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Intercom for Sound, Lighting and Production Professionals

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MS301

3-Circuit Intercom Master Station w/ IFB Function

Highlights

- Three circuits rather than the usual two.
- Each circuit can be intercom or IFB in any combination.
- Circuits are linkable (A + B) or (A + B + C) with auto termination impedance adjustment.
- Each circuit's termination can be lifted via rear panel DIP switches.
- Independent level control of program audio output for each circuit with an LED VU meter for each.
- Mic switch on each circuit can be tapped for locking or held and released for momentary.
- Internal power supply is linear (except for microprocessor functions) with 2.4A continuous output.
- Toroidal transformer with extensive monitoring and auto-control of overload and heat considerations.
- Full duplex, hands-free operation, in moderately noisy environments. (with optional gooseneck mic.)
- Paging output (balanced and isolated) on rear panel activated by front panel momentary button.
- Dry contacts on rear panel also closed by page button
- Front panel 4-pin XLR may be used for gooseneck mic. or headset.
- Gooseneck or headset mic. may be dynamic or electret. Lighted front panel switch sets choice.
- Front panel green LED indicates presence of 24VDC across the three circuits.
- Three front panel flashing red LEDs report trouble status of each circuit. Other circuits are not affected.
- System resets when the problem is repaired.
- While switching is all electronic, the audio paths remain analog providing comfortable long-term listening.
- A front panel button initiates 'Override' which overrides front panel controls on LS2 and LS3 loudspeaker stations, restoring preset volume and status.

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Performance

The MS301 is a full featured main station with integral high capacity power supply. It has the capacity to control three independent communications circuits. The single rack unit high (1U: 1.75”) cabinet is available with either plain side panels (standard) or available rack-mount side panel.

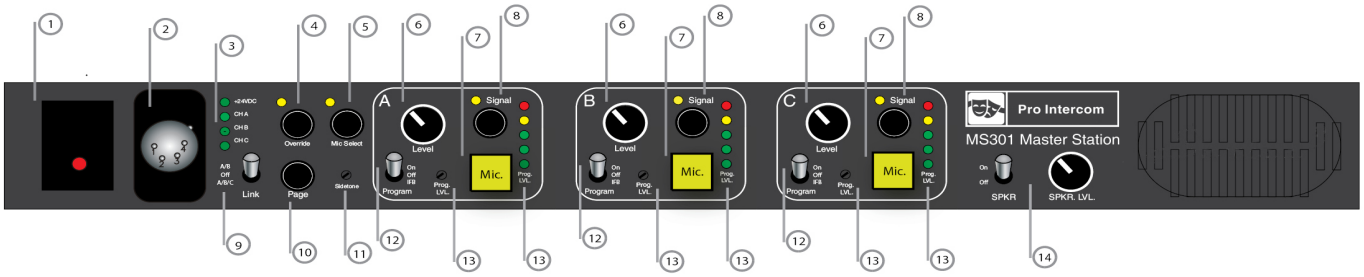
The MS301 has three independent communications circuits labeled A, B, and C. The operator may communicate with stations connected to any or all of the circuits by enabling the circuit ON switches. The SmartSwitch® feature allows the circuit enabling switches to be used automatically in either push on/push off or PTT (Push To Talk) modes. Normally, the three circuits remain independent, and stations connected to one cannot speak to stations connected to the others. During rehearsals, or other activities where a more global common communications circuit would be desirable, switching the LINK function can join circuits A and B, or link all three circuits together. This allows an operator at the MS301 to cue or guide two or three separate groups of personnel who are otherwise independent. A standard headset may be used with the MS301, or, if desired, a gooseneck microphone (LSM-n, sold separately) may be plugged into the front panel headset jack, and the MS301 can be used as a fully duplex hands-free communications station utilizing its internal wide-range speaker. The sidetone null control can be adjusted to effectively reduce any possibility of ringing and feedback. The operator can monitor any circuit at any level, while communicating with any, all or none of the circuits. Individual volume faders provide for a complete custom mix.

A front panel switch diverts the output of the headset (or gooseneck) microphone to a rear panel 600 ohm balanced output (both XLR and ¼” TRS), permitting paging through a remote paging amplifier, eliminating the need for a separate microphone for this purpose. This output may also be sent to an audio console. To activate the remote amplifier, a pair of normally open contacts, accessible on the rear panel, are closed as long as the Page key is pressed.

An external auxiliary program inputs jack is provided. A trim switch on the rear panel allows connection with either Mic level (nominal -44dBm) or line level (-24dBm) sources. The connector allows for either XLR or ¼”, balanced or unbalanced inputs. These allow external sources such as program feeds, run-of-the-show relays, paging announcements or other background information to be mixed onto the communication circuit(s). Individual faders allow adjustment of the level of auxiliary program material to each of the three circuits. When an operator at the MS301 activates the headset or gooseneck mic, he can either talk over the program material or interrupt it. A unique feature of the MS301 automatically fades the program material down to zero over a one second interval, while bringing the MS301 mic level up to full. The effect is pleasant and non-alarming to a listener on the circuit. When the mic switch is deactivated, the program material fades up to full over a one second interval. This is especially useful when broadcasting with guests or talent. The interruption can be set to instantaneous, if so desired.

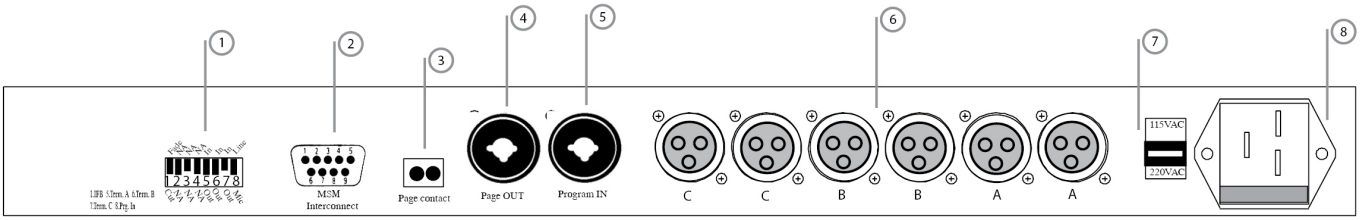
The internal power supply provides power for up to 66 beltpacks connected to the circuits. Power is well regulated at 24 volts DC and will automatically adjust down during periods of line voltage brownout or high loading with powered speakers or other equipment. Short circuit protection and current limiting prevent component damage in the event of mis-connection or cable failure. The toroidal transformer, coupled with linear regulators ensure noise-free operation under all conditions. The MS301 has a quiet built-in fan that turns on automatically when needed to cool the unit. Front panel indicators show the status of all circuits and allow an operator to quickly address a circuit problem.

Each circuit has a characteristic impedance of 200 ohms at audio frequencies, allowing many beltpacks to connected together without significantly changing the circuit performance. The termination networks are automatically removed and inserted during circuit linking to ensure a constant impedance for all circuits. The termination networks may also be manually removed by setting a switch on the rear panel, if desired. This may be useful when using an adjunct network, or if interfacing with a larger communications system.



Front Panel Controls

1. Main power switch: Illuminated. Indicates AC voltage present.
2. Headset/Handset/Gooseneck Mic input: Accepts standard dynamic or electret mic headsets/handsets/ gooseneck microphones terminated with 4pin female XLR.
3. Intercom circuit power indicators: Top LED indicates 24VDC present in unit. Individual channels are lit Green when in normal operating conditions. Flashing Red indicates a short circuit. Solid Red indicates overheating of power supply has occurred, and circuit has shut down.
4. Override activation button: Latching button sends signal to override equipped products to return them to preset volume levels. Lit LED indicates override is active.
5. Mic select switch: Allows user to select between dynamic or electret mic input into Headset / Handset input. Lit LED indicates Electret Mic setting Non Illuminated LED indicates Dynamic Mic setting..
6. Talk circuit volume control: Allows user to balance "local' listen levels of each circuit individually. This control only effects levels at this station, and does not effect others on the talk circuit.
7. Mic control button: Controls mic operation for assigned talk circuit. Button has both momentary and latching function. Press and hold while talking, release when done talking, for momentary operation. Press quickly for latching operation. Illuminated switch indicates an active Mic in either mode of operation.
8. Signal Button: Used to signal or "call" other users on assigned talk circuit. Non latching button illuminates signal LEDs both locally and remotely. When sending or receiving a signal the LED will start to flash if button is depressed for more than .25 seconds. The signal button will also trigger any Blazon strobe units to flash 4-5 times as a visual cue to users not closely monitoring their station.
9. Link control switch: 3 position toggle for linking intercom talk circuits. Up position combines circuit A and circuit B into a single talk circuit. Middle position allows all 3 circuits to operate Independently of each other. Down position combines all 3 circuits into one single talk circuit.
10. Page output button: Non-latching button for connecting to a house paging system. When the button is depressed it simultaneously closes a dry contact and opens the users mic to a 600Ω balanced audio output located on the back panel. (See back panel diagram for contact and output reference.)
11. Sidetone control: Recessed rotary potentiometer used to adjust the level of the users own voice locally. This control will only effect the level locally, and will have no effect on other users in the talk circuit. May also be used as a "Nulling Pot" to help eliminate feedback when using with a gooseneck mic and speaker. The zero setting of this control is typically near the 12 o'clock position.
12. Program input selection: 3 position toggle allows user to select between 4 variables of program input. In the upper position the program material will be present in assigned talk circuit with the ability to talk over the input. In the middle position the program input is not present in the assigned talk circuit. In the lower position the program input is present in the talk circuit, with the ability to interrupt when speaking. The interrupt feature is user defined, with a DIP switch on the rear panel, for instant interrupt, or interrupt with fade.
13. Program level control and indicators: A recessed rotary potentiometer is used to adjust the program material volume for each assigned circuit. In addition a LED VU meter is available for visually monitoring levels while not listening to the circuit. The LEDs confirm signal present, and warn of audio clipping.
14. Built in speaker controls: A 2 position toggle for turning the built in speaker on and off. Rotary volume knob for adjusting desired speaker listen levels. These controls effect the built in speaker only, and have no effect on the user's headset or handset.



① **Dip Switch:** 8 position Dip switch for user defined functions.

1. IFB function. Down will fade out program input and fade in Mic when Mic is activated. Up will cut program input instantly and replace with Mic input instantly when Mic is activated.

2-4 are not active at this time.

5-7 will activate and deactivate the 200ohm termination circuit for each talk circuit. Down position will activate termination circuit, Up will deactivate termination circuit. (5=A, 6=B, 7=C).

8. Changes Program input impedance. Down is line level (+4db), Up is Mic level (-20db).

② **Female 9 pin D sub:** Used for interconnection to / from MSM300

③ **Male 2 pin terminal:** Dry contact associated with Page Out feature. Contact is normally open, and closes when Page out button is activated on the front panel.

④ **Paging output:** Combination 3 pin female XLR 1/4" phone out. Sends 600ohm balanced audio signal from Mic input on front panel when page out button is activated.

⑤ **Program material input:** Combination 3 pin female XLR 1/4" phone input. Accepts Line level or Mic level input from external audio source. Input level is user defined by Dip switch #8 on the rear panel.

⑥ **Talk circuit out:** 3 pin male XLR. 2 per circuit (May be connected to a patch panel, or daisy chained)

Pinout: 1= Shield 2= 24vdc 3= Audio

⑦ **Voltage selector switch:** Use to select between 115VAC or 220VAC power source.

⑧ **AC Line Input / Fuse Holder:** Fuses - 100/120V 2A/250V 220/240V 1A/250V

Accessories

1. The **MSM300** connects to the **MS301** via the 9-pin **D-SUB** connector on the rear panel, providing three additional fully functional circuits.

2. We offer a range of Gooseneck Microphones fitted with the required 4-pin **XLR.** Your choice depends upon length of the gooseneck, and the amount of noise canceling required by the environment.

3. Rack ear side panels. Bolt on in place of the plain panels which are standard.

Technical Specifications

Current draw (at 120VAC): 0.14A (no load), 1.05A @2.4A DC out

Power output: 24 volts **DC** regulated @ 2.4**A** continuous

Line termination: DC: 5KW, 50 Hz-20 KHz: 200Ω

Transducer impedances: Mic: 200Ω dynamic or 1.2kΩ electret, Earphone: 200~600Ω

Aux. input: Mic level: (-44dBm) 48KΩ, Line level (-24dBm): 1KΩ

Size (excluding ears) : 17" width x 9.5" depth x 1.75" height (432 x 241 x 44.5 mm)

Weight: 9.8lbs. 4.5Kg

Warranty

The MS301 is covered by a 3-year limited warranty against defects in workmanship or materials. Misuse, abuse and modification void this warranty except where a modification is agreed upon by the factory and executed by a qualified technician. Local and regional laws may grant you further rights.

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MS300
Intercom
Master Station

Highlights

- Three circuits rather than the usual two.
- Circuits are linkable (A + B) or (A + B + C) with auto termination impedance adjustment.
- Each circuit's termination can be lifted via rear panel DIP switches.
- Mic switch on each circuit can be tapped for locking or held and released for momentary.
- Full duplex, hands-free operation, in moderately noisy environments. (with optional noise-canceling gooseneck mic.)
- Front panel 4-pin XLR may be used for gooseneck mic. or headset.
- Gooseneck or headset mic. may be dynamic or electret. Lighted front panel switch sets choice.
- Front panel **green** LED indicates presence of 24VDC across the three circuits.
- Three front panel flashing **red** LEDs report trouble status of each circuit. Other circuits are not affected.
- System auto-resets when the problem is eliminated.
- While switching is all electronic, the audio paths remain analog providing comfortable long-term listening.

Each circuit has a characteristic impedance of 200 ohms at audio frequencies, allowing many beltpacks to be connected together without significantly changing the circuit performance. The termination networks are automatically removed and inserted during circuit linking to ensure a constant impedance for all circuits. The termination networks may also be manually removed by setting a switch on the rear panel, if desired. This may be useful when using an adjunct network, or if interfacing with a larger communications system.

Power Supply

The internal power supply provides power for up to 66 beltpacks connected to the circuits. Power is well regulated at 24 volts DC and will automatically adjust down during periods of line voltage brownout or high loading with loudspeakers stations or other equipment. Each of the 3 circuits has its own rectifier, regulator and protective components, so a fault in one circuit does not affect the others. Short circuit protection and current limiting prevent component damage in the event of mis-connection or cable failure. The toroidal transformer, coupled with linear regulators ensure noise-free operation under all conditions. The MS300 has a quiet built-in fan that turns on automatically when needed to cool the unit. Front panel indicators show the status of all circuits and allow an operator to quickly address a circuit problem.

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11. Built in speaker controls: A 2 position toggle for turning the built in speaker on and off. Rotary volume knob for adjusting desired speaker listen levels. These controls effect the built in speaker only, and have no effect on the user's headset or handset.

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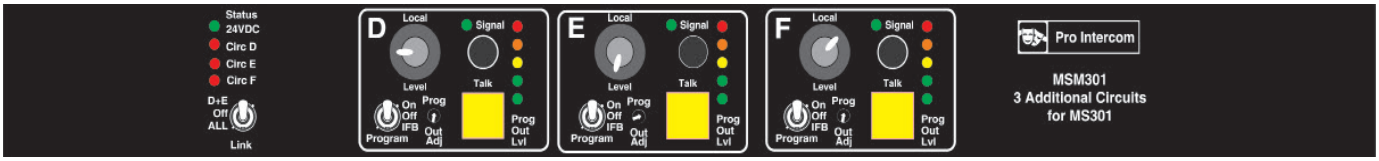
MSM301

3-Circuit Add-On for MS301



The MSM301 attaches to an MS301 to double the number of available independent circuits from 3 to 6. The new circuits: D, E & F have all the capabilities of the original 3, including program audio insertion and control and the ability to use each circuit as either intercom or IFB with program muting or ducking. Connection of the two units is via D-Sub connector and the short cable is supplied with the MSM301. As with the original 3 circuits, each of the new circuits has 2 XLRs on the rear for connecting stations. The number of stations connected any of these XLRs can be further increased by the use of an SB1 accessory.

The MSM301 is powered by the MS301 to which it is attached. It does not increase the amount of current available and is intended only to increase the number of independent communications circuits. The total current available remains at 2.4A, roughly the equivalent of 75 beltpacks. If your objective is only to connect more stations to the three circuits on the MS301, the MSM301 is not necessary. You can accomplish this with SB1s, Y-cables and the loop-through function on most stations.

Circuits may be linked when required, as may be the case in sound or lighting checks and rehearsals. You may link D to E or select ALL. If ALL is selected on both the MS301 and MSM301 all 6 circuits will be linked.

The Status Bar of LEDs indicates that the unit is receiving its 24 volt operating current from the MS301 (green), and the trouble status of any of the circuits (red). If there is a problem on a circuit the red LED will flash. If the problem is serious enough to damage the MS301 power supply components the red LED will be constantly ON and the circuit disconnected until repaired. Most probable are short circuits between Pin 2 and ground or Pin 1-3 reversals in the system wiring. Phase *must* be maintained when using microphone cable for intercom.

On the rear panel there are DIP switches to allow you to choose between ducking and muting the program audio in the IFB mode, and for lifting the termination circuit of each circuit individually. The MSM301 automatically maintains the 200Ω termination impedance when linking, but there may be applications where one of its circuits is connected differently.

The MSM301 is intended to be located next to the MS301 and not remotely. For remote Master Station functions, see the RSM300 (Remote Sub-Master 300). Attempting to use the MSM301 other than as an extension of the MS301 will almost certainly damage the unit as it is integrated with the microprocessor in the MS301.

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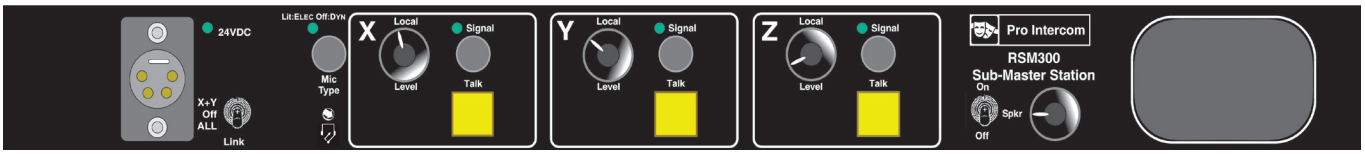
RSM300
Remote Sub-Master



The RSM300 provides for specialty groups within the technical staff to have their own sub-networks while the group directors remain in communications with the director/producer who is at the Master Station.

A classic example is lighting, where the lighting director would have an RSM300 with her Circuit X connected to one of the circuits on the MS301 Master Station while her Y-circuit is connected to specialty lighting or effects and her Z-circuit is connected to the follow-spot operators. She now has communications with 3 different groups, all independent of one another. None can hear the others, unless she chooses to use her linking switch. The RSM300 can be used with a headset or, if far enough away from the stations to which she is talking, and the noise level is not excessive, she can plug a noise-canceling, close-talking gooseneck microphone into the front panel and use it with the built-in speaker for hands free two-way communications. See 'Sidetone'' below.

The 'Talk' buttons are either momentary (press and hold) or latching (tap once, tap again to shut off). The audio level at which each circuit is heard locally is individually adjustable. A signal LED (bright green) is provided for each circuit should it be turned down or off, and pressing the signal button lights the signal lamps on the other stations connected to the same circuit. The speaker can be turned off and its level adjusted.

Both dynamic and electret microphones can be used, either as part of a headset or as gooseneck mic. The selector button is marked 'Mic Type' and an LED announces the status.

The smallest control on the front panel could be the most useful. It is marked with a symbol which indicates 'Sidetone', the sound of your own voice coming to your own earphone from your own microphone. With the RSM300 it can be used to adjust your volume in your headset, or lower the level of your own voice coming from the speaker, thus making hands-free use possible. The control only affects local levels, not what others hear.

If the system has a program feed and the RSM300's X-circuit is connected to a circuit on the MS301 which has the program on it, the RSM300 operators will hear it on the X-circuit. It cannot be passed along to circuits Y and Z.

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