



COLOUR DUO

2-CHANNEL COLOUR CHANNEL STRIP

Operation Manual

DIYRE

Welcome to the Colour Duo

Thank you for purchasing the Colour Duo. Now let's get oriented.

The Duo is designed to be the ultimate Palette for the Colour format. It is a two-channel, combination mic preamp and line-level processor. The channels can be used independently or as a stereo pair. The Colour section features three Colour slots with independent controls, a makeup gain/trim control, and a wet/dry mix knob. Colours can be swapped via the Duo's unique drawer feature without having to disconnect or power down the unit.

If you purchased your Colour Duo as a DIY kit, please visit the online assembly guide:
diy.re/duo-manual

Quick Start Guide

This manual will help you get the most out of your Duo by covering the features in-depth and demonstrating some use cases. But the Duo is also designed to be easy and intuitive to use, so if you'd rather play around than read, just follow the steps below:

- Plug the external power supply into the **POWER INPUT** jack and then into an outlet.
- Connect a microphone to the **MIC INPUT** jack or a line output to the **LINE INPUT** jack.
- Connect either the XLR or ¼" TRS output jack to a line input on your audio interface.
- Press the **ACTIVE** switch to engage audio.
- Start Colouring!

Front Panel Description



GAIN (not labeled): Sets the mic preamp gain, between +20 and +66dB

48V: Engages phantom power

HPF: Engages the 80Hz high-pass filter

COLOUR: Engages the Colour section. When this switch is out the entire Colour section, including the controls for **TRIM** and **MIX**, is bypassed.

Ø: Flips the polarity of the mic signal by 180 degrees

PAD: Engages the -20dB pad

MIC/LINE: Switches between **MIC** (default) and **LINE** (pressed in) modes. In **MIC** mode the input is taken from the **MIC INPUT** jack, and the Gain knob and all preamp switches are in-circuit. In **LINE** mode the input is taken from the **LINE INPUT** jack and the **48V**, **HPF**, **Ø**, and **PAD** switches are disabled.

COLOUR KNOB x 3 (not labeled): Adjusts the level of each Colour without changing the overall gain

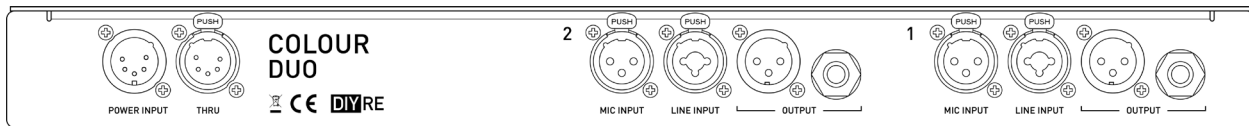
COLOUR SWITCH x 3 (not labeled): Engages each Colour and also indicates which Colour is in each position. Every Colour module automatically sets the LED to a unique hue when installed.

TRIM: Adjusts the post-Colour volume by -14/+10dB; set to the center position for unity gain.

MIX: Blends the dry signal with the output from the Colours

ACTIVE: Engages/disengages power to the drawer. Turn the **ACTIVE** switch off before removing the drawer to prevent pops, then engage the switch after re-inserting the drawer.

Rear Panel Description



POWER INPUT: DC power input from the external power supply

THRU: Used for powering multiple Duos from a single, external power supply. To daisy chain, run a 5-pin XLR cable from the **THRU** jack of the first Duo to the **POWER INPUT** jack of the next unit to be powered. Up to four Duos can be powered by a single external power supply.

MIC INPUT: Balanced, XLR microphone input

LINE INPUT: Balanced, XLR/TRS combo input

OUTPUT: Parallel XLR and TRS output jacks. Both are balanced and carry the same signal, but only one can be used at a time. If a jack is plugged into the TRS output jack, the XLR output will be muted.

Using The Drawer

The Colour Duo is the first Palette to allow for swapping Colours without using any tools or powering down the unit. To remove the drawer, simply loosen the two thumb screws on the front panel and pull the drawer toward you. Removing and inserting the drawer with the power on is completely safe for the equipment. However we recommend disengaging the **ACTIVE** switch before removing the drawer to prevent a pop in your speakers.

This is the recommended process for swapping Colours:

- Disengage **ACTIVE** switch
- Loosen thumb screws and remove drawer
- Swap Colours
- Insert drawer and tighten thumb screws completely
- Engage **ACTIVE** switch

Rack or Desktop Use

You can use the Duo on a desktop or mounted in a standard 19" rack. Use the provided rubber feet for desktop use, or the rack ears for rack mounting. Note that if you have applied the rubber feet, you will need to remove them for rack mounting.

Use Cases

Because of its versatile array of inputs and outputs, there are many ways to use the Colour Duo. This section illustrates three of them.

Two-Channel Mic Preamp

Besides being a Colour processor, the Duo is also a pair of no-compromise microphone preamps. With the Colour section bypassed, you can use them as a pair of transparent, low-noise preamps. Or engage Colours for processing on the way in.

- Connect microphones to the two **MIC INPUT** jacks. They can be a stereo pair or two different mics for different sources.
- Make sure the **MIC/LINE** switch is in the out position on both channels.
- Connect the **OUTPUT** jacks to two line inputs on your audio interface.
- Create two tracks in your DAW and set their sources to the two line inputs you connected to in the previous step.
- Start recording.

Stereo Bus Processor

Because of its stepped controls, the Duo makes an excellent stereo bus processor. In this example we will put the Duo across the mix bus for some subtle finishing.

- Connect two outputs from your audio interface to the **LINE INPUT** jacks. On most interfaces, channels 1/2 are reserved for the studio monitor outputs, so you'll likely want to use outputs 3/4 or higher.
- Connect the **OUTPUT** jacks to the two line inputs on your interface that correspond to the outputs you chose in the previous step. That is, if you used outputs 3/4 you should also connect the Duo to inputs 3/4.
- Create a hardware insert and set the inputs and outputs to the channels you chose in the previous steps. Check the documentation for your DAW if in doubt about how to create hardware inserts.

Hardware Insert for Mixing

You can also use the Duo as two independent Colour processors. In this example, we'll set up the Duo as a hardware insert on two separate tracks.

- As in the previous case, connect the Duo's **LINE INPUTs** and **OUTPUTs** to a pair of channels on your audio interface. For this example we'll use channels 3 and 4.
- Choose the two tracks in your DAW you want to affect with the Duo. Let's use Bass and Kick for this example.
- Create a hardware insert on the Bass track using input/output 3, and on the Kick track using input/output 4.
- You can now use the two channels of the Duo as if they were plugins on the Bass and Kick tracks. When you are ready to capture your processing, you can live render the individual tracks or live bounce the entire session (consult your DAW's manual for how to do these).

Troubleshooting

If the unit doesn't power up:

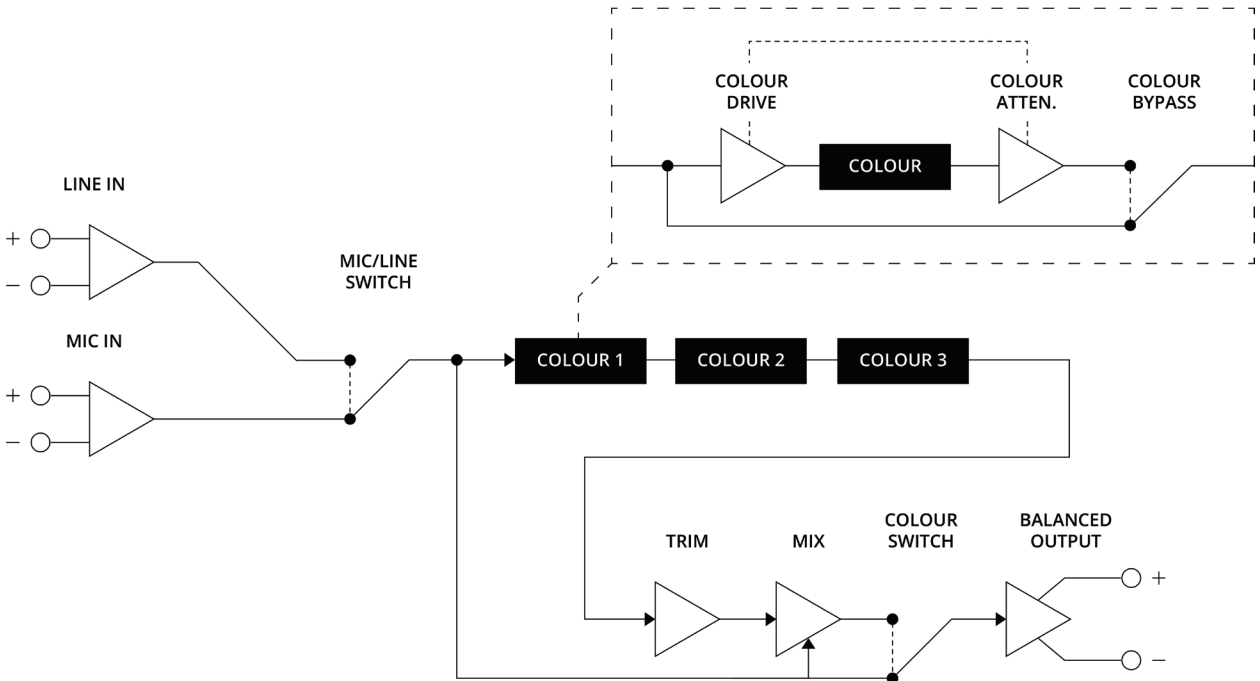
- Check the blue LED on the external power supply. If this LED is on, the problem is further down the line. If this LED is off, contact us for a replacement power supply.
- Check the connection between the I/O board and drawer. Make sure the drawer is completely inserted and that the thumb screws are screwed in. Power is passed to the audio circuitry through the two sets of large connectors CON1 and CON2.
- Make sure the **ACTIVE** switch is in. No power will pass to the drawer when this switch is out.

If there's no audio at the output:

- Make sure the **MIC/LINE** switch is in the correct position for the type of input you're using.
- Similarly, make sure you are plugged into the correct input jacks for the input type.
- Make sure the **ACTIVE** switch is in.
- If you are using a microphone that requires phantom power, make sure the **48V** switch is in.
- Check the output jacks. Note that if there is a cable plugged into the TRS output jack, the XLR output will be muted.
- Make sure no empty Colour slots are engaged. If there is no Colour in a slot, engaging that slot will mute the signal.

If there's excessive distortion:

- Make sure you are connected to the correct input. Connecting a line output to the **MIC INPUT** will usually clip the signal.
- Check your input levels. It's easy to accidentally overdrive analog gear when connecting it to a digital interface. DAWs use the dBFS scale, where 0dB is the absolute highest level the software can reproduce. Analog pro audio gear, on the other hand, is calibrated to +4dBu. Unfortunately, there is no standard conversion between dBFS and dBu, but it's common for 0dBFS to be as high as +24dBu. This means that if you are sending an average level of -6dBFS from your DAW, the Colour Duo is seeing a whopping +18dBu at the input. This level will create significant distortion in most Colour modules, and does not leave much room to turn the Colour knobs without clipping. So, when in doubt, turn down the level coming out of your DAW a bit.



Block Diagram

Audio enters the Duo through either the **MIC INPUT** or **LINE INPUT**. The **MIC INPUT** can amplify the mic signal up to 60dB, while the **LINE INPUT** has a fixed attenuation of -6dB. The **MIC/LINE** switch selects which input is sent to the rest of the unit.

Signal is then sent to the Colours in series. Each Colour contains a bypass switch, and a dual-gang potentiometer which controls gain before the Colour and attenuation after. The Colours feed a gain/trim stage to make up for the gain or loss from the Colours. This signal then feeds the wet/dry mix stage, where it is summed with the dry signal from before the Colour section. The **COLOUR** switch selects between the output from the mix stage or the output from the **MIC/LINE** switch. This feeds the balanced output which provides +6dB gain.

Specifications

Line Input

Impedance: 24k Ω

Max Input Level: 27.5dBu

Mic Preamp

Input Impedance: 3.6k Ω with pad out, 7.2k Ω with pad in

Gain: 20-66dB

HPF: 80Hz, 6dB/octave

Pad Attenuation: 20dB

EIN (Equivalent Input Noise): -130dBV

Line Output

Output Impedance: 50 Ω

Max Output Level: +22dBu

General

Colour Drive Control Range: -6 to +12dB

Trim Control Range: -14 to +10dB (unity at center)

Distortion: 0.005% at 1kHz with Colour section bypassed, 0.008% with Colour section engaged

Frequency Response: ± 0.2 dB 20Hz to 20kHz rel. 1kHz

Noise: -96dBu, 20Hz to 20kHz, input terminated with 600 Ohms

Power Rails: ± 16 vDC, +48vDC

Wall Power: 100-240VAC, $\sim 50/60$ Hz 2.5A

Dimensions

Width: 19" with rack ears, 17" without

Height: 1.72"

Depth: 8.5"


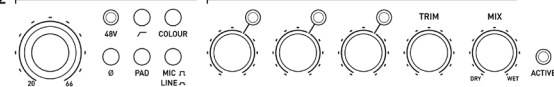
Replacement Parts

Below is a list of off-the-shelf components (other than custom parts) should you need a replacement down the road. For parts listed 'DIYRE' please contact us for replacements at diy.re/contact

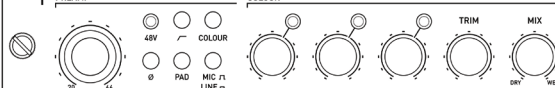
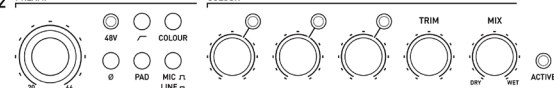
REFERENCE DESIGNATOR	VALUE	MAN. PART NUMBER	SOURCE
BR1	Diode bridge	DF06M-E3/45	Vishay
CON1A, CON2A	DIN 41612, female	9272326804	Harting
CON1B, CON2B	DIN 41612, male	9221326921	Harting
IC1 (drawer)	1512 mic preamp	1512P08-U	THAT Corp.
IC1, IC2 (I/O board)	1256 input receiver	1256P08-U	THAT Corp.
IC2-IC5	5532 dual opamp	NE5532P	TI
J1, J5	TRS output jack	PJ-644D	Daier
J2, J6	3-pin XLR output jack, male	NC3MAAH-1	Neutrik
J3, J7	3-pin XLR/TRS combo input jack	NCJ6FA-H	Neutrik
J4, J8	3-pin XLR input jack, female	NC3FAAH1	Neutrik
J9	5-pin Power thru jack, female	AC5FAH-AU-B	Amphenol
J10	5-pin Power input jack, male	AC5MAH-AU-B	Amphenol
N/A	Threaded thumb screw plate	Custom	DIYRE
N/A	PCB rail card guide	E-500	Bivar
N/A	External switch-mode power supply	Custom	DIYRE
Q1	BC327 transistor	BC32740BU	ON Semiconductor
Q2	BC337 transistor	BC33740BU	ON Semiconductor
N/A	Rubber feet	95495K66	McMaster-Carr
SW1-SW4, SW1_DB-SW6_DB	Pusbutton switch	PD-S2L	Well Buying
SW4, SW1_DB, SW4_DB, SW5_DB, SW6_DB	Lightpipe switch cap	PBLP-1001	Bivar
U1	DPDT 24V relay	J104D	CIT
VR1	C1k potentiometer	Custom	DIYRE
VR2, VR3, VR4, VR6	B20k potentiometer	Custom	DIYRE
VR5	B10k potentiometer	Custom	DIYRE
VR1 knob	Skirted aluminum knob	Custom	DIYRE
VR2-VR6 knob	Non-skirted aluminum knob	Custom	DIYRE

Recall Sheet

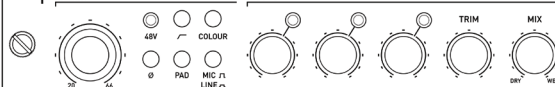
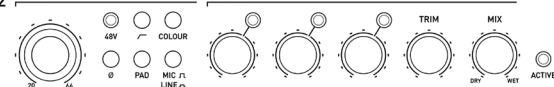
Print your own at diy.re/recall

	1 PREAMP COLOUR	2 PREAMP COLOUR	
			

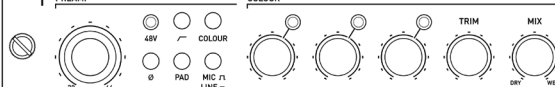
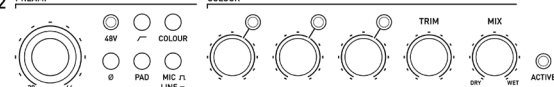
Date: _____ Track: _____ Ch 1. Colour 1: _____ Ch 2. Colour 1: _____
 Artist: _____ Instrument (Ch. 1): _____ Ch 1. Colour 2: _____ Ch 2. Colour 2: _____
 Project: _____ Instrument (Ch. 2): _____ Ch 1. Colour 3: _____ Ch 2. Colour 3: _____

	1 PREAMP COLOUR	2 PREAMP COLOUR	
			

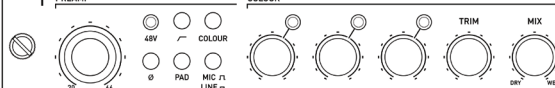
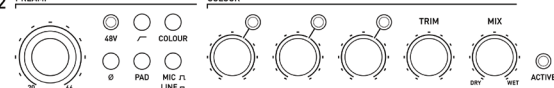
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 Artist: _____ Instrument (Ch. 1): _____ Ch 1. Colour 2: _____ Ch 2. Colour 2: _____
 Project: _____ Instrument (Ch. 2): _____ Ch 1. Colour 3: _____ Ch 2. Colour 3: _____

	1 PREAMP COLOUR	2 PREAMP COLOUR	
			

Date: _____ Track: _____ Ch 1. Colour 1: _____ Ch 2. Colour 1: _____
 Artist: _____ Instrument (Ch. 1): _____ Ch 1. Colour 2: _____ Ch 2. Colour 2: _____
 Project: _____ Instrument (Ch. 2): _____ Ch 1. Colour 3: _____ Ch 2. Colour 3: _____

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Date: _____ Track: _____ Ch 1. Colour 1: _____ Ch 2. Colour 1: _____
 Artist: _____ Instrument (Ch. 1): _____ Ch 1. Colour 2: _____ Ch 2. Colour 2: _____
 Project: _____ Instrument (Ch. 2): _____ Ch 1. Colour 3: _____ Ch 2. Colour 3: _____

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 Artist: _____ Instrument (Ch. 1): _____ Ch 1. Colour 2: _____ Ch 2. Colour 2: _____
 Project: _____ Instrument (Ch. 2): _____ Ch 1. Colour 3: _____ Ch 2. Colour 3: _____

Safety

As with any electronic device, operating the Colour Duo safely requires some common sense and respect for the dangers of electrical power. Treat your Colour Duo like a hair dryer. Don't turn it on when it's wet, only clean it with a dry cloth, and if you spill a liquid on it unplug it immediately and don't turn it back on until it's been repaired by a tech.

Warranty

DIY Recording Equipment, LLC (DIYRE) warrants this product to be free from defects and will remedy any such defects free of charge according to the terms of this warranty. DIYRE will repair or replace at its option any defective component(s) of this product, excluding the coating and labeling for a period of two (2) years from the original date of purchase. In the event that a particular product is no longer available, DIYRE will replace the product with a similar product of equal or greater value. To make a request or claim under this limited warranty, return your Colour Duo prepaid to DIYRE with a copy of the original invoice. This limited warranty will not apply if the product has been damaged due to abuse, misuse, misapplication, accident, or as a result of service or modification by the user. This warranty applies only to units assembled by DIYRE, not DIY kits.

Disclaimer

The Colour Duo is an electronic device intended to be used with properly grounded amplifiers and other audio devices. Connecting the Colour Duo to mis-wired or faulty equipment may result in electric shock. The user is responsible for using the Colour Duo safely and DIYRE disclaims liability for any damage or injury resulting from the use of this product. If you are not completely sure of the safety of connecting the Colour Duo to a certain piece of equipment, consult a qualified technician before proceeding.

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