCD. The time scale can be altered by momentarily lowering the START/STOP switch. To return to normal operation or the next option, momentarily raise the START/STOP switch to the STOP position.

NOTE: The Graph Time Scale option is only available if **DIP Switch #3** is in the

¹If the Analyzer does not display "Ready", momentarily raising the START/STOP switch to the STOP position will stop any test in progress and return the Analyzer to the Ready state.

DOWN position (Factory Setting is **DOWN**). If the LCD does not display Graph Time Scale during any option step, then this feature is disabled. Refer to the section on setting the dip switches to enable this feature.

Sonoclot Signatures printed at both 0.33 cm/min and 0.50 cm/min are shown below to illustrate the different Time Scale settings. Changing either the **GRAPH TIME SCALE** or the **CLOT SIGNAL SCALE** alters the overall shape of the Sonoclot Signature. In order to avoid confusion in reading a Sonoclot Signature, it is recommended that once settings for the Sonoclot Signature are configured for anticipated use, the configuration should not be modified.



Changing the Clot Signal Scale

The Clot Signal scale for the Sonoclot Signature can be adjusted for any of eight different settings ranging from **0-25** to **0-200**. There are also two settings that allow automatic rescaling so that information is not lost when the Clot Signal moves outside the full scale range setting.

The Sonoclot Analyzer allows the user to select the scale size recorded on the Printer. This feature provides the flexibility to accurately graph different types of blood samples. Use the following table to determine a preferred Clot Signal Scale.

Test	Recommended Scales
Blood viscosity	0-25, 0-40
Platelet poor plasma	0-50, 0-75
Whole blood	0-100, 0-100 Auto, 0-120, 0-120 Auto
Other scales	0-150, 0-200

The two AUTO scales, **0-100 Auto** and **0-120 Auto** are useful in capturing Sonoclot Signatures for test samples that exceed the initial maximum scale. If during an analysis the Clot Signal exceeds the initial maximum scale setting, the scale will automatically increase to the next highest setting, up to the highest scale setting.

For your applications, if you find that the Sonoclot Signatures too frequently go off the Printer scale, then increase the scale setting. If the Sonoclot Signatures are compressed into the lower part of the graph, decrease the scale setting. Once you have determined an appropriate scale for your application, stick with it. Users are sometimes confused if they see a Sonoclot Signature printed on a new scale they are not accustomed to.

The Clot Signal Scale is changed by turning the scale knob on the back of the Sonoclot Analyzer. Simply turn the knob until the white line points to the desired setting. For your convenience, the scale is also displayed on the LCD while you are turning the knob. When you find the proper setting, stop at that point. The message on the display will disappear after 2 seconds.

If you change the scale while the Printer is printing, the new scale takes effect 2 seconds after the knob is turned. This delay allows you to display the current scale by turning the knob one position and then return it back quickly without changing the Sonoclot Signature being printed.

Changing either the **GRAPH TIME SCALE** or the **CLOT SIGNAL SCALE** alters the overall shape of the Sonoclot Signature. In order to avoid confusion in reading a Sonoclot Signature, it is recommended that once settings for the Sonoclot Signature are configured for anticipated use, the configuration should not be modified.

Configuring the Sonoclot Analyzer to Send Data to a Computer

The Sonoclot Analyzer may be connected to a computer instead of the Printer. In this configuration, the Sonoclot Analyzer sends filtered Clot Signal data to the computer in ASCII format rather than the graphics data that is sent to the Printer.

To run the Sonoclot Analyzer with a computer rather than a Printer, set **DIP Switch #3** in the UP position. The Sonoclot Analyzer may be connected to an IBM compatible computer with a straight through RS-232 cable.

The serial communication specifications are:

Receptacle on Sonoclot Analyzer: 25 pin D-Sub socket

Baud Rate	9600 bps
Date bit length	8 bits
Parity	NONE
Stop bits	1
Handshake Protocol	Hardware

Serial Input/Output (to/from instrument) Signal Pins

<u>Pin</u>	<u>Name</u>	<u>I/O</u>	<u>Description</u>
2	Data In	1	serial receive data - not used
3	Data Out	0	serial transmit data
4			connected to pin 5
5			connected to pin 4
6	Ready	0	set when instrument is on, connected to pin 8
7	GND		ground
8		0	connected to pin 6
20	Busy		Must be high for Sonoclot to send data

Data is transmitted from the instrument every second when the Sonoclot Analyzer is processing a sample. The format for each data record is:

Time: The number of seconds since the last analysis began. This counter resets when the next analysis begins (START switch raised).

CLOT SIGNAL: The value of the instrument signal. This value corresponds to the CLOT SIGNAL value on the LCD display.

Noise: If noise is detected, this message is transmitted.

Results: The Onset and the Clot RATE data from the analysis are transmitted after both the Onset and Clot RATE have been calculated.

Error: Errors detected by the Sonoclot Analyzer. The error code number is included to aid troubleshooting.

The data within the record are tab delimited and each record is terminated with a carriage return (no line feed).

The data are only printed during an analysis.

The Onset and Clot RATE are zero at the beginning of each analysis and then remain at their calculated value as soon as a result is found.

Two flags are provided.

The Noise Flag is normally 0 and is 1 if the Sonoclot Analyzer has failed to read a good value for Clot Signal. This can happen if the Sonoclot Analyzer is subjected to mechanical noise, if a probe is incorrectly mounted in the Sonoclot Analyzer resulting in mechanical interference, or if the clot dries into a crust that prevents the electromechanical oscillator from oscillating.

The Result Flag is initially 0. If the Sonoclot Analyzer encounters a Sonoclot Signature on which the Onset and Clot RATE results cannot be interpreted with high confidence, then the Result flag is set to 1. This may happen if the Head Assembly is not promptly closed after completion of the mixing cycle at the beginning of a test analysis.

Using the Sonoclot Analyzer With a Strip Chart Recorder

In order to be compatible with previous Sonoclot Analyzers, a strip chart recorder can be used as a replacement for the Printer. To run the Sonoclot Analyzer with a strip chart recorder rather than a Printer, set dip switch 3 in the UP position. Connect the Sonoclot Analyzer to the strip chart recorder through the BNC connector on the rear of the Sonoclot Analyzer.

The Sonoclot Analyzer provides a DC voltage on the BNC terminal that represents the current Clot Signal value. The scale is 100 Clot Signal Units per 10 millivolts. The output range of the DC output voltage is 0-15 millivolts which corresponds to a Clot Signal range of 0-150. Most strip chart recorder users select an input voltage range of 0-10 millivolts, which represents a Clot Signal range of 0-100. This setting is convenient with conventional strip chart paper.

Remember, when using a strip chart recorder you have to manually start the recorder at the beginning of each analysis and to stop the recorder when you complete the analysis.

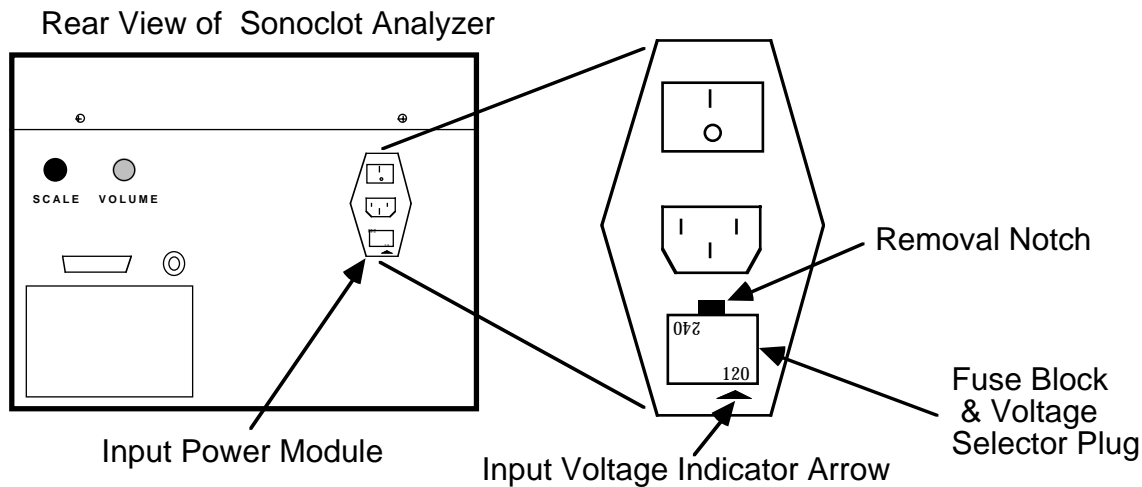
Changing the Line Voltage Setting

Sonoclot Analyzer

The Sonoclot Analyzer can be configured for common input voltages used throughout the world. The Sonoclot Analyzer has input line voltage settings and each setting supports a wide range of input line voltages. The settings and the corresponding input voltage ranges are:

120 Vac for 100 to 130 Vac
240 Vac for 210 to 260 Vac

The input voltage setting is set with the Fuse Block & Voltage Selector Plug (Voltage Selector Plug) on the Input Power Module on the rear of the Sonoclot Analyzer. This plug can be removed by first removing the power cord and then inserting a small blade screwdriver into the removal notch and prying the Voltage Selector Plug out. The Voltage Selector Plug may be inserted into the Input Power Module in either of two different orientations: 120 or 240. The input voltage setting is selected by inserting the Voltage Selector Plug oriented so that the Input Voltage Indicator Arrow points to the desired input voltage range.



Printer

The input voltage for the Printer is determined by the Printer Power Module. Two modules are available: 120 Vac or 240 Vac. Each module is labeled with its required input voltage range.

