



Model 5132 Party-Line Interface Module



Model 5132S Party-Line Interface Module Front Panel

The Model 5132 Party-Line Interface Module is a compact, self-contained unit for use in custom broadcast, live-performance, and general party-line intercom applications. The module provides a high-quality 2-channel party-line to analog line-level (“4-wire”) audio signal interface in an easy to use yet technically sophisticated package. The module’s basic functions include two channels of 2-wire-to-4-wire conversion with auto-null capability, input and output level metering, a +28 volt DC party-line power source with two channels of 200 ohm intercom audio termination, and DC output control and status monitoring. With the internal party-line power source enabled, belt-pack user devices can be directly connected. Alternatively, the Model 5132 can be connected into an existing party-line circuit that includes a power source and intercom audio terminations. Two analog inputs and two analog outputs interface the Model 5132 with a variety of external audio transport, matrix intercom, and infrastructure equipment. Module operation requires only an externally-provided source of 12 volts DC. Advanced features include remote control and monitoring capability when installed with a Studio Technologies’ Model 5190 Remote Access Module.

Applications for the Model 5132 include sports broadcasting booth packages, remote news gathering “fly packs,” stadium audio/video interface (I/O) locations, and government/corporate/performance space/aerospace test infrastructure projects. The number of Model 5132 modules used in a project can vary widely—from one to dozens. And in each case the performance will be completely “pro” with audio quality, reliability, and installation flexibility matching that of larger-scale products. Typical applications will find the Model 5132’s line-level audio inputs and outputs being interfaced with fiber-optical transport modules, matrix intercom systems, and audio/video routers. The flexibility of the Model

5132’s party-line intercom interface allows direct connection to either intercom belt-pack devices or an existing party-line intercom circuit.

The Model 5132 provides a full-featured 2-channel interface which includes two 2-wire-to-4-wire hybrid circuits with automatic nulling capability. The analog hybrid circuitry provides excellent audio quality and high return-loss. Audio level meters provide confirmation of system performance during setup and operation. The Model 5132’s party-line interface is accessible using a 3-pin male XLR connector. This allows industry-standard party-line intercom user belt-packs to be directly interfaced. With a maximum output current of 180 milliamperes (mA), up to three of the popular RTS® BP325 devices can be directly connected. Devices from Clear-Com® are also compatible.

The Model 5132 is directly compatible with applications that must interface with existing party-line intercom circuits. The internal power source and 200 ohm terminations can be disabled by way of a pushbutton switch on the Model 5132’s front panel.

The line-level audio inputs and outputs were carefully designed for use in permanent as well as field applications. Filtering on the inputs and outputs minimizes the chance that radio frequency (RF) energy will interfere with the audio signals. Other components were included to address ESD (“static”) and DC over-voltage conditions. The party-line power source is monitored for protection against damage due to fault conditions. In addition, the module’s DC power input is protected from accidental polarity reversal.

For operation, the Model 5132 only requires connection of an analog audio input, an analog audio output, and an external source of nominal 12 volts DC. The acceptable input voltage range is 10 to 18, allowing a variety of power sources to be utilized. Power supply circuitry within the Model 5132 creates the voltages required for the analog and digital circuitry.

Standard connectors are used throughout the Model 5132. Users will access the party-line intercom interface using a 3-pin male XLR connector. The line-level audio input and output connections are made using 5-position “header” connectors. The DC power input and data bus connections use a 4-position header. Low-cost IDC (insulation displacement connector) mating sockets allow simple interconnection between the headers and the audio input, audio output, DC input, and RS-485 data signals.

For compliance with international broadcast audio level standards two versions of the Model 5132 are available. The Model 5132S supports SMPTE® audio levels where the analog audio reference level is +4 dBu. The Model 5132E supports applications that require European Broadcast Union (EBU) compliance with an analog audio reference level of 0 dBu.

Model 5132 Party-Line Interface Modules do not include a mounting enclosure or chassis. They are intended for mounting in custom 19-inch rack panels, equipment boxes, broadcast furniture, “NEMA” I/O boxes, or other specialized enclosures. It is expected that integration firms will create applications that use Model 5132 modules as part of complete broadcast, production, corporate, and government solutions. Sophisticated users will be able to create “one-off” solutions to solve unique challenges.

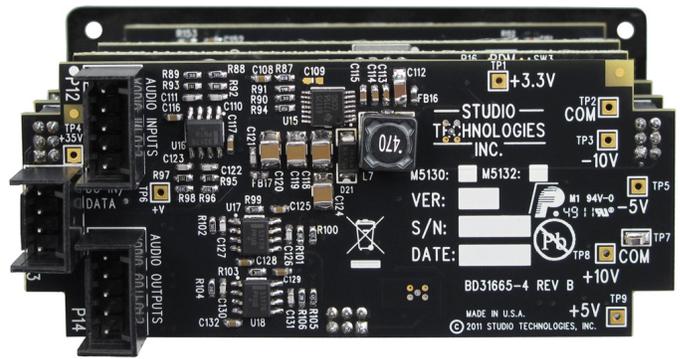
Party-Line Interface

The Model 5132’s party-line interface is very flexible, offering excellent performance when operating both “stand alone” or interconnected with an existing intercom circuit. When enabled, the internal party-line intercom power supply circuitry provides a low-noise, current-limited source with a nominal 28 volt DC output. Termination networks provide the required 200 ohm impedance for the audio signals associated with the two party-line intercom channels. With these features the Model 5132’s party-line intercom interface is essentially identical to that created by stand-alone intercom power supplies or powered master stations.

Two LEDs, located on the Model 5132’s front panel, provide an indication of the power source’s on/off state and the state of the DC voltage present on pin 2 of the party-line intercom XLR connector. Logic circuitry contained within the Model 5132 monitors the voltage on pin 2. When the Model 5132 is providing intercom power this function will monitor pin 2 for a low-voltage/over-current condition. If detected, the DC output will automatically enter a protection mode. Once the fault condition is removed normal operation will again resume. When an external source of intercom power is present the Pin 2 Status LED offers the user a simple “go/no go” indication for rapid troubleshooting.

Analog Hybrids with Auto Nulling

The 2-wire-to-4-wire hybrids provide low noise, low distortion, good frequency response, and high return-loss (“nulling”), even when presented with a wide range of party-line conditions. Unlike telephone-line (“POTS”) oriented DSP-based hybrid circuits, the Model 5132’s analog circuitry maintains extended frequency response. With this wide audio bandwidth,



Model 5132 Party-Line Interface Module Back View

natural-sounding voice signals can be sent to, and received from, the connected party-line user devices. This bandwidth also allows high-frequency “call light” and “mic kill” signals to pass through to connected equipment.

The Model 5132’s sophisticated auto nulling function uses analog circuitry under microprocessor control to achieve significant trans-hybrid loss. This return-loss “null” is achieved by making a series of software-directed adjustments to account for the resistive, inductive, and capacitive conditions that are present on the connected party-line user devices and associated cabling, as well as, if present, a connected external intercom circuit. Whenever a user presses the Model 5132’s Auto Null pushbutton digital circuitry adjusts the 2-wire-to-4-wire hybrids to achieve their maximum return-loss for both interface channels. The nulling process is automatic, lasting less than 15 seconds, and only takes place upon user request. The resulting null parameters are stored in non-volatile memory.

Audio Inputs and Outputs

Two analog line-level inputs and outputs are associated with the “4-wire” audio portion of the Model 5132’s circuitry. These are intended to interconnect with a variety of devices, including matrix intercom systems, audio-over-fiber transport systems, and specialized audio equipment. The audio input and output circuitry is electronically balanced and capacitor coupled to minimize the chance that hum, noise, or interfacing issues will occur. The two Model 5132 versions allow compatibility with equipment that supports SMPTE (+4 dBu) and EBU (0 dBu) analog audio level standards.

Indicators

The Model 5132 contains four 5-segment LED level meters. Two meters display the level of the signals being received from the party-line channels and two display the level being sent to the party-line channels. At the time of installation and

setup the meters are invaluable in helping to confirm correct operation. During normal operation the meters offer rapid confirmation of the audio signals flowing into and out of the module. Four additional LED indicators are also provided offering status indications of the internal party-line power supply, pin 2 status, auto null, and remote control data functions.

Pro Audio Quality

The Model 5132's audio circuitry was designed in the spirit of professional audio equipment rather than that found in typical party-line intercom devices. High-performance components are used throughout, providing low-distortion, low-noise, and high headroom. The internal party-line power source offers a unique level of performance—its ability to deliver power while maintaining audio quality is simply unmatched.

Model 5132 Specifications

General Audio:

Frequency Response (analog input to party-line interface):

- 3.0 dB @ 80 Hz
- 2.5 dB @ 100 Hz
- 2.3 dB @ 20 kHz
- 3.0 dB @ 24 kHz

Distortion (THD+N, measured at 1 kHz, analog input to party-line interface):

- Party-Line Interface Pin 2: 0.06%
- Party-Line Interface Pin 3: 0.02%

Signal-to-Noise Ratio (measured at 1 kHz, analog input to party-line interface):

- Party-Line Interface Pin 2: 60 dB
- Party-Line Interface Pin 3: 86 dB

Audio Inputs: 2

Type: analog, electronically balanced, capacitor-coupled, 20 k ohms

Nominal Level: +4 dBu (Model 5132S), 0 dBu (Model 5132E)

Maximum Level: +24 dBu

Audio Outputs: 2

Type: analog, electronically balanced, capacitor-coupled, intended to drive balanced loads of 2 k ohms or greater

Nominal Level: +4 dBu (Model 5132S), 0 dBu (Model 5132E)

Maximum Level: +24 dBu into 10 k ohms

Source Impedance: 200 ohms, nominal, differential

Party-Line Intercom Interface:

Type: 2-channel party-line, unbalanced (common on pin 1, DC modulated with channel 1 audio on pin 2, channel 2 audio on pin 3)

Compatibility: single- and dual-channel intercom circuits and user devices from vendors such as RTS® and Clear-Com®

Nominal Audio Level: -10 dBu

Maximum Audio Output Level:

Pin 2: +9 dBu with +23 dBu (Model 5132S) on audio input

Pin 3: +10 dBu with +24 dBu (Model 5132S) on audio input

DC Output Voltage (pin 2 to pin 1), local party-line power enabled: 28 volts nominal, selectable on/off

DC Output Current (pin 2 to pin 1) local party-line power enabled: 180 mA maximum; requires ≥ 5 mA current draw for detection of connected device

Impedance (pin 2 to pin 1; pin 3 to pin 1), local party-line power enabled: 200 ohms, nominal

Impedance (pin 2 to pin 1; pin 3 to pin 1), local party-line power disabled: >10 k ohms

Hybrids: 2

Topology: 3-section analog circuitry compensates for resistive, inductive, and capacitive party-line loads

Nulling Method: automatic upon user initiation, processor implements digital control of analog circuitry; settings stored in non-volatile memory

Nulling Line Impedance Range: 120 to 240 ohms

Nulling Cable Length Range: 0 to 3500 feet

Trans-Hybrid Loss: >45 dB, typical at 1 kHz

Meters: 4, 5-segment LED, modified VU ballistics

Remote Control Capability: pin 2 DC output status, auto null and "mic kill" activation

Connectors:

Party-Line Intercom: 1, 3-pin male XLR

Audio Inputs and Outputs: 2, 5-position male header (refer to Appendix A in the User Guide for mating connector details)

DC Input/Data: 1, 4-position male header (refer to Appendix A in the User Guide for mating connector details)

Power Requirement: 12 volts DC nominal, 800 mA max; acceptable range 10-18 volts DC, 950 mA max at 10 volts

Dimensions (Overall):

3.75 inches wide (9.5 cm)

1.69 inches high (4.3 cm)

2.30 inches deep (5.8 cm)

Mounting: Requires custom implementation; no mounting method provided (refer to Appendix B in the User Guide for details)

Weight: 0.2 pounds (91 g)

Specifications subject to change without notice.

Studio Technologies, Inc.

Skokie, Illinois USA

+1 847-676-9177

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