DATA SHEET NM 1

NETWORK MIC PREAMP

General Description

The NM 1 Network Mic Preamp is a very versatile single channel CobraNet I/O box that finds use in many applications. The NM 1 presents matchless features in a compact, reliable, easy to install and maintain package. It has a single studio-grade microphone input with +48 volt phantom power, and a single amplifier output for connection to an external loudspeaker. The microphone signal can be transmitted over CobraNet and the amplifier input can be driven by any CobraNet audio channel. The NM 1 design is based on the Cirrus Logic CS18101 CobraNet chip and CM-2 reference design including the secondary CobraNet port for data and power supply redundancy (more on this later). It also has logic I/O on a DB-15 connector for reading external switches and driving indicator LEDs so it can be connected to a custom switch panel to implement microphone enable, busy indication and similar functions.

The feature that adds the most versatility to the NM 1 is Power Over Ethernet (PoE). It is fully compliant with the IEEE 802.3af standard as a Powered Device (PD). This means it's powered through the CAT 5 cable that connects it to an Ethernet switch. Of course, the Ethernet switch used must comply with the 802.3af standard as Power Supply Equipment (PSE); these switches are available from all the major Ethernet equipment manufacturers.

Think about this: the NM 1 does not need a power outlet close by. No AC line voltage wiring. No additional electrical box in the wall. No wall wart, batteries, solar panel, pedals or water wheel. The only wiring needed is the data cable back to the Ethernet switch and the local analog audio, making planning and installation much easier and much less expensive.

Rane's engineers have designed the NM 1 to have a redundant PoE supply along with the redundant data connections. It can be powered from either Ethernet port independent of which one carries the CobraNet data, so an independently redundant power system comes along with the redundant data system with no redundant effort. Switching between ports for PoE is almost seamless and audio interruption is minimal. If the primary port fails the secondary port takes over very quickly, typically 10 ms, without loss of programmed settings.

All parameters are controllable via standard SNMP messages including microphone gain and muting, amplifier output level and muting, and CobraNet Audio channel and Bundle assignments. Four exterior switches assign the NM 1 MIB's SysName variable to uniquely identify each unit on the network.

All NM 1 audio and data connectors are metal with locking, annular-ring shields for maximum durability, security and immunity from electromagnetic interference, be it radio, static or legislative hot airwaves. And all this fits in a very rugged (but good looking) extruded aluminum box.

Features

- Power Over Ethernet (PoE) with built-in redundancy.
- Audio over CobraNet.
- Dual CobraNet interfaces for hardware redundancy.
- Microphone Preamp with 48V phantom power.
- SNMP Software-controlled preamp gain.
- Audio power amplifier for monitor loudspeaker.
- Switch/LED interface.
- Switch selectable address.
- All connectors are metal with captive features.

NM 1

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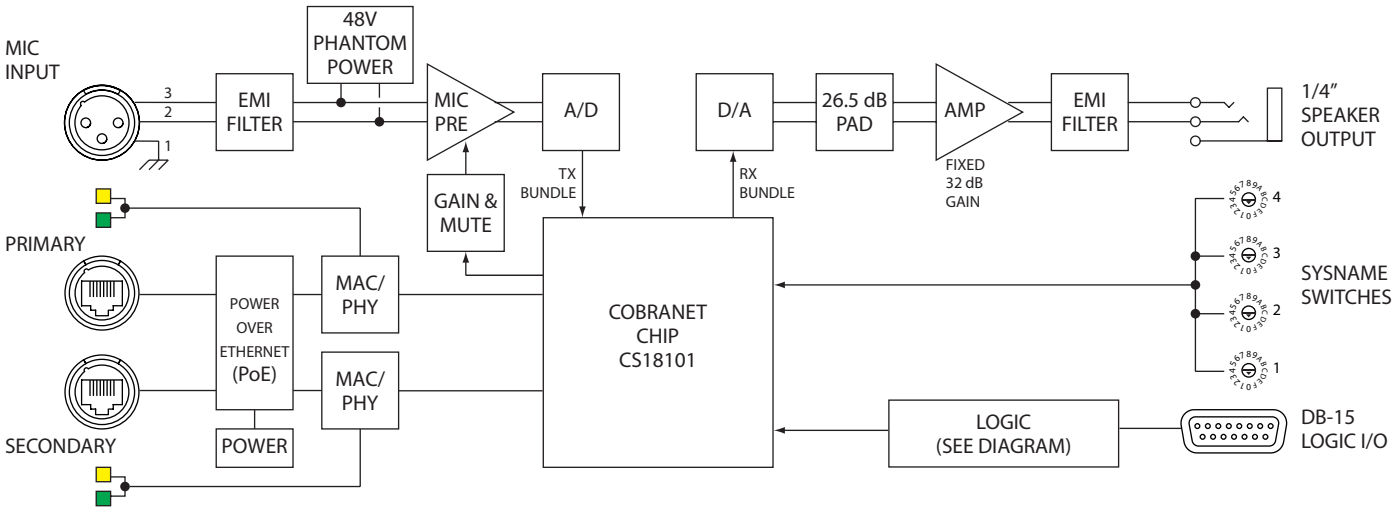
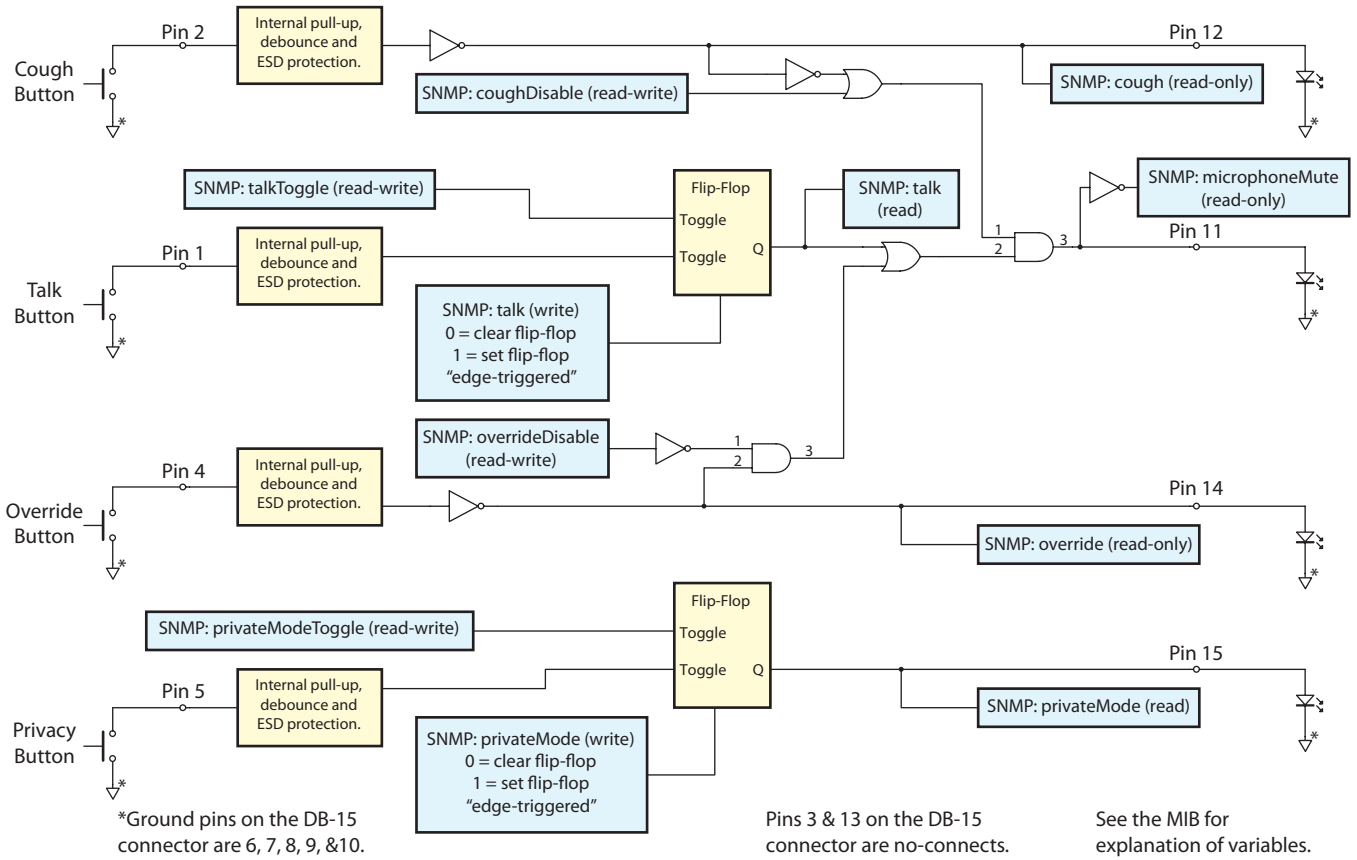
Parameter	Specification	Limit	Units	Conditions / Comments
Microphone Input:				
.....Connector	XLR			Neutrik NC3FBH1 or similar
.....Phantom Power	48V		VDC	IEC 61938 P48
.....Frequency Response	100 Hz to 20 kHz	+0/-2	dB	
.....THD + Noise	0.01	max	%	-10 dBu, 1 kHz, A-weighted
.....EIN	-128	typ	dBu	A-weighted. 150 Ω source, Gain=30
.....CMRR	60	typ	dB	10 – 20 kHz
.....Source Impedance	150	typ	Ω	150 – 600 Ω
.....Input Impedance	4600	typ	Ω	pin 2 or 3 to pin 1
.....Gain	10 – 65	±1	dB	software controlled, 1 dB increments
.....Mute	-60	min	dB	attenuation at 1 kHz
Amplifier Output:				
.....Connector	¼" TRS			6.3 mm with metal bushing
.....Average Power	1	max	watt	into 8Ω, pink noise HPF @ 100 Hz
.....Peak Power	6	max	watt	into 8Ω, pink noise HPF @ 100 Hz, CF = 15 dB
.....Load	4	min	Ω	
.....THD+N	0.25	typ	%	8Ω, ½ watt, 1 kHz, 20 kHz BW
Codec: Converters				CS4272
Power Supply: PoE	37-57		VDC	350 mA maximum per IEE802.3af
Unit: Conformity	FCC, cULAus			
Unit: Size	1.85" H x 7.25" W x 4.95" D			4.7 x 18.5 x 12.6 cm
.....Weight	6.8 oz			193 grams
Shipping: Size	3.6" H x 11.75" W x 7.2" D			9.2 x 29.9 x 18.3 cm
.....Weight	2 lb			907 grams

Block Diagram



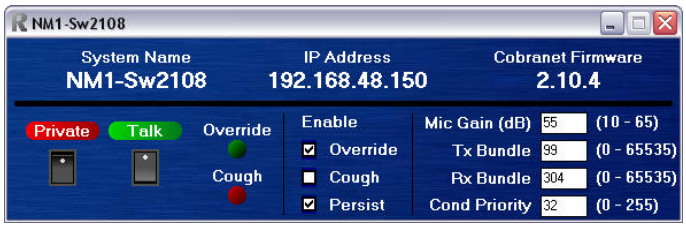
Logic Diagram



*Ground pins on the DB-15 connector are 6, 7, 8, 9, &10.

Pins 3 & 13 on the DB-15 connector are no-connects.

See the MIB for explanation of variables.



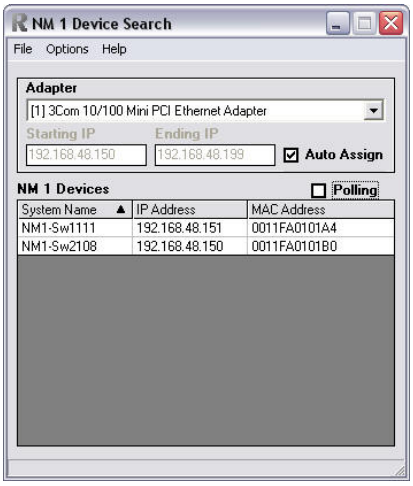
NM 1 Software Overview

The NM 1 hardware ships with Rane's NM 1 Search and Control software for Windows XP, Vista and 7 (32-bit only). The Search software polls a network for all connected CobraNet devices and displays their System Name (sysName), IP Address and MAC address. While Polling you can assign them different IP Addresses if needed. Exiting Polling mode reduces the list of CobraNet devices to only the NM 1s. NM 1 Search is much like Peak Audio's Disco application, without the Bee Gees music built in. Disco doesn't give you much insight into what the NM 1's capabilities and settings are unless you study the NM 1 MIB & DB-15 logic in detail by reading the manual. We know you avoid reading manuals since your spouse may catch you. Disco's advantage is its ability to view many more MIB variables than the Rane software. So using both is typical, especially if you're new to the NM 1.

Once you stop the Search software's Polling, double-clicking on a found NM 1 opens the Control section of the software where you can set each NM 1's common parameters and monitor the state of their logic input (switch) and (LED) output states. Note that multiple instances of the Control software is supported. The NM 1 parameters adjustable from the Control dialog are: mic gain, transmit Bundle, receive Bundle, Conductor Priority, plus the mic mute (via Talk), private mode, override enable, cough enable and Persistence. The read-only NM 1 parameters are also displayed for you in full living color: talk, private, cough, and override LEDs. See the primer on logic, below.

When you install the NM 1 software, it copies the NM 1 data sheet, manual, and the NM 1 MIB and CobraNet MIB into the default folder: C:\Program Files\Rane Corporation\NM 1 Software\

Get all the other gory details in the software's Help file. Note the Persist variable setting discussed in the help file, particularly if you're in a rush (and who isn't). We warned you, in writing.



NM 1 IP Address and control

The IP address in the NM 1 is lost when power is disconnected, it is not persistent. This means it would behoove you to carefully write your SNMP control software. Most systems use either the NM 1's sysName variable or the MAC address to uniquely identify each NM 1, then send it an IP address for control. Some people use the network switch's ability to identify which source address packets are coming from which port/device to allocate IP addresses. Using the sysName has an advantage when it comes to maintenance since, were an NM 1 need replacing (or if you re-configure the room or add or subtract NM 1s), simply setting the hardware sysName switches correctly on the replacement NM 1 makes identification more convenient than using MAC address or switch port. While CobraNet does not use the IP address for audio packet delivery (it uses MAC addresses), SNMP requires IP addresses.

NM 1 Bundles and other fun

The NM 1 transmits a single audio channel within a single Bundle. It also receives a single audio channel in a single Bundle. By default, the NM 1 uses Audio Channel 1 within the transmitted and received Bundles. While Bundles typically contain up to 8 Audio Channels, by default, the NM 1 transmits only a single Audio Channel in its Bundle. This is achieved by setting the NM 1's CobraNet TxSubCount variable to 1 (not 8). This means that only a single Audio Channel is transmitted which significantly reduces the data being transmitted on the network. Of course, any of the NM 1 settings can be changed using standard SNMP set and get messages.

Primer on NM 1 DB-15 I/O Logic

The Talk input is permanently set up to be a momentary toggling function. Use a momentary switch, of course. Hit is once, it mutes, hit it again, it unmutes. Lather, rinse, repeat. The corresponding Talk output permanently follows this functionality.

The Private input functions the same way Talk does, as a permanent momentary toggle. The Private output follows this functionality, always.

The Override input is a push-to-talk. Hit it and the mic is on. It also overrides the Mute, so if the Mute is on, Override unmutes it while the Override input is grounded. However, the Override input can be ignored by setting the overrideDisable MIB value. In other words, set the overrideDisable to 1 to cause the override switch to have no effect on the Talk function. [Setting overrideDisable true (1) means override is disabled.] Asserting overrideDisable does not change the function of the Override LED (output). This means you can completely customize the Override input function and disconnect override from the audio. For example, use the Override input for voting Yes and the override LED to indicate a Yes vote. Or implement a page switch instead.

The Cough input functions exactly like the Override input & output, except the Cough is a push-to-mute — or what we affectionately call push-to-cough.