Loudspeaker Management System
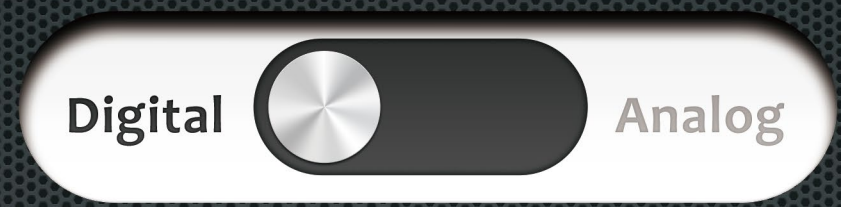
Cinema Sound Processor CM24

Digital Power Amplifier

Cinema Coaxial Speakers

**Digital** — **Analog**

# REVOLUTIONARY

## Digital Sound Solutions

- Cinema Sound Processor
- Digital Power Amplifier
- Coaxial Loudspeaker System
- Loudspeaker Management System

## Perfect 3D & Sound

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**FOCUX**

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# CM24
## Cinema Sound Processor



## Features

### Inputs / Outputs
✔ 8-channel digital input (AES/EBU) for 2K/4K digital cinema server.
✔ 8-channel analog input for 1.3K digital cinema server, or connects existing film sound processors.
✔ 4-channel analog input for nonsync (L and R), microphone (built-in feedback exterminator) and auxiliary modes.
✔ 12-channel analog output: L (HF and LF), R (HF and LF), C (HF and LF), SW, Ls, Rs, Bsl, Bsl and monitor (built-in mixer).

### Signal Processing
✔ Main volume, 1/3-octave graphic equalizer and pink noise generator for all full-range channels.
✔ Parametric equalizer, delay, gain and polarity for each channel.
✔ Crossover support for 3 screen channels.

### Control
✔ Wireless touchscreen control and work status display.
✔ Software for PC
✔ Ethernet connector (can be monitored, controlled, configuration and upgraded).
✔ Debug files that can be saved and recalled at any time.

## Brand New Design

FOCUX designs very easy-to-operate controls for the CM24. Users can control the processor via the wireless touchpad. The work status of each channel will be clearly displayed in real time.

FOCUX CM24 is the world's first wireless cinema processor, ushering in the new era of digital cinema. This is a brand-new design for operating the cinema processor. This processor is amazing! You can never find a button on such a powerful device. All functions will be condensed into 7 buttons on a 7-inch wireless touchpad. You can use one finger to control it with ease.

## Advantage

This is a super powerful audio processor! The CM24 only 1.75 inch (44mm) high and installed with up to 200 professional audio processors. FOCUX brings a truly advanced experience to global digital theatres.

Sound engineers can precisely adjust each channel to suit the sound's details. Moreover, the additional functions such as the rapid switch between 7.1 and 5.1 as well as the independent parameter adjustment for left, right, and back surround speakers are included to enable maximum performance of the cinema speakers.

The CM24 provides multiple remote control modes. Users can operate the system software via a wired/wireless network anywhere. With the software provided by FOCUX, users can adjust and operate all functions. Through TMS, all daily standard operations can be performed as well as automation functions.

## All-In-One

The CM24 processor has excellent sound performance and is designed for digital cinemas. The processor features a 20-channel input and 12-channel output. Built-in functions include: 1/3 octave equalizer, parametric equalizer, crossover, delay, phase control, volume control and noise generator, which ensures the demands of digital cinemas. CM24 is so powerful that it greatly outperforms other digital processors.

## CM24 Technical Specifications

### Inputs and Outputs

8-CH Digital Input: 25-pin female D-connector
Input impedance: 110 Ohm balanced

8-CH Analog Input: 25-pin female D-connector
Input impedance: >20 k Ohm balanced

Non-sync Input: 2-channel XLR connector
Input impedance: >20k Ohm balanced

Auxiliary Input: XLR connector
Input impedance: >20 k Ohm balanced

Microphone Input: XLR connector
Input impedance: >10 k Ohm balanced

Main Output: 8-channel 25-pin male D-connector
Output impedance: 50 Ohm

Extended output: 4-channel 25-pin male D-connector
Output impedance: 50 Ohm

Ethernet Connector
RJ-45 for network connection and PC setup software

### Digital Audio Performance

PCM: 44.1 kHz, 48 kHz, 96 kHz; 16 bit, 20 bit, 24 bit

### Audio Performance

Distortion: 0.001% (1 kHz @ -10 dBfs)

Dynamic Range: >120 dB typ (unweighted)

Digital Crossovers: three passive or bi-amp screen channels

Graphic EQ: 30-band (1/3-octave) on all channels
(except for subwoofer)

Parametric EQ: 14-band on all channels
(10-band for subwoofer, 8-band for monitor)

Delay: All channels separately adjustable from 0–500 ms

Feedback Exterminator: only for microphone

### General

Power: 90-240 VAC, 50-60 Hz

Humidity: 20%–80% relative humidity (noncondensing)

Operating: 32°F–104°F (0°C–40°C)

Touchscreen: 7 inch diagonal (178 mm)

Dimensions: 19" x 1.75" x 9" (483 mm x 44 mm x 229 mm)

Weight: 7 lbs (3.2 kg)



Rear Panel

# DP48
## Loudspeaker Management System

## Features

✔ 32-bit (40-bit floating point) DSP
✔ High Performance 24-bit A/D and D/A Converters
✔ Accurate 1 Hz Frequency Resolution.
✔ 6-Band Parametric Equalizers for each Input and Output
✔ Delay for each Input and Output
✔ Full-Function Limiters on Output Channels
✔ Crossover Filters (2 per Input / Output)
✔ Pink noise and single frequency generator

✔ USB interfaces for PC Control and Configuration
✔ Storage up to 30 Program Setups
✔ "One Touch" easy access setup button
✔ Backlit 4-Line x 32 Character LCD Display
✔ Full 5-segment LEDs on every Input and Output
✔ Original Neutrik XLR connectors
✔ Security Lock

## DP48 Technical Specifications

### Inputs and Outputs

Input Impedance: >10k Ohms

Output Impedance: 50 Ohms

Maximum Level: +12dBu

Type: Electronically balanced

### Audio Performance

Frequency Response: +/- 0.1dB (20 to 20 kHz)

Dynamic Range: 115dB type (unweighted)

Distortion: 0.002% (1 kHz @+4dBu)

### Digital Audio Performance

Processor: 32-bit (40-bit floating point)

Sampling Rate: 96 kHz

Analog Converters: High Performance 24-bit

### Front Panel Controls

Display: 4 x 32 Character Backlit LCD

Level Meters: 5 segment LED

Buttons: Mute/Edit Controls

       One Touch Menu Controls

       4 Ways Menu Controls

Dial Encoder: Embedded Thumb Wheel

### Connectors

Audio: 3-pin XLR

      RS-485 X 2

USB: Type B

Power: Standard IEC Socket

### General

Power: 110/240 VAC (50-60Hz)

Dimensions: 19"x1.75"x9" (483x44x229 mm)

Weight: 7lbs / 3.2kg

### Audio Control Parameters

Gain: -40 to +12dB in 0.1dB steps

Polarity: +/-

Delay: Up to 1000ms per I/O

Parametric Equalizers (6 per I/O)

      Type: Parametric, Hi-shelf, Lo-shelf

      Gain: -30 to +15dB in 0.1dB steps

      Bandwidth: 0.05 to 3 octaves (Q=0.404 to 28.852)

Crossover Filters (2 per Input / Output)

      Types: Butterworth, Bessel, Linkwitz Riley

      Slopes: 12 to 48dB/Oct

Limiters

      Threshold: -20 to +20dBu

      Attack: 0.3 to 100ms

      Release: 2 to 32X the attack time

### System Parameters

No. of Programs: 30, (10 factory programs and 20 user define)

Frequency Modes: 36 steps/Oct, 1Hz resolution

Security Lock: Lock/Unlock

Copy channels: All parameters (with PC software)

Channel Names: 6 character length

## High Quality

The DP48 is a digital system processors which offer a whole new level of performance with Complete Equalization and Loudspeaker Control System designed for the touring, fixed sound installation and cinema markets. The absolute latest in available technology is utilized with 32-bit (40-bit floating point ) processors and high performance 24-bit Analog Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices.

A complete set of parameters include I/O levels, delay, polarity, 6 bands of parametric EQ per channel, multiple crossover selections and full function limiters. Precise frequency control is achieved with its 1 Hz resolution. Inputs and outputs can be routed in multiple configurations to meet any requirement. The DP48 can be controlled or configured in real time on the front panel or with the intuitive PC GUI accessed via the USB. Software upgrade for CPU and DSP via PC keeps the device current with newly developed algorithms and functions once available. Multiple setup storage and system security complete this professional package.

The DP48 is the most effective way to manage all aspects of Loudspeaker management for proaudio system applications. The following are just some of the features of the device.

Rear Panel

# D Series
## Digital Power Amplifier

4 channels
Each with output up to 2100w/4Ω

Power utilization up to 90%

Weighs only 9kg
Height of only 44mm

Digital amplifier circuit
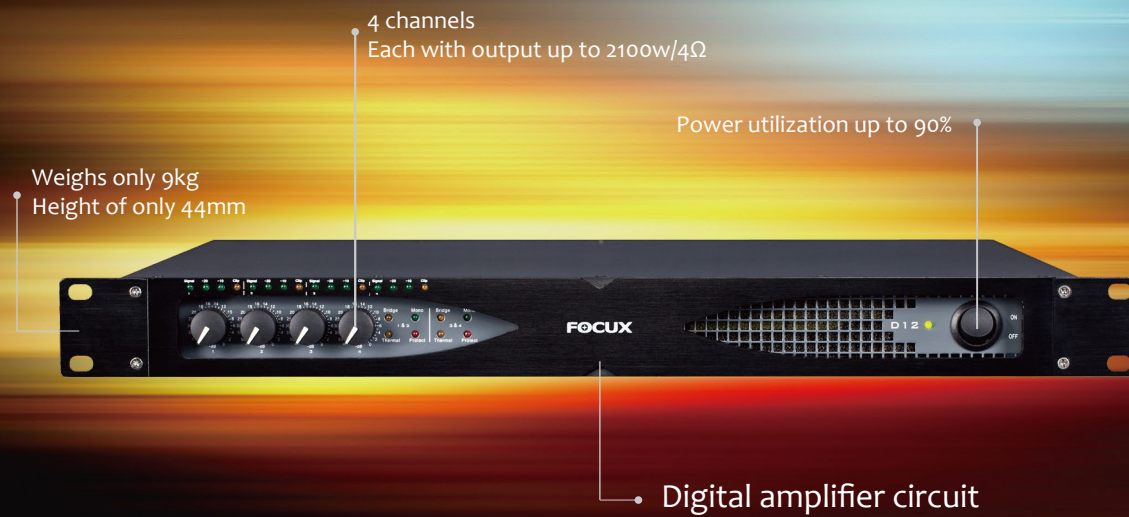
## Perfect Speech Intelligibility

The FOCUX digital amplifier can produce more than 90% power, but the analogue amplifier can only produce about 45%, which means if both amplifiers produce the same outputs, the FOCUX digital amplifier will save more than 50% power!

## Extremely Efficient

The FOCUX digital amplifier will not produce any loss and distortion like an analogue amplifier in terms of signal and sound quality; a FOCUX signal can achieve high-fidelity. Along with the FOCUX digital amplifier, its coaxial speaker can generate perfect speech intelligibility.

## More Safety

The FOCUX digital amplifier can produce more than 90% power. In other words, less than 10% of power will be transformed to useless heating power, which is 5 times less than an analogue amplifier! Less heating power will not only extend the life of the components, but also maintain the safety, reliability, and durability of the products.

## Absolutely Digital

FOCUX increases the efficiency of its digital cinema sound system by 100% more than the current analogue system.

This is amazing progress, which means FOCUX digital digital sound systems have become the highest performance products in the audio industry.

FOCUX released the first digital amplifiers system in cinema industry. We are proud to announce that REAL digital sound systems are available in movie theatres from now on.

## Light and Thin

With 8,400 W across four channels in a single rack space at a mere 17.6lbs weight, the D series is equally versatile in touring and permanently installed racks. This is a revolutionary breakthrough!

Rear Panel

## D Series Technical Specifications

| Model | D4 | D6 | D12 |
|---|---|---|---|
| Rated Output Power, 8Ω (THD=1%,1KHz) | 4 x 450 W | 4 x 650 W | 4 x 1200 W |
| Rated Output Power, 4Ω (THD=1%,1KHz) | 4 x 800 W | 4 x 1100 W | 4 x 2100 W |
| Rated Output Power, 2Ω (THD=1%,1KHz) | 4 x 1400 W | 4 x 1800 W | 4 x 3600 W |
| Maximum Bridged Output Power, 16Ω (THD=1%,1KHz) | 2 x 900 W | 2 x 1300 W | 2 x 2400 W |
| Maximum Bridged Output Power, 8Ω (THD=1%,1KHz) | 2 x 1600 W | 2 x 2200 W | 2 x 4200 W |
| Maximum Bridged Output Power, 4Ω (THD=1%,1KHz) | 2 x 2800 W | 2 x 3600 W | 2 x 7200 W |
| Maximum RMS Voltage Swing, (THD=1%,1KHz) | 60 V | 72 V | 97 V |
| Gain, selectable | +26 dB   (20X) | | |
| Frequency Response | 20 Hz - 20 kHz (1W @ 8 Ω, ±0.5dB) | | |
| Signal to Noise Ratio | ≥105 dB (20 Hz - 20 kHz, A weighted) | | |
| Crosstalk separation | >70dB @ 1 kHz | | |
| Input Impedance | 20 kΩ balanced | | |
| THD | typical < 0.02 %, full power ≤ 1 % | | |
| Damping Factor @ 8Ω | ≥200 @100 Hz / 1 KHz | | |
| Power Requirements | AC~100-240V (50-60Hz) | | |
| Protection | overheat/thermal output power control/long term output power control/output short-circuit/overload protection/dc protection | | |
| Dimensions (W x D x H) | 19" x 14.3" x 1.75"<br>483mm x 364mm x 44 mm | | |
| Net weight | 17.6 lbs (8 kg) | | |

# Cinema Coaxial Speakers

X30

X15, X20

C10    BA18    X14    BA18    C8

## Precise Sound Localization

The FOCUX coaxial loudspeaker are designed to reproduce dialogues, large dynamic scenes, ambient sound, and soundtrack music well, which allow moviegoers to enjoy an extraordinary acoustic experience.

FOCUX's cutting-edge technology combines the Hi/Mid range. The mid-range and high frequency play from the same location, which effectively remove sound interference, and perfectly reproduce the accuracy and delicacy of the sound.
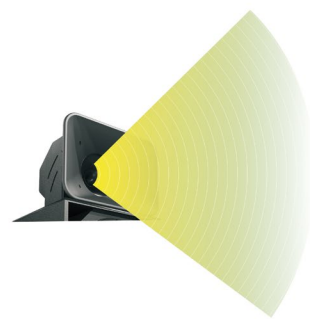
FOCUX Mid-high system: only one coaxial speaker function but delivers clear sound waves.
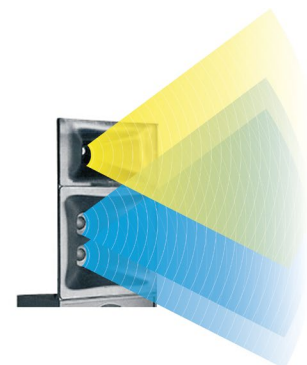
Traditional Mid-high system: two or more speakers function in different locations and deliver distorted sound waves.

CLEAR

DISTORTED

## Screen Channel

The X Series is the world's first cinema coaxial screen channel speaker system. X15, X20 and X30 are also the most compact three-way systems in digital cinema so far. It performs extremely well in very compact spaces. This design can shorten the distance of Hi, Mid, and Low frequencies; therefore, it provides smooth and perfect reproductions of movie soundtracks.

This technology completely bypasses tradition. The delicate design of the FOCUX speaker appears in the X Series. Integrated with the technology of a coaxial speaker and an excellent horn system, the X Series features a more powerful dynamic output so that audiences can enjoy the accuracy, quality, and reliability of a complete cinema audio solution.

| Model | X14 | X15 | X20 | X30 |
|---|---|---|---|---|
| Picture | | | | |
| Type | 2-Way Screen Channel Loudspeaker | 3-Way Screen Channel Loudspeaker System | 3-Way Screen Channel Loudspeaker System | 3-Way Screen Channel Loudspeaker System |
| Frequency Response | 55 Hz - 18 kHz ±3 dB | 45 Hz - 18 kHz ±3 dB | 45 Hz - 18 kHz ±3 dB | 40 Hz - 18 kHz ±3 dB |
| System Maximum SPL | 122 dB continuous | 123 dB continuous | 125 dB continuous | 128 dB continuous |
| | 128 dB Peak | 129 dB Peak | 131 dB Peak | 134 dB Peak |
| Power Rating(AES) | 400 W | LF   400 W | LF   500 W | LF   800 W |
| | | MHF 200 W | MHF 250 W | MHF 300 W |
| Peak power | 1600 W | LF  1600 W | LF  2000 W | LF  3200 W |
| | | MHF  800 W | MHF 1000 W | MHF 1200 W |
| Nominal Impedance | 8 Ω | LF 8 Ω | LF 8 Ω | LF 4 Ω |
| | | MHF 8 Ω | MHF 8 Ω | MHF 8 Ω |
| Sensitivity(1W/1M) | 96 dB | LF   97 dB | LF   98 dB | LF   100 dB |
| | | MHF 100 dB | MHF 101dB | MHF 103dB |
| Coverage Angle | 90° horizontal x 90° vertical | 100° horizontal x 60° vertical | 100° horizontal x 60° vertical | 100° horizontal x 60° vertical |
| Crossover Frequency | passive | 400 Hz | 400 Hz | 400 Hz, 2.2 kHz |
| Transducers | One 12" Coaxial driver | One 10" Coaxial driver | One 10" Coaxial driver | One 10" Coaxial driver |
| | | One high-power 15" cone driver | One high-power 15" cone driver | One high-power 15" cone driver |
| Dimension(H x W x D) | 20.7" x 15.4" x 14.4" | 37.8" x 21.1" x 17.7" | 37.8" x 21.1" x 17.7" | 50.8" x 21.1" x 17.7" |
| | 525 x 390 x 365 (mm) | 961 x 536 x 450 (mm) | 961 x 536 x 450 (mm) | 1290 x 536 x 450 (mm) |
| Net Weight | 44 lbs (20 kg) | 94.8 lbs (43 kg) | 100 lbs (45.5 kg) | 130 lbs (59 kg) |

## Surround

The C series surround speaker is the world's first cinema coaxial surround system and features excellent sound performance. This design makes the C8 and C10 surround speakers perform with perfect sound quality. They bring accuracy and clarity to cinema

| Model | C8 | C10 |
|---|---|---|
| Picture | | |
| Type | Surround Loudspeaker | Surround Loudspeaker |
| Frequency Response | 54 Hz - 18 kHz ±3 dB | 50 Hz - 18 kHz ±3 dB |
| System Maximum SPL | 115 dB continuous | 120 dB continuous |
| | 121 dB Peak | 126 dB Peak |
| Power Rating(AES) | 180 W | 300 W |
| Peak power | 720 W | 1200 W |
| Nominal Impedance | 8 Ω | 8 Ω |
| Sensitivity(1W/1M) | 92 dB | 95 dB |
| Coverage Angle | 90° horizontal x 90° vertical | 90° horizontal x 90° vertical |
| Crossover Frequency | passive | passive |
| Transducers | One 8" Coaxial driver | One 10" Coaxial driver |
| Dimension(HxWxD) | 13.2" x 15.7" x 9" | 15.2" x 18.3" x 10.2" |
| | 335 x 400 x 230 (mm) | 385 x 464 x 259 (mm) |
| Net Weight | 22 lbs (10 kg) | 28.7 lbs (13 kg) |

## Subwoofer

The BA18 is designed to provide low-frequency with ample headroom in critical applications. Another feature is that the BA18 can be used in Arrays. With its compact design, it can be used in arrays to deliver very low distortion for ultimate low-frequency clarity. Just place two or more BA18 subwoofers in a specific location and the result is a more powerful and ultra-low sound performance. Therefore, maximum output can be generated with fewer subwoofers making this system highly efficient.

| Model | BA18 |
|---|---|
| Picture | |
| Type | Subwoofer |
| Frequency Response | 38 Hz - 200Hz ±3 dB |
| System Maximum SPL | 124 dB continuous |
| | 130 dB PEAK |
| Power Rating(AES) | 600 W |
| Peak power | 2400 W |
| Nominal Impedance | 8 Ω |
| Sensitivity(1W/1M) | 96 dB |
| Coverage Angle | N |
| Crossover Frequency | N |
| Transducers | One 18" cone driver |
| Dimension(HxWxD) | 22.8" x 24.8" x 30.7" |
| | 580 x 630 x 780 (mm) |
| Net Weight | 116.8 lbs (53 kg) |

# Cinema System Diagrams
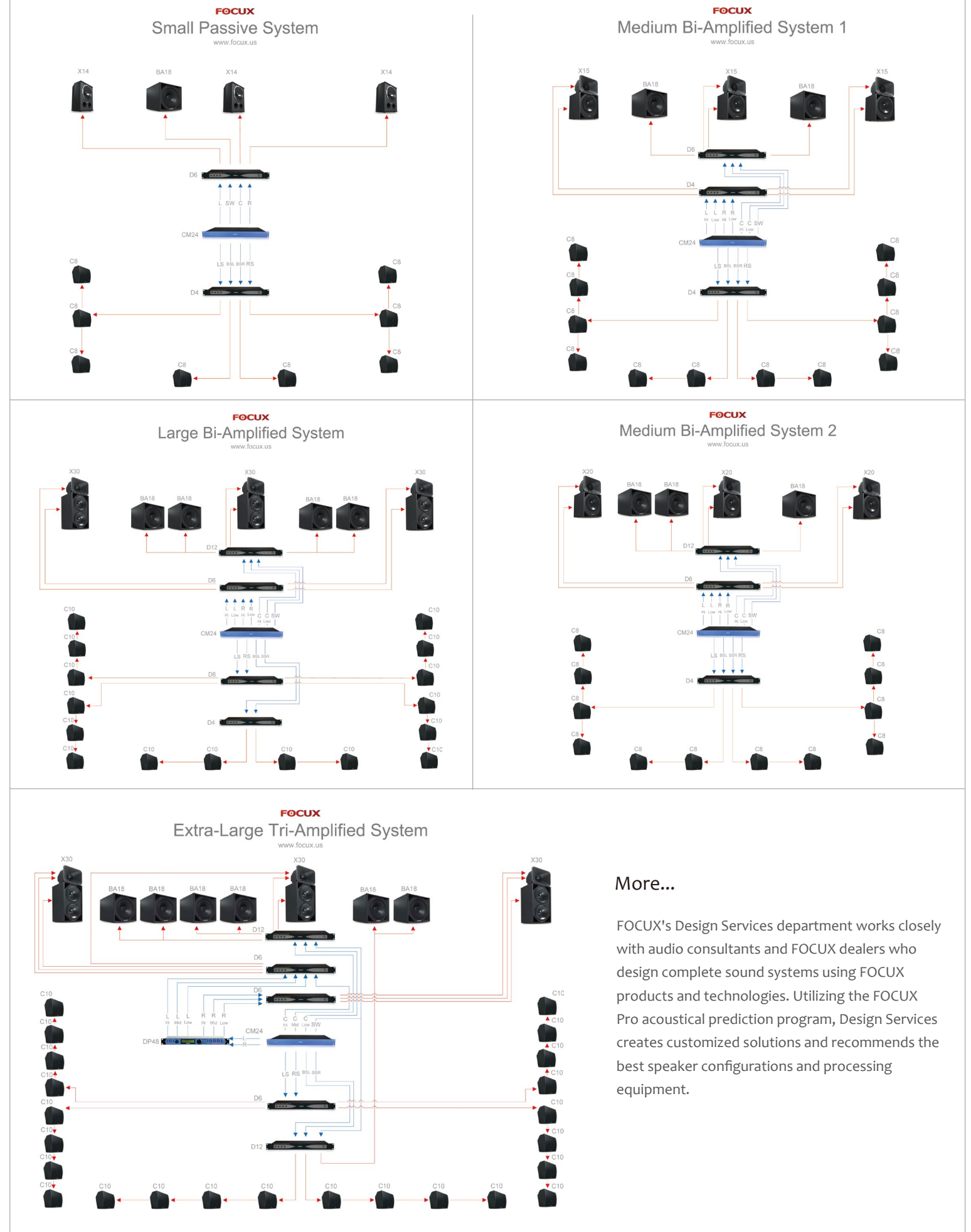


## More...

FOCUX's Design Services department works closely with audio consultants and FOCUX dealers who design complete sound systems using FOCUX products and technologies. Utilizing the FOCUX Pro acoustical prediction program, Design Services creates customized solutions and recommends the best speaker configurations and processing equipment.