

# SignalTools Plug-ins

Version 7.2



**Copyright**

© 2006 Digidesign, a division of Avid Technology, Inc. All rights reserved. This guide may not be duplicated in whole or in part without the express written consent of Digidesign.

Avid, Digidesign, Pro Tools, Pro Tools|HD, Pro Tools LE, Pro Tools M-Powered, and VENUE are either trademarks or registered trademarks of Avid Technology, Inc. in the US and other countries. All other trademarks contained herein are the property of their respective owners.

Product features, specifications, system requirements, and availability are subject to change without notice.

PN 9329-55487-00 REV A 08/06

# contents

<b>Chapter 1. Introduction</b> .....	1
SignalTools Features .....	1
System Requirements .....	2
Working with SignalTools .....	2
Conventions Used in This Guide .....	2
<b>Chapter 2. Installation</b> .....	3
Installing SignalTools Plug-ins .....	3
Removing SignalTools Plug-ins .....	3
<b>Chapter 3. SignalTools Plug-ins</b> .....	5
SurroundScope .....	5
PhaseScope .....	6
SignalTools Display Options .....	7
SignalTools Level Meters .....	9
<b>Appendix A. DSP Requirements for TDM Plug-ins</b> .....	11
<b>Appendix B. DSP Delays Incurred by TDM Plug-ins</b> .....	13



# chapter 1

## Introduction

Welcome to the SignalTools DigiRack plug-ins.

---

### SignalTools Features

SignalTools includes two multichannel plug-ins:

**SurroundScope** SurroundScope provides surround signal strength indication and precision level metering for multichannel tracks with 3 to 8 channels.

**PhaseScope** PhaseScope provides signal phase metering and precision level metering for stereo tracks.

### Supported Formats

SignalTools plug-ins are available in TDM and RTAS formats.

### Supported Systems

SignalTools plug-ins support the following systems:

- Pro Tools TDM
- Pro Tools LE (PhaseScope only)
- Pro Tools M-Powered (PhaseScope only)
- VENUE (PhaseScope only)

### Sample Rate Support

SignalTools plug-ins support 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz sample rates.

### Multiple Meter Types

SignalTools plug-ins let you select from the following meter types: Peak, RMS, Peak+RMS, VU, BBC, Nordic, DIN, and VENUE.

### Phase Meter Display

SignalTools plug-ins let you view the phase coherency of any two channels of a multichannel signal.

### Leq(A) Averaging Meter

SignalTools plug-ins let you view the true weighted average of the power level sent to any channel or combination of channels in a multichannel track.

---

## System Requirements

To use SignalTools, you need one of the following:

- A Digidesign-qualified Pro Tools|HD system, Pro Tools|LE system, or Pro Tools M-Powered system running Pro Tools 7.0 or higher
- A Digidesign-qualified Pro Tools system and a third-party software application that supports the Digidesign TDM or RTAS plug-in standard
- A Digidesign VENUE system

### Compatibility Information

Digidesign can only assure compatibility and provide support for hardware and software it has tested and approved.

For complete system requirements and compatibility information, refer to the Digidesign Web site ([www.digidesign.com](http://www.digidesign.com)).

---

## Working with SignalTools

Refer to the *Pro Tools Reference Guide* for information on working with plug-ins, including:

- Using Plug-ins as inserts
- The Plug-in window
- Adjusting plug-in parameters
- Automating plug-ins
- Using the Plug-in Settings Librarian


---


## Conventions Used in This Guide


All Digidesign guides use the following conventions to indicate menu choices and key commands:


Convention	Action
File > Save Session	Choose Save Session from the File menu
Control+N	Hold down the Control key and press the N key
Control-click	Hold down the Control key and click the mouse button
Right-click	Click with the right mouse button

The following symbols are used to highlight important information:

 *User Tips are helpful hints for getting the most from your Pro Tools system.*

 *Important Notices include information that could affect your Pro Tools session data or the performance of your Pro Tools system.*

 *Shortcuts show you useful keyboard or mouse shortcuts.*

 *Cross References point to related sections in this guide and other Digidesign guides.*

## chapter 2

# Installation

---

## Installing SignalTools Plug-ins

### To install the SignalTools plug-ins:

- 1 Download the installer for your computer platform from the Digidesign Web site ([www.digidesign.com](http://www.digidesign.com)).
- 2 Double-click the SignalTools Installer application.
- 3 Follow the on-screen instructions to complete the installation.
- 4 When installation is complete, click Finish (Windows) or Quit (Macintosh).

The SignalTools Installer installs the following components in the corresponding locations:

- The *SignalTools* plug-in in the Program Files/Common Files/Digidesign/DAE/Plug-ins folder (Windows) or the Library/Application Support/Digidesign/Plug-ins folder (Mac).



*The SignalTools plug-ins are not copy-protected and do not need to be authorized.*

---

## Removing SignalTools Plug-ins

If you need to remove the SignalTools plug-ins from your system, follow the instructions below for your computer platform.

### Windows

#### To remove the SignalTools plug-ins:

- 1 From the Start menu, choose Settings > Control Panel and double-click Add or Remove Programs.
- 2 Select the SignalTools plug-in from the list of installed applications and click the Change/Remove button.
- 3 Follow the on-screen instructions to remove the plug-in.
- 4 When removal is complete, click OK.

### Mac OS X

#### To remove the SignalTools plug-ins:

- 1 Locate and open the Plug-ins folder on your Startup drive (Library/Application Support/Digidesign/Plug-ins).
- 2 Drag the SignalTools plug-in to the Trash, or to the Plug-ins (Unused) folder.




## chapter 3

# SignalTools Plug-ins

### SurroundScope

SurroundScope is a plug-in that provides surround metering for multichannel track types from 3 channels (LCR) to 8 channels (7.1 surround). Stereo and mono tracks are not supported.

 *This new version of SurroundScope is compatible with sessions that used the previous versions of SurroundScope.*



**SurroundScope**

## Surround Display

SurroundScope detects the multi-channel format of the track and displays each channel in the signal in a circle around the Surround Display.



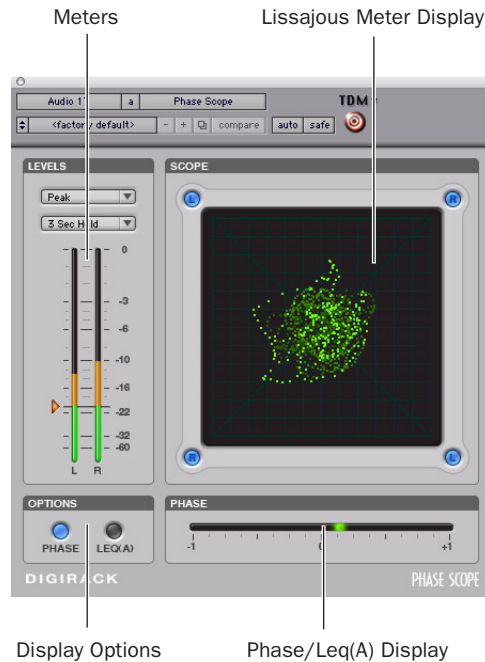
*SurroundScope Surround Display (5.0 shown)*

The Surround Display generates a composite image that indicates relative signal strength in the displayed channels.

- ◆ A circle in the center of the display indicates a surround signal that is panned equally to all channels.
- ◆ An irregular shape that is closer to one side of the display indicates that the channels on that side have a stronger signal.
- ◆ A teardrop shape that points toward a single channel indicates that the signal is panned to that channel.

## PhaseScope

PhaseScope is a multichannel metering plug-in that provides signal level and phase information for stereo tracks only. (Mono and LCR or greater multichannel tracks are not supported.)

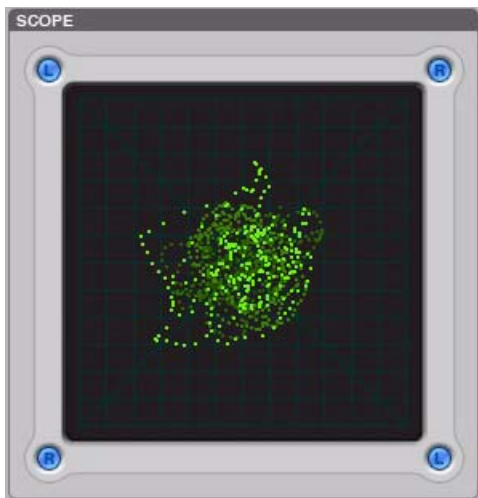


*PhaseScope*

## Lissajous Meter Display

The PhaseScope Lissajous Meter displays the relationship between the amplitude and phase of a stereo signal, enabling you to monitor stereo imaging graphically.

💡 A “Lissajous curve” (also known as a Lissajous figure or Bowditch curve) is a type of graph that is able to describe complex harmonic motion. To learn more, search the Web or your local library for information on its origins and its two principal developers, Jules Antoine Lissajous, and Nathaniel Bowditch.



PhaseScope Lissajous Meter Display

The Lissajous Meter display is divided into four quadrants, with left and right channels arranged diagonally. When audio is panned predominantly to a particular speaker channel, a diagonal line appears, indicating the channel.

The Lissajous Meter displays in-phase material as a vertical line and out-of-phase material as a horizontal line.

## SignalTools Display Options

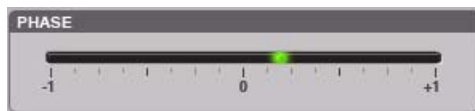
The following display options are available on both SignalTools plug-ins. To choose between these display options, click the corresponding button in the Options section of the plug-in window.



SignalTools display options

### Phase Meter Display

The Phase Meter indicates the phase coherency of two channels of a multi-channel signal.



SignalTools Phase Meter

The Phase Meter is green when the channels are positively out of phase (values from 0 to +1) and red when the channels are negatively out of phase (values from 0 to -1).

At center or zero position, the signal is a perfect stereo image. At the +1 position, the signal is a perfect mono image. At the -1 position, the signal is 100% out of phase.

**SurroundScope** With SurroundScope you can select the two channels to compare by clicking the channel buttons around the Surround Display. Selected channels are indicated in blue.



Selecting SurroundScope channels for phase metering

**PhaseScope** With PhaseScope, the left and right channels are always compared.

## Leq(A) Meter Display

The Leq(A) Meter display lets you view the *true weighted average* of the power level sent to any channel or combination of channels (except the LFE channel) in a multichannel track.

The Leq(A) Meter display shows a floating average for the level over the interval chosen in the Window menu. For example, with a setting of 2 seconds, the display shows the average value for the most recent 2 seconds of audio playback.



SignalTools Leq(A) meter and controls

## Selecting Channels for Leq(A) Metering

**SurroundScope** With SurroundScope, you can select any combination of channels for Leq(A) metering by clicking the channel buttons around the Surround Display. Selected channels are indicated in green.



Selecting SurroundScope channels for Leq(A) metering

**PhaseScope** With PhaseScope, you can select either or both channel for Leq(A) metering by clicking the channel buttons in the corners of the Lissajous display. Selected channels are indicated in green.



Selecting PhaseScope channels for Leq(A) metering

## Leq(A) Metering Controls


**Window** The Leq(A) window menu lets you choose the length of time over which an average signal value is calculated. Settings range from 1 second to 2 minutes.

When the Leq(A) meter is in INF (infinite) mode, it is constantly averaging the signal without a floating average.

**Reset** The Reset button lets you manually reset the start time of the Leq(A) measurement window.

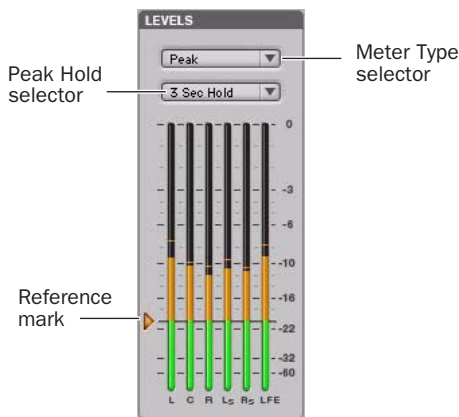
**Auto Reset** When enabled, causes the start time of the Leq(A) measurement window to be automatically reset whenever playback starts in Pro Tools.

**Hold on Stop** When enabled, causes the Leq(A) measurement window timer to pause when playback stops, and resume when playback begins again.

 *In any of the Loop Transport modes, the measurement start time is automatically reset each time playback goes back to the beginning of the loop.*

## SignalTools Level Meters

The SignalTools plug-ins let you choose the type of metering to use. Each meter type has a different metering scale and response.




SignalTools level meters

### Meter Types

**Peak** (Default meter type) Uses the metering scale in DigiRack EQ III and Dynamics III plug-ins.

**RMS** (Root Mean Square) was used in previous versions of the Digidesign SurroundScope plug-in and uses the same “true” RMS metering scale.

 *The “true” RMS meter scale is not the same as the AES 17 RMS scale. For a sine wave with a peak value of  $-20$  dBFS, the “true” RMS meter will show a value of  $-23$  dBFS. (The same sine wave will show a value of  $-20$  dBFS on an AES 17 RMS meter.,*

**Peak + RMS** Uses a multi-color display to show both types of metering. Peak metering is shown in conventional green color, while RMS metering is shown in blue.


**VU** (Volume Unit) Uses AES standards for signal level indication.

**BBC** Uses IEC-IIa standards for signal level indication. This style of metering suppresses short duration peaks that would not affect broadcast program material. Reference calibration (4 dB) is  $-18$  dBFS.

**Nordic** Uses IEC Type I standards for signal level indication and provides greater resolution for readings between  $-10$  dBu and  $+4$  dBu. Reference calibration (0 dB) is  $-18$  dBFS.

**DIN** Uses IEC Type I standards for signal level indication and provides greater resolution for readings between  $-10$  dBu and  $+5$  dBu. Reference calibration ( $-9$  dB) is  $-18$  dBFS.

**VENUE** Provides Peak metering behavior with a meter scale calibrated specifically for Digidesign VENUE systems. Reference calibration (0 dB) is  $-20$  dBFS.

 *Meter values are always displayed on control surfaces in dBFS values, regardless of the Meter Type setting.*

### Meter Peak Hold Options

Each of the SignalTools plug-ins lets you choose the style of peak hold when peaks are shown in the plug-in meters.

**3 Second** Displays peak levels for 3 seconds

**Infinite** Displays peak levels until meters are cleared

**No Peak Hold** Does not display peak levels

## Reference Mark Options

Each SignalTools meter type lets you adjust the level of the reference mark on the side of the meter display. The mark is set to  $-20$  dBFS by default.



*SignalTools meters also change color to show different ranges of level. The relative range of color automatically adjusts to follow the current Reference Mark setting in all meter types (except Peak+RMS).*

### **To change the reference level of a SignalTools meter:**


- Drag the reference mark to a different location on the meter scale.

## appendix a

# DSP Requirements for TDM Plug-ins


The number of SignalTools TDM plug-ins you can use at one time depends on how much DSP power is available in your system. Since the TDM hardware on Pro Tools cards provides dedicated DSP for real-time TDM plug-ins, plug-in performance is not limited by CPU processing power.

The DSP tables on the following pages show the total number of instances of SignalTools plug-ins that can be powered by a single DSP chip on Pro Tools|HD-series cards.

 *The table shows theoretical maximum performance when no other plug-ins are sharing available DSP resources. You will typically use more than one type of plug-in simultaneously.*

## Monitoring DSP Usage

The System Usage window (Windows > Show System Usage) shows how much DSP is available in your system and how it is being used in the current Pro Tools session.

 *For more information about DSP usage and allocation, see the Pro Tools Reference Guide.*

## SignalTools DSP Requirements

The following tables show the maximum number of instances of each SignalTools plug-in that can be powered by a single DSP chip on HD Core or HD Process cards, or on an HD Accel card.

**Table 2. Maximum instances of PhaseScope plug-in per DSP chip for a Pro Tools HD Core and HD Process card at 44.1 and 48 kHz\***

Plug-in	Stereo
PhaseScope	5

**Table 3. Maximum instances of SurroundScope plug-in per DSP chip for a Pro Tools HD Core and HD Process card at 44.1 and 48 kHz\***

Plug-in	LCR	Quad & LCRS	5.0	5.1 & 6.0	6.1 & 7.0	7.1	DSP chips per HD card
SurroundScope	4	3	2	2	1	1	9

**Table 4. Maximum instances of PhaseScope plug-in per DSP chip for a Pro Tools HD Accel card at 44.1 and 48 kHz\***

Plug-in	Stereo
PhaseScope	13

**Table 5. Maximum instances of SurroundScope plug-in per DSP chip for a Pro Tools HD Accel card at 44.1 and 48 kHz\***

Plug-in	LCR	Quad & LCRS	5.0	5.1 & 6.0	6.1 & 7.0	7.1	DSP chips per HD card
SurroundScope	9	7	5	4	4	3	9

*\*Maximum instances are approximately half at 88.2 kHz and 96 kHz, and approximately a quarter at 176.4 and 192 kHz. Actual results will likely be less due to system and session variables.*

## appendix b

# DSP Delays Incurred by TDM Plug-ins

Virtually all TDM plug-ins incur some amount of signal delay.

If you are working with mono tracks, or are processing all channels with the same plug-in, the signal delays are not long enough to be significant and should not be a concern.

This signal delay is significant only if you use a plug-in on one channel of a stereo or multi-channel signal but not the others, since this can cause the channels to be slightly out of phase.

Table 1 on page 14 shows the delays inherent in the SignalTools plug-ins.

### Channel Delay Indicator

The Channel Delay Indicator in the Mix window displays the total delay, in samples, incurred on the track from the use of any TDM plug-in on that channel.

### To see the amount of time delay on a track that uses plug-in inserts.

- In the Mix window, Control-click (Windows) or Command-click (Macintosh) the track's Volume Indicator to toggle between Volume ("vol"), Peak ("pk") and Channel Delay ("dly") indications.

### Compensating For Delays

**Automatic Delay Compensation** Pro Tools TDM systems provide automatic Delay Compensation to compensate for signal processing delays. For details, see the *Pro Tools Reference Guide*.

**Manual Delay Compensation** If it becomes necessary to manually compensate for plug-in delay, use the TimeAdjuster plug-in included with Pro Tools to offset other tracks, as appropriate. See the *DigiRack Plug-ins Guide* or the *Pro Tools Reference Guide* for more information on TimeAdjuster.

## SignalTools DSP Delay

Table 1. Samples of delay incurred by SignalTools plug-ins

Plug-in	Samples of delay on HD Core or HD Process cards	Samples of delay on HD Accel cards
SurroundScope	4	4
PhaseScope	4	4



[www.digidesign.com](http://www.digidesign.com)

---

**DIGIDESIGN**

2001 Junipero Serra Boulevard  
Daly City, CA 94014-3886 USA  
Tel: 650.731.6300  
Fax: 650.731.6399

**TECHNICAL SUPPORT (USA)**

Tel: 650.731.6100  
Fax: 650.731.6384

**PRODUCT INFORMATION (USA)**

Tel: 650.731.6102  
Fax: 800.333.2137

**INTERNATIONAL OFFICES**

Visit our Digidesign Web site  
for contact information