FORM DSP — LOUDNESS & DENSITY SHAPING PROCESSOR

PUSH

LOUDNESS
ISN'T JUST GAIN.



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WHAT PUSH IS

- Clean

PUSH is a dynamics processor designed for mix buses and mastering. It shapes the waveform to reduce the difference between signal peaks and average level. This can make the material denser and increase its loudness.

Most of the time you will reach for it with a single thought in mind:

I NEED THIS LOUDER AND DENSER. I'LL PUT PUSH ON IT.

This processing also generates harmonics and can change the tonal character of the signal. CLEAN, COLOR and EDGE offer three approaches to the shaping, each with a different response and sound.

The result depends on the source material, its input level and the settings you choose. The following quick start takes you through a first setup and shows you how to assess the changes by ear.

What it actually does

Turning up the gain raises the whole signal, including its peaks. PUSH shapes the waveform so that the average level can rise relative to those peaks. This reduces the crest factor: the difference between peak and average level.

You can use this change to gain loudness, or bring the output level back down to gain headroom. At a similar loudness to the original, the processed signal can have lower peaks.

MATCH compensates for the loudness increase automatically. This also helps you assess the processing itself: with less difference in loudness, changes in density, transients and tone are easier to judge. With MATCH enabled and OUTPUT TRIM at 0 dB, compare the input and output dBTP readings to see how much headroom you have gained.

What PUSH is not

PUSH is not a saturation toolbox for detailed harmonic shaping. Its controls let you influence the response and tonal character of the processing, but they do not provide independent control over individual harmonics. The harmonics it generates are part of the waveform shaping used to create density and loudness.

QUICK START

- Clean



The whole window: CLEAN, PUSH at 62 %, +2.4 LU loudness gain, −1.2 dB crest reduction.

01

Start with CLEAN

Insert PUSH on your master, mix bus or the track you want to process. Load Init and leave CHARACTER on CLEAN. Play a representative section of your material.

02

Find your working level

Turn PUSH up gradually and watch CREST REDUCTION. A negative reading means the difference between peaks (dBTP) and average level (RMS) is becoming smaller.

If the reading barely changes, try raising INPUT TRIM. Listen as you adjust it: the input level affects how strongly the signal is shaped. Settle on a working level before fine-tuning PUSH.

03

Find the amount

Adjust PUSH while listening to the body of the sound, the impact of transients and any change in tone. Look at CREST REDUCTION to follow what is happening, without aiming for a particular number.

04

Compare at matched loudness

Enable MATCH, keep OUTPUT TRIM at 0 dB and allow at least three seconds of audio for the loudness measurement to settle.

Compare with bypass. Does the added density help? Do the transients still have the impact you want? Adjust PUSH and compare again.

05

Check the headroom

With MATCH enabled and OUTPUT TRIM at 0 dB, compare the input and output dBTP readings. A lower output true peak at similar loudness shows how much headroom you have gained.

06

Choose the result

Use MATCH as a reference for judging the processing. Once you have chosen your settings, switch it off to retain the loudness increase that PUSH creates. Leaving MATCH enabled takes that increase back out.

To explore a different sound, try COLOR or EDGE and repeat the comparison. Readjust PUSH for each character: the same knob position does not produce the same amount of processing in all three modes.

HOW IT WORKS

Clean

3.1 The signal chain

The signal passes through several stages inside PUSH. Their order matters: the input level affects the shaping, while the output level is adjusted after it.

	STAGE	WHAT HAPPENS
1	INPUT TRIM	Adjusts the level entering PUSH. It affects both the processing and the unprocessed signal used by MIX.
2	Band split	With SPLIT enabled, frequencies below 120 Hz bypass the shaping stage and are combined with the processed signal afterwards.
3	Waveform shaping	CHARACTER selects the shaping curve. PUSH sets how strongly the signal is driven into it, and SHAPE adjusts its form.
4	Output ceiling	Controls the sample peaks of the processed signal before it reaches MIX and OUTPUT TRIM.
5	MIX	Blends the processed and unprocessed signals.
6	OUTPUT TRIM	Adjusts the level after the blend.
7	MATCH	Matches the output loudness to the input loudness, measured in LUFS.
8	TP SAFE	Provides additional protection against true peaks at the end of the signal chain.

The output ceiling acts on the processed signal. The unprocessed signal added by MIX does not pass through it, and OUTPUT TRIM comes afterwards. Both can therefore raise the output above the ceiling.

Sample peaks are the levels of the individual digital samples. True peaks also account for peaks that can occur between those samples when the waveform is reconstructed. This is why a sample ceiling and true peak protection serve different purposes.

3.2 Waveform shaping and loudness

A waveform describes how the signal changes over time. PUSH reshapes it using a curve that determines the output level for each incoming sample.

The curve changes the relationship between stronger and weaker parts of the signal. This can bring the average level closer to the peaks, reducing the crest factor and allowing the material to become louder and denser.

This shaping also changes the tone. It generates harmonics: frequency components at whole-number multiples of a fundamental frequency. Their amount and distribution contribute to the sound of the processing.

The input level determines which part of the curve the signal reaches. The source material matters too: a sustained sound and a short drum hit distribute their energy differently, so the same settings can produce different results.

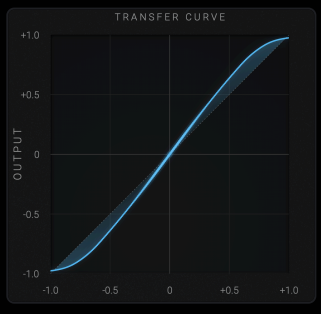
3.3 The three characters

CLEAN, COLOR and EDGE use different shaping curves. They differ in how they affect the waveform, the harmonics they generate and how much processing is available.

CLEAN

CLEAN uses a symmetrical curve that generates odd-order harmonics, such as the third and fifth harmonics.

SHAPE changes how broadly the curve acts. Towards BODY, it shapes more of the waveform. Towards PEAK, it leaves lower levels unchanged and concentrates the shaping on higher levels.

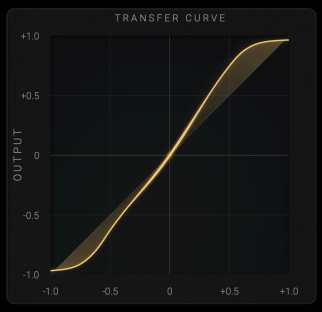


Transfer curve in CLEAN.

COLOR

COLOR also generates even-order harmonics, such as the second and fourth harmonics. This gives it a different tonal character from CLEAN and EDGE.

SHAPE changes the balance of these even harmonics. The tonal change can already be audible at low PUSH settings. As the drive increases, odd harmonics become more prominent too.

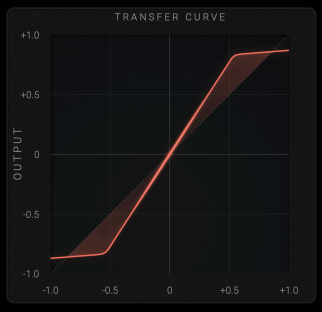


In COLOR, at the same PUSH setting.

EDGE

EDGE leaves the signal unchanged below a certain point on its curve and shapes it above that point. The transition is called the knee.

SHAPE adjusts how rounded or abrupt this transition is. At moderate settings, the shaping can be concentrated on the peaks. Higher settings allow stronger crest reduction and more pronounced distortion.

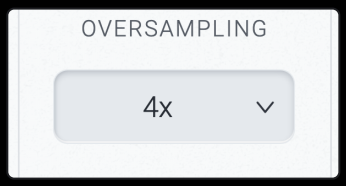


In EDGE, at the same PUSH setting.

The same PUSH setting does not produce the same result in all three characters. When comparing them, adjust the amount and use MATCH to reduce the influence of loudness differences.

3.4

Oversampling and aliasing



Waveform shaping can generate frequencies above the range the project sample rate can represent. These can appear back in the audible range as additional, unrelated frequencies. This is called aliasing.

Oversampling runs the shaping at a higher internal sample rate. This allows more of those high frequencies to be filtered out before the signal returns to the project sample rate, reducing aliasing.

PUSH uses 4x oversampling by default. Higher settings can help with strong processing on material containing plenty of high-frequency energy, but require more processing power.

Oversampling and TP SAFE address different things. Oversampling reduces aliasing from the shaping process. TP SAFE handles true peaks at the output.

WORKING WITH PUSH

- Clean

4.1 Set the working level

INPUT TRIM affects how the signal reaches the shaping curve. Adjusting it can change both the strength of the processing and its tonal character.

Two signals at the same loudness in LUFS can have different peak levels and reach different parts of the shaping curve. There is therefore no single LUFS target for the input.

Use a representative passage to establish the input level. The bright band on the transfer curve shows which part of the curve your signal is reaching. CREST REDUCTION shows how the relationship between peaks and average level is changing.

Once the processing responds as you want, leave INPUT TRIM in place while you refine the other settings. If you change it later, check the amount of processing again.

4.2 Set up SPLIT

SPLIT determines whether the low end passes through the shaping stage. With SPLIT enabled, frequencies below 120 Hz bypass the shaping and are combined with the processed signal afterwards.

Compare both settings while listening to the relationship between the bass and the rest of the material. Pay attention to the weight of the kick and bass, their definition and how they sit within the mix.

Make this choice before fine-tuning INPUT TRIM and PUSH. SPLIT changes which part of the signal is being shaped, so switching it later may call for different settings.

4.3 Compare the characters

Start with CLEAN, then try COLOR and EDGE. Each character responds differently, so readjust PUSH when switching between them.

To compare their tonal differences, use similar amounts of crest reduction as a starting point and enable MATCH. This makes it easier to hear how the characters differ without comparing a lightly processed signal with a much more heavily processed one.

After choosing a character, adjust the amount to suit the material. Similar meter readings do not mean the results will sound the same.

4.4 Balance density and transient impact

Increase PUSH gradually and listen to how the material holds together. Pay attention to the body of sustained sounds and to the leading edge of drums and other transients.

More processing may add useful density, but it can also soften attacks or make individual sounds less distinct. If the material starts to lose the movement or impact you want, reduce PUSH and compare again.

CREST REDUCTION helps you follow these changes. Treat it as a description of the processing rather than a target. Different sources can sound very different at the same reading.

4.5 Use MATCH as a reference

A louder signal can make changes in tone and dynamics harder to judge. Enable MATCH to compare the processed and unprocessed sound at matched loudness in LUFS.

Keep OUTPUT TRIM at 0 dB and allow at least three seconds of audio for the measurement to settle. Compare with bypass, listening for changes in transient impact, tonal balance and the separation between sounds.

The true peak readings can still differ. With loudness matched, a lower output dBTP reading shows the headroom gained through the processing.

4.6 Check the final result

Once you have chosen your settings, switch MATCH off to retain the loudness increase. Listen again in context and check the output level.

Try more than one section of the track. A setting that works well in a quieter passage may respond more strongly when the arrangement becomes louder or denser.

If PUSH feeds a limiter or another processor, listen to the complete chain as well. Changes to the peaks and average level can affect how the following processor responds.

4.7

Adjust the other controls as needed

Use MIX to blend the processed signal with the original. This lets you explore stronger shaping while retaining some of the unprocessed sound.

Use TP SAFE when you need additional true peak protection at the output. Check the final dBTP reading, particularly after changing MIX or OUTPUT TRIM.

Consider higher OVERSAMPLING settings when using strong processing on material with substantial high-frequency content. Compare the audible result and the processing load; 4x is the default starting point.

THE CONTROLS

Color

CONTROL	RANGE OR OPTIONS	DEFAULT
PUSH	0 to 100 %	0 %
CHARACTER	CLEAN, COLOR, EDGE	CLEAN
SHAPE	0 to 100 %, with five snap positions	0 %
MIX	0 to 100 %	100 %
INPUT TRIM	−12 to +12 dB	0 dB
OUTPUT TRIM	−12 to +12 dB	0 dB
SPLIT	On or off, crossover at 120 Hz	Off
OVERSAMPLING	Off, 2x, 4x, 8x	4x
MATCH	On or off	Off
TP SAFE	On or off	Off

5.1 PUSH

The main PUSH control, labelled AMOUNT, sets the strength of the waveform shaping. Its effect depends on the input level, source material and selected character.

The percentage indicates the control position, not a percentage of loudness gain or crest reduction. The same position produces different results in CLEAN, COLOR and EDGE.

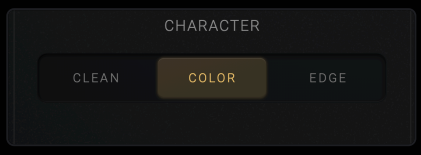


At 0 %, waveform shaping is inactive. The trims and other output functions can still affect the signal.

To enter an exact value, double-click the number above the control.

5.2 CHARACTER

CHARACTER selects the shaping curve and determines the function and labels of SHAPE.

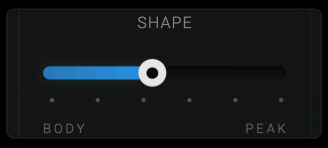


The interface follows the selection: blue for CLEAN, gold for COLOR and red for EDGE. The characters are described in section 3.3.

5.3 SHAPE

SHAPE adjusts the form of the selected curve.

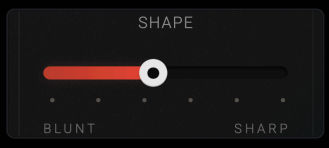
CHARACTER	LABELS	ADJUSTMENT
CLEAN	BODY to PEAK	Moves from shaping more of the waveform to concentrating the processing on higher signal levels.
COLOR	ROUND to RICH	Changes the balance of even-order harmonics. Higher even harmonics become more prominent towards RICH.
EDGE	BLUNT to SHARP	Changes the knee from a rounded transition to a more abrupt one.



SHAPE in CLEAN.



SHAPE in COLOR.



SHAPE in EDGE.

SHAPE can also change crest reduction, particularly in CLEAN and EDGE. Readjust PUSH if you want to retain a similar amount of processing.

5.4

MIX

MIX blends the processed and unprocessed signals.

At 100 %, you hear only the processed signal. At 0 %, you hear only the unprocessed path. Intermediate positions combine both, allowing parallel processing.



The output ceiling acts before MIX, so adding the unprocessed signal can raise the output above that ceiling.

5.5

INPUT TRIM and OUTPUT TRIM





INPUT TRIM and OUTPUT TRIM, both from −12 to +12 dB.

INPUT TRIM adjusts the level before shaping and affects both the processed and unprocessed paths. It sets the operating point and can therefore change the strength and sound of the processing.

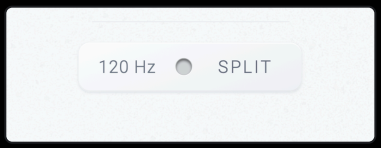
The mark on INPUT TRIM indicates the incoming signal's true peak headroom before the trim adjustment. It is a level reference, not a recommended setting.

OUTPUT TRIM adjusts the level after the output ceiling and MIX without changing the shaping. Raising it can take the output above the internal sample ceiling.

5.6

SPLIT

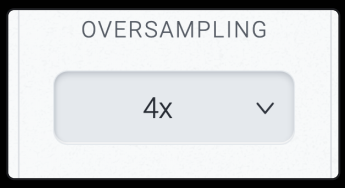
SPLIT divides the signal at 120 Hz. The lower band bypasses the shaping stage and is combined with the processed upper band afterwards.



This changes which part of the signal drives the shaping. After switching SPLIT, check whether INPUT TRIM and PUSH need adjusting.

Only the shaping stage is bypassed for the lower band. The following output stages still apply to the combined signal.

5.7 OVERSAMPLING

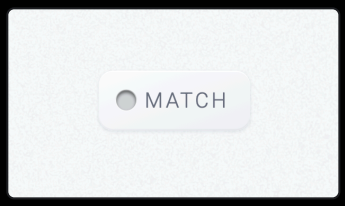


OVERSAMPLING sets the internal sample rate used for waveform shaping.

Higher settings reduce aliasing at the cost of additional CPU load. They can be useful with strong processing on material containing substantial high-frequency content.

Lower settings reduce processing load but do not substantially reduce PUSH's overall latency.

5.8 MATCH



MATCH compensates for the loudness increase introduced by the processing, matching the processed signal to the input's short-term loudness in LUFS.

Its measurement window is three seconds. Compensation starts only when the first complete window is available.

OUTPUT TRIM remains effective with MATCH enabled. Leave it at 0 dB for a loudness-matched comparison. TP SAFE follows MATCH and can reduce the final output further.

MATCH is a reference function. The comparison workflow is described in section 4.5.

5.9 TP SAFE



TP SAFE reduces true peaks at the final output, after OUTPUT TRIM and MATCH. The amount of reduction depends on the signal; on some material it may make little difference.

It does not guarantee that every possible signal will remain below 0 dBTP. For a strict delivery limit, verify the final output with an appropriate true peak meter.

Enable TP SAFE before playback. Switching it on can produce an audible level change and may interrupt playback at high sample rates with very small buffers.

5.10

BYPASS

PUSH’s BYPASS passes the input through without processing while retaining the plug-in’s reported delay.

Use the internal BYPASS for comparisons within PUSH. Your host’s bypass may handle latency differently.

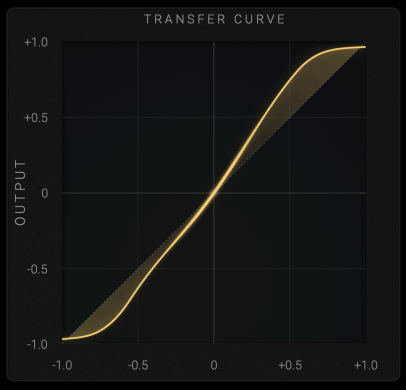


THE DISPLAYS

Color

6.1 The transfer curve

The transfer curve shows how PUSH maps incoming sample values to outgoing values. Input runs horizontally and output vertically. The curve changes with PUSH, CHARACTER and SHAPE.



The line represents the shaping curve for the current settings. It is not a recording of the output waveform.

The bright band shows the part of the curve your signal is currently reaching. This helps you see how the input level relates to the shaping.

A hold mark shows how far the signal reached during the previous 1.5 seconds, making brief peaks easier to follow.

The extent of the bright band does not directly indicate the amount of crest reduction. Different characters can produce different amounts of processing even when the signal reaches a similar area of the display.

6.2 Input and output meters

The input meter is on the left, and the output meter is on the right. Each has a level bar for each channel and two numerical readings.

DISPLAY	READING
Left number	Short-term loudness in LUFS, measured over three seconds
Right number	True peak level in dBTP
Bars	Level per channel, with peak hold marks

The input meter measures after INPUT TRIM. The output meter measures at the end of the signal chain, including any changes made by OUTPUT TRIM, MATCH and TP SAFE.

The LUFS reading describes the most recent three seconds of audio. It is not an integrated loudness measurement of the whole track.

A dash means the measurement window is not yet complete. The reading becomes available after three seconds of audio.

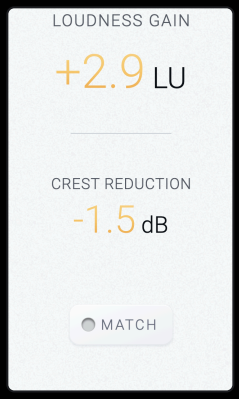


Input meter, left, and output meter, right.

6.3

LOUDNESS GAIN and CREST REDUCTION

These two readings describe the change produced by the processing.



LOUDNESS GAIN

LOUDNESS GAIN shows the change in short-term loudness, expressed in LU.

A reading of +2.0 LU means the processing has increased loudness by 2 LU. LU expresses a difference; LUFS expresses the loudness of a signal.

CREST REDUCTION

CREST REDUCTION shows the change in crest factor, expressed in dB.

A reading of −2.0 dB means the crest factor has decreased by 2 dB. Zero means it is unchanged, and a positive reading means it has increased.

PUSH calculates crest factor as the difference between true peak and unweighted RMS level over the same three-second window. RMS describes average signal level without the frequency weighting used for the LUFS measurement.

A reading near zero does not necessarily mean the sound is unchanged. Tonal changes can occur with little change in crest factor.

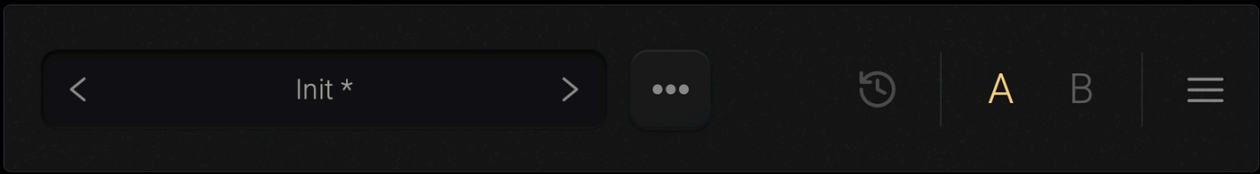
Processing readings and output readings

LOUDNESS GAIN and CREST REDUCTION are measured before OUTPUT TRIM. They describe the processing rather than the final output level.

The input and output meters show the levels at their respective positions in the signal chain. OUTPUT TRIM, MATCH and TP SAFE can therefore make the difference between those meters differ from the processing readings.

PRESETS, A/B AND UNDO

- Color



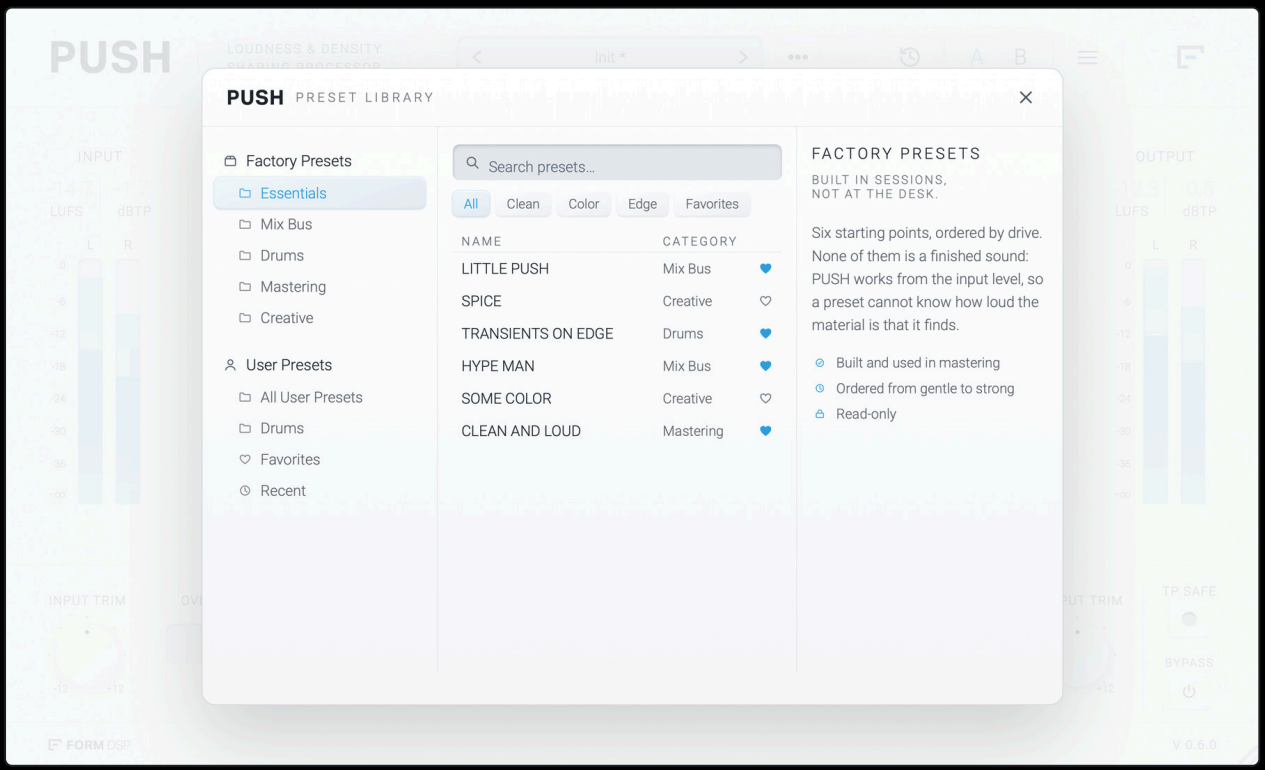
The header: preset navigation, the preset menu, undo, A/B, and the main menu.

7.1 Presets

Use the arrows beside the preset name to step through the presets. Click the name to open the preset browser.

The button beside the name opens the preset menu, with commands for saving, renaming and deleting presets.

An asterisk after the name indicates that settings have changed since the preset was loaded.



Factory presets

PUSH includes six factory presets.

PRESET	CATEGORY	SETTINGS
LITTLE PUSH	Mix Bus	EDGE at half travel, with SPLIT enabled.
SPICE	Creative	Strong shaping blended with the unprocessed signal at 21 % MIX.
TRANSIENTS ON EDGE	Drums	A sharp knee with SPLIT enabled.
HYPE MAN	Mix Bus	EDGE across the full frequency range, with SPLIT disabled.
SOME COLOR	Creative	COLOR across the full frequency range.
CLEAN AND LOUD	Mastering	CLEAN with PUSH at 100 %.

Init

Init returns the processing controls to their starting state, including CHARACTER and both trims.

7.2 A/B

A and B hold two sets of settings for comparison. Click either slot to make it active.



Right-click the A/B control to copy the active settings to the other slot. You can then change one version while keeping the other available for comparison.

7.3 Undo and redo

Click the undo arrow in the header to reverse the last change. Right-click the same control to redo it.

The history includes control adjustments and preset loads.

APPEARANCE AND WINDOW SIZE

- Color

8.1 Colour scheme

Choose Light or Dark in the main menu. PUSH remembers your choice across sessions.

Both colour schemes use the same control layout.



The Light colour scheme.



The Dark colour scheme.

8.2 Window size

Drag the handle in the bottom right corner to resize the window. The interface scales from 70 % to 160 % while keeping its proportions.

You can also select a size from the main menu.

The window size is stored by your host as part of the session. It is not part of a preset.

WHERE TO USE PUSH

- Edge

9.1 Mix bus

Use PUSH to add density to a mix before mastering.

Start with CLEAN and a small amount of processing. Around 1–2 dB of crest reduction can be a useful range to explore, depending on the material.

Compare SPLIT on and off to hear how including the low end changes the result. Listen to the balance between added density and the movement of the mix.

9.2 Before a limiter

Place PUSH before a limiter to shape peaks before they reach the limiting stage.

EDGE can be useful here because it concentrates the shaping above its knee. This can reduce how strongly the limiter needs to catch individual peaks.

Judge the complete chain. The useful setting is the one that improves the combined result, rather than either processor in isolation.

9.3 Drum bus

Try EDGE on a drum bus to explore stronger peak shaping and added density.

With SPLIT enabled, the lower band bypasses the shaping. Compare how this affects the weight of the kick and the balance with the snare, cymbals and room sound.

On sparse or isolated hits, stronger processing can flatten the attack without adding much useful body.

9.4 Parallel processing

Use a stronger PUSH setting, then lower MIX to blend the shaped signal with the original. Around 20 % MIX is a starting point for exploring this approach.

The blend can add density while retaining some of the unprocessed transient character. Adjust PUSH and MIX together to find the balance.

9.5 Tonal colour

Try COLOR at a modest setting when you want an audible change in tone as well as density.

Use SHAPE to explore the harmonic balance. Listen in the arrangement: a fuller sound in isolation may become too thick when combined with other sources.

SPECIFICATIONS

Edge

10.1 System requirements and formats

SYSTEM	MINIMUM OPERATING SYSTEM	PLUG-IN FORMATS
macOS on Intel	macOS 10.15	VST3, AU, AAX Native
macOS on Apple Silicon	macOS 11	VST3, AU, AAX Native
Windows, 64-bit	Windows 10	VST3

10.2 Audio specifications

SPECIFICATION	VALUE
Project sample rates	44.1 to 192 kHz
Channels	Stereo
Internal precision	32-bit floating point
Loudness measurement	ITU-R BS.1770, short-term

10.3

Latency

OVERSAMPLING	LATENCY IN SAMPLES AT 48 KHZ	LATENCY IN MILLISECONDS
Off	1248	26.00 ms
2x	1252	26.08 ms
4x	1254	26.12 ms
8x	1254	26.12 ms

These figures apply at a project sample rate of 48 kHz. Switching SPLIT or TP SAFE on or off does not change the reported latency.

PUSH reports its processing delay to the host. With plug-in delay compensation enabled, the host can keep playback aligned with other tracks.

This compensation does not remove the delay heard by a performer monitoring live through PUSH. Avoid placing PUSH in the monitoring path when recording performers who need an immediate response.

INSTALLATION AND LICENCE

Edge

11.1 Installation

Run the installer, then restart your host. PUSH installs its plug-in files in the following locations:

FORMAT	LOCATION
macOS VST3	`/Library/Audio/Plug-Ins/VST3/`
macOS AU	`/Library/Audio/Plug-Ins/Components/`
macOS AAX	`/Library/Application Support/Avid/Audio/Plug-Ins/`
Windows VST3	`C:\Program Files\Common Files\VST3\`

If an update does not appear in your host, check which plug-in format it has loaded.

For Pro Tools, use the macOS AAX Native version. No iLok is required. Pro Tools on Windows and HDX DSP processing are not supported.

11.2 User presets

Saved presets are stored as individual files in these folders:

SYSTEM	LOCATION
macOS	`~/Library/Audio/Presets/Form DSP/PUSH/`
Windows	`%APPDATA%\Form DSP\PUSH\`

You can open the preset folder from PUSH's main menu. Copy these files to back up your presets or transfer them to another computer.

11.3

Trial

The 14-day trial includes all features and requires a FORM DSP account. Start it from the licence screen that appears when you first open PUSH.

When the trial expires, PUSH stops passing audio. The plug-in still loads and retains your project settings, but audio remains muted until a valid licence is activated.

11.4

Licence activation

A personal licence can be active on two computers at the same time. The licence screen shows how many activations are in use.

To activate PUSH:

01 Open PUSH and follow the activation link on the licence screen.

02 Sign in with the FORM DSP account used for your purchase.

03 Confirm the activation in your browser. PUSH receives the licence automatically.

Moving an activation

To free an activation, open the licence screen on the computer you are leaving and choose Deauthorize. You can then activate PUSH on another computer.

File-based activations cannot be released this way; see section 11.5.

11.5

Offline use

After online activation

PUSH can continue working for up to 30 days without an internet connection. When connected, it checks the licence once a day.

Computers that remain offline

File activation allows you to activate PUSH without connecting the studio computer to the internet.

01 Create an activation request file from PUSH's licence screen.

02 Transfer the request to a computer with internet access and complete the activation.

03 Transfer the response file back to the offline computer and load it through the licence screen.

A file-based activation is permanent for that computer and cannot be deauthorized. Choose this method for a machine you intend to keep activated.

11.6 Updates

Choose Check for Updates in the main menu to check for a new version.

PUSH also displays a notification when an update is available. Dismissing it prevents further notifications for that version; a later version can trigger a new notification.

11.7 Uninstalling

Delete the PUSH plug-in files from the relevant locations in section 11.1.

Your saved presets remain available unless you separately delete the preset folder listed in section 11.2.

MEASUREMENTS

Edge

A.1 Test conditions and definitions

The measurements were made on the release build, rendered offline at 48 kHz with 4x oversampling and TP SAFE disabled unless stated otherwise. They were repeated on 5 October 2026.

Programme measurements use five sources: percussion, a rhythmic bus, pads and two finished masters. Results are means unless a range or individual values are shown. The headroom comparison in section A.2 uses four sources.

TERM	DEFINITION USED IN THIS APPENDIX
Loudness	LUFS measured using ITU-R BS.1770. Matched-loudness results are read after the first four seconds, once the measurement window is complete.
Headroom gained	Input true peak minus output true peak, with MATCH enabled and loudness matched.
Crest factor	Sample peak minus unweighted RMS level, measured over the whole file.
Normalised test level	Material adjusted to −10.5 LUFS. This is a test condition, not a universal input target.
As recorded	The original source level, between −17 and −10 LUFS for these tests.

The panel uses true peak and a three-second window for its crest measurement. The appendix uses sample peak over the whole file. Across these comparisons, the two methods differed by 0.2 dB at the median and by up to 1.1 dB.

Distortion measurements

Distortion on programme material is estimated from the part of the output that cannot be explained by linear filtering of the input. The measurement covers 20 Hz to 20 kHz and includes harmonics, intermodulation and aliasing. Gain and linear frequency-response changes are excluded.

The multitone test uses 24 tones from 30 Hz to 16 kHz. It measures additional products between 20 Hz and 20 kHz relative to the test signal. It is not a single-tone THD measurement.

A.2

Headroom gained with MATCH

PUSH was set to 90 %. The figures show mean headroom gained across four sources at each input loudness, in dB.

INPUT LOUDNESS	CLEAN	EDGE	COLOR
−24 LUFS	−0.06	−0.33	−0.63
−18 LUFS	+0.64	+1.49	+0.23
−12 LUFS	+2.97	+5.12	+3.90
−9 LUFS	+4.77	+6.38	+5.64

Positive values indicate lower output true peaks at matched loudness. Negative values indicate higher output true peaks.

Individual results ranged from −1.28 to +9.33 dB. The means therefore describe these test sources, not a guaranteed result for other material.

A.3

Distortion at comparable crest reduction

PUSH was adjusted separately for CLEAN and EDGE to achieve the same crest reduction. SHAPE remained at its default.

The figures below are differences in programme distortion, expressed in dB, with EDGE measured relative to CLEAN. A negative value means EDGE produced less measured distortion.

Ranges cover all five sources unless a number in parentheses indicates fewer qualifying sources. Where two values are listed, they are the individual results.

INPUT CONDITION	1 DB CREST REDUCTION	2 DB	3 DB	4 DB OR MORE
Peaks at -6 dBTP	−14.9 and −12.5 (2)	Beyond CLEAN's range	Beyond CLEAN's range	Beyond CLEAN's range
Peaks at -3 dBTP	−16.3 to −3.3	−10.8 and −9.5 (2)	Beyond CLEAN's range	Beyond CLEAN's range
Peaks at 0 dBTP	−12.9 to −0.5	−8.3 to +0.3	−5.4 to +0.9	−3.4 and −3.3 (2)
Normalised to -10.5 LUFS	−3.1 and −0.8 (2)	−0.7 and +0.2 (2)	−0.5 to +0.9 (3)	−1.3 to +0.5 (2)

Each source was adjusted by gain alone to reach the stated input condition. At -10.5 LUFS, three of the five sources had input true peaks between +2.4 and +4.9 dBTP.

Changing the analysis window shifted the distortion estimate by up to 0.5 dB, and by up to 1.4 dB on the short percussion loop. Small differences should therefore be interpreted cautiously.

These results compare particular settings and sources. They do not establish one character as consistently cleaner than another.

A.4

Results at maximum PUSH

All three characters were measured with PUSH at 100 %.

MEASUREMENT	CLEAN	COLOR	EDGE
Mean crest reduction on programme material as recorded	3.2 dB	4.4 dB	5.6 dB
Programme distortion, input peaks at 0 dBTP	−22 to −17 dB	−20 to −14 dB	−16 to −11 dB
Multitone distortion, input peaks at 0 dBFS	−22 dBc	−19 dBc	−15 dBc
Two-tone test, referenced to the quieter tone	−16 dBc	−9 dBc	−2 dBc
Aliasing with a 9 kHz test tone	−123 dBc	−63 dBc	−53 dBc

The two-tone test uses 60 Hz at −6 dBFS and 4 kHz at −26 dBFS. Its results are referenced to the quieter 4 kHz tone.

The aliasing test uses a 9 kHz tone at −6 dBFS with 4x oversampling.

Maximum PUSH produces different amounts of crest reduction in each character. This table therefore compares maximum settings, not equivalent processing amounts.

A.5

Effect of SHAPE on crest reduction

The following values show the largest measured change in crest reduction across the full SHAPE range.

Tests used five sources, both as recorded and normalised to −10.5 LUFS, with PUSH at 30, 60, 90 and 100 %.

CHARACTER	CHANGE IN CREST REDUCTION
COLOR	0.05 dB or less at the normalised test level; up to 0.25 dB as recorded
CLEAN	Up to 0.75 dB
EDGE	Up to 0.85 dB

SHAPE changed crest reduction least in COLOR. In CLEAN and EDGE, adjusting SHAPE could produce a larger change in processing amount.

A.6

True peak overshoot

This table shows how far the output true peak exceeded the output sample peak, in dB. PUSH was at 100 % and TP SAFE was disabled.

The final column repeats the EDGE test with an additional 6 dB of input gain.

MATERIAL	CLEAN	COLOR	EDGE	EDGE, INPUT +6 DB
Resampled loop, band-limited	0.00	0.00	0.00	0.00
Rhythmic bus, band-limited	0.00	0.00	0.00	0.00
Percussion	+0.11	+0.53	+0.20	+1.44
Finished master A	+0.71	+1.05	+1.12	+2.21
Finished master B	+0.27	+0.82	+0.84	+2.13
Synthetic clicks	+1.29	+2.40	+2.57	+4.32

Values of 0.00 are rounded. The two band-limited sources showed overshoot of 0.001 dB or less.

These figures describe the difference between sample peak and true peak. They are not absolute output levels in dBTP.

TROUBLESHOOTING

Edge

B.1 Quick checks

OBSERVATION	WHAT TO CHECK	REFERENCE
PUSH loads but produces no audio	Check the licence screen. An expired trial mutes the output until a valid licence is activated.	11.3–11.4
A reading shows a dash	Allow three seconds of audio for the measurement window to fill.	6.2
Increasing PUSH produces little crest reduction	Check the input level and operating point. Try adjusting INPUT TRIM and reassess the processing.	4.1 and 5.5
TP SAFE makes little or no audible difference	Check the output dBTP reading. The signal may not require any reduction.	5.9
Enabling TP SAFE causes a click or playback interruption	Enable it before playback, particularly at high sample rates with small buffers.	5.9
LOUDNESS GAIN differs from the difference between the input and output LUFS readings	Check OUTPUT TRIM, MATCH and TP SAFE. These affect the final output after the processing measurement.	6.3
CREST REDUCTION changes when adjusting SHAPE	This can occur, particularly in CLEAN and EDGE. Readjust PUSH if you want to retain similar crest reduction.	5.3
The low end is being shaped more than intended	Compare SPLIT on and off, then readjust the processing if needed.	5.6

OBSERVATION	WHAT TO CHECK	REFERENCE
An installed update does not appear in the host	Check which plug-in format the host has loaded. On macOS, AU and VST3 are separate installations.	11.1

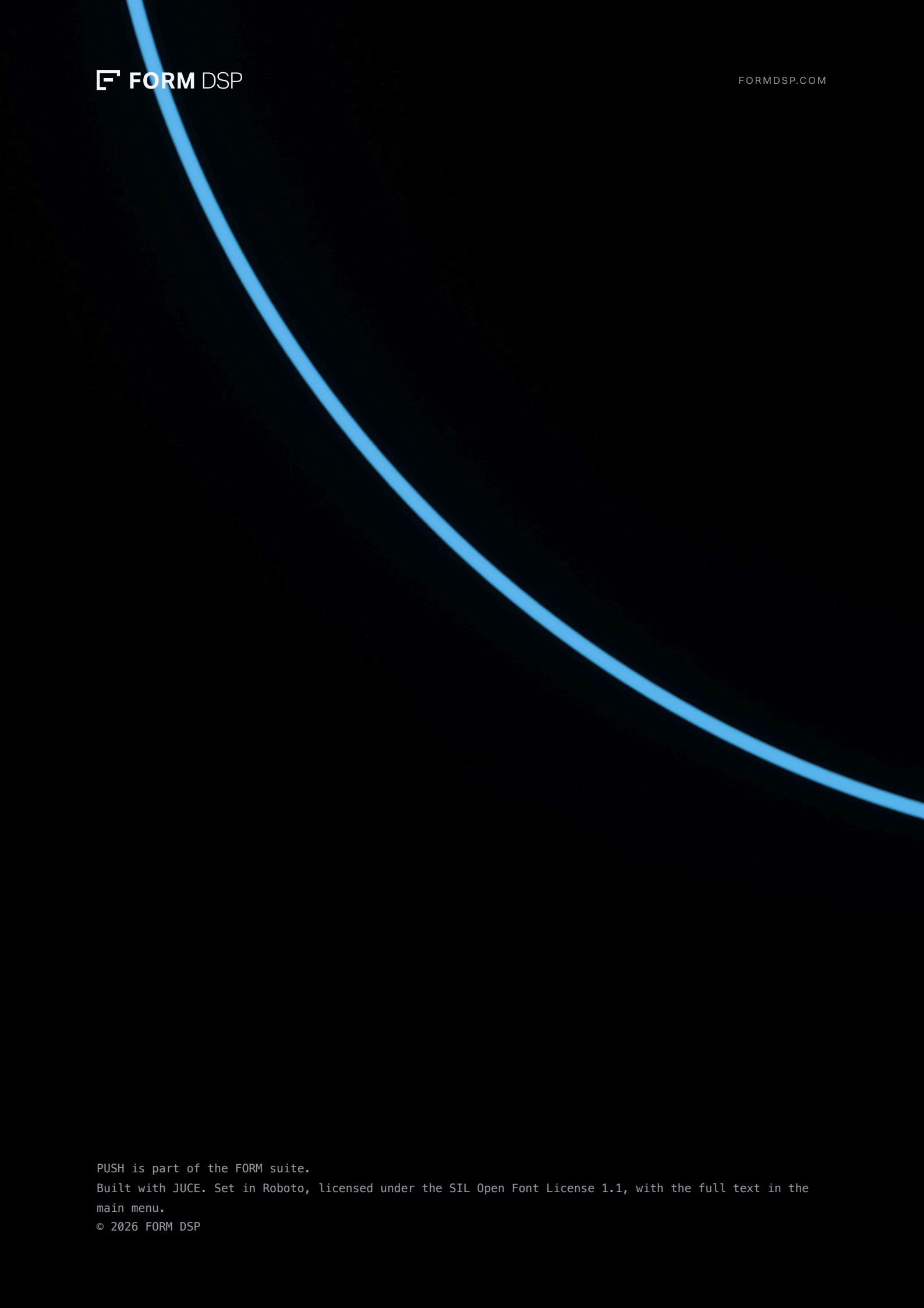
B.2

Contact support

If the issue remains, contact support@formdsp.com.

Include:

- Your PUSH version.
- Your host and its version.
- Your operating system and plug-in format.
- The preset or settings involved.
- The steps needed to reproduce the issue.



PUSH is part of the FORM suite.

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