The Waves Dorrough Meter Collection

User Guide

WAVES

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Chapter 1 – Introduction

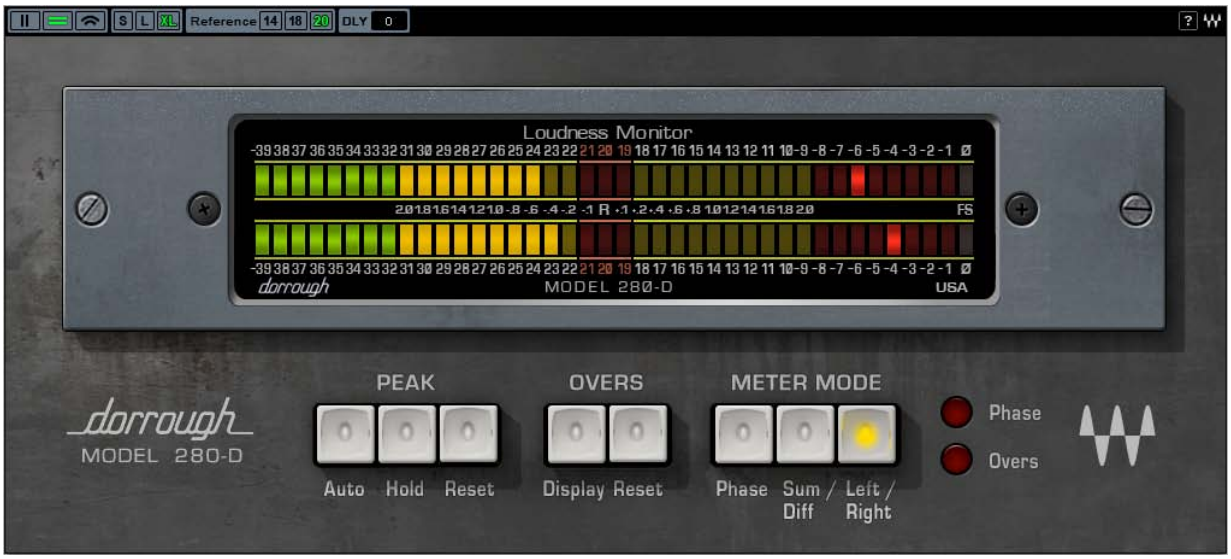
1.1 Welcome

Thank you for choosing Waves! In order to get the most out of your Waves processor, please take the time to read through this manual.

In conjunction, we also suggest that you become familiar with www.wavesupport.net. There you will find an extensive **Answer Base**, the latest **Tech Specs**, detailed **Installation** guides, new **Software Updates**, and current information on **Authorization** and **Registration**.

By signing up at www.wavesupport.net, you will receive personalized information on your registered products, reminders when updates are available, and information on your authorization status.

1.2 Product Overview



ABOUT DORROUGH

Dorrough Electronics designs and manufactures precision audio and video monitoring devices. For over 20 years, Dorrough has pioneered new technologies in audio signal processing and monitoring for the broadcast, motion picture, and recording industries.

The patented Dorrough Ballistic is based on the mathematics intrinsic to audio waveforms. The average integrates amplitudes in the context of time, for a true reading of audio power that satisfies both ear and machine. Simultaneously, users are provided with a real time peak, which picks up destructive "burst anomalies" the ear might miss, but that are all too noticeable to recording devices.

The mathematical cohesion between Peak and Average also provides users with a unique window into qualitative aspects of the sounds they are recording. By observing the relationship (gap) between the Peak and Average displays, the user can observe graphically the effects of processing, compression, and even detect distortion. While traditional VU meters are useful for determining average sound levels, and PPM meters are known for their ability to catch fast transient peaks, neither provides both average and peak level displays, which are needed to get an indication of overall program loudness.

Dorrough Meters are fully compatible with AES/EBU standards.

1.3 About the Modeling

Modeling the Dorrough Meters was one of the most ambitious projects Waves has ever undertaken. We realized that modeling the visual behavior of a hardware device is as great an engineering challenge as modeling the audio behavior of a hardware device. Delivering superfast peak and average metering, while preserving the analog feel and look of the original hardware meters were of the utmost importance. The results are, we feel, the most accurate audio software meters available.

1.4 Mono and Stereo Components

WaveShell technology enables us to split Waves processors into smaller plug-ins, which we call **components**. Having a choice of components for a particular processor gives you the flexibility to choose the configuration best suited to your material.

The Waves Dorrough Meter Collection—Stereo Edition includes two component processors:

- **Dorrough Mono** – A mono meter, available in 3 sizes and 3 styles.
- **Dorrough Stereo** – A stereo meter, available in 3 sizes and 3 styles.

1.5 Surround Components

The Waves Dorrough Meter Collection—Surround Edition includes the Waves Dorrough Mono and Stereo meters plus two additional component processors:

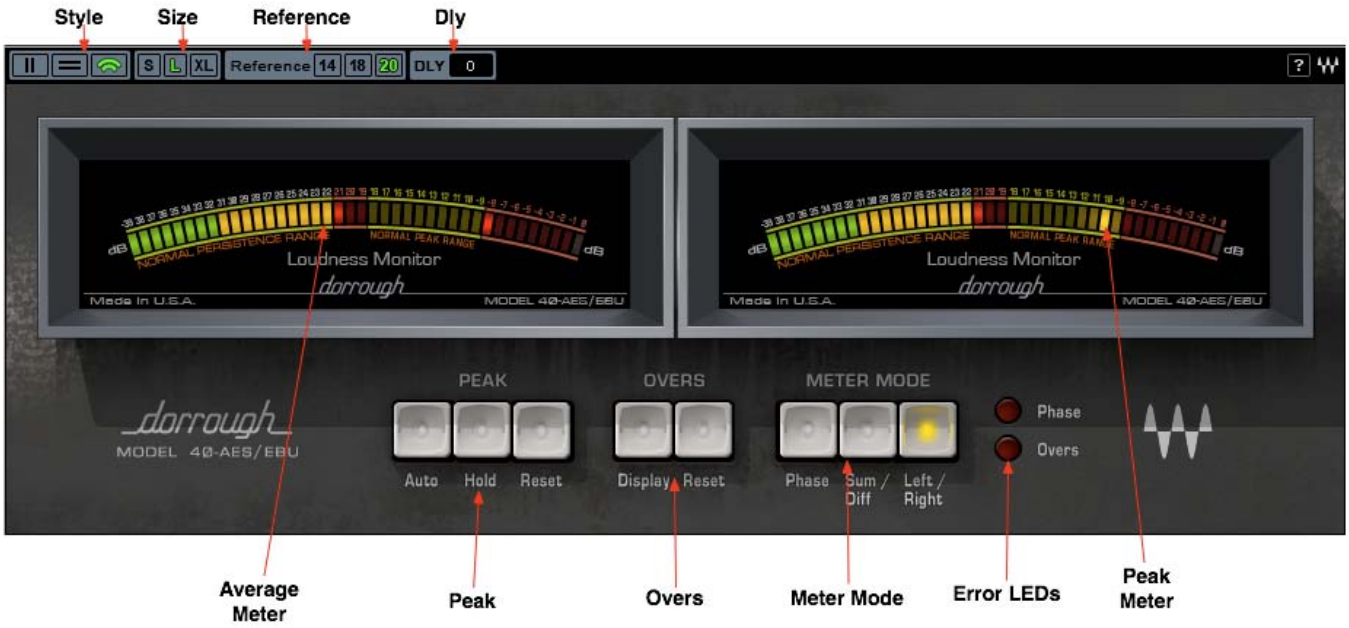
- **Dorrough Surround 5.0** – A dedicated 5 channel meter, available in 3 sizes, 3 styles, and 3 channel configurations. (Available in Pro Tools, Nuendo, and Cubase only.)
- **Dorrough Surround 5.1** – A dedicated 6 channel meter, available in 3 sizes, 3 styles, and 3 channel configurations. (Available in all supported hosts.)

Chapter 2 – Quickstart Guide

- Choose the style you want to work with: Arc, Horizontal, or Vertical.
- Choose your size: Small, Large, or Extra Large.
- The Average level should not exceed the middle three red LEDs; Peaks should reach the area of the upper scale red section. These guidelines apply to normal loudness levels; today's mastered music levels are usually considerably hotter.
- When working with a stereo signal, choose Sum/Diff mode to make sure there is no energy drop in the sum which could be caused by phasing problems and that the difference (diff) is not too low compared to the sum.
- The Overs error LED lights up when there are more than 3 samples that exceed 0 dBFS.

Chapter 3 – Interface and Controls

3.1 Interface



3.2 Dorrough Meter Controls

Style controls choice of meter style.

- Vertical (340/380)
- Horizontal (240/280)
- Arc (40 AES/EBU)

Size controls choice of meter size.

- Small
- Large
- Extra Large

Reference controls choice of reference level.

- 14 (0 VU = +4 dBu = -14 dBFS)
- 18 (0 VU = +4 dBu = -18 dBFS)
- 20 (0 VU = +4 dBu = -20 dBFS)

Although the meters are digital and display full scale metering, three reference levels are offered for better orientation when working in conjunction with analog devices.

The selection (-20,-18, or -14) represents a reference level of +4dBu, which is usually represented by "0" on professional analog VU meters.

-20 dBFS is the Digital AES reference standard.
-18 dBFS is the Digital EBU reference standard.
-14 dBFS is commonly used in post-production and certain mastering situations.

Please note: Reference levels will only give you correct readings if your interface and analog devices are calibrated to correct levels. Therefore, it is imperative that your studio is calibrated.

Dly (Delay)

Range
0-50,000 samples

Resolution
500 samples steps

Due to I/O buffer distribution in certain host applications (e.g. Sound Forge, WaveLab, and Logic) metering response may precede the audio coming out of your system. To compensate for this possibility, we added a Delay control that allow synchronization of the meter display with the audio. (This will not alter the input signal in any way.)

Do not change the Dly setting if you do not have sync problems between your audio and the meter display.

Peak controls the peak display mode.

- **Auto** holds the peak for 3 seconds.
- **Hold** holds the peak for an infinite time.
- **Reset** resets the peaks.

When none of these modes is selected, the peak display will constantly refresh.

Overs

Like their hardware counterparts, Waves Dorrough meters are able to detect and display the number of Overs, which are defined as 3 samples or more that exceed 0 dBFS (-0.0008 dBFS @ 24bit).

- **Overs Display** LED displays the number of Overs.
- **Overs Reset** resets the Overs count to 0.

Meter Mode controls the metering mode. (Stereo components only)

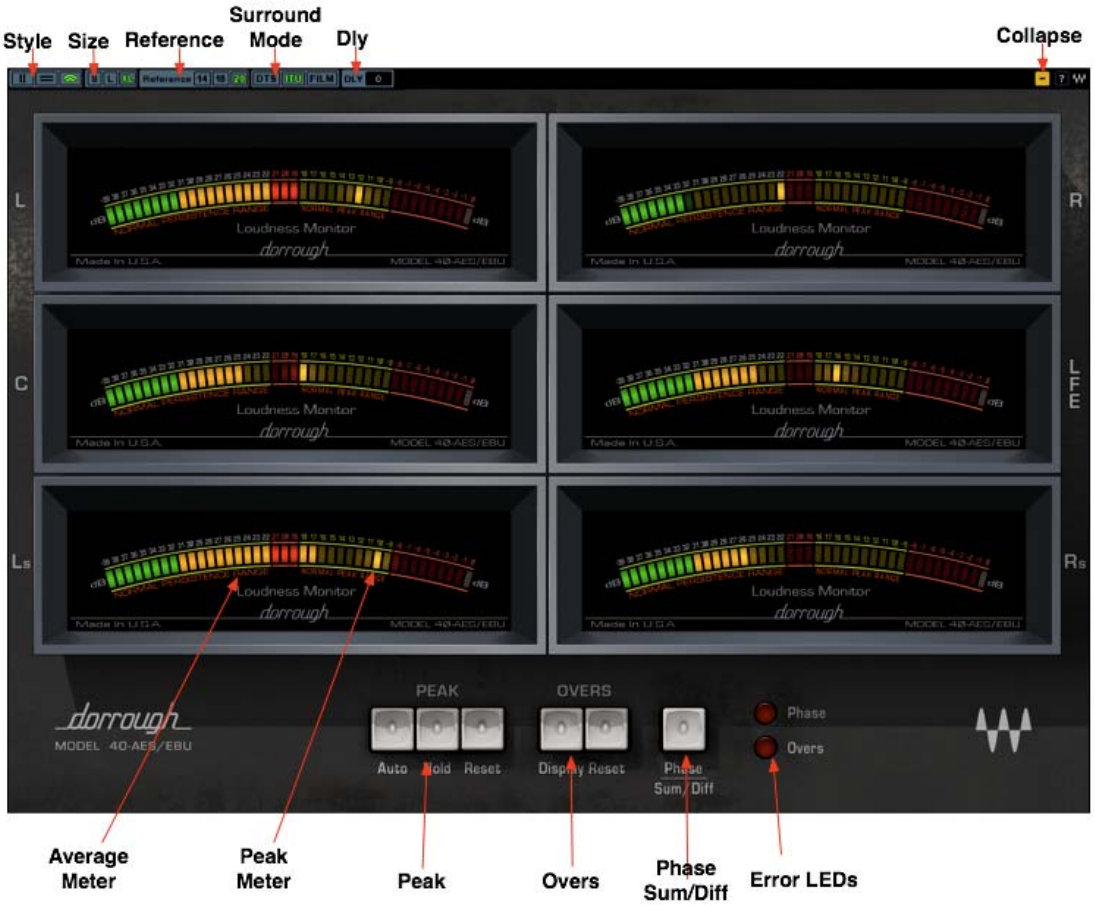
- **Left/Right** displays Left and Right channel levels independently.

- **Sum/Diff** (Sum and Difference) Left/Upper meter displays the Sum of Left + Right; Right/Lower meter displays the energy difference between Left and Right.

- **Phase** displays phase correlation between Left and Right.
  - 0 LED indicates that the signal is 100% correlated (mono)
  - -39 LED indicates that the signal is 100% out of phase
  - -20 LED indicates that the signal has random correlation

Readings between -20 and 0 can be considered good phase correlation; readings between -20 and -39 can be considered bad phase correlation.

3.3 Surround Edition Controls



The Surround Edition includes the Waves Dorrough Mono and Stereo meters, plus 5.0 and 5.1 channel meters. Their controls are the same as those for the Mono and Stereo meters as described above, with the addition of controls for **Meter Order**, **Sum & Diff / Phase**, and **Collapse**.

Meter Order controls the layout of the meters according to common disciplines practiced in the surround sound industry. You can select between:

- **Film** (Default)
  5.0: L, C, R, Ls, Rs
  5.1: L, C, R, Ls, Rs, LFE

- **ITU**
  5.0: L, R, C, Ls, Rs
  5.1:L, R, C, LFE, Ls, Rs

- **DTS**
  5.0: L, R, Ls, Rs, C
  5.1: L, R, Ls, Rs, C, LFE

Sum & Diff / Phase Page

The Surround Edition plug-ins features a special single Sum & Diff / Phase page, which allows the selection of channel pairs to be displayed on two sets of Sum & Diff / Phase Meters.

Please note:
The Waves Dorrough Meter **Lt vs Rt** mode is a bit different than the standard Dolby Lt / Rt matrix .

The Waves Dorrough Meter **Lt vs Rt** mode displays the sum of:

- **5.0**: Left + Left Surround + 0.5 Center vs. Right + Right Surround + 0.5 Center
- **5.1**: Left + Left Surround + 0.5 Center + 0.5 LFE vs. Right + Right Surround + 0.5 Center + 0.5 LFE

Collapse (- / +) hides the control section, leaving the meters displayed.

Chapter 4 – The WaveSystem

4.1 Interface Controls

Controls can be in one of three states:

- **Not Selected** where the control is not the target of any user entry
- **Selected** where the control is the target of mouse control entry only
- **Selected and Active** where the control is the target for both mouse and keyboard entry

Toggle Buttons

Toggle buttons display the state of a control, and allow switching between two or more states. **Single-click** to change the control's state. Some toggle buttons have a text display which updates with the current setting, and others (bypass, solo, or monitoring toggles) illuminate when the control is active.

Some processors have **link buttons** between a pair of toggle buttons, allowing click-and-drag adjustment while retaining the offset between the controls.

Value Window Buttons

Value windows display the value of a control and allow **click-and-drag** adjustment, or **direct control via the keyboard**.

- **Using the mouse**, click-and-drag on the value window to adjust. Some value windows support left/right, some up/down (as you hover over a button, arrows will appear to let you know which direction of movement that button supports).
- **Using the arrow keys**, click once with mouse to select the button, and then use up/down – left/right (depending on the direction supported by that button) to move in the smallest incremental steps across the button's range (holding down the arrow keys will move faster through the range).
- **Using key entry**, double click on the button to open the value window, and directly enter the value from your keyboard. If you enter an out of range number, the button stays selected but remains at the current setting (system beeps? If system sounds are on?)

Some processors have **link buttons** between a pair of value windows, allowing click-and-drag adjustment while retaining the offset between the controls.

TAB Functions

TAB moves the 'selected' status to the next control, with shift-TAB moving in the reverse direction.

Additionally, the Mac has an option-TAB function for ‘down’ movement and shift-option-TAB for ‘up’ movement where applicable.

If you have several Value Window Buttons selected, TAB functions will take you through the selected controls only.