



DuTCH.audio IC2.1 user-manual



9-2-1-3-4-5-6-8-7	
In Gain	Width
-3.0dB	+1.5dB
Dry	Blend
+2.0dB	-2.0dB
1	Output 2
+3.0dB	+5.9dB

DuTCH.audio IC2.1 Insert Computer



Thank you for purchasing the DuTCH audio Insert Computer IC2.1.

The IC2.1 Insert Computer integrates our well-known and proven analog circuitry with a computer-interface to take it to the next level. The IC2.1 can be controlled using the intuitive and classy front-panel, as well as through the use of a VST3/AU plugin, which allows you to save and automate settings while even multiple units can be stacked using this plugin. With the built-in Ethernet interface, you can easily connect the IC2.1 to your existing network or you can also connect the IC2.1 via USB.



In this manual, we'll provide an overview of this device's functionality and instructions for its use. We presume you have a background in professional studio equipment, allowing us to concentrate on the core aspects.

Important Safety Instructions:

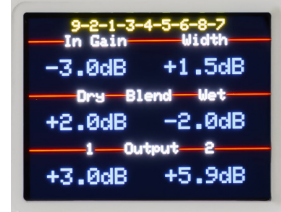
Please follow these precautions when using this product:

- Read and keep these instructions.
- Heed all warnings and follow all instructions.
- Dangerous voltage lives inside this machine. Opening is only allowed by qualified service personnel.
- Unplug this machine during lightning storms or when unused for long periods of time.
- Do not use this machine near water or outside.
- Clean only with a dry, soft cloth. Do not spray any liquid cleaner onto the cabinet, as this may lead to dangerous shocks.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other machines (including amplifiers) that produce heat. Avoid exposure to direct sunlight.
- This machine typically runs slightly warm when operated. Install in a normal ventilated area. If the product will be used in a rack, make certain there is sufficient air movement within the rack. Preferably offer some empty rack space above the unit and do not place it on top of hot equipment.
- Refer all servicing to qualified service personnel. Servicing is required when the machine has been damaged in any way, such as when the powersupply plug is damaged, liquid has been spilled or objects have fallen into the machine, the machine has been exposed to rain or moisture, does not operate normally, or has been dropped.
- **WARNING:** To reduce the risk of fire or electric shock, do not expose this machine to rain or moisture.

Operation:

The IC2.1 can be used in standalone mode with the elegant and user-friendly front-panel or in combination with our VST3/AU plugin which also allows you to save and automate settings.

The easy-to-read display will show the selected inserts order, values for input, blend, MS width and output gains. The programmable insert names will also be briefly shown (*in the centre of the display*) when an insert is activated or de-activated. Names can be programmed using the plugin (*explained further along this manual*) and will be saved in the IC2.1 EEPROM.



Input:

Input select:

The IC2.1 has 2 stereo inputs with gold-plated XLR's which are fully passive when the active input gain is not activated. You can choose between the 2 inputs by pushing the corresponding button.

✓ *It's possible to use both inputs at the same time, but keep in mind that this could cause some impedance mismatches causing level drops and/or change in sound.*

Active gain:

By pushing the *input* encoder you will enable the active gain stage which enables you to change the input gain to your liking. You can change the gain in 0.1dB per step with a +/- 10dB gain range. The value will be displayed on the central display. The changed value will show up in green for 2 seconds and will then revert back to blue.

Polarity swap:

When you push the *polarity* button, the polarity of both L and R will be swapped. Sometimes swapping polarity will give a better phase response. In most cases swapping polarity is not needed, but in the cases where you want to, this function comes in very handy. *Keep in mind that this function only works with balanced input signals.*

Swap L/R:

When you push the *swap l/r* button, the Left and Right channels will be swapped. Sometimes this will bring things to the surface that you didn't notice before because of the new listening approach.

Inserts:

Buttons and labels:

All 9 inserts are passive with just relays, except for insert 3, which can be also be used in blend mode and insert 5/6 which can be used in mid/side mode. All active circuits rely on transparent circuitry but will be fully passive when not engaged.

The push-buttons can be labelled to your liking by typing in names using the VST3/AU plugin and will be stored in the IC2.1 EEPROM. The name will be shown on the centre of the display for 2 seconds. The switch itself will also turn green when an insert is active. The insert order will be shown on the top row of the display. (*for instance, 1-2-4-6-8-7*)

✓ *It's also possible to label the push-buttons by adding labels under the switch cover. More information can be found on our website.*

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 the order will become 2>1.

Insert 3 (blend):

Insert 3 has an active parallel/blend function. *When you press either the *dry* or *wet* encoder knob you will activate the blend functionality* on insert 3. When activated, you can blend dry and wet signals together. The display will show you the values for dry and wet gain. The gain range is from -34dB > +2dB in 0.5dB per step and will be shown on the display. When blend is off, the display will show *-off-* for both dry and wet.

Most parallel processing devices uses a single control for blending from wet to dry in percentages. *The IC2.1 uses two separate controls for dry and wet in dB scale. This approach gives you way better control over what happens to the blended signal and you can easily do level matched AB comparisons.* This is pretty much impossible with a single blend knob.

- ✓ *It's also possible to activate the blend function when insert 3 is not activated. The dry and wet knobs become gain knobs and it becomes an active gain in between inserts 2 and 4. Because the wet control is not passing the insert itself, you can combine the wet/dry gains to add up to approx. 10dB of gain.*

Insert 4:

Insert 4 is a 100% passive insert with just relays.

Insert 5 and 6 (mid/side):

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

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

Mid Side:

When the *midside* button is engaged, both inserts 5 and 6 will work in MS mode. Left channel is Mid (sum), Right channel is Side (diff).

- ✓ *The mid/side button also acts as a button to enter the user-menu, see user-menu section in this manual for more information.*

Width:

When you push the *width* encoder, the width circuit becomes active and you can change the gain of the side channel and so, making it more wide or narrow. The width gain range is +/- 10dB in 0.1dB per step. We chose to use a dedicated width enable button for A/B purposes.

- ✓ *The width encoder is also used for the user-menu, see user-menu section in this manual for more information.*

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).

- ✓ *When you don't use inserts 5 and/or 6, you can still make use of the mid/side functionality. When the 'mid/side button is on, it passes through the active MS circuit. This way you can change the gain of the side channel and you can also listen to the mid or side channel by using the mute buttons.*

Insert 7 and 8:

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 (7 and/or 8), it will pass the signal to the corresponding send/return. It will first pass insert 7 and then it goes into insert 8. When you push the *swap 7/8* button, it will swap the order of the inserts. So instead of 7>8 the order will become 8>7.

Insert 9:

Insert 9 is a 100% passive insert section with just relays. With insert 9 you can swap the order of insert 9 from insert 9 to pre insert 1. When you push the *pre 9* button, this is what will happen:

- pre 9 **off**: inputs > 1>2>--->7>8>**9**> outputs
- pre 9 **on**: inputs > **9**>1>2>--->7>8> outputs

✓ *insert 9 is using XLR send and return connectors on the back of the unit.*

Output:

The IC2.1 has 2 stereo outputs with gold-plated XLR's which is fully passive when the active output gain is not activated. You can choose between the 2 outputs by selecting the corresponding button.

✓ *It's possible to use both outputs at the same time, but keep in mind that this could cause some impedance mismatches causing level drops and/or change in sound.*

Active gain:

By pushing the *output 1* or *output 2* encoder you will enable the active gain stage for the corresponding output which enables you to change the output gain to your liking. You can change the gain in 0.1dB per step with a +/- 10dB gain range. The value will be shown on the display. The changed value will show up in green for 2 seconds and will then revert back to blue.

Insert bypass:

When you press the *ins bypass* button, all inserts will be bypassed and the button will start blinking along with all insert buttons.

Bypass gain:

When you press the *bp gain comp* button, all inserts will be bypassed and they will start blinking for visual feedback. Next to that, the *Bypass Gain* will become active (*for both outputs*). The bypass gain can be used to compensate for gain loss of the bypassed inserts so that you can do a level-matched AB between source and master with the push of a single button. The Bypass gain range is +/- 10dB in 0.1dB per step shown in yellow on the display.

Function:

The *function* button can be used to restore one of the 10 plugin snapshots directly from the frontpanel which are previously saved in the plugin. Press the '*function*' button (button will start blinking) and then press the insert button 1-9 and for 10 choose pre-9. This function only works when there are snapshots saved in the plugin. See plugin section for more information.

✓ *More functionality will be added to the function button with future updates.*

User menu:

Main menu:

You can enter the user menu by holding the *midside/menu* button for 2 seconds. By using the *width/menu* encoder you can scroll through the various menu-items and by pressing the encoder you will enter the submenu or confirm a setting.

Settings menu:

Display:

Show labels lets you enable or disable the insert pushbutton labels. Default is enabled.

Network:

mode: change network from DHCP to static (manual IP setup)

IP: sets IP address (for instance 192.168.1.100)

Netmask: sets subnetmask (for instance 255.255.255.0)

Gateway: sets gateway (for instance 192.168.1.1)

DNS: sets DNS (for instance 192.168.1.10)

Recall on startup:

enables or disables last settings state (inserts, gains etc) Default is enabled.

Factory reset:

Clears the memory and reverts to initial settings (*factory clear can also be performed by holding insert 1 button during bootup*)

Status:

Shows the current IP address (DHCP or static)

Exit menu:

Exits menu and reverts back to default state.

Rearpanel:



Inputs:

The IC2.1 has two set of stereo balanced inputs (right side) with gold-plated Neutrik XLR's.

Inserts:

The IC2.1 has 9 stereo balanced inserts with industry standard Tascam DB25 analog connections. Each DB25 connector holds 2 inserts corresponding with the frontpanel numbering. Insert 9 uses XLR connectors for send and returns.



More information about the analog DB25 standard we use can be found further along this manual in the technical section and also on our website.

Output:

The IC2.1 has 2 sets of stereo balanced outputs (left side) with gold-plated Neutrik XLR's.

Network:

The IC2.1 is using IP based RJ45 ethernet connection (100 mbit) for automation and recall.

USB:

The IC2.1 can also be connected and controlled via a standard USB cable. Firmware updates are done via USB, but also needs an ethernet connection.

Power:

Power is provided by an internal SMPS interface which can be used from 100 to 250VAC.

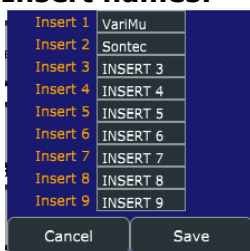
Plugin and firmware updates:

Plugin:

The IC2.1 can be controlled using the intuitive front panel, but it's also possible to control and save settings by making use of our VST3/AU plugin. To make thing easy to read and control, the plugin has the same layout as the front-panel. The IC2.1 connects to your existing network using a standard ethernet port (DHCP or fixed IP) or via a standard USB connection. The plugin will auto-detect the connected IC2.1. The plugin is also used for firmware updates.

✓ *Of course, making use of the plugin is not mandatory, but there are a lot of advantages to using the plugin so we suggest making use of it.*

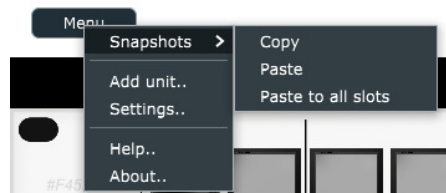
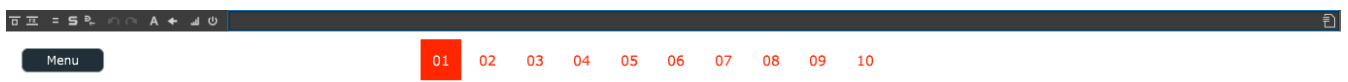
Insert names:



Within the plugin it's possible to add labels to the 9 insert pushbuttons (8 characters) so that you can instantly see the name of the connected insert. This label is saved into the IC2.1 EEPROM so even if you move to a different computer, the names will show up correctly in the plugin right away. When you press an insert button, the set name will also appear for 2 seconds on the display (*can be disabled*) on the frontpanel.

Snapshots:

Besides using plugin presets, it's also possible to make use of 10 snapshots to instantly switch between various chains and settings. These snapshots can be automated so when sequencing an album with different chains and settings per track you don't have to do this by hand.



By clicking on the numbers from 01 to 10 you can skip between various snapshots. Snapshots will be automatically saved when you make adjustments. You can also copy/paste snapshots from the menu button in the plugin.

Select a snapshot you want to copy to another position, click *'copy'* from the menu> snapshots and then select the snapshot you want to paste to and click *'paste'*.

Alternative you can *'paste to all slots'* if you want the same snapshot to be pasted to all positions.

✓ *keep in mind that switching between inserts and other functions might introduce small clicks. This is not always coming from the relays, but could also come from connected equipment that 'needs to settle' before it works. Automating snapshots is the preferred automation method since this will give you multiple settings at once with just one action.*

Plugin Menu:

In the menu button, to be found in the left corner of the plugin, you can make various settings.

Add unit:

When using a fixed IP address or using a fixed DHCP reservation, it's a possible to add the unit by hand by typing in its IP address. This will also slightly speed up the detection process. In that case it's also best to disable the 'Auto add detected units' in the settings menu.

Settings:

Show rack rails: You can enable or disable the 19inch rack rails.

Auto add detected units: enable/disable auto add units that will be detected by the plugin. This might helpful when multiple units are inside your network and you don't want those units to be added automatically.

GUI Scale: adjust the plugin GUI size to your liking.

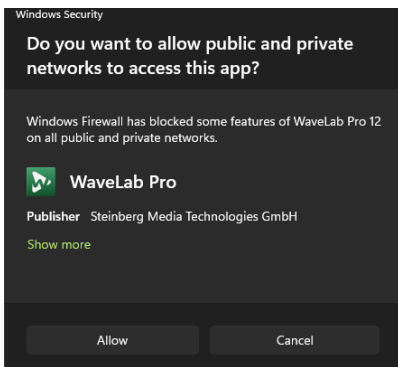
Help:

When you click help, you will be forwarded to the user section on our website.

About:

When you click about information about the plugin and firmware versions will be shown.

IMPORTANT NOTICE:



It's important that understand that the Insert Computer and your DAW need to connected to the same network, so they can see each other. By default, the IC2.1 is set to DHCP so it gets an IP address automatically and the plugin searches for a unit in the same network. This will work fine, but you might want to make a DHCP reservation or use a fixed IP address. This will speed the first time connection slightly up.

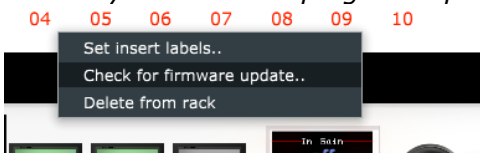
When you are using Windows, **the first time you open the dutch.audio rack plugin in your DAW, you will get a popup from the windows firewall.** The plugin needs access to your network to make a connection to the Insert Computer.

Depending on your OS (windows 10/11) it will look something like in this screenshot. You need to click **Allow** once for the plugin to communicate with your network and the IC2.1.

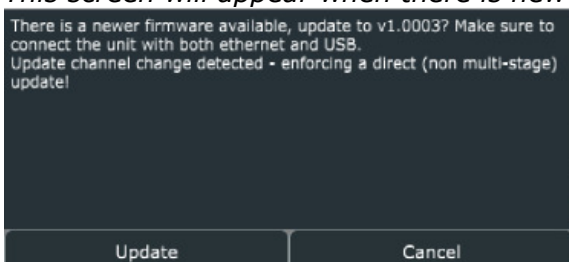
Firmware updates:

The IC2.1 firmware can be easily updated over the internet using the plugin. To update the firmware, your IC2.1 also needs to be connected to your computer with a USB cable.

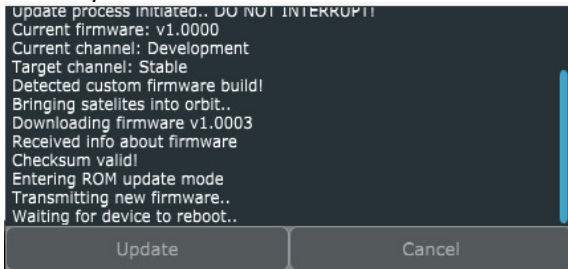
Click anywhere in the plugin to open the firmware update dialog.



This screen will appear when there is new firmware available.



Click update and the IC2.1 firmware will start updating, the screen will look something like this



DON'T INTERRUPT the update process.

After all updates are done, the IC2.1 will reboot and will revert back to its previous state and the plugin will 'show update' complete. It's good practice to re-open the plugin after a firmware update has finished.

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 leds for visual feedback. All relays are sealed, long-life SMD Omron Relays.

In and output and insert 9 connectors are gold-plated Neutrik XLR's, DB25 inserts (inserts 1-8) are gold-plated wurth connectors. Active analog circuits make use of AD/Analog Devices and THAT line drivers. The mid/side circuit is based on the circuit originally designed by Wayne Kirkwood, but with additions/modifications.

When this device is used in passive mode (no active stages activated), it's 100% passive and only relay-contacts are inline. This means it's basically a straight wire.

Computer control by using a solid embedded ARM cortex M3 CPU and a dedicated EEPROM for storing settings and memory.

Specifications:

- Max gain passive: >+24dBu
 - Max gain active stages: +24dBu
 - Noise level passive: >119dB(a)
 - Noise level active: >118dB(a)
 - Stereo crosstalk: >110dB(a)
 - Stereo crosstalk mid/side: ~80dB(a)
 - THD passive: <0.00043%
 - THD active: 0.00050%
-
- Input voltage 100 to 240VAC 50/60HZ.
 - Power consumption minimum 15 watt maximum 30 watt
 - Unit size: 2u 19 inch, depth 25cm
 - Weight: approx 4kg
 - RJ45 ethernet connection (DHCP or fixed IP)
 - VST3/AU 64bit plugins available for all platforms.

Specifications subject to change because always improving

DB25 connections:

The IC2.1 uses the analog Tascam DB25/DSUB standard for inserts 1 to 8. Even though the DB25 pinout is exactly the same as the digital standard, the channels vs send/return is different. More information can be found on our website.

For 2 inserts, you will need 1 DB25 cable, so for 8x insert, you need 4 DB25 cables.

Below is a basic schematic explaining the channels and functionality.

Insert 1:

Channel 1 insert 1 left send	(male XLR)
Channel 2 insert 1 right send	(male XLR)
Channel 5 insert 1 left return	(female XLR)
Channel 6 insert 1 right return	(female XLR)

Insert 2:

Channel 3 insert 2 left send	(male XLR)
Channel 4 insert 2 right send	(male XLR)
Channel 7 insert 2 left return	(female XLR)
Channel 8 insert 2 right return	(female XLR)

We can also supply Grimm TPR8 DB25 cables, which are the ideal cables for your IC1.1.

Grimm | **AUDIO** Grimm Audio TPR 'Twisted Pair Reference' cables are developed with physics in mind. Their design focuses on high RF immunity and low microphonics. The perfect symmetry of the cross-section and heavy shielding contribute to high RF immunity. Low microphonics is provided by a special interface layer under the shield and other construction details.

TPR delivers the most natural and least coloured transfer available. Get reference quality for a mainstream price.

Service and warranty:

- We offer a standard 2 year limited warranty on all of our products.
- In the event that you or a third party has (partly) altered or repaired anything, the warranty will expire, and you will be held responsible for the damages caused by any possible malfunctioning of the product. Warranty repairs are only made by us or by a workshop we agree upon.
- We are not responsible for any malfunction of or damage caused by parts that are not produced by DuTCH.audio.
- If you choose to ship back a faulty unit to us you must contact us before you do so. We need the serial number (located on the back of the unit) to handle the repair and if warranty is still valid.
- The product should be returned in its original package or packed in such a way that it is not damaged during the shipment with extra support for the rack ears. We are not to be held responsible for any damages during the shipment.
- The customer always pays the shipping cost to us.
- The customer is responsible for the product until it is delivered to us
- If we find that the product is flawless the customer will be charged 200 euro to cover our costs for examination and handling. The return costs will also be charged.



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DuTCH.audio has earned a reputation for excellence in the world of mastering. The Insert Computers continue this legacy by combining cutting-edge technology with a deep understanding of the needs of audio professionals. Its commitment to quality, versatility, and user-friendliness sets it apart as a top choice for those who demand the best in audio gear.