



ISA 430 MKII: Producer Pack

The ISA 430 MKII represents the pinnacle of Focusrite's analogue channel strip technology, bringing together all the classic designs in one comprehensive production tool. Augmented with additional features and flavours, alongside unmatched internal routing and connectivity, the ISA 430 MKII enables today's recording professional to enjoy the unique sonic contribution of these heritage designs within one extremely versatile processor. Focusrite's iconic status as the leading manufacturer of channel strips remains unrivalled.



- Classic Focusrite transformer-based Mic-pre with variable impedance and 'Air' feature
- Multi format Compressor; switch between Focusrite's transparent VCA circuit and a vintage optical circuit
- Unmatched flexibility with an incredible variety of insert points and variable signal path arrangements
- Ability to function as 4 separate modular processors: mic pre, EQ, Dynamics and stereo ADC
- Precision VU metering of input level, Insert 1 or 2 Return level, Compressor gain reduction or Sidechain listen level (switched)
- Classic Focusrite EQ design; an expanded version of the original ISA 110
- Post mic pre output for the shortest possible signal path
- Proprietary Focusrite discrete Class A VCA Gate and Expander designs
- 'Listen' feature for precise control over compression, gating, expansion and de-essing
- De-esser design based on optical technology for lower distortion and transparency
- Soft Limiter to avoid critical digital overload
- Optional Stereo A/D – 24-bit 192 kHz Delta Sigma converter

The input section on the ISA 430 MKII features a large, professional-grade VU Meter with adjustable calibration, which can be selected to display any one of a number of multiple points in the signal chain. Additional visual monitoring is available through the inclusion of two LED bar graph meters, allowing the signals being fed to the input and output of the unit, or the ADC input levels to be viewed.

As with the ISA 428, the ISA 430 MKII has a variable impedance option on its classic transformer-based Mic-pre, ranging from 600 to 6800Ω (at 1kHz). This provides the engineer with increased control over the interaction between microphone and pre-amp, tailoring the response to suit his or her needs. Pressing the 'Air' switch further extends this principle, introducing an inductor circuit into the secondary of the transformer, which adds clarity and 'spaciousness' to the signal without the need for EQ.

The split configurable Inserts and changeable signal path order combine to

produce an unrivalled flexibility; herein lies the real benefit of the ISA 430 MKII as a 'do-all' processor for the most demanding of engineers. Both Inserts can be used to separate the individual sections of the channel strip. This means that if the post-mic output and ADC inputs are in use, the ISA 430MKII can function as four discrete processors simultaneously! (EQ and dynamics split mode; see diagram on page 6). Insert 2 can also be located post-dynamics should this be required, and for further adaptability, the dynamics can be shifted to a pre-EQ or post-sum position.

A significant development from the original ISA 430 can be found in the Compressor section, which now boasts a vintage opto circuit in addition to the original discrete Class A VCA design. Selecting the optical Compressor or Limiter results in a more coloured sound, as opposed to the extremely transparent VCA circuit. The ISA 430 MKII caters for the most varied of signals, containing an 'Auto Release' function (switch activated) that changes the

release time with each transient to suit the nature of the waveform. If the signal sounds excessively processed, a remedy lies in the Compressor 'Blend' feature, allowing the pre- and post-dynamics signals to be mixed. This can help restore a track's natural dynamism without losing the desired effect of compression.

The ISA 430 MKII features the same classic Focusrite EQ as the original ISA 110, but with two extra frequency values for both the high and low shelving, and with the added benefit of being able to insert the EQ into the sidechain of the Compressor and Gate sections. This allows for fully frequency-conscious compression, gating and expansion, making the ISA 430 MKII the most powerful dynamics processor yet developed.

The Gate section uses the Focusrite Class A VCA as the control element to remove the effect of unwanted interference and high levels of wide-band system noise build-up.



ISA 430 MKII SPECIFICATIONS

Line

Gain Range:	+10dB to +40dB continuously variable
Input Impedance:	>1M Ω
Mic	
Gain Range:	0 to +60dB in 10dB steps
Input Impedance:	Variable as follows: 600 Ω , 1400 Ω , 2400 Ω , 6800 Ω
EIN:	-128dB with 150 Ω terminating impedance at 60dB of gain
Noise:	-97dBu
THD:	0.001% with -20dBu 1kHz input and 20Hz-22kHz bandpass filter

Compressor (VCA mode)

Threshold Range:	-28dB to +12dB
Ratio:	1.5:1 to 10:1
Slope:	Soft knee
Attack:	100 μ S to 100mS
Release:	100mS to 7S, variable or auto (program dependent)

Compressor (Vintage Opto mode)

Threshold Range:	-28dB to +12dB
Ratio:	1.5:1 to 5:1 in Comp mode 5:1 to 20:1 in Lim mode

Slope:

Soft knee in Comp mode,
Hard knee in Lim mode

Attack:

Fixed

Release:

Fixed

Gate

Threshold Range:	-40dB to +10dB
Gate Range:	0 to -80dB
Attack:	switched fast or slow
Release:	100mS to 5S
Hold:	20mS to 4S
Expander Ratio:	0 to 5:1

De-Esser

Threshold Range:	22dB
Frequency Range:	2K2 to 9K2
Ratio at centre	
Frequency:	2:1
Limiter Threshold	
Range:	20dBu
Ratio:	infinite (Brick Wall)
Attack:	Frequency dependent

Switching this section to expand mode causes the Gate to function as an Expander. Instead of cutting off any signal below the threshold, an expander proportionately decreases it. This provides a more natural sound when reducing noise from non-percussive sources (especially vocals).

'Hysteresis' increases the level-difference between the gate switching on and switching off, and prevents the gate oscillating ('chattering') with particular combinations of input signal and threshold settings. This function is particularly useful when gating a signal with a very long decay time and large amounts of level modulation (for example a Grand Piano).

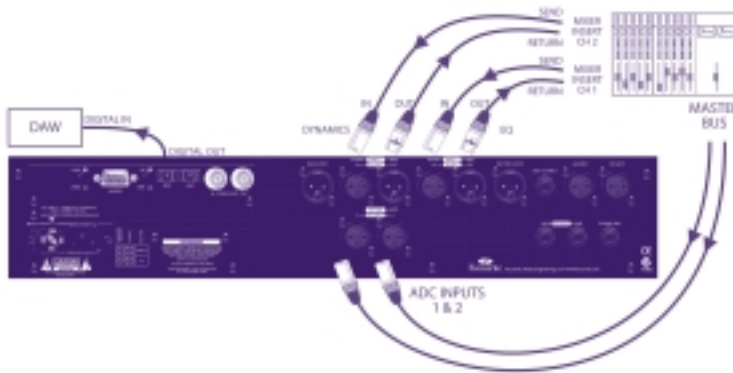
The ISA 430 MKII's De-esser is based on a low-distortion optical technology design, allowing transparent removal of excessive sibilance from a vocal performance. The circuit uses phase cancellation to create a smoother and less intrusive de-esser than traditional compression-based designs.

All four dynamic processors; the compressor, gate, expander and de-esser, feature Focusrite's unique 'Listen' feature. Selecting 'Listen', inverts the operation of the processor, so only the chosen frequencies that are being affected can be heard, rather than straining to hear the overall effect in a complex signal.

The sensitively designed soft Limiter, also present in the ISA 428, can be made to act on both the analogue output and the inputs to the optional ADC. The gradual changes in ratio leading up to 0dBFS produce a gentler limiting effect whilst still preventing a level overload.

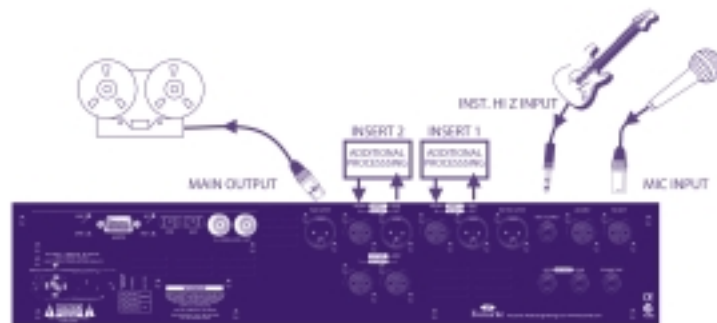
The optional stereo A/D card provides the ISA 430 MKII with 24-bit 192kHz capabilities and employs the same converters as those featured in the TEC award nominated ISA 428. (For more information, see the ADC details overleaf.)





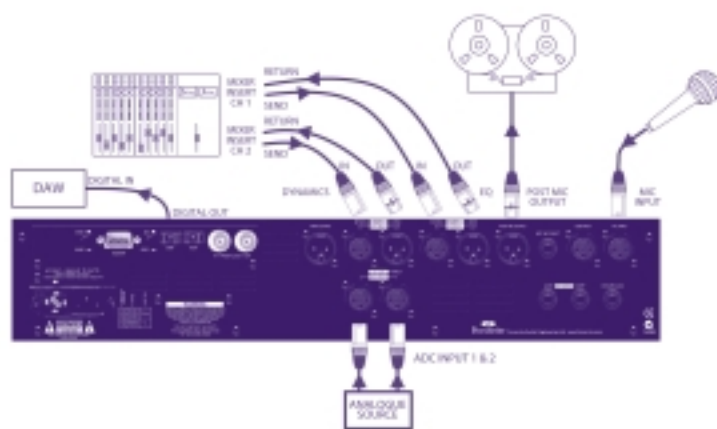
Split 'mixdown mode'

This example shows how to use the ISA 430 MKII in split mode as a mixdown tool. The unit has been switched to both 'EQ split' and 'Dyn split', and connected to two channel inserts of a mixing console. One is used to EQ, the other as a dynamics processor. The stereo mix is then converted using the ISA 430 MKII's ADC and soft Limiter for high quality digital mastering.



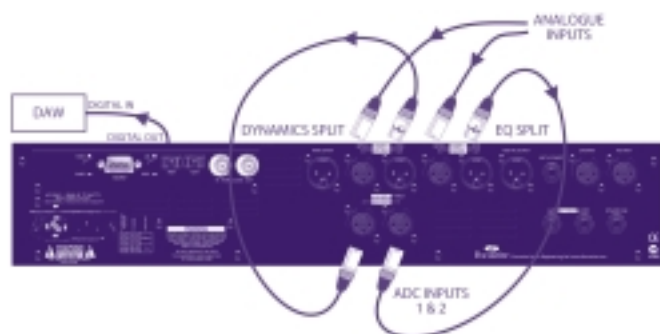
Record channel

This example shows the ISA 430 MKII being used for mic or guitar recording. The Insert points may be used to add external processing 'in-line' if required.



Using the ISA 430 MKII as four discrete units

This example shows how to use the ISA 430 MKII as four individual processing units. This unit is switched to 'EQ split' AND 'Dyn split', and ADC Inputs 1 & 2 are switched on. The unit is simultaneously allowing equalisation, plus separate dynamics processing of audio. At the same time, it is permitting two channels of A/D conversion into a DAW, as well as allowing super clean microphone recording!



Split + digital record mode

This example shows an analogue input connected to Insert Return 1 and then routed, via EQ modules, to Insert Send 1, which then feeds ADC Input 1. A second analogue input is connected to Insert Return 2 and then routed, via the dynamics module, to Insert Send 2, which then feeds ADC Input 2. This allows two separate sources to be processed and recorded via the digital output.



A-D Conversion

Just paying for the PCB and circuitry, without any additional casing and metalwork, affords a considerable reduction in cost whilst maintaining an extremely high level of sonic clarity. However, the benefits from installing Focusrite's optional ADC extend far beyond the obvious financial advantages and space saving issues. As most converters use the same chips, it is the quality of the surrounding analogue circuitry that makes the difference. This is the reason why the ISA ADC is unrivalled in terms of both price and performance.

Focusrite's R and D team have carefully considered the organisation of the PCB layout and grounding, ensuring that the S/N ratio and linearity of the converter are optimised. The noise floor and THD (Total Harmonic Distortion) are kept to a minimum by the nature of the power supply and the analogue input design, with analogue filtering positively effecting the sound of the digital noise. In addition, the supporting circuitry around the ADC (dealing with data transmission, bit reduction and incoming word clock) has been carefully structured, as it influences the converter through heat, power supply and data jitter.

One of the most important aspects of the ADC is the clock design, as this determines the linearity of the digital output. All Focusrite ADCs are designed to have incredibly low jitter figures ($44.1\text{kHz}-192\text{kHz} < 20 \text{ psec}$) which significantly improve the quality of the sound.

With the converters housed within the analogue units, the signal path is kept as short as possible, having no unnecessary analogue connections to the inputs of recording equipment. In addition, Focusrite units do not contain extraneous clocks or other sources of digital noise, unlike so many digital desks and multi-I/O DSP configurations.

"It is always easy to jump to the conclusion that onboard ADC cards offered on analogue outboard are cut price in features and performance, but this simply isn't the case here. Not only can I not imagine a digital scenario that this unit would not easily interface to, but the quality of the conversion is extremely good, and at least the equal of any unit out there that retails for the same money for just a converter alone."

Jon Thornton, ISA 428 review, Resolution, September 2003

