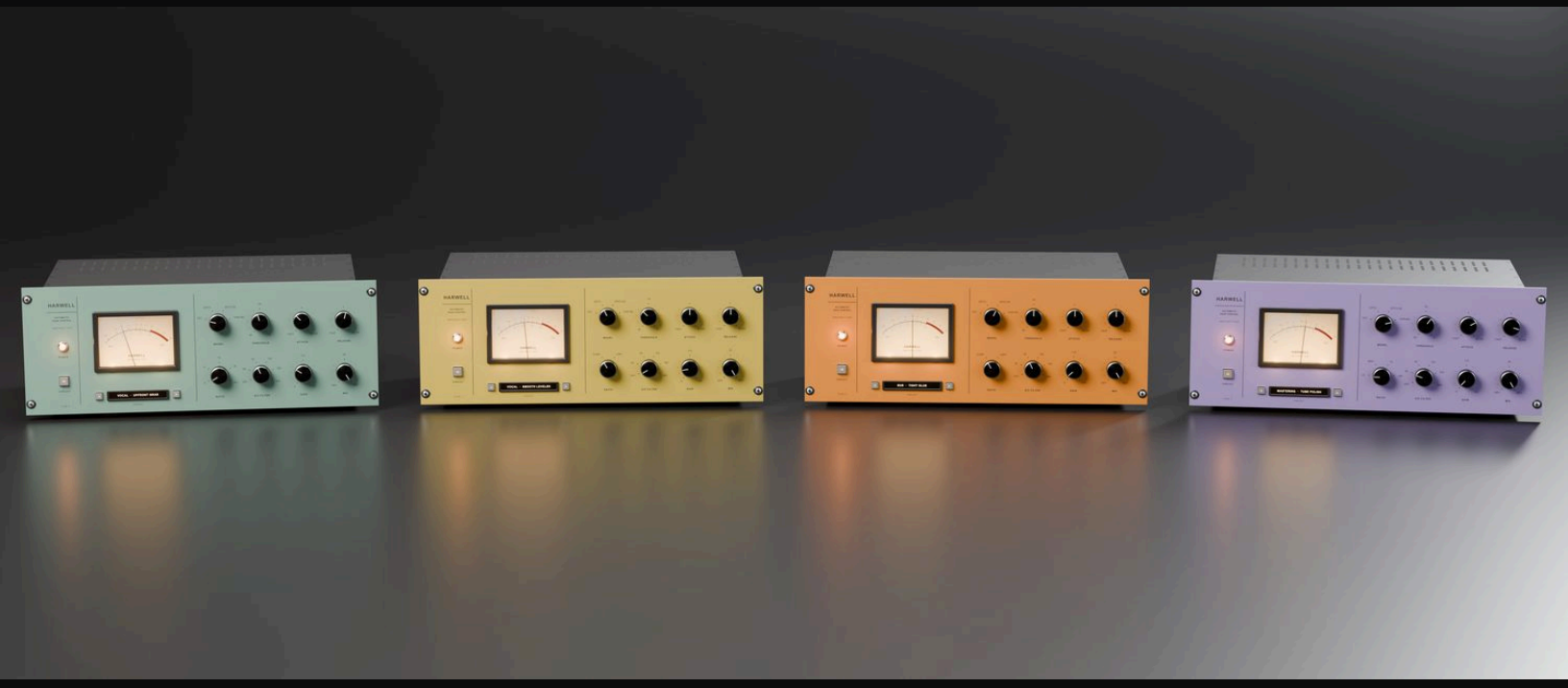
HARWELL

AUTOMATIC GAIN CONTROL



USER MANUAL

ABSTRACT DSP

VERSION 1.0

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1 Welcome

Harwell is four classic studio compressors in one rack unit: a FET peak limiter, a tube optical leveler, a solid-state optical leveler and a variable-mu tube limiter. Each model is matched to the measured behavior of the hardware it follows, with its own faceplate color, RATIO switch and sound.

Thank you for choosing Harwell.

Quick start

1. Insert Harwell on a track or bus. It opens on the **Opto** model with gentle settings.
2. Turn **MODEL** to choose a compressor. The faceplate changes color with it.
3. Turn **THRESHOLD** down until the meter shows a few dB of gain reduction on the loud parts.
4. Set **RATIO**, **ATTACK** and **RELEASE** to taste. Noon on ATTACK and RELEASE is each model's typical setting.
5. Use **GAIN** to restore the level, then press **IN** to compare with the dry signal.

Or click the preset display under the meter and pick a preset for your source.

2 Installation and activation

Run the installer for your system. If Harwell doesn't appear, rescan plug-ins in your host.

	WINDOWS	MACOS
System	Windows 10 or 11, 64-bit	Apple Silicon or Intel
Formats	VST3, CLAP	AU, VST3, CLAP
Installed to	C:\Program Files\Common Files\VST3 and \CLAP	/Library/Audio/Plug-Ins/Components, /VST3 and /CLAP
Hosts	Any 64-bit VST3 or CLAP host	Logic Pro, GarageBand and any 64-bit AU, VST3 or CLAP host

FL Studio: open Options > Manage plugins and click Find installed plugins. Harwell appears under Effects.

Your presets are saved in **Documents/Harwell/Presets**. Back up that folder to keep them.

Trial and activation

Harwell runs fully for **7 days** as a free trial. A small TRIAL tag shows in the preset display. After the trial it passes audio through untouched until you activate it.

1. Click the **HARWELL** name plate, then the license line on the About card (or click the preset display once the trial has ended).
2. Paste the license key from your receipt email and click **Activate**.

Activation needs an internet connection once; after that Harwell works offline. Each key works on up to **3 computers**. To move it, choose **Deactivate this computer** on the license card first.

3 The front panel

Drag a knob up or right to turn it up. Hold Shift for fine control, use the mouse wheel, or double-click to return to the default. A small tag shows the exact value while you turn.

Figure 1. The Harwell front panel

Shown on the FET model. The numbers are used throughout this manual.



1. Name plate (click for About)
2. POWER pilot lamp
3. CIRCUIT IN (bypass)
4. Gain reduction meter
5. Preset display (click for menu)
6. Previous / next preset
7. MODEL
8. THRESHOLD
9. ATTACK
10. RELEASE
11. RATIO
12. S/C FILTER
13. GAIN
14. MIX

CONTROL	RANGE	DEFAULT	WHAT IT DOES
1 **Name plate**			Click for the About card (version, website, support email). Click again to close.
2 **POWER**	lit / dark	lit	Pilot lamp. Lit while the circuit is in.
3 **CIRCUIT IN**	in / out	in	Bypass. Out passes the signal untouched, with a short crossfade, and the panel lights go dark. Your host's bypass controls it too.
4 **Meter**	0 to −20 dB		Shows gain reduction. The needle rests at 0 and swings left as Harwell compresses.
5 **Preset display**		Init	The current preset. Click it for the preset menu. A small B shows when you're on compare slot B.
6 **Arrows**			Step to the previous or next preset.

7	**MODEL**	FET, Opto, Opto SS, Vari-Mu	Opto	Chooses the compressor. The faceplate and RATIO switch change with it. Switching while playing is smooth.
8	**THRESHOLD**	−40 to 0 dB	−18 dB	Where compression starts. Turn it down to compress more. On the FET it also sets how hard the color is driven.
9	**ATTACK**	FAST to SLOW (1–10)	5.5	How quickly compression starts, scaled to each model's range.
10	**RELEASE**	FAST to SLOW (1–10)	5.5	How quickly it recovers, scaled to each model's range.
11	**RATIO**	per model	per model	Each model's own switch. See section 5.
12	**S/C FILTER**	Off, 60, 90, 150, 250, 400 Hz	Off	High-pass on the detector only, so bass stops driving the compression. The audio itself isn't filtered.
13	**GAIN**	0 to +24 dB	0 dB	Makeup gain. On the Opto, Opto SS and Vari-Mu it sits before the color stage, so more gain adds warmth. On the FET it adds level only.
14	**MIX**	0 to 100%	100%	Blends dry and compressed signal for parallel compression.

Figure 2. CIRCUIT IN (3) and bypass

Press IN to switch the circuit out: the audio passes untouched, the lamps go dark and the needle drops.



CIRCUIT IN: processing



CIRCUIT OUT: bypassed, lights off

4 The four models

Each model is our own design, built to the measured behavior of a classic compressor: how it detects level, its curve, its timing and its color.

Figure 4. The four models

Turning MODEL (7) changes the circuit, the RATIO (11) positions and the faceplate color.



FET Seafoam



OPTO Butter



OPTO SS Tangerine



VARI-MU Lilac

	FET	OPTO	OPTO SS	VARI-MU
Faceplate	Seafoam	Butter	Tangerine	Lilac
Type	FET peak limiter	Tube optical leveler	Solid-state optical leveler	Variable-mu tube limiter
Character	Fast, gritty, upfront	Smooth and gentle, warm	Quicker, tighter, very clean	Soft at first, firmer as it works
Attack	20 µs to 2.4 ms	3 to 30 ms	3 to 40 ms	8 to 55 ms
Release	0.25 to 2.4 s	150 ms to 1.5 s, three stages	150 ms to 1.5 s, program dependent	15 to 390 ms
Tone	Flat	Flat	Slightly lean lows, open top	Tight sub, bump near 50 Hz
Great on	Drums, aggressive vocals, bass grit, parallel	Vocals, bass, pads	Acoustic, pop vocals, DI bass, overheads	Mix bus, drum bus, mastering, piano

FET

Attack well under a millisecond, so it shapes transients as well as level. Lower THRESHOLD drives it harder and dirtier. ALL lets the front of each hit through before the squash: the classic room-mic sound.

Opto

A lamp-and-photocell leveler. It reacts in about 10 ms and lets go in stages, quickly at first, then slowly. It responds more to bright peaks than to bass, so low notes stay full.

Opto SS

The same kind of cell with a solid-state amplifier: faster and cleaner. Its release remembers: quick after a short hit, slower after long compression, which keeps sustained parts even.

Vari-Mu

The tubes themselves change gain, so compression starts softly and firms up as the level rises. It never sounds clamped, which is why it suits a whole mix.

5 The RATIO switch

Each model has its own RATIO switch, printed on its faceplate. Every model remembers its setting when you switch away and back. The last position is always that model's limiting mode.

Figure 5. RATIO (11) on each model

Each model has its own switch positions. The last one is that model's limiting mode.



FET
4 · 8 · 12 · 20 · ALL

OPTO
COMP · LIMIT

OPTO SS
COMP · LIMIT

VARI-MU
LO · MED · HI · LIM

MODEL	POSITIONS	HOW IT PLAYS
FET	4, 8, 12, 20, ALL	Harder than printed, like the original: about 5:1, 11:1, 17:1 and 39:1. ALL is the all-buttons-in mode, aggressive and dirty.
Opto	COMP, LIMIT	About 2:1 with a firm knee. LIMIT is about 4.5:1.
Opto SS	COMP, LIMIT	About 4:1 over a soft knee. LIMIT is about 7.5:1.
Vari-Mu	LO, MED, HI, LIM	About 1.3:1, 1.8:1 and 3.5:1 near the threshold, rising as the level rises. LIM is a near brick wall.

In host automation these appear as FET Ratio, Opto Ratio, Opto SS Ratio and Vari-Mu Ratio.

6 Presets

Harwell includes 26 factory presets grouped by source. They assume a track peaking around −10 dBFS (a bus around −6, a master around −3). Adjust THRESHOLD if your level differs. Loading a preset never changes bypass or quality.

Figure 3. Meter and preset display
The meter reads gain reduction. Click the name for the preset menu, or step with the arrows.



PRESET	MODEL	WHAT IT DOES
Init	Opto	Every control at its default.
Drums: Kick Punch	FET	Slow attack lets the beater through; adds punch.
Drums: Snare Crack	FET	Grabs the body, keeps the crack.
Drums: Room Smash	FET	ALL mode at 40% mix for room or parallel crush.
Drums: Bus Thicken	Vari-Mu	Glue and weight on a drum bus, 70% mix.
Drums: Overhead Tame	Opto SS	Evens out cymbals and overheads.
Vocal: Smooth Leveler	Opto	Classic gentle leveling for a lead vocal.
Vocal: Upfront Grab	FET	Fast, present, in-your-face lead.
Vocal: Tight Pop	Opto SS	Controlled and bright for modern pop.
Vocal: Rap Upfront	FET	ALL mode at 60% mix: dense but breathing.
Vocal: Backing Tuck	Opto	Flattens backing vocals behind the lead.
Vocal: Gentle Tube	Vari-Mu	Barely there, a little tube control.
Bass: Even Notes	Opto	Evens out note-to-note level.
Bass: Growl	FET	Grit and attack on electric bass.

Bass: 808 Control	Opto SS	Holds an 808 steady, keeps its hit.
Bass: DI Control	Opto SS	Clean, even DI bass.
Keys & Guitar: Acoustic Strum	Opto SS	Smooths strumming dynamics.
Keys & Guitar: Electric Sustain	FET	Long sustain on clean electric guitar.
Keys & Guitar: Piano Glue	Vari-Mu	Gentle control for piano and keys.
Keys & Guitar: Pad Leveler	Opto	Keeps pads and synths steady.
Bus: Tube Glue	Vari-Mu	A dB or two of glue on a mix or group.
Bus: Tight Glue	Opto SS	Tighter, cleaner glue for a group bus.
Bus: Parallel Smash	FET	ALL mode, driven hard, mixed in at 30%.
Mastering: Tube Polish	Vari-Mu	About 1 dB of slow tube compression.
Mastering: Smooth Opto	Opto	Gentle optical leveling on the master.
Mastering: Tube Limiter	Vari-Mu	Catches the loudest moments, adds a little level.

Your presets and A/B

Choose **Save preset...** from the preset menu to save your settings. They appear under **Yours**. **Show presets folder** opens the folder. **Compare: A / B** holds two complete settings to switch between, and **Copy A to B** (or B to A) copies one to the other.

7 Quality and specifications

Normal quality has no latency and suits tracking and mixing. Use HQ when you drive the color hard or print a final mix. Choose it under **Quality** in the preset menu. Switching while playing is smooth.

QUALITY	WHAT IT DOES	LATENCY	CPU (ONE CORE, 48 KHZ)
Normal	Runs at your session rate	0 samples	about 1.1–1.3%
HQ 2x	2x oversampling, less aliasing	4 samples	about 2x Normal
HQ 4x	4x oversampling, aliasing far below audibility	6 samples	about 4x Normal

Latency is reported to your host, so tracks stay aligned.

Specifications

Channels	Mono or stereo, stereo-linked so the image never shifts
Sample rates	22.05 to 384 kHz, same response at every rate
Bypass, MIX at 0	Bit-transparent
Formats	VST3, CLAP (Windows); AU, VST3, CLAP (macOS); 64-bit only

8 Tips

Pick the model by the job. FET for transients and attitude, Opto for a vocal or bass that should sit still, Opto SS for clean, tight control, Vari-Mu to glue a mix without hearing it work.

Parallel compression. Set the FET to ALL, pull THRESHOLD down for 15 dB or more of reduction, match the level with GAIN, then set MIX to 20–40%.

Stop bass pumping. On a mix or drum bus, set S/C FILTER to 60–150 Hz so the kick and sub stop ducking everything else.

Quiet source? Lower THRESHOLD instead of boosting the input. It reaches −40 dB.

Release sets the feel. Fast release is louder and more energetic; slow release is smoother and more natural.

Compare fairly. Match levels with GAIN before you judge with the IN button. Louder almost always sounds better.

9 Troubleshooting and support

PROBLEM	SOLUTION
Harwell doesn't appear in my host	Rescan plug-ins and check the install folders in section 2. On macOS, restart the host for AU.
The meter doesn't move	Make sure CIRCUIT IN is lit, then turn THRESHOLD down.
It sounds quieter	Compression lowers the loud parts. Raise GAIN.
Tracks are out of time	Your host should compensate for HQ latency. If it doesn't, use Normal quality.
"Trial ended" or no sound change	Activate your key (section 2). If activation fails, check your internet connection, then email support with your order number.
"Maximum number of computers"	Deactivate the key on a computer you no longer use, or email support and we'll reset it.
Where are my presets?	Documents/Harwell/Presets. Copy that folder to move them to another computer.

Support

Email **support@abstractdsp.com** or visit **www.abstractdsp.com**. Please include your operating system, your host and the Harwell version shown on the About card.

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