



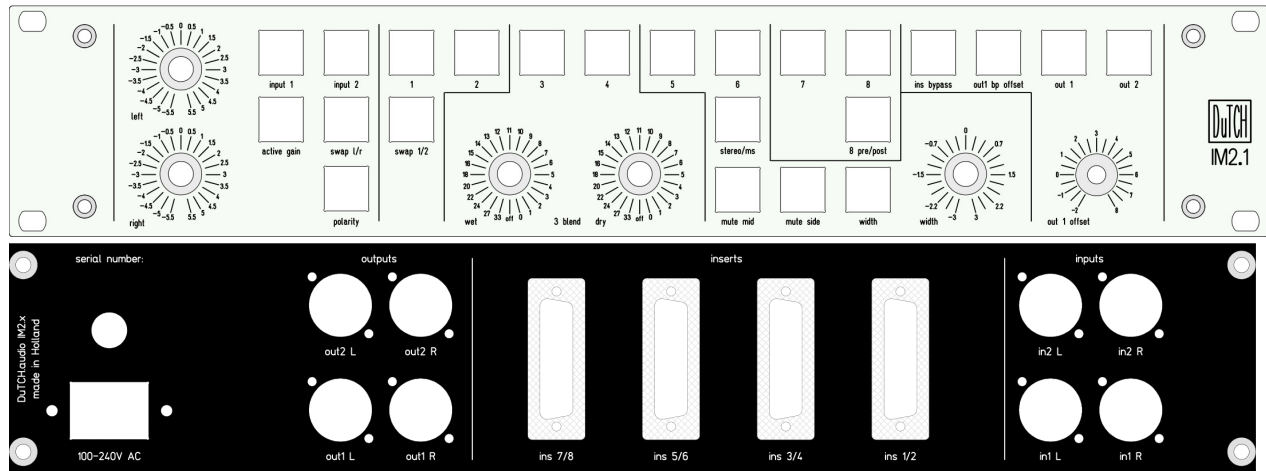
*DuTCH audio IM2.1 manual*





# DuTCH audio IM2.1 manual

(v1.1 23-01-2019)



Thank you for purchasing the DuTCH audio mastering Insert Matrix IM2.1. In this manual we will explain how this device works and how to use it. Since this is not really a beginner's device, we will skip the basics and focus on it's functions. We will go from the inputs (left side), to the inserts (middle) and to the outputs (right side), basically how the device handles signals.

## Inputs:

### Input 1 / input 2:

You can choose between the 2 inputs by pushing the corresponding button. It's also possible to use both inputs at the same time, but keep in mind that this could cause some impedance changes.

### Swap L/R:

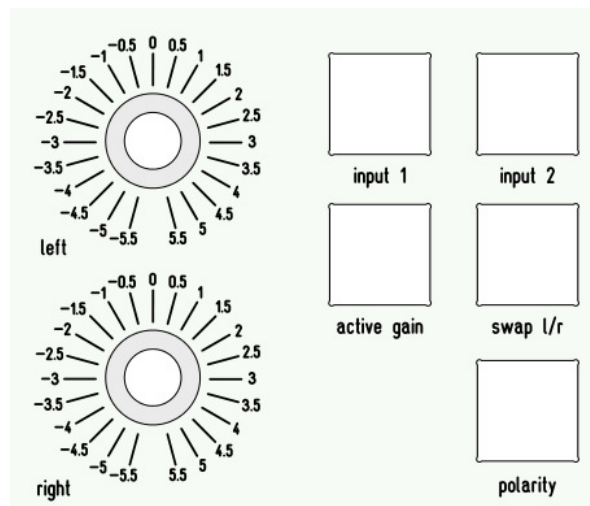
When you engage the 'swap l/r' button the left and right channel will be swapped in order. Sometimes this will bring things to the surface that you didn't notice before because of the new listening approach.

### Polarity:

The 'polarity' button will swap the polarity of both Left and Right. Sometimes swapping polarity will give a better response, mostly in the low frequencies. In most cases swapping polarity is not needed, but in the cases where you want to, this button comes in very handy. Keep in mind that obviously this only works with balanced signals.

### Active gain:

Both inputs are passive with just relays, but by pushing the 'active gain' button you will enable the active gain stage which enables you to change the input gain to your liking. In the mid/0 position, there is no gain applied though it passes the active gain circuit. You can change the gain in 23x0.5dB steps from +5.5dB to -5.5dB with stepped switches.



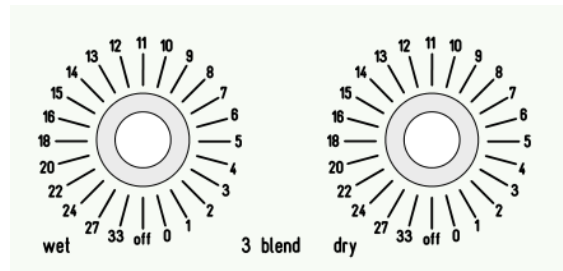
# Inserts:

## Insert 1 and 2:

This is a 100% passive insert section with just relays. When disabled, it will directly pass the signal internally to the next stage. When you enable the insert (1 and/or 2), it will pass the signal to the corresponding send/return. It will first pass insert 1 and then it goes into insert 2. When you push the 'swap 1 /2' button, it will swap the order of the inserts. So instead of 1>2 it will become 2>1.

## Insert 3 (blend):

Insert 3 has an active parallel/blend function. With insert 3 you can blend the dry and wet signal together. Most parallel processing uses one control for blending from wet to dry and uses a potmeter. The IM2.1 uses two separate controls for wet and dry with stepped switches instead of a potmeter. This way you don't have channel imbalance, easy recall and way better control over what happens to the signal. For instance you can choose to compress the signal and blend in just a bit of dry signal. But you also choose to use the dry signal and blend in a bit of quite aggressive compression.



The first steps on the stepped attenuators have 1 dB per step and the last steps have more course steps, the lowest step is -33dB. The off position mutes the wet or dry signal.

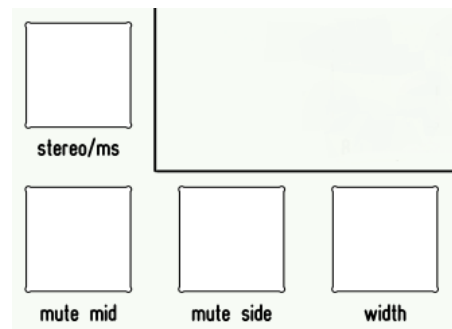
## Insert 4:

Insert 4 is a regular passive insert.

## Insert 5 and 6 (mid/side):

Insert 5 and 6 can be used for Mid/Side processing.

When set to stereo, it will be 100% passive, when set to MS, it will pass the active mid/side circuit.

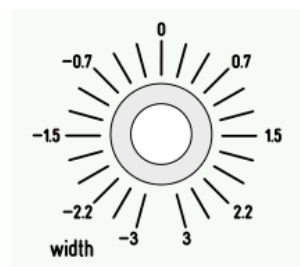


## Mid Side:

When the 'stereo/ms' button is engaged, both inserts 5 and 6 will work in MS mode. Left channel is Mid (sum), Right channel is Side (diff). You should keep in mind that the sum will be louder than the diff channel because of the LR summing/gain buildup. So you should be a bit careful with 'distortion sensitive equipment' but in practice this will not lead to any problems.

## Width:

When you enable the 'width' button, the width circuit becomes active and you can change the gain of the side channel and so, making it more wide or narrow. We chose to use a dedicated width enable button for A/B purposes. The width gain range is +/- 3dB with 23 steps. This way you have more precise control than with course steps and a big range you probably won't need.



## Mid / Side mute:

The 'mute mid' and 'mute side' buttons will let you mute mid or side so that you can listen to just the sum (mid) or the diff (side).

## Other MS functions:

When you don't use inserts 5 and/or 6, you can still make use of the mid/side functionality. When the 'stereo/ms' button is set to MS, it passes through the active MS circuit. This way you can change the gain of the side channel and you can also listen to just the mid or side channel by muting mid or side.

### Insert 7:

Insert 7 is a regular passive insert.

### Insert 8:

With insert 8 you can swap the order of insert 8 from insert 8 to pre insert 1, so it basically becomes insert 0. When you push the '8 pre/post' button, this is what will happen:

8 pre/post **off**: inputs > 1>2>3>4>5>6>7>**8** > outputs

8 pre/post **on**: inputs > **8**>1>2>3>4>5>6>7 > outputs

## Outputs:

### Outputs:

You can choose between the 2 outputs by selecting the corresponding button. It's also possible to use both outputs at the same time, but keep in mind that this could cause some impedance and so level changes.

### Ins bypass:

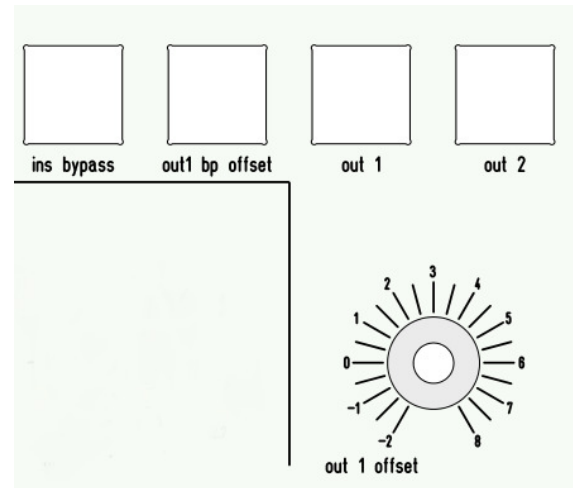
When you engage 'ins bypass' all inserts will be bypassed. You will see that all lights on the insert switches will go out, giving you extra visual feedback. Simply said, the input section will go directly to the output.

### Out 1:

Out 1 is a passive output selector with just relays, so no active circuit. So basically, it's passing the signal from the inserts straight into the output. But when you push the 'out 1 bp offset', it will bypass all inserts and the active gain stage 'out 1 offset' comes active. The monitor offset will allow you to change the bypass gain to make up for the processing of the inserts. This way you can A/B between the analog processing and level-matched bypassed signal. The gain range is set from -2dB to +8dB done with a potmeter instead of a stepped switch for a more precise adjustment. And since this is just an AB function no recall is needed. Internally the gain range of the monitor trim can be calibrated with 2 multiturn trimmers.

### Out 2:

Out 2 is a passive output selector with relays and no active stages.



## Rearpanel:

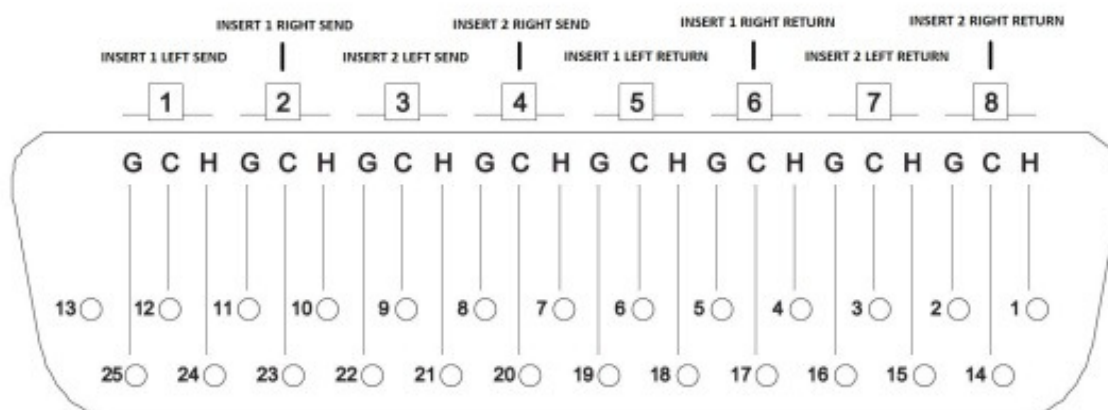
### Inputs:

The IM2.1 has two balanced inputs. Both inputs consist of gold-plated Neutrik XLR's.

### Inserts:

The IM2.1 has 8 balanced inserts connected on the back with industry standard Tascam DB25 analog connectors. Each connector holds 2 inserts corresponding with the frontpanel numbering.

### Pin-out for TASCAM DB25 8 Channel Balanced Connector



*Note: Be careful with DB25 tascam standard premade cables. The digital AES/EBU cables like the Hosa AES-803T have their XLR's connected in the wrong way which swaps send/return. Though it's an easy fix (swap all XLR male and female), you might want to look at this carefully.*

### Outputs:

On the rearpanel you will find 2 outputs with balanced gold-plated Neutrik XLR's.

## Technical:

### Hardware:

This device is built around mostly passive circuits, but some sections need to be active, but always with transparency in mind. The sturdy frontpanel-switches have, depending on their function, 2 color leds for visual feedback. All relays are high sensitive, long-life (15.000.000 cycles) Omron Relays.

Stepped switches are military grade Blore Edwards for long life and really nice mechanical feel. In and output connectors are gold plated Neutrik and industrial DB25 connectors for inserts. Active sections make use of SSM214x and Burr Brown drivers. Mid/Side section makes use of THAT and Burr Brown drivers. The mid/side circuit is based on the well known circuit from Wayne Kirkwood, but with additions/modifications.

PSU's are build around long-life industrial Meanwell SMPS's which run with way less noise and way more efficient then linear PSU's. Both the relays/leds and active circuit PSU's are running on their own separate PSU.

When this device is used in passive mode, so without active stages, it's 100% passive and only relay-contacts are inline. This means it's basically a straight wire.

### **Pushswitch labeling:**

To have some extra visual feedback on the push-switches you can put labels under the switch-covers. You can simply, but carefully, remove the switch cover with a small screwdriver and put something like a transparent dymo letratag sticker on the white plastic piece inside the switch-cover.

### **Specifications:**

Maximum gain passive: >+24dBu  
Maximum gain active gain: +24dBu  
Maximum gain mid/side: +22dBu  
Noise level passive: >118dB(a)  
Noise level active: >116dB(a)  
Stereo crosstalk: >110dB(a)  
Stereo crosstalk mid/side: >80dB(a)  
THD passive: 0.00042%  
THD active: 0.00045%

Input voltage 100 to 240VAC 50/60HZ.

Power consumption minimum 5 watt

Power consumption maximum 30 watt

(Power consumption depends on the amount of inserts, input, output etc activated)

Unit size: standard 2u 19 inch, depth 25cm

Weight: approx 4kg

Specifications subject to change because always improving



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