TENSOR

Owner's Manual

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Version 1.3 (firmware 1.1.0+)
November 2018

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Please register your product at redpandalab.com/register

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Getting Started

The Tensor performs realtime tape stop/slowdown/reverse, time stretching, and pitch shifting. The hold footswitch can loop and manipulate phrases up to 4.8 seconds. Both footswitches can be set to momentary or latching mode. The Tensor is always listening to what you play, so you can switch from bypass to effect with no gap or delay. Intelligent randomization adapts to the current knob settings to add random glitches, stutters, and pitch changes.

The Tensor maps between real time (as you play) and an alternate time based on the combination of control settings. It takes some practice to play and hear in disjoint time bases, but in most cases you can concentrate on what you are playing and let the Tensor stretch, shift, and warp the sound.

In addition to its front-panel knobs and switches, the Tensor supports USB MIDI to record, playback, and sequence sound changes.

To get familiar with the Tensor, start with a full wet, normal playback setting:
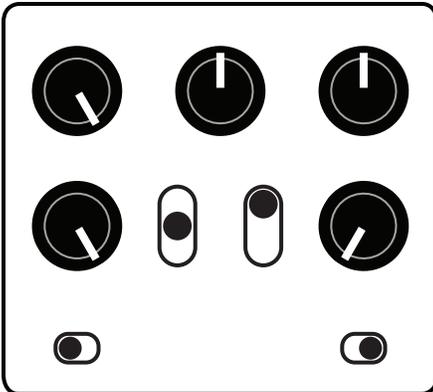
Play a loop or some music through the Tensor and turn each of the knobs to see its effect on the sound. Try the **SPEED**, **TIME**, and **PITCH** knobs one by one, then combine them. Next, slowly turn up the **RAND** (random) knob and hear how it interacts with the other controls.

In live play mode, the Tensor does tape speed, time stretching, and pitch shifting while maintaining a real-time feel. It will fall behind when slowing down or stretching the audio, but tries to find good points to jump back so that it remains playable.

With a MIDI controller or remote footswitch, you can also use the Tensor as a looper / sample playback pedal.

Controls
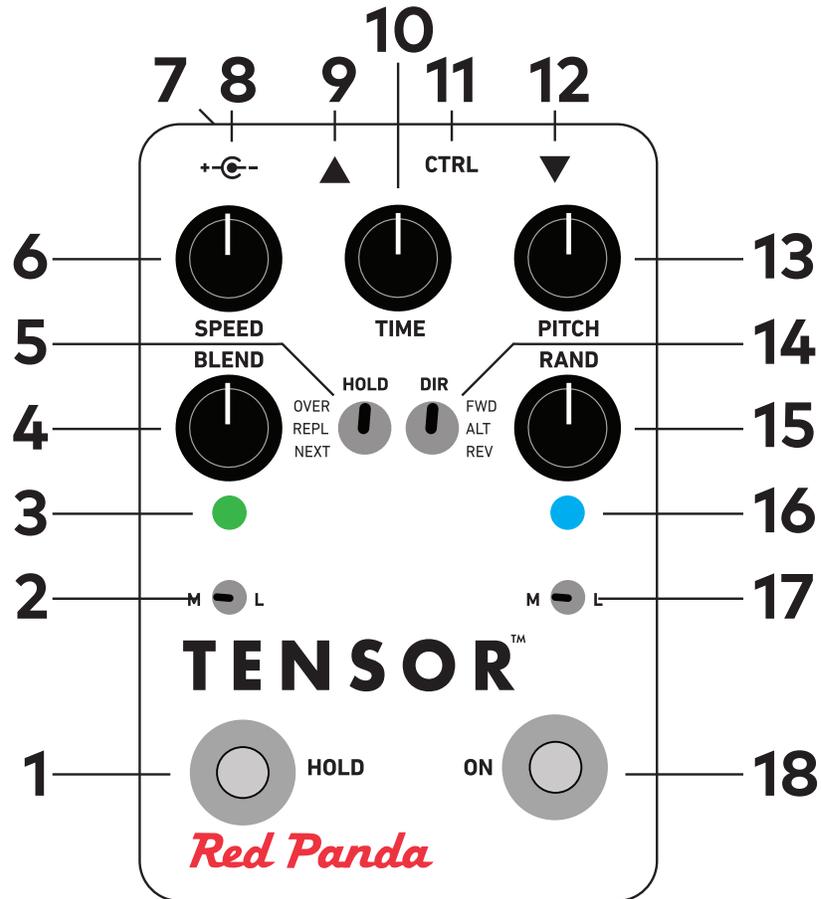
1	Hold switch	**10**	Time stretch
2	Momentary hold	**11**	Expression/control port
3	Hold indicator	**12**	Input
4	Wet/dry blend	**13**	Pitch shift
5	Hold mode	**14**	Loop direction
6	Tape speed	**15**	Randomization
7	USB MIDI	**16**	Bypass indicator
8	9 VDC 250 mA	**17**	Momentary effect
9	Output	**18**	Bypass switch

Stop

−100%　　100%
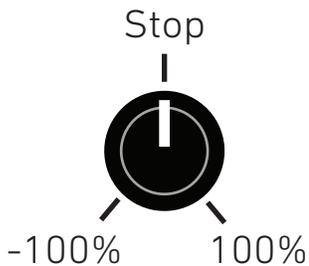
SPEED: -100% to +100%—Tape speed effect. Smoothly changes the playback speed, from forward (clockwise) to reverse (counter clockwise). In the middle, the sound is stopped. Reverse playback will play short segments of audio backwards, simulating studio tricks where a tape is flipped over to create a reverse guitar solo. The Tensor analyzes your playing to automatically adjust the size and timing of the reversed segments (See **NXT** hold mode or "Drift" if you need more control).

1:1

1:2　　2:1

1:4　　4:1
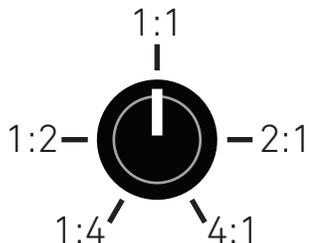
TIME: 1:4 to 4:1—Time stretch/compression. Normal playback is in the middle position (12:00). To the left, playback is stretched without pitch shifting. To the right, playback is compressed without pitch shifting. Time compression only works during loop playback; during live play and recording it will play at normal speed (since it cannot hear the future). Stretching or compressing more than 2x will introduce glitches, which you can use to create new textures.

The right LED turns magenta when time stretching is active and cyan when time compression is active.

M2 P1 M2
m3　　m3
P4　　P4
P5　　P5
m7　　m7
−1　　+1
−2　　+2

PITCH: -2 to +2 octaves—Pitch shifting. No pitch shift in middle position (12:00). In live play mode, pitch shifting happens in realtime. In hold modes, the loop playback speed is changed to maintain the best fidelity. You can combine the **PITCH** and **TIME** controls to adjust the pitch and loop length independently. The **PITCH** knob is quantized to intervals.

BLEND: Wet/dry blend, from 100% dry to 100% wet.

RAND: Randomization. Rotating the knob clockwise will change the amount and type of randomization. Lower settings will add occasional stutters, in the middle it will randomly repeat short segments, and at maximum setting it shuffles short slices of sound. Speed and pitch will be randomized based on the knob settings. For example, if the **PITCH** knob is at 12:00, no pitch randomization will happen.

HOLD: Hold (looping) mode. See "Hold Modes" for more information.
　　OVR: Overdub (sound on sound)
　　REC: Record (replace)
　　NXT: Next (dual buffer)

DIR: Hold loop direction.
　　FWD—Loop plays forward.
　　ALT—Loop alternates between forward and reverse.
　　REV—Loop plays in reverse.

M/L (HOLD)—Sets **HOLD** footswitch to momentary or latching mode.

HOLD footswitch—See "Hold Modes" for more information. If the pedal is bypassed, pressing **HOLD** will engage the effect and it will return to bypass after exiting hold mode.

M/L (ON)—Sets **ON** footswitch to momentary or latching mode.

ON footswitch—Switches the effect between engaged and bypass. If the **SPEED** control is stopped (12:00), engaging the pedal will ramp the speed down for a turntable stop effect.

Presets

Presets store knob and toggle switch settings, expression pedal assignment, loop decay, and glide parameters. You can change presets without interrupting the sound, allowing you to change settings while playing. The right LED blinks green when a preset is loaded.

The Tensor can store 31 presets that can be recalled using a MIDI controller. See "MIDI Program Change Messages" for more information.

Drift

While the Tensor is engaged (blue LED on), holding down the **ON** footswitch will cause the tape speed effect to continue playing at the set speed without splicing back to the current time. Releasing the footswitch will snap back to the current time. If playback falls too far behind, it will stop (tape stop effect). The Tensor will continue recording in "real time" as it plays.

When the **ON** footswitch is set to momentary mode, drift mode is always active. This is useful for instant rewind effects and reverse solos. With **BLEND** 100% wet (5:00) and **SPEED** set to -100% (7:00), pressing the **ON** footswitch will rewind what you just played (up to about 2.4 seconds). It continues recording, so you can instantly flip between forward and reverse.

To play a reverse guitar solo with precise control over each segment, briefly lift your foot and re-press the **ON** footswitch for each segment. It is similar to a horn player pausing to breath, but it takes some practice to get the timing down because you are playing notes ahead of when you hear them. (Hold **NXT** mode or the automatic reverse playback function are other options for reverse soloing.)

Control Port

The **CTRL** (control) port can be used to connect an expression pedal or remote switch. See "Using the Control Port" for information on supported devices and how to configure them.
*   Expression pedal: assignable to any combination of knob settings.
*   Control voltage: 0-3.3V on tip, sleeve grounded.
*   Remote switch: 1- to 4-button switch to select presets or access pedal functions.

By default, the control port is configured for an expression pedal that morphs from the current knob settings (toe down) to normal playback (heel down). For example, if the SPEED knob is set to 12:00 (stopped), you will get a tape stop effect as you push the pedal down.

Hold Modes

The Tensor has three hold modes for recording and manipulating short loops (up to 4.8 seconds). You can switch between modes while playing. The momentary/latch (**M**/**L**) switch determines how the hold function responds. You can jump straight from bypass into hold mode.

Recording and playback

Press the hold button to start recording a loop:
M (momentary): press **HOLD** to start recording, release to stop recording and play back loop.
L (latching): press **HOLD** once to start recording, press again to stop recording and play back loop.

Momentary mode is useful for short loops/stutters, or off-beat loops. Latch mode is useful for longer loops, and behaves like a traditional looper or tap tempo.

The left LED will be red during loop recording. It is green during loop playback, but blinks red at the beginning of the loop.

Press the **HOLD** footswitch again to replace, overdub, or update the loop.

Press the **ON** footswitch to stop loop playback. The Tensor will record to live play or bypass, whichever was active when you entered hold mode.

Hold/Record (REC) Mode

The loop is replaced each time you start recording. The loop is recorded in "real time" (as you play), and played back based on the control settings.

Hold/Overdub (OVR) Mode

Recording the first loop sets the loop length. After recording the initial loop, pressing the **HOLD** footswitch will turn on overdub mode (LED will turn red). Live audio is added to whatever is currently looping (sound on sound), based on the control settings. For example, if you overdub while playing back a loop at +1 octave, the new sound is recorded at 2x "tape speed". If you turn the **PITCH** knob back to 12:00 (unison), the first pass will return to normal speed and the second will be shifted down one octave. This works with all of the controls, so you can:
• Get longer, low-fidelity loops by overdubbing with the speed control set near 12:00.
• Overdub with time compression or expansion.
• Randomization will scatter small fragments of sound randomly throughout the buffer.

Some limitations:
• Some settings will result in noise and low fidelity artifacts, especially with time stretching and com-pression.
• Recording a sustained note on the first loop can cause a click, if the Tensor is not able to find a good loop point.

Overdub with the **HOLD** switch set to **M** (momentary) will punch in the overdubbed sound, which can turn sustained sounds into rhythmic bursts similar to a transformer scratch. You can record a silent loop initially to set the loop length.

Hold/Next (NXT) mode

NXT mode uses dual buffers, recording into one buffer while playing back the last buffer. Each time the LED blinks red, the buffers are swapped. You can think of it like playing rounds (row, row, row your boat...) or use it like tap tempo.

The buffer is recorded in "real time" (as you play), while the previous buffer is played back based on the control settings. The maximum loop length is reduced to 2.4 seconds, so that playback and recording times can be completely independent. Some examples:

* Reverse delay with tap tempo. You can play one measure ahead of what you hear, and play it back in reverse.
* Repeat with harmony and/or polyrhythms.
* Realtime time compression. Play your notes back at 3/2 speed or twice as fast.. The buffer will repeat to fill up the time.

If you switch from one of the other hold modes to NXT mode while playing a loop that is longer than 2.4 seconds, the loop length will be reduced by half.

If you switch from NXT mode to one of the other hold modes, the buffer that is currently playing will repeat. You can use this to loop fragments that you have already played.

Loop directions (DIR)

FWD—Loop plays forward.
ALT—Loop alternates between forward and reverse.
REV—Loop plays in reverse.

You can change the loop direction at any time. The **SPEED** knob and **DIR** switch are combined to determine the playback direction. For example, if **SPEED** and **DIR** are both reverse, the loop will play forward.

Loop decay (MIDI setting)

In overdub (**OVR**) mode, the previously recorded sound stays at the same level as you add new layers. Using MIDI continuous controller messages, you can set it to attenuate the previous loop so that the old sounds will gradually fade away. The fade out only happens while overdubbing (red LED), not while the loop is playing.

Moderate settings will emphasize the most recent overdub passes and the loop will evolve as older sounds fade away. You can create dense sheets of sound by using a short loop and jumping between pitches.

At the maximum level, the previously recorded sound is completely muted. That allows you to splice in (punch in) small fragments of sound instead of overdubbing. It works well with the **HOLD** footswitch in momentary (**M**) mode.

See the "**MIDI Continous Controller Messages**" for information, or download the TouchOSC template from our web site for your tablet or phone. This setting is stored when the power is turned off.

Advanced Configuration

Setting maximum input level
The Tensor can handle signals up to +5.2 dBu (4 Vpp) in its default setting. The maximum input level is adjustable using MIDI System Exclusive (SysEx) messages, or via the TouchOSC template we provide. The Tensor adjusts the input and output levels to maintain a consistent signal level.

If you are using a synthesizer or mixing console and the Tensor is clipping, you can increase the maximum input level.

If you are using a quiet instrument, such as single coil guitar pickups or a consumer cassette deck, you can set the Tensor to a +0.5 dBu maximum input level, which may give a slight improvement in signal-to-noise ratio.

Setting bypass mode
The Tensor has three different bypass modes:
- **Analog** - analog bypass path. The analog bypass path has slightly higher headroom and lower noise, but there may be a click when switching between bypass and effect.
- **DSP** - signal always passes through DSP. Smoother switching between bypass and effect.
- **Kill Dry** - dry signal is muted - even in bypass - for use on an aux send.
- **Auto** (default) - chooses bypass based on effect momentary/latching setting:
  Momentary: DSP bypass
  Latching: analog bypass

Kill Dry is useful when using multiple effects processors in parallel and mixing their outputs together, including:
- Using an aux send to route a signal to the Tensor, bringing the output back to an aux return or mixer channel.
- Splitting the signal into multiple bands, processing each with a different effect, and combining the outputs with a mixer.

Kill Dry is not intended for typical serial effects routing or amp effects loops. The dry signal will be muted at all times. The **BLEND** knobs acts as an output level control.
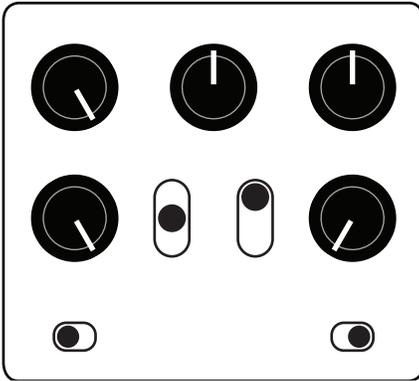
The bypass mode can be changed using MIDI System Exclusive (SysEx) messages, or via the TouchOSC template we provide.
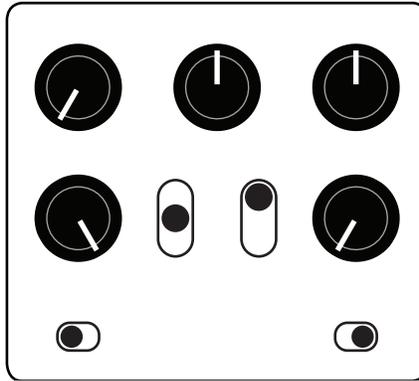
Setting MIDI channel
The Tensor transmits and receives on MIDI channel 1 by default. The MIDI channel can be changed using MIDI System Exclusive (SysEx) messages, or via the TouchOSC template we provide.

Sample Settings

Normal Playback

Tape Reverse

Use an expression pedal to morph from forward (heel down) to reverse (toe down). Set **SPEED** to 12:00 for tape stop effect.

Rewind
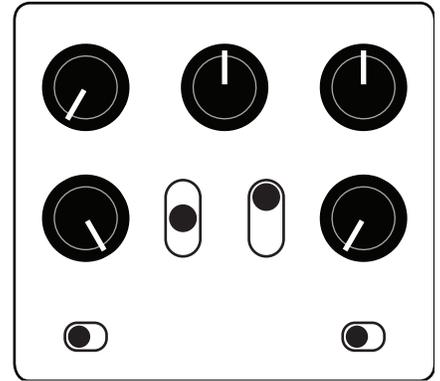
The Tensor listens in bypass. Hold down the **ON** footswitch to instantly rewind what you just played.

Glitch
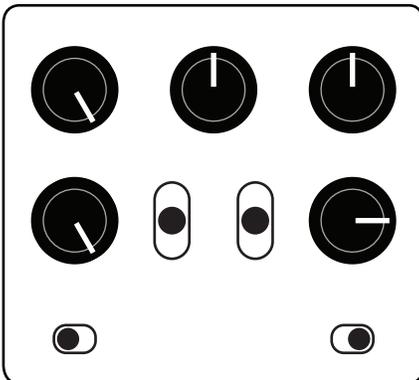
Moving **RAND** knob will change the character from stutters and repeats to small slices. Adjust **SPEED** and **PITCH** to add random shifts.

Tape Flanger
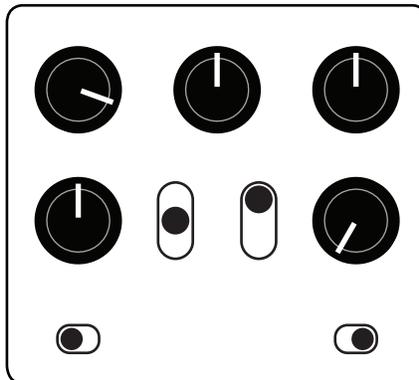
Carefully adjust **SPEED** knob until you hear the *whoosh* sound. Hold the **ON** footswitch to let the wet and dry sounds slip and release to snap back.

Voice Doubling
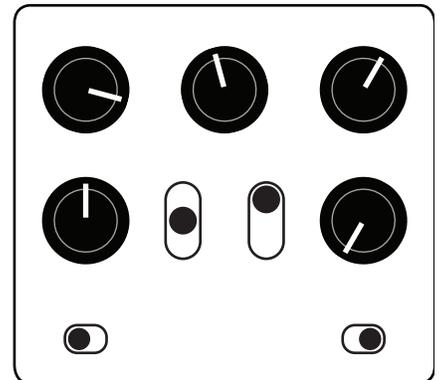
PITCH shift up slightly, then use **SPEED** to bring pitch down until it is slightly detuned. **TIME** stretch slightly to separate voices. **RAND** at 8:30 will add occasional instability.

Tap Tempo Reverse
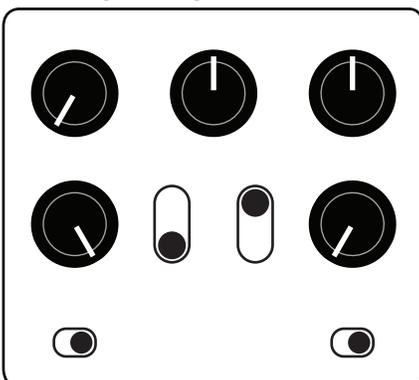
Using **NXT** mode gives you more control over the timing of reverse playback. Tap **HOLD** twice to set the length of each reversed slice.

Random Accompaniment
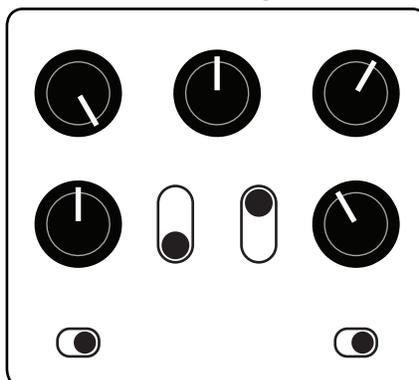
Use **HOLD** footswitch to set tempo. The last segment will be rearranged, creating different variations. Adjust **PITCH** as needed.

Stutter
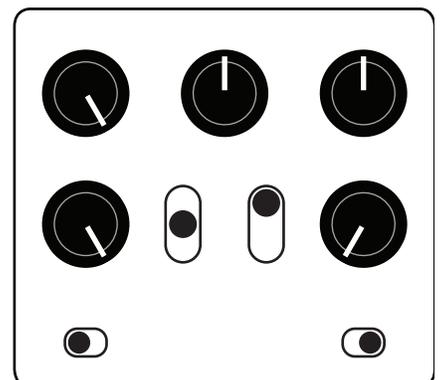
Quickly tap **HOLD** footswitch to grab short pieces of sound. Adjust **DIR**, **PITCH**, and **RAND** to create variation.

Additional Techniques

Stutter

Using **REC** mode with momentary (**M**) hold footswitch allows you to loop very short pieces of sound. Each time you press the **HOLD** footswitch it will replace the loop, and pressing the **ON** footswitch will stop the loop. Playing a legato phrase while rhythmically tapping the **HOLD** footswitch will create sample-and-hold effects, or you can grab part of a phrase and let it repeat.

Setting the loop direction (**DIR**) to **FWD**, **ALT**, or **REV** each give a different feel to the held fragment. The **TIME** and **PITCH** knobs take it beyond basic stutter effects, and the **RAND** knob combined with **PITCH** will add variation and instability.

If you go directly from bypass to the **HOLD** footswitch, pressing the **ON** footswitch will disable the loop and put the Tensor back in bypass. That allows you to add an intense stutter effect to otherwise normal playing.

Transformer loops

Use **OVR** (overdub) hold mode with **M** (momentary) **HOLD** footswitch. Press and hold the **HOLD** footswitch to set the loop length, without playing anything. Release the **HOLD** footswitch and the empty loop will begin playing. While it is looping, play a sustain note and rhythmically press and release the **HOLD** footswitch to punch in and out.

Pitch up / speed down

For sounds like chorusing, flanging, and voice doubling, shifting the **PITCH** up and then bringing the **SPEED** down will allow you to dial in detuned sounds above or below the dry signal.

Loop splicing

Use MIDI continuous controller messages (or the TouchOSC templates) to set **loop decay** to its maximum value. In overdub mode, the **HOLD** footswitch will now splice in (replace) new audio instead of adding it to the existing loop. Use momentary footswitch mode to drop in short fragments of sound.

Reverse soloing

With the **ON** footswitch in momentary mode and **SPEED** set to -100%, you can instantly jump between forward and reverse playback. The Tensor listens in bypass, so pressing the **ON** footswitch will rewind what you just played. While playing in reverse, the Tensor is still listening to what you play, so you can seamlessly jump between forward and reverse. To play an entire solo in reverse, hold the ON switch down and momentarily lift it up when you want to retrigger the reverse segment, similar to how a horn player incorporates breathing. This allows you to reverse a whole measure, or only parts of it.

Looping what you already played

Typically you engage the **HOLD** footswitch when you want the Tensor to start recording a new loop. Using **NXT** mode, you can let the Tensor continously record what you play, then grab the last buffer and start looping it, similar to the original Electro-Harmonix 16 Second Delay.

Use **NXT** mode with the **BLEND** at 100% dry, and set the delay time using the **HOLD** footswitch (up to 2.4 seconds). Adjusting the other knobs as you want the loop played back. To loop the last segment, flip the **HOLD** mode toggle switch from **NXT** to **REC** and use the **BLEND** knob to bring up the wet signal.

Using the Control Port

The **CTRL** (control) port allows you to connect an expression pedal, control voltage, or a remote footswitch to access pedal functions. To configure a device, hold down the right footswitch while plugging it in. The Tensor will detect which device is connected using the steps below.

The configuration is remembered when the device is unplugged or power is turned off.

Expression Pedal

An expression pedal can be assigned to any combination of knob settings at the heel and toe position. Moving the expression pedal will morph between the settings. If no knob assignments are made, the expression pedal will morph from the current knob settings (toe down) to normal playback (heel down). For example, if the SPEED knob is set to 12:00 (stopped), you will get a tape stop effect as you push the pedal down.

You can also calibrate the range of the expression pedal, to ensure that its full travel is used.

Calibrating Expression Pedal Range (no knob assignments):
1. Start with the pedal powered on and nothing plugged into the **CTRL** port.
2. Hold the right footswitch while plugging in the expression pedal. The right LED will blink orange three times to indicate it is in **CTRL** configuration mode. You can release the right footswitch and begin configuration immediately.
3. Move the expression pedal to the heel down position.
4. Move the expression pedal to the toe down position.
5. Hold the right footswitch for 2 seconds to save the configuration. The right LED will blink green to indicate that the configuration has been saved.

Configuring Expression Pedal Knob Assignments
1. Start with the pedal powered on and nothing plugged into the **CTRL** port.
2. Hold the right footswitch while plugging in the expression pedal. The right LED will blink orange 3 times to indicate it is in **CTRL** configuration mode. You can release the right footswitch and begin configuration immediately.
3. Move the expression pedal to the heel down position.
4. Adjust the knobs for the desired sound.
5. Move the expression pedal to the toe down position.
6. Adjust the knobs for the desired sound.
7. Hold the right footswitch for 2 seconds to save the configuration. The right LED will blink green to indicate that the configuration has been saved.

Knobs that are not adjusted during configuration will not be affected by the expression pedal. Expression pedal assignments are stored in presets and when the expression pedal is unplugged or power is turned off. The

Expression pedals with 5-25 kΩ linear potentiometers work best.

Control Voltage

Control voltage input is configured the same way as an expression pedal.

CV Range: 0-3.3V (with over/under-voltage protection)
Tip: 0-3.3V input
Ring: 3.3V output (with current limiting)
Sleeve: ground

The expression input has current limiting in case you use a TS cable, but it is preferable to use a 1/4" TRS cable with the ring unconnected. We sell a suitable cable at our web site, and the Expert Sleepers 'floating ring' cable is another option. Instructions for building your own cable are available on our Knowledge Base.

Remote Switch

A remote switch has up to 4 modes of 4 switches that can access presets and pedal functions. It works with our remote switches, some third-party switches, and is DIY friendly for different control interfaces. See our Knowledge Base for infomation on building a compatible switch. Note that the switch uses parallel resistors, and switches with shorting contacts will not work without an adapter (most tap-tempo switches and the Roland FS-6, for example).

1, 2, 3, and 4-button switches are supported. The modes and functions accessible will depend on the number of buttons. A single-button switch can load or save your favorite sound. A two-button switch can access two presets or be used as a remote for the Tensor's foot switches.

To save a preset, hold the corresponding button for two seconds. The right LED will blink green to indicate that the preset has been stored. Presets are also accessible via MIDI program change messages.

Configuring a Remote Switch:
1. Start with the pedal powered on and nothing plugged into the **CTRL** port.
2. Hold the right footswitch while plugging in the remote switch. The right LED will blink orange 3 times to indicate it is in **CTRL** configuration mode. You can release the right footswitch and begin configuration immediately.
3. Press one of the buttons on the remote switch to select a mode.
4. Hold the right footswitch for 2 seconds to save the configuration. The right LED will blink green to indicate that the configuration has been saved.

Remote switch modes

Mode	Switch	Function	LED Indication
1	A	Preset 1 (hold to save)	Blinks green when saved
	B	Preset 2 (hold to save)	Blinks green when saved
	C	Preset 3 (hold to save)	Blinks green when saved
	D	Preset 4 (hold to save)	Blinks green when saved
2	A	Left footswitch	
	B	Right footswitch	
	C	Preset 1 (hold to save)	Blinks green when saved
	D	Preset 2 (hold to save)	Blinks green when saved
3	A	Record / Overdub	
	B	Play / Stop	
	C	Play Once	
	D	Toggle **TIME** & **PITCH** (tap) Toggle **SPEED** (double tap)	
4	A	Toggle **SPEED** knob	Blink green (on) / red (off)
	B	Toggle **TIME** knob	Blink green (on) / red (off)
	C	Toggle **PITCH** knob	Blink green (on) / red (off)
	D	Toggle **RAND** knob	Blink green (on) / red (off)

To access a different mode, you must unplug and reconfigure the remote switch. For more advanced

control, MIDI continuous controller messages can be used.

Loop Sampler (Remote Mode 3)

Mode 3 is designed to use the Tensor as a loop sampler with live loop manipulation. Switches A-C control loop record, overdub, play, and retrigger functions. Switch 4 toggles between the current knob settings and the default (normal playback settings). For example, you can set **SPEED** to reverse and **PITCH** to -1 octave for instant access to reverse and half-speed effects.

Mode 3 loop modes

Mode	Switch			Next Mode
Live	A			Record
Record	A			Overdub
Record		B		Play loop
Record			C	Play once
Overdub	A			Toggles overdub/play
Overdub		B		Stop
Overdub			C	Stop after loop
Play loop	A			Record
Play loop		B		Stop
Play loop			C	Stop after loop
Play once	A			Record
Play once		B		Stop
Play once			C	Retrigger
Stop	A			Record
Stop		B		Play loop
Stop			C	Play once
*			D	Toggle **TIME** & **PITCH**
*	(2x)		D	Toggle **SPEED**

Using MIDI

The Tensor is a class-compliant USB device, which allows you to:
*   Control all parameters of the Tensor
*   Access additional hidden parameters

The Tensor can work with any class compliant USB MIDI host, including:
*   Macintosh and Windows computers. The Tensor shows up as a MIDI device and is available to all programs.
*   Apple iPad, iPod touch, and iPhone using the Lightning to USB 3 Camera Adapter. We provide TouchOSC templates for download from our web site.
*   Standalone USB MIDI hosts allow you to connect the Tensor to hardware with 5-pin DIN MIDI connectors without the use of a computer. Examples include:
    iConnectivity iConnectMIDI4+
    iConnectivity mio4
    Disaster Area Designs Gen3 MIDI controllers with their gHOST option (*unconfirmed - email us*)
    Kenton MIDI USB Host MkII
    Primova Sound MIDX-20 (*unconfirmed - email us for details*)
    Sevilla Soft USB Host MIDI 2
    See our Knowledge Base for up-to-date information

The Tensor sends and receives on MIDI channel 1 by default. You can change the MIDI channel using SYSEX or the TouchOSC template available on our web site. The MIDI channel is remembered when power is off. See "**System Exclusive (SysEx) Messages**" below for more information.

Pitch can be set using CC 22 (which matches the knob) or CC 30, which sets the pitch in semitones. The active pitch is the last knob movement or control change message received. CC 30 is scaled in semitones with 64 being unison, so the valid range is from 40-88. Set the minimum and maximum values on your MIDI controller to the desired range. CC 31 sets the rate of change from one pitch setting to the next, as a constant time per octave.

MIDI Continuous Controller Messages

CC Num	Destination	Notes	
4	Expression pedal	CTRL input	
20	Speed	0	Reverse 100%
		64	Stop
		127	Forward 100%
21	Time	0	1:4 stretch
		64	1:1
		127	4:1 compress
22	Pitch	0	-2 octaves
		64	Unison
		127	+2 octaves
23	Blend	0	100% dry
		127	100% wet
24	Random		
25	Loop decay	0	0 dB
		1	-0.25 dB
		...	...0.25 dB steps
		126	-31.5 dB
		127	off
28	Hold mode	0–42	Next
		43–85	Replace
		86–127	Overdub
29	Loop direction	0–42	Reverse
		43–85	Alternate
		86–127	Forward
30	Pitch semitones Overrides CC 22 to set pitch to a specific semitone. See table below.	40	-2 octaves
		...	
		64	unison
		...	
		88	+2 octaves
31	Pitch glide rate	Sets glide time per octave	
		0	minimum
		127	maximum
80	Hold footswitch	0–63	Up
		64–127	Down
81	Effect on footswitch	0–63	Up
		64–127	Down
85	Hold momentary/latch	0–63	Momentary
		64–127	Latching

CC Num	Destination	Notes	
86	Effect momentary/latch	0-63	Momentary
		64-127	Latching
87	Hold / Sample (Receive only)	127	Record
		96	Overdub
		64	Loop play / retrigger
		48	One shot play / retrigger
		24	Stop (save loop)
		0	Live (clear loop)
88	Bypass (Receive only)	0-63	Bypass
		64-127	Effect on
90	Drift (Receive only)	0-63	Off
		64-127	On

Speed (CC 20) Mapping

MIDI CC Value	Speed	MIDI CC Value	Speed
0	-100%	64	Stopped
8	-87.5%	72	12.5%
16	-75%	80	25%
24	-62.5%	88	37.5%
32	-50%	96	50%
40	-37.5%	104	62.5%
48	-25%	112	75%
56	-12.5%	120	87.5%
64	Stopped	127	100%

Time (CC 21) Mapping

MIDI CC Value	Stretch (Speed)	MIDI CC Value	Compression (Speed)
0	**1:4 (25%)**	**64**	**1:1 (100%)**
8	5:16 (31%)	66	17:16 (106%)
16	3:8 (38%)	68	9:8 (113%)
24	7:16 (44%)	70	19:16 (119%)
32	**1:2 (50%)**	**72**	**5:4 (125%)**
36	9:16 (56%)	76	11:8 (138%)
40	5:8 (63%)	**80**	**3:2 (150%)**
44	11:16 (69%)	84	13:8 (163%)
48	**3:4 (75%)**	**88**	**7:4 (175%)**
52	13:16 (81%)	92	15:8 (188%)

MIDI CC Value	Stretch (Speed)	MIDI CC Value	Compression (Speed)
56	7:8 (88%)	**96**	**2:1 (200%)**
60	15:16 (94%)	100	9:4 (225%)
64	**1:1 (100%)**	104	5:2 (250%)
		108	11:4 (275%)
		112	**3:1 (300%)**
		116	13:4 (325%)
		120	7:2 (350%)
		124	15:4 (375%)
		127	**4:1 (400%)**

Pitch Semitone (CC 30) Mapping

MIDI CC Value	Transposition	MIDI CC Value	Transposition
40	-2 octaves	64	Unison
41	-1 octave + M7	65	m2
42	-1 octave + m7	66	M2
43	-1 octave + M6	67	m3
44	-1 octave + m6	68	M3
45	-1 octave + P5	69	P4
46	-1 octave + d5	70	d5
47	-1 octave + P4	71	P5
48	-1 octave + M3	72	m6
49	-1 octave + m3	73	M6
50	-1 octave + M2	74	m7
51	-1 octave + m2	75	M7
52	-1 octave	76	octave
53	-M7	77	octave + m2
54	-m7	78	octave + M2
55	-M6	79	octave + m3
56	-m6	80	octave + M3
57	-P5	81	octave + P4
58	-d5	82	octave + d5
59	-P4	83	octave + P5
60	-M3	84	octave + m6
61	-m3	85	octave + M6
62	-M2	86	octave + m7
63	-m2	87	octave + M7
64	Unison	88	2 octaves

Loop / Sample (MIDI CC 87)

You can use MIDI CC 87 to record, overdub, loop, and trigger samples. When loop playback is stopped, no wet (processed) sound will be heard. The blend control is still active, so no sound will be heard when playback is stopped if the blend control is set to 100% wet.

Combine this with Loop Decay (CC 25) to make previous loops gradually fade out during overdubbing.

MIDI Program Change Messages

The Tensor can store 31 presets for recall via MIDI program change messages. You can store the current setting as a preset using SYSEX or the TouchOSC template available on our web site.

You can also save a preset by holding down both the **HOLD** and **ON** footswitches for several seconds, then sending a MIDI program change message. That allows you to store a preset using a MIDI foot controller or another device that cannot sent system exclusive messages.

System Exclusive (SysEx) Messages

Set maximum input level

Byte (hex)	Description
F0	System Exclusive (SysEx)
00	Red Panda ID byte 1
02	Red Panda ID byte 2
23	Red Panda ID byte 3
08	Tensor ID
10	Set maximum input level
xx	01: +7.2 dBu max (5.0 Vpp) 02: +5.2 dBu max (4.0 Vpp) (default) 03: +0.5 dBu max (2.3 Vpp)
F7	End of Exclusive (EOX)

Set Bypass Mode

Byte (hex)	Description
F0	System Exclusive (SysEx)
00	Red Panda ID byte 1
02	Red Panda ID byte 2
23	Red Panda ID byte 3
08	Tensor ID
11	Set bypass mode
xx	00: auto (default) 01: analog bypass 02: DSP bypass 03: kill dry
F7	End of Exclusive (EOX)

Set MIDI channel (transmit & receive)

Byte (hex)	Description
F0	System Exclusive (SysEx)
00	Red Panda ID byte 1
02	Red Panda ID byte 2
23	Red Panda ID byte 3
08	Tensor ID
12	Set MIDI channel
xx	00: channel 1 (default) 01: channel 2 ... 0F: channel 16
F7	End of Exclusive (EOX)

Save Preset to Internal Memory

Byte (hex)	Description
F0	System Exclusive (SysEx)
00	Red Panda ID byte 1
02	Red Panda ID byte 2
23	Red Panda ID byte 3
08	Tensor ID
13	Save preset to memory
xx	Preset location (program change number)
F7	End of Exclusive (EOX)

Support, Repairs, and Warranty

Technical Support

Please register your product at redpandalab.com/register within 30 days of purchase.

For technical support, send your question via email to support@redpandalab.com or use the contact form on our web site. Be sure to include your serial number. We are a small company with limited resources for technical support, so it might take us a few days to reply. You will hear from a person who designed, built, or tested your product.

Product manuals and firmware updates are available at redpandalab.com/support

Repairs

If you think your product needs repair, first send an email with your serial number and a description of the problem to support@redpandalab.com. We may be able to get you up and running again without sending in the pedal, but if it does need repair we will arrange for it to come back to us or an authorized service center close to you. Warranty repairs are done for free, and non-warranty repairs will be done at the lowest possible cost to you.

Warranty

This product is warranted against defects in materials and workmanship for one (1) year from date of original purchase. It does not cover damages or wear resulting from accident, misuse, abuse, or unauthorized adjustment and/or repair. Should this product require service (or replacement at our option) while under warranty, please contact support@redpandalab.com.

Firmware Updates

The Tensor's firmware can be updated via drag and drop using any Mac or PC. No driver or special software is required.

To tell which version of firmware your pedal is running:
1. Hold down both footswitches and connect power.
2. The blue LED will blink.
3. Continue holding both footswitches for 2 seconds.
4. The blue LED will turn solid. The pedal is now in USB Mass Storage mode.
5. Connect the pedal to the computer using a mini USB cable.
6. Open the TENSOR drive on your computer.
7. Open the VERSION.TXT file in a text editor.

Downloading the new firmware
1. Go to www.redpandalab.com/downloads
2. Download the firmware file to your computer.
   Mac: download .dmg file
   Windows: download .zip file
3. Double-click the downloaded file to expand (.zip) or mount it (.dmg).

Caution
- Do not rename the extracted file.
- Never turn off the pedal's power while an update is in progress. Otherwise the system software or the pedal itself may be destroyed.

Update procedure:
1. Hold down both footswitches and connect power.
2. The blue LED will blink.
3. Continue holding both footswitches for 2 seconds.
4. The blue LED will turn solid. The pedal is now in USB Mass Storage mode.
5. Connect the pedal to the computer using a mini USB cable.
6. Open the TENSOR drive on your computer.
7. Copy the firmware file to your Tensor:
   Mac: right click on the "Update Firmware" script and select "Open".
   Windows: drag the .bin file to the TENSOR drive.
8. After the firmware update is complete, the green and blue LEDs will be solid.
9. If an error occurred, the red LED will blink instead.
10. Eject the TENSOR drive from your computer:
    Mac: click the eject button or drag the TENSOR icon to the trash
    Windows: right-click on the TENSOR icon in My Computer and select "Eject"
11. Disconnect the USB cable.
12. Turn the pedal's power off.

Troubleshooting
If the left LED blinks red, turn the Tensor off, then on, and try again.

If you are using a Mac and downloaded the .zip instead of the .dmg file, Mac OS X will flag the .bin file as unsafe and the firmware update will fail. See the readme.txt file for instructions on how to proceed.

If you continue to have problems, please email support@redpandalab.com.

Specifications

Maximum input level:	+0.5 dBu (high gain)
	+5.2 dBu (default)
	+7.2 dBu (max)
Frequency response:	20-20 kHz, +0/-0.5 dB
Input impedance:	1 MΩ
Output impedance:	< 1 kΩ
Bypass:	analog buffered
Power supply:	9V DC, center negative
Power connector:	2.1mm I.D. x 5.5mm O.D. barrel connector
Power consumption:	220 mA
Dimensions:	78 (W) x 124 (D) x 59 (H) mm
	3.1 (W) x 4.9 x 2.3 (H) inches
Weight:	0.4 kg / 14 oz

Credits

Design and engineering	Curt Malouin
Documentation	Curt Malouin
Graphics	Sylvie Demers
Testing	Sylvie Demers
	Eric Iverson
	Randy Molina

Thank You

I would like to thank the following people who generously provided inspiration, ideas, and feedback during development of the Tensor.

Juan Alderete
Bobb Bruno
Denver Dalley
Jonathan Hischke
Henry Kaiser
Josh Klinghoffer
Sarah Lipstate
Paul Morrison
Jesse Nieminen
Vernon Reid
Nick Reinhart
Nick Semrad
Rie Sinclair
Warren Walker