

StudioComm for Surround

Model 76B Central Controller / Model 77B Control Console

As creating and distributing multi-channel surround (5.1) and stereo (2-channel) audio material has become a day-to-day reality, the ability to simply and effectively monitor these sources is imperative for recording, post-production, and broadcast facilities. Studio Technologies has addressed these needs with the StudioComm for Surround Model 76B Central Controller and Model 77B Control Console. With its digital audio inputs, analog outputs, Dolby® E dialnorm support, and extensive set of user resources it's a simple task to integrate the system into virtually any facility. The carefully selected group of features, including flexible input source selection, dialnorm display, channel downmix, channel solo, and reference level, make the system powerful yet simple to operate. And by using the best of contemporary technology, as well as following rigorous design practices, the system's audio quality is excellent. With the StudioComm for Surround system any audio console, disk-based recording system, or broadcast facility can have a complete multi-channel monitor system. Its unique feature set makes it especially well suited to meet the unique needs of broadcast master control applications.

Model 76B Central Controller

A StudioComm for Surround system starts with the Model 76B Central Controller. It occupies one space in a standard 19-inch rack. Two surround (5.1) and three stereo (2-channel) audio inputs, along with a surround (5.1) and an auxiliary stereo (2-channel) monitor outputs, are provided. The surround and stereo inputs are digital and compatible with AES3id sources. These unbalanced digital signals utilize BNC connectors and are ubiquitous in most post-production and broadcast environments. Sample rates of up to 192 kHz and bit depth of up to 24 are directly supported. With the system's dynamic range of greater than 106 dB, there isn't a problem ensuring that a source's audio quality is maintained. The monitor outputs are analog, balanced line-level, with a maximum signal level of +26 dBu. They include power-up/power-down protection circuitry to help maintain the health of the connected loudspeaker systems.

A source of Dolby E metadata can be connected to the Model 76B Central Controller. This RS-485/RS-422 115.2 kbit/s serial data signal carries numerous data elements, including one that represents the average dialog level of an associated audio program. This dialog normalization or "dialnorm" value is an integral part of many broadcast distribution systems, ending up as part of consumer audio playback systems. Hardware and software within the Model 76B separates the dialnorm element that relates to one of the connected surround audio sources. This dialnorm level value can be displayed on the Model 77B Control Console, as well as being used to automatically adjust the surround monitor output level. This provides a unique solution to the broadcast and post-production world, allowing a professional environment to accurately simulate an end user's experience.



Model 77B Control Console

Key Features:

- Dolby® E metadata dialnorm support
- Flexible input source selection
- Unbalanced digital inputs
- Supports multiple control consoles
- Excellent audio quality
- Channel pop solo function



Model 76B Central Controller Front Panel



Model 76B Central Controller Back Panel

Digital audio signals are interfaced with the Model 76B using nine BNC connectors. Analog monitor output signal connections are made using one 25-pin D-subminiature connector. An advanced flash-based microcontroller integrated circuit provides the logic “horsepower” for the unit. AC mains power is connected directly to the Model 76B, which is factory selected for 100, 120, or 220/240 V operation. The internal power supply utilizes two toroidal mains transformers for quiet audio operation. One 9-pin D-subminiature connector is used to connect the Model 76B with up to four Model 77B Control Consoles. A second 9-pin “D-sub” connector is used to interface the Dolby E dialnorm data and remote control signals with the Model 76B.

Model 77B Control Console

The Model 77B Control Console is the “command center” and is designed to reside at an operator’s location. It allows fingertip selection of all monitoring functions. Numerous LED indicators provide complete status information. A 4-digit numeric display indicates the monitor output or dialnorm level in real time. A major strength of the Model 77B is its ability to configure, under software control, many important operating parameters.

While most installations will use only one Model 77B Control Console, up to four can be connected to a Model 76B Central Controller. This provides multiple users with full control over a facilities’ monitor system. The Model 76B can provide power for the first two Model 77B units while an external 12 volt DC source is required for a third and fourth unit. The interconnecting cables use 9-pin D-subminiature connectors to carry RS-485 data and DC power.

Additional Details

The Model 77B provides four buttons and associated LEDs for selecting the input source to be monitored. The buttons are designed such that up to six unique input choices are available. Using the Model 77B’s configuration mode, each of the six input choices can be configured from the system’s two surround (5.1) and three stereo (2-channel) inputs. The configuration mode also allows stereo inputs A and B to be used as either stereo or monaural sources. This is especially useful in broadcast applications where a 2-channel AES3id source may carry two independent monaural signals. To highlight this powerful feature: the Model 77B allows independent monitoring of the two channels associated with a single AES3id source. Broadcast master control applications can greatly benefit from this configuration flexibility.

The surround monitor output level can be controlled by way of a large, easy-to-use rotary control. The control, actually a digital encoder, allows level selection in precise 0.5-dB steps. The auto mute all function causes the monitor output channels to automatically mute whenever the output level is set to its minimum position. Using the reference level function, the monitor output level can be set to a pre-configured value. This is provided for audio-with-picture applications that require a specific monitor output level. The reference level is easily configured by taking an electronic “snapshot” of the desired monitor output level. For operator confirmation a 4-digit LED readout can display the level of the surround monitor output channels. To match the needs of a facility, it can be configured to display either the attenuation level or the sound pressure level (SPL).

The dim function allows the surround monitor output level to be reduced by a fixed dB amount. The dim level is configured from among four available values. A mute all function allows all surround monitor output channels to be simultaneously muted. The channel solo section provides individual surround channel monitoring control, allowing a single channel to be monitored while the others are automatically muted. Multiple channels can also be simultaneously selected for “soloing.”

A special solo mode is also provided, called channel pop solo, which offers a unique aid in monitoring audio material. Channel pop solo allows the level of a single channel to be raised while the level of the other channel is reduced. This helps to emphasize the content on one channel without fully muting the others. Broadcast applications can benefit from the channel pop solo mode, allowing, for example, the center channel to be highlighted while still maintaining some level on the other channels. The amount of level increase—the “pop”—as well as the amount of attenuation can be configured to meet the needs of specific applications or users.

Two functions allow the input sources to be checked for level or phase inconsistencies. The 5.1 to stereo downmix function is used to create a stereo signal from the selected surround (5.1) source. The stereo to mono downmix function allows audio on the left and right channels to be added (summed) and monitored on the center output channel. The two downmix functions can be simultaneously enabled, allowing a surround source to be checked for mono compatibility.

In addition to the surround (5.1) monitor output, a stereo (2-channel) auxiliary monitor output is also provided. A stereo signal, connected to stereo input C on the Model 76B Central Controller, can be routed to the auxiliary monitor output. A pushbutton on the Model 77B Control Console allows on/off control of the signal; no level control or signal modification takes place. The auxiliary monitor output feature can be useful in special applications, e.g., in a broadcast control room setting where an audio signal, such as site-event cue signals, needs to be monitored by way of an independent set of loudspeakers.

For flexibility, the StudioComm for Surround system is designed to easily integrate with equipment such as production intercom systems, on-air or recording tally signals, audio consoles, and film motion-control electronics. Three remote-control input functions are provided: mute all, dim, and auxiliary monitor output on/off. By providing access to these functions, talkback or slate activity from an audio console or other communications system can control the level of the surround monitor output or enable to the auxiliary monitor output.

Specifications

Model 76B Central Controller

General Audio:

Frequency Response: digital inputs to monitor outputs loaded with 10 k ohms

32 to 48 kHz Sample Rate: 20 Hz-20 kHz ± 0.05 dB

88.2 to 96 kHz Sample Rate: 20 Hz-40 kHz ± 0.05 dB

176.4 to 192 kHz Sample Rate: 20 Hz to 40 kHz ± 0.05 dB;
down 0.5 dB at 80 kHz

Distortion (THD+N): 0.004%, ref 1 kHz, +4 dBu output

S/N Ratio: 86 dB, ref +4 dBu output

Dynamic Range: greater than 106 dB

Crosstalk: 104 dB at 1 kHz; 90 dB at 20 kHz, ref -1 dBFS input

Digital Audio Inputs: 5

Configuration: two surround (5.1) and three stereo (2-channel)

Supported Sample Rates: 32, 44.1, 48, 88.2, 96, 176.4, and 192 kHz

Word Length: 24 bits maximum

Type: AES3id-2001 (SMPTE 276M)

Impedance: 75 ohms, unbalanced

Reference Level: -20.0, -18.0, -16.0, or -14.0 dBFS, selectable

Sync Source: all inputs independently self-clocking

Monitor Outputs: 8

Configuration: organized as one surround (5.1) and one auxiliary stereo (2-channel)

Type: electronically balanced, compatible with balanced or unbalanced loads

Nominal Level, Surround (5.1): 0 or +4 dBu, selectable

Nominal Level, Auxiliary: -12, -6, 0, or +4 dBu, selectable

Maximum Level: +26 dBu into 600 ohms or greater

Dolby E Metadata Input:

Type: RS-485/RS-422

Data Rate/Format: 115.2 kbit/s, 8-N-1

Remote Control Inputs: 4

Functions: remote mute all, remote dim, auxiliary monitor output on/off, one spare

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

Downmix:

Functions: 5.1 to stereo, stereo to mono

5.1 to Stereo: LS @ -3 dB summed with L;

RS @ -3 dB summed with R;

C @ -6 dB summed with L and R;

C, LFE, LS, and RS monitor outputs mute

Stereo to Mono: L @ -3 dB summed with R @ -3 dB to C;

L, R, LS, RS, and LFE monitor outputs mute;

C input mutes

Control Console Interface:

Power: 12 volts DC, 200 milliamperes maximum

Control Data Type: RS-485

Control Data Rate/Format: 115.2 kbit/s, 8-N-1

Polling Interval: 50 milliseconds

Connectors:

Digital Audio Inputs: 9, 75 ohm BNC (per IEC 60169-8 Amendment 2)

Monitor Outputs: 25-pin D-subminiature female

Control Console: 9-pin D-subminiature female

Metadata and Remote Control Input: 9-pin D-subminiature female

AC Mains: 3-blade, IEC 320 C14-compatible (mates with IEC 320 C13)

AC Mains Requirement: 100, 120, or 220/240 V, $\pm 10\%$, factory configured, 50/60 Hz, 30 watts maximum

Dimensions (Overall):

19.00 inches wide (48.3 cm)

1.72 inches high (4.4 cm)

8.75 inches deep (22.2 cm)

Mounting: one space (1U) in a standard 19-inch rack

Weight: 8.8 pounds (4.0 kg)

Model 77B Control Console

Application: up to four Model 77B Control Consoles can be connected to Model 76B Central Controller (two can be powered by Model 76B)

Power: 12 volts DC, maximum current 100 milliamperes, typically provided by Model 76B Central Controller

Control Data:

Type: RS-485

Data Rate/Format: 115.2 kbit/s, 8-N-1

Connector: 9-pin D-subminiature female

Dimensions (Overall):

7.20 inches wide (18.3 cm)

2.20 inches high (5.6 cm)

5.40 inches deep (13.7 cm)

Weight: 1.7 pounds (0.8 kg)

Specifications and information contained in this Data Sheet subject to change without notice.

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