

StudioComm

from **STUDIO TECHNOLOGIES INC.**

Model 78
&
Model 79

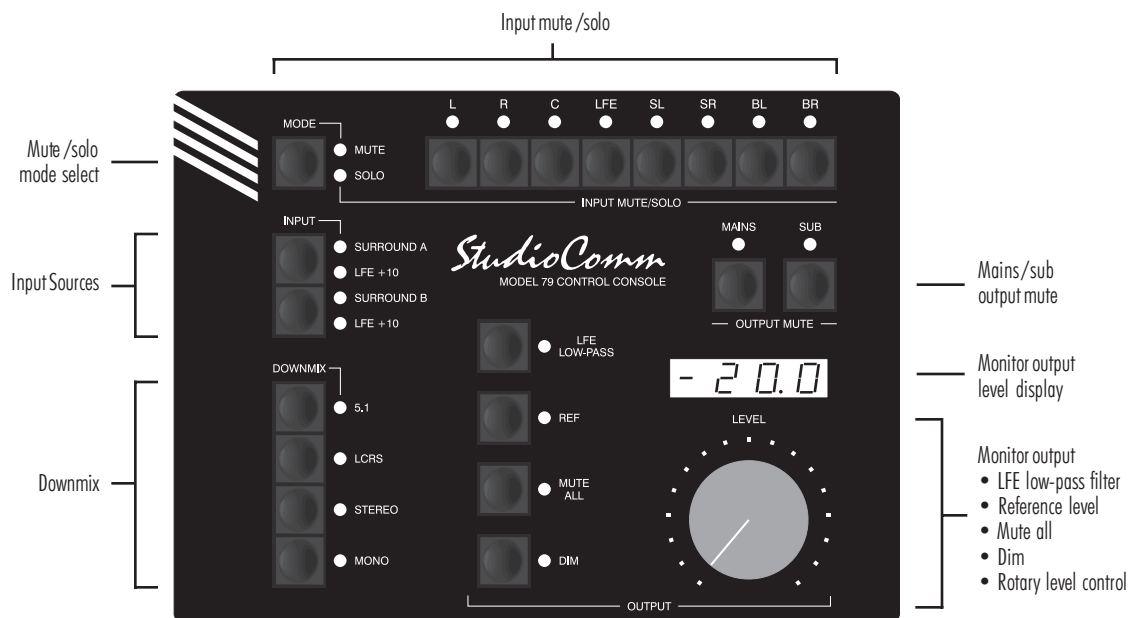


StudioComm for Surround

Once exclusively the domain of major motion picture studios and large production facilities, the recording, mixing, editing, and distribution of multichannel "surround" audio material has become much more widespread. To handle these tasks, the ability to effectively monitor multichannel sources has become imperative for more and more facilities. Studio Technologies has addressed this need with the StudioComm for Surround Model 78 Central Controller and Model 79 Control Console. The system is perfect for 8-channel "7.1" applications, including adding 7.1 monitoring capability to disk-based recording systems. It's also ideal for upgrading a post-production, mastering, or broadcast facility to support multichannel monitoring. The StudioComm for Surround Model 78 and Model 79 combination is THX® pm3 approved.

The system's core design goals were audio quality and ease of use. Designed to support the most sophisticated audio requirements, the signal path was optimized for sonic quality. The operator features and controls were carefully selected to enhance usability and minimize the learning curve. For the first time, advanced multichannel monitoring features such as source selection, level control, downmix, and bass management are available in a compact, sonically excellent, and cost-effective system.

A StudioComm for Surround system starts with the Model 78 Central Controller. Occupying just one rack space, it allows connection of two 8-channel inputs and an 8-channel monitor output. The Model 79 Control Console is a compact, comfortable "command center" designed to reside at the operator's location. With the StudioComm for Surround system any audio console, disk-based recording system, or broadcast facility can have a complete 7.1 multichannel monitor system.



Model 79 Control Console Front Panel

Model 78 Central Controller

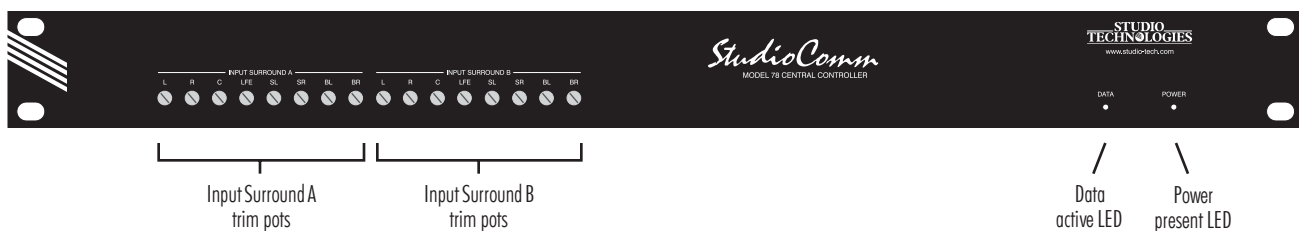
The Model 78 Central Controller is a single rack-space unit that contains analog, digital, and power supply electronics. Two 8-channel analog sources can be connected. In many applications the first input, Surround A, will be connected to a multichannel output on an audio console or digital audio workstation. The second input, Surround B, will be connected to a playback device, such as a multitrack tape recorder or disk storage system. For film or video post applications Surround A would be considered the direct source, while Surround B would be considered the playback source. For flexibility, the inputs are compatible with balanced or unbalanced signals having a nominal level range of -12dBV to $+6\text{dBu}$. Fifteen-turn trim potentiometers are used to precisely calibrate the input signals.

A sophisticated bass management function is integral to the Model 78's design. The overall goal of bass management is very simple: to ensure that the entire audio bandwidth of all channels can be accurately monitored. Many loudspeaker systems have inherent low-frequency limitations, preventing a true picture of the source material from being presented. To overcome this, the low-frequency energy from the seven main channels can be separated and then routed to the subwoofer loudspeaker. A general-purpose bass management configuration is implemented from the factory. In most cases this will provide highly effective monitoring. To support specialized applications a technician can revise many of the bass management parameters, including disabling bass management entirely.

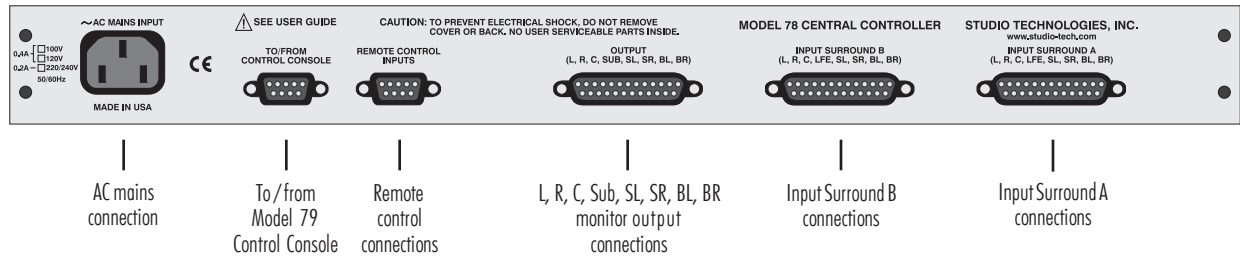
The Model 78 provides an 8-channel monitor output to connect to the loudspeaker system. The outputs are electronically balanced and designed for connection to audio power amplifiers or amplified loudspeakers. Protection circuitry provides power-up and power-down protection. Note that while each of the two surround inputs has an LFE channel associated with it, the monitor output designates a subwoofer, rather than an LFE output. This terminology was carefully selected to highlight the fact that the output channel designated for connection to the subwoofer loudspeaker may have more than just LFE content. The bass management function redirects low-frequency energy from the main channels, combines it with the LFE content, then routes the sum to the subwoofer output.

Audio input and output connections are made using three 25-pin D-subminiature connectors. The Model 78's audio path features analog switches for input source selection and digitally controlled analog gain circuits for monitor level control. One 9-pin D-subminiature connector is used to connect the Model 78 to the Model 79 Control Console. A second 9-pin "D-sub" connector is used to interface remote control signals with the Model 78. An 8-bit microcontroller provides the logic "horsepower" for the Model 78. AC mains power is connected directly to the Model 78, which is factory selected for 100, 120, or 220/240V operation. The internal power supply utilizes two toroidal mains transformers for quiet audio operation.

Model 78 Central Controller Front Panel



Model 78 Central Controller Back Panel



Model 79 Control Console

The Model 79 Control Console is a compact self-contained unit designed to be located at the operator's position. It allows fingertip control of all monitoring parameters. Numerous LED indicators provide complete status information. A 4-digit numeric display indicates the monitor output level in real time. A major strength of the Model 79 is its ability to configure, under software control, a number of operating parameters. For example, during the installation and calibration process, the relative levels of the monitor output channels can be adjusted. This helps to ensure that maximum performance from the loudspeaker system can be easily obtained. All configuration parameters are stored in nonvolatile memory.

The Model 79 provides two buttons and associated LEDs for selection of the surround source to be monitored. While in most cases only one input source will be monitored at a time, both inputs can be selected for simultaneous monitoring. This feature can be useful, allowing the creation of a rough mix of the two sources. It is also a fast, effective means of making a "seat-of-the-pants" check on the phase relationship between synchronized signals. For compatibility with some cinema formats the two input buttons also allow +10dB of gain to be added to each input's LFE channel.

Four downmix modes allow the selected source to be checked for compatibility among different formats. The downmix functions, 5.1, LCRS, Stereo, and Mono, were implemented primarily for use in sound-for-picture applications. As such, from the factory the downmix coefficients were selected to be effective in these environments. However, a technician can easily change each downmix mode to meet the specific needs of a facility or audio format.

An LFE low-pass filter function is provided as a means of checking the audio content in the selected input's LFE channel. The operator can enable and disable the function as required, helping to ensure that the proper signals are being mixed to the LFE channel. Having the correct mix content is critical as the LFE channel is often band-restricted during distribution.

The monitor output level can be controlled by way of a large, easy-to-use rotary control. The "curve" or "taper" of the level control can be configured to match an operator's preference. The choices available are true logarithmic and modified logarithmic. The level control auto mute-all function allows the monitor output channels to automatically mute whenever the rotary level control is in its fully counterclockwise (minimum) position. This is useful in applications such as broadcast. By using the reference level function, the monitor output level can be set to a preconfigured value. This is provided for applications that require a specific monitor level to be quickly selected. The reference level is easily configured by taking an electronic "snapshot" of the position of the rotary level control. For operator confirmation, the 4-digit LED readout displays the level of the monitor output.

For operator convenience, the dim function allows the monitor output level to be reduced by a fixed dB amount. The mute-all function allows one button to simultaneously mute all eight monitor output channels. The input mute/solo section provides individual input channel control. One push-button switch sets the operating mode for either mute

or solo. In the mute mode, individual input channels can be muted as required. In the solo mode, one channel can be monitored while the others are automatically muted. Depending on the configuration, multiple channels can be simultaneously selected for "soloing." The flexibility of having both input mute and input solo available allows an operator to quickly select the most comfortable and productive operating mode.

Two output mute functions are also provided. One button allows the seven main output channels to be directly muted. A second button allows the subwoofer monitor output channel to be muted. The output mute function, along with the input mute/solo function, allows an operator complete flexibility when checking an input source and its path to the loudspeaker system. These mute and solo resources are crucial in a multichannel environment, especially when signals are passing through the integrated bass management system.

The Model 79 Control Console connects to, and is powered by, the Model 78 Central Controller. The Model 79 generates MIDI system-exclusive messages to control the Model 78. Remote-control signals connected to the Model 78 Central Controller are routed to the Model 79 via pins in the interconnecting cable.

Remote Control Capability

For flexibility, the StudioComm for Surround system is designed to easily integrate with recording consoles, studio communications systems, and film or video motion-control electronics. Three remote-control input functions are provided: mute all, dim, and input source override. By providing access to the StudioComm's mute all and dim functions, talkback or slate activity from an audio console or other communications system can control the monitor output level. The input source override function is provided expressly for film post applications, allowing automatic switching of the StudioComm's input source whenever the mode of a recording system changes between playback and record. This function, often referred to as PEC/direct switching, allows accurate monitoring during dialog replacement or other overdub sessions.

Channel Assignment and Routing

The Model 78/Model 79 combination is expressly designed to support 8-channel 7.1 monitoring, with the input channels designated as left, right, center, LFE, surround left, surround right, back left, and back right. While it is anticipated that this channel arrangement will be quite common, the channels can obviously be used in alternative arrangements. Using the system with 5.1 sources is also perfectly acceptable.

While the StudioComm for Surround system for multichannel monitoring will do many wonderful things, it is not designed to selectively route input signals to different output channels. The input-channel-to-output-channel relationship is maintained. A signal that arrives on the SL channel of the Surround B input will, when selected, output only on the SL channel of the monitor output. Any rerouting of the input signals must be done prior to their connection to the StudioComm for Surround system. This should not be a drawback in most facilities, but it is important to highlight this fact.

Specifications

Model 78 Central Controller

General Audio:

Frequency Response: 20Hz-20kHz ± 0.2 dB (down 0.5dB @ 80kHz), monitor outputs

Distortion (THD+N): 0.004%, measured at 1kHz, +4dBu, monitor outputs

S/N Ratio: 90dB, ref +4dBu out, 20Hz-20kHz, monitor outputs

Crosstalk: 80dB, typical, ref +4dBu in, 20Hz-20kHz, monitor outputs

Audio Inputs: 16, organized as two 8-channel "7.1" inputs

Type: electronically balanced, compatible with balanced or unbalanced sources

Impedance: 24k ohms

Nominal Level: -12dBV to +6dBu, adjustable

Level Calibration: 15-turn trim potentiometers

Monitor Outputs: 1, 8-channel "7.1"

Type: electronically balanced, compatible with balanced or unbalanced loads

Maximum Level: +27dBu into 10k ohms, +26dBu into 600 ohms

Main Input Channel High-Pass Filters: 7

Type: 2nd order Sallen-Key; factory configured for 12dB/octave; field configurable for flat or 12dB/octave response

Response: -3dB @ 80Hz, nominal, 12dB/octave; field configurable

Main Input Channel Low-Pass Filters: 7

Type: 2nd order Sallen-Key; 12dB/octave; field configurable for disabled or 12dB/octave response

Response: -3dB @ 80Hz, nominal, 12dB/octave; field configurable

Secondary Input Channel Low-Pass Filter:

Type: 2nd order Sallen-Key; 12dB/octave

Response: -3dB @ 80Hz, nominal, 12dB/octave; field configurable

LFE Input Channel to Subwoofer Output:

Overall Gain: 0 or +10dB, nominal, switch selectable

LFE Input Channel Low-Pass Filter:

Type: four cascaded 2nd order Sallen-Key sections; 48dB/octave (8th order)

Response: -6dB @ 120Hz, nominal, field configurable

Operation: switch selectable, on/off

Connectors:

Audio: 3, 25-pin D-subminiature female

Control: 2, 9-pin D-subminiature female

AC Mains: 3-blade IEC-type

Remote Control Inputs: 3

Type: +5V logic, activates on closure to system common

AC Mains Requirement:

100, 120, or 220/240V, $\pm 10\%$, factory configured, 50/60Hz, 30VA

Dimensions (Overall):

19.00 inches wide (48.3cm)

1.72 inches high (4.4cm)

9.58 inches deep (24.3cm)

(1 standard rack space)

Weight: 9.5 pounds (4.3kg)

Model 79 Control Console

Application: supports Model 78 Central Controller

Power: provided by Model 78 Central Controller

Output Data: generates MIDI system-exclusive messages

Connector: 1, 9-pin D-subminiature female

Dimensions (Overall):

7.2 inches wide (18.3cm)

2.2 inches high (5.6cm)

5.4 inches deep (13.7cm)

Weight: 1.9 pounds (0.9kg)

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Contact Us

For further information please contact:

Studio Technologies, Inc.

5520 West Touhy Ave., Skokie, Illinois 60077 USA

Telephone 847-676-9177

Fax 847-982-0747

www.studio-tech.com