

CITRONIC®

DSM2-6mkII

DIGITAL SPEAKER MANAGEMENT

170.659UK



Features

- 96kHz sampling frequency, 32-bit A/D and D/A converter, 24-bit DSP processor
- Input channel: 6-band parametric EQ, Delay, Polarity
- Output channel: Signal select, 6-band parametric EQ, Gain, Delay, Polarity, Crossover, Limiter
- Built-in USB and RS485 com ports
- Program function, recall and copy
- 30 internal user programs
- Password protection

Introduction

Thank you for purchasing this high quality Citronic digital speaker management system. The aim of our audio processing range is to offer cost-effective, high performance sound sculpting tools for live sound reinforcement and installation applications. The Citronic DSM2-6 offers a comprehensive and professional speaker management solution delivering unsurpassed sound quality.

The DSM2-6 comprises a 2 input, 6 output digital sound processor with fully assignable high and low pass crossover filters on each output for low or high frequency outputs or in combination for mid frequency output. Each filter can be assigned as Butterworth, Linkwitz-Riley or Bessel type across various cut-off slopes to give ultimate flexibility.

Each input channel has gain and phase correction and 6 bands of independent parametric or shelving EQ to tailor the input tone.

Each output channel has 6 bands of independent parametric EQ for tone shaping and to compensate for room or speaker anomalies. Also, each output has time alignment delay and adjustable limiter to protect the outputs from overloading.

In addition to the user-friendly front panel menus, all functions may be manipulated and stored via USB using the included PC software. A graphic interface allows quick and easy adjustment of all the main parameters. Further slave DSM2-6 units can be linked via RS485 connection (RJ45)

Signal connection is XLR throughout, balanced or unbalanced and each output may be addressed from either input A or B or A+B combined.

The internal memory can store up to 30 user programs and each can be named for easy identification. Each can be recalled at will and the unit can be password protected to lock out the functions to unauthorized persons.

This unit has been built to Citronic's exacting standards using high grade circuit boards and components housed in a heavy duty steel chassis casing to give long term, reliable service.

Installation

Set the DSM2-6 into a 1U space in a rack, ensuring enough depth to contain the unit and any connectors attached to it. Secure the front panel with rack screws and nuts to hold in place and stop the unit slipping. Plug the included power cable into the rear panel IEC connector and connect to the mains. Be sure to switch the DSM2-6 on before switching on the power amplifiers to avoid loud thumping sounds through the speakers and switch the amplifiers off before switching off the DSM2-6.

Connection to each channel is served by XLR for both inputs and outputs.

For balanced connections, follow the table below.

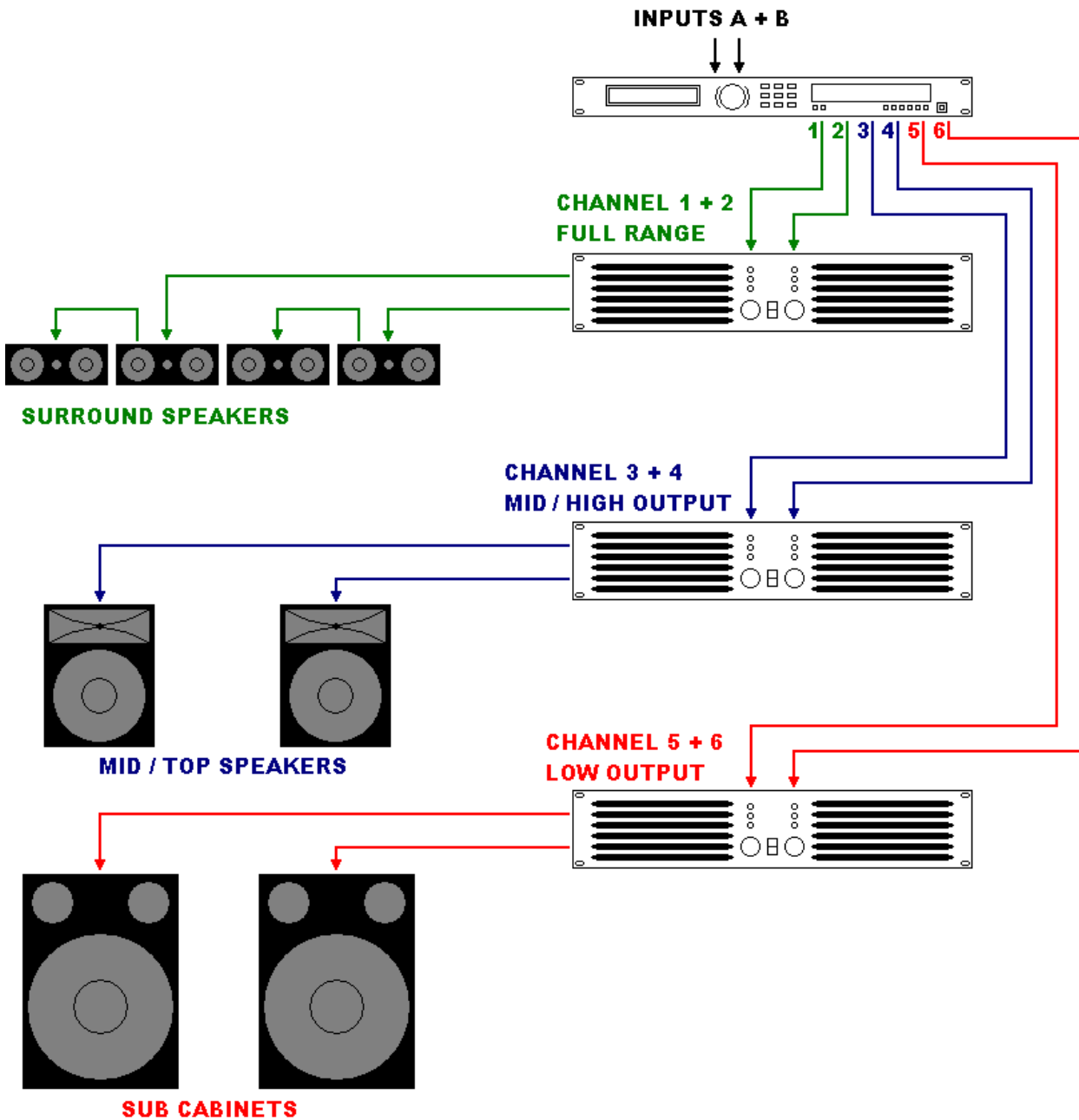
Connection	XLR connector
Hot (+)	Pin 2
Cold (-)	Pin 3
Earth	Pin 1

For unbalanced connections, follow the table below.

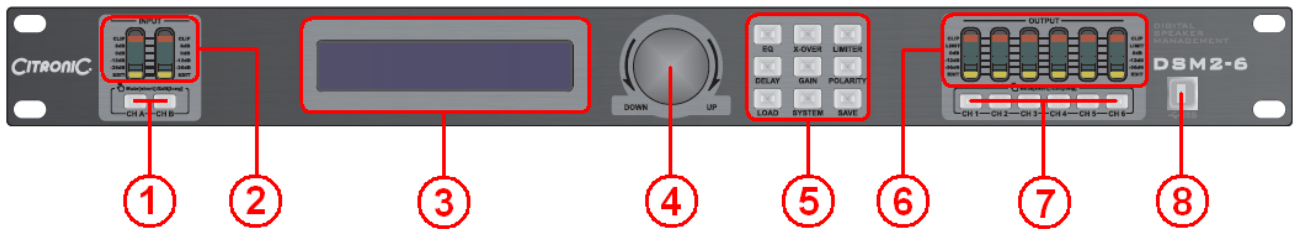
Connection	XLR connector
Signal (Hot)	Pin 2
Earth (Cold)	Pin 1 + 3

Applications

Use the DSM2-6 to control and distribute the signal to up to 6 amplifier channels driving different speaker arrays. A typical configuration with 2 subs, 2 mid/tops and 4 surround cabinets is shown below...

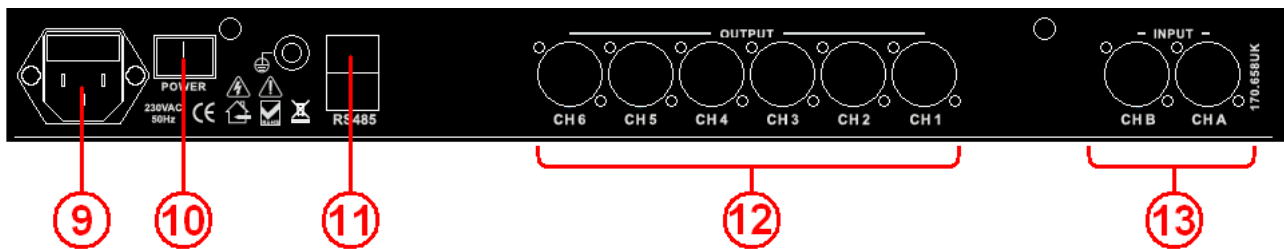


Front Panel



1. MUTE/EDIT buttons for Input channels (CH A, CH B)
2. MUTE/EDIT/LEVEL indicators for Input channels (CH A, CH B)
3. Main LCD display
4. Data wheel
5. Parameter & System buttons
6. MUTE/EDIT/LEVEL indicators for Output channels (CH 1 - CH 6)
7. MUTE/EDIT buttons for Output channels (CH 1 - CH 6)
8. USB input

Rear Panel



9. IEC mains inlet & fuse holder
10. Power switch
11. RS485 interconnect
12. Balanced XLR outputs CH1 – CH6
13. Balanced XLR inputs CH A, CH B

Operation – getting started

- 1) Begin by selecting an appropriate program for the particular setup or if not available, choose an empty program by rotating the data wheel (4) and pressing it in to select.
- 2) Press and hold the MUTE/EDIT button (7) for output CH1 until the yellow “EDIT” LED lights
- 3) Press the “GAIN” parameter button (5) and turn the data wheel (4) to select the Gain amount and which input (A, B or A+B) is required – turning the data wheel alters the current value, pressing the data wheel in selects and moves the cursor on to the next value.
- 4) Select the “X-OVER” (cross-over) parameter button and, using the data wheel, select the type of filter curve to be used (Butterworth, Linkwitz-Riley or Bessel), dB/Oct (decibels per octave or steepness) and the cut-off frequency. Pressing the “X-OVER” button again toggles between HPF and LPF (High Pass Filter and Low Pass Filter)
Increasing just the HPF frequency removes the low frequencies – for mid-high cabinets.
Decreasing just the LPF frequency removes the high frequencies – for low or sub cabinets
Using both HPF and LPF together creates a Mid Pass Filter – for mid cabinets
- 5) If required, frequencies can be cut or boosted for the selected channel by pressing the “EQ” button and performing the parameter editing process for the 6 bands of parametric EQ

- 6) For speakers which are to be placed at long distances apart, sometimes it is necessary to “time align” the signals from these so that the sound wave from each arrives at the listener at the same moment. This can be achieved by pressing the “DELAY” button and applying a delay to the speaker output nearest to the listener, avoiding the “doubling” effect that can result from distant speakers. Sound travels at 340m per second, so a speaker 170m further away than the nearest speaker would need a half second delay to be time-aligned.
- 7) When 2 speakers directly face each other, their sound waves can cancel each other out. This can be solved by reversing the polarity of one speaker using the “POLARITY” parameter. This can also be a useful tool for avoiding various other phase-cancelling problems.
- 8) The “LIMITER” function allows the user to limit the output of the amplifier by controlling the volume as it reaches a certain amount, creating a “ceiling” level. Applying the limiter to the output can help protect amps and speakers from overload.
- 9) When all CH1 settings are completed, press and hold the MUTE/EDIT button (7) for outputs CH2 through to 6 and repeat the process (channels and parameters may be edited in any desired order)
- 10) Likewise, certain parameters for input channels A and B can be edited as desired
- 11) Select each output in turn and decide if it is to be a left, right or mono output and select the appropriate input to suit
- 12) When all channels are set to the required values, press the “SAVE” button and store to an unused program memory and rename if required – the option to password lock the program will also be offered at this stage. The “LOAD” button allows the user to recall any of the saved programs at will.

Example setup

Press and hold **MUTE/EDIT** button for CH1 and press the **GAIN** button

... set Gain to **0dB** and select input **A**

... press the **X-OVER** button and select the **HPF to L-R** filter type **24dB/oct** at **120Hz**
(LPF remains unset at 20kHz)

Press and hold **MUTE/EDIT** button for CH2 and press the **GAIN** button

... set Gain to **0dB** and select input **B**

... press the **X-OVER** button and select the **HPF to L-R** filter type **24dB/oct** at **120Hz**
(LPF remains unset at 20kHz)

Press and hold **MUTE/EDIT** button for CH3 and press the **GAIN** button

... set Gain to **+6dB** and select input **A+B**

... press the **X-OVER** button and select the **LPF to L-R** filter type **24dB/oct** at **120Hz**
(HPF remains unset at 20Hz)

Press and hold **MUTE/EDIT** button for CH4 and press the **GAIN** button

... set Gain to **+6dB** and select input **A+B**

... press the **X-OVER** button and select the **LPF to L-R** filter type **24dB/oct** at **120Hz**
(HPF remains unset at 20Hz)

... the result is a standard 2-way crossover where CH1 and CH2 are the mid-high L & R outputs and CH3 and CH4 are a pair of identical sub outputs (mono to keep in phase and boosted by 6dB to balance the mid-highs).

Depending upon the required sub-bass style, the cut-off frequency may be varied – lower cut-off frequencies filter out more of the input and consequently may need more gain boost to “make up” for the reduction of input.

Typically, outputs CH5 and CH6 may be full range (without crossover filtering) for surround or background speaker L + R feeds.

From this basic 2-way crossover, a more sophisticated program may be derived with EQ settings to compensate for room resonances and speaker characteristics or even to suit a particular music type.

System Menu

Repeated pressing of the SYSTEM button gives access to the following settings...

SYSTEM SETUP MENU
1. Device ID Setup

SYSTEM SETUP MENU
2. Password

SYSTEM SETUP MENU
3. Power On Setup

SYSTEM SETUP MENU
4. Backlight Setup

SYSTEM SETUP MENU
5. Current Program

SYSTEM SETUP MENU
6. System Information

1. Device ID setup

For setups using multiple DSM2-6 mkII units together, they can be addressed by a single computer via the RS485 interface. It will be necessary to set the device ID of each DSM2-6 mkII so that they can each be edited in turn by the computer. The included software has the ability to switch between DSM2-6 mkII units by entering the particular device number when syncing with the computer.

2. Password

Here it is possible to set up and enter the user password to protect programs from being edited by unauthorised persons.

3. Power on setup

The user can choose whether or not to mute all channels whenever the DSM2-6 mkII is powered up. This can help to avoid unwanted noises through the amplifiers when powering up a system.

4. Backlight setup

The user can set the backlight "auto-off" when there is no front panel activity.

5. Current Program

Allows the user to set the program status at power up.

6. System information

Details of hardware/firmware type for reference

Maintenance and Servicing

There are no user serviceable parts inside this unit.

General case cleaning may be recommended using a dry or slightly damp cloth and connectors should be checked periodically for good electrical contact.

Any attempt to open and modify or repair the circuitry of this unit will void the warranty.

Refer all repair and servicing to qualified personnel and all warranty issues must be handled by the retailer where the unit was purchased.

Technical Specification

Frequency Response	20Hz – 20kHz \pm 0.5dB
Input Impedance	20k Ω balanced
PC com port	1 USB front panel, 2 RS485 rear panel
Output Impedance	100 Ω balanced
CMRR	>70dB @ 1kHz
Input Range	\pm 25dBu
Channel crosstalk	>80dB @ 1kHz
Delay time step	0–10ms @ 21 μ s step / 10–20ms @ 84 μ s step / 20–1000ms @ 0.5ms step
Output gain per EQ band	-12dB – +12dB @ 0.1dB step
Crossover	Low pass, High Pass or both combined. Type: Linkwitz-Riley, Butterworth or Bessel @ 12, 18, 24 or 48dB per octave
Limiter (each output)	Threshold: -20dBu - +20dBu @ 0.5dBu step, Attack time: 0.3ms – 100ms, Release time is selectable as 2, 4, 6, 8, 16 or 32 times the attack time.
Processor	96kHz sampling frequency, 32-bit floating point DSP
Display	2 x 24 character backlit LCD, mute and edit LEDs and 8-LED level meters
THD	\leq 0.01% @ output = 0dBu/1kHz
SNR	\geq 110dB
Power	AC 230V, 25W
Dimensions	482 x 232 x 44mm
Weight	4.2kg