StudioComm for Surround

Model 76 Central Controller / Model 77 Control

STUDIO TECHNOLOGIES INC.

As the production of both multi-channel surround (5.1) and 2-channel stereo audio material has become a day-to-day reality, the need for monitoring these sources is imperative for recording, post-production, and broadcast facilities. Studio Technologies has addressed this need with the StudioComm for Surround Model 76 Central Controller and Model 77 Control Console. With its digital audio inputs and analog outputs, it's a simple task to integrate the system into virtually any facility. The carefully selected group of features, including downmix, channel mute/solo, and reference level, make the system both powerful and simple to use. And by using the best of contemporary technology, as well as following rigorous design practices, the system's audio quality is simply 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.

Model 77 Control Console

Model 76 Central Controller

A StudioComm for Surround system starts with the Model 76 Central Controller. It occupies just one rack space but allows connection of two surround (5.1) inputs and three stereo inputs, along with separate surround and stereo monitor outputs. 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. And 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.

Key Features:

- Digital audio inputs
- Analog outputs
- Configurable downmix
- Channel mute/solo
- Level adjustment, reference level, and dim

Digital audio signals are interfaced with the Model 76 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 76, 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 76 with up to four Model 77 Control Consoles. A second 9-pin "D-sub" connector is used to interface remote control signals with the Model 76.

Model 77 Control Console

The Model 77 Control Console is the "command center" that 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 level in real time. While most installations will use only one Model 77 Control Console, up to four can be connected to a Model 76 Central Controller. This provides multiple users with full control over the monitoring system. Each Model 77 connects to a Model 76 Central Controller using a 9-pin cable. A major strength of the Model 77 is its ability to configure, under software control, many important operating parameters.

Model 76 Central Controller Front Panel

Model 76 Central Controller Back Panel

Additional Details

The Model 77 provides five buttons and associated LEDs for selection of the surround and stereo input sources to be monitored. While in most cases only one input source will be monitored at a time, stereo input C can be selected for simultaneous monitoring with one of the two surround or other two stereo inputs. This allows the two selected inputs to be combined ("summed").

The surround and stereo monitor output levels can be controlled by way of a large, easy-to-use rotary control. The level control auto mute all function ensures that the monitor output channels automatically mute whenever the output level is set to the full attenuation (minimum) position. By using the reference level function, the monitor output level can set to a pre-configured value. This is provided for audio-with-picture applications that require a specific monitor 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 displays the level of the monitor output. It can be configured to display either the attenuation level or the sound pressure level (SPL).

The dim function allows the monitor output level to be reduced by a fixed dB amount. The dim level is selected from four available levels. A mute all function allows all monitor output channels to be simultaneously muted.

The channel mute/solo section provides individual channel control. One pushbutton switch sets the operating mode for either mute or solo. In the mute mode, individual channels can be muted as required. In the solo mode, a single channel can be monitored while the others are automatically muted. Depending on a configuration setting, the mute/solo activity will impact audio either pre (before) or post (after) the downmix functions. In either solo mode multiple channels can be simultaneously selected for "soloing." The flexibility of having both mute and solo available allows an operator to quickly select the most comfortable and productive operating mode.

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 channels is reduced. This helps to emphasize the content on one channel without fully muting the others. Broadcast applications can benefit from this 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. Note that channel pop solo is only available when the mute/solo function is configured for post downmix.

Two functions allow the format of the monitored sources to be checked for level or phase inconsistencies. The surround 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. A small speaker simulator feature is associated with the stereo to mono downmix function. It is included to assist an operator in determining compatibility with "real-world" playback environments. It functions by placing an audio bandpass filter into the path of the mono signal, simulating the response of a loudspeaker associated with an inexpensive television or clock radio.

Up to four Model 77 Control Consoles can be connected to a Model 76 Central Controller. The Model 76 can provide power for the first two Model 77 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 that carry RS-485 data and DC power. Remote control signals, including mute all and dim, connect to the Model 76 using a second 9-pin D-sub connector.

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. Two remote-control input functions are provided: mute all and dim. By providing access to these functions, talkback or slate activity from an audio console or other communications system can control the monitor output level.

While the StudioComm for Surround system for multi-channel monitoring will do many wonderful things, it is not designed to selectively route input signals to the different output channels. An input-channel-to-output-channel relationship is maintained. As an example, a signal that arrives on the center channel of surround input A will output only on the center 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's important to highlight this fact.

Specifications

Model 76 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: organized as 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 stereo (2-channel)

Type: electronically balanced, compatible with balanced or unbalanced loads

Nominal Level: 0.0 or +4.0 dBu, selectable

Maximum Level: +26 dBu into 600 ohms or greater

Remote Control Inputs: 4

Functions: remote mute all, remote dim, two spare

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

Downmix:

Functions: surround (5.1) to stereo, stereo to mono

Surround 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

Stereo to Mono Bandpass Filter:

Response: –3 dB @ 100 Hz and 5 kHz, nominal, 12 dB/octave

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

Monitor Outputs: 25-pin D-subminiature female

Control Console: 9-pin D-subminiature female

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, ±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 77 Control Console

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

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