TECHNICAL NOTES

TN116 Use of Leased Lines on the M4x

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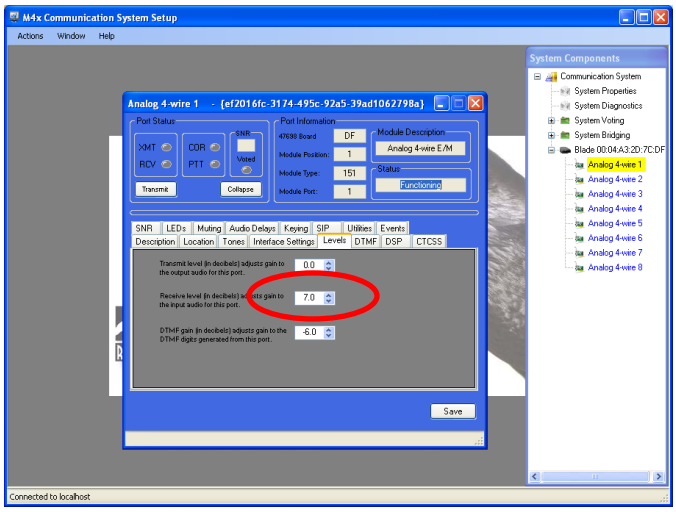
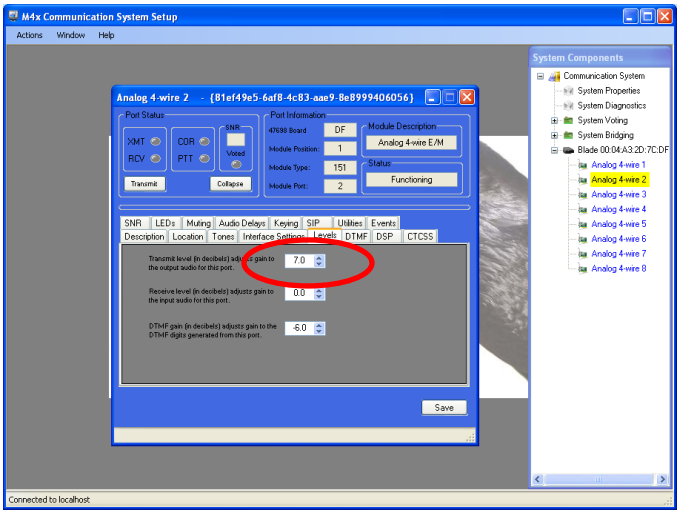
Occasionally, leased lines are used as a means of backhauling audio to and from one site to another. For example, leased lines might be used to backhaul audio from a remote receiver site to a voter/comparator.

Leased lines can be problematic in that they generally have high amounts of loss. Typical loss reported by our customers is 13-15 dB but has been reported as high as 20 dB. Other problems, although rare, have been reported with leased lines such as voltages on the line which can cause noise or other undesired effects. They are also subject to other failures such as being accidentally cut by construction equipment or age and weathering. Transmission over the air, using microwaves, fiber optics, and IP all typically have little or no loss and are thus preferred to leased lines, but these methods are not always available.

There are several means by which the losses on the leased lines can be made up in whole or in part on the input side of the M4x. One way is to simply add gain to the receive side of the port to which the line is connected. Up to 7 dB of gain can be added in this manner. If more gain is needed than that, up to 7 dB of gain can be added to the output side of any port to which the inbound port is either cross patched or bridged to. As such, adding 7 dB on the input side and 7 dB on the output side would make up for 14 dB of loss.





In the above screen shots 7 dB of gain is added to the receive side of port 1 and 7 dB of gain is added to the transmit side of port 2. If a signal at a level of -24 dBm came in to port 1 and was cross patched out port 2, the level out of port 2 would be -10 dBm.

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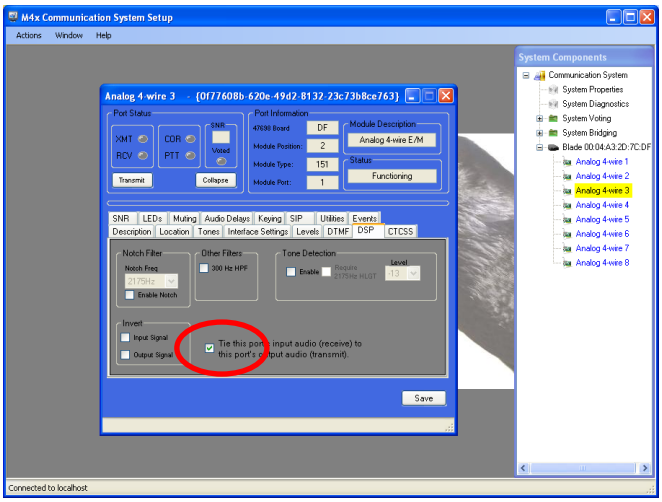
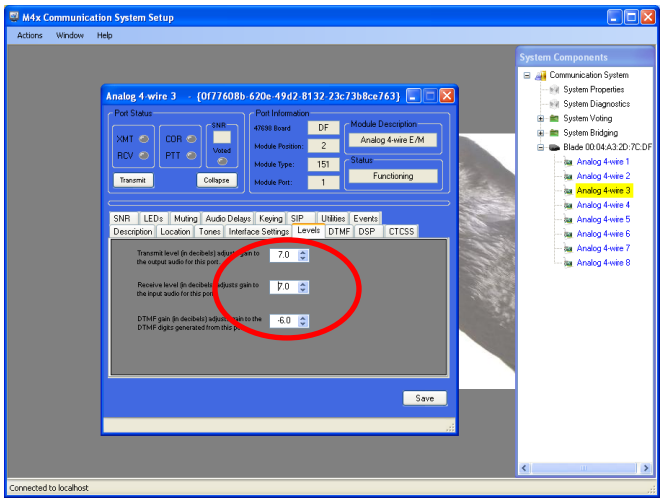
In certain situations it might not be necessary to add gain to the output side of a port because that port might be shared by other ports not requiring additional gain. For example, a locally wired port that has little or no loss might sound unacceptably loud with the gain turned up 7 dB. In these cases another means of adding gain is required. This can be done using a spare or otherwise unused port of the M4x as a *preamp port*. In this case, audio comes in to the port where gain is added on the inbound side. Through a software setting, that audio is then routed out that same ports transmit path where more gain can be added. The outbound audio is then routed via cable to the desired input port with up to 14 dB of additional gain added.





Using the prior example of a cross patch from port 1 to port 2, assume it is not desirable to add gain to the output side port 2 as shown in figure 2. Instead, port 3 configured as shown above, can be used as a *preamp port* with gain added to the input, output, or both sides of this port and then cross cabled to port 1. Port 2 can then be set back to the default output level of 0 dB or other gain or loss value.

If the M4x has no spare ports, then additional expansion modules can be added if expansion slots on the Blade are available. If expansion slots are not available, a relatively low cost Mini-Blade can be added to provide up to two expansion ports to be used as preamps ports as described above. If more than two ports are required, a higher capacity Blade can be added or a second Mini-Blade can be added depending on the number of ports needed.