



XIRIUM

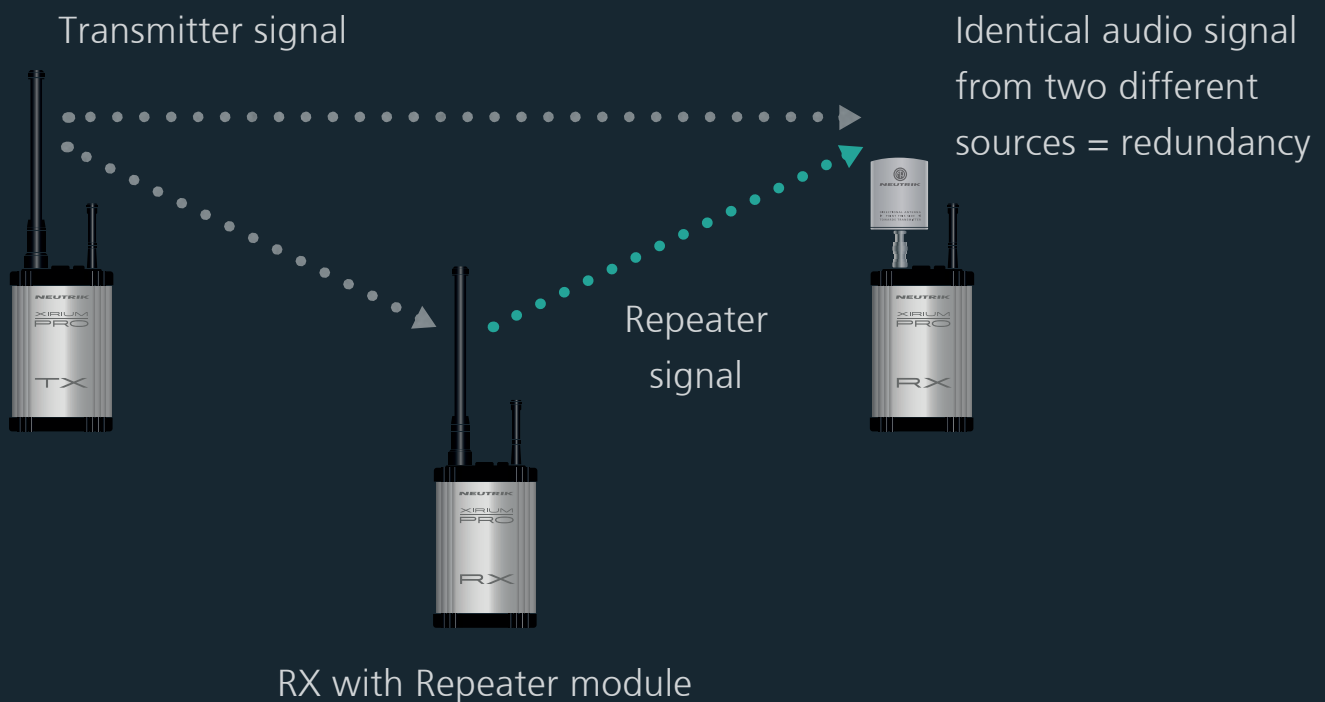
PRO

Mounting Guide

Line-of-sight + redundant RF path

For a reliable wireless audio link, make sure all XIRIUM PRO devices have line-of-sight. If a link cannot be established with line-of-sight, the receiver may be in a drop-out zone.

A drop-out zone is a point where phase cancellation occurs between the direct signal and the deflected one. Relocating the transmitter (TX) and/or receiver (RX) can help eliminate this phase anomaly. The use of a repeater can eliminate this problem as it provides a redundant RF path to all receivers within range. The RX receives the identical audio signal from two different sources (Transmitter and Repeater).

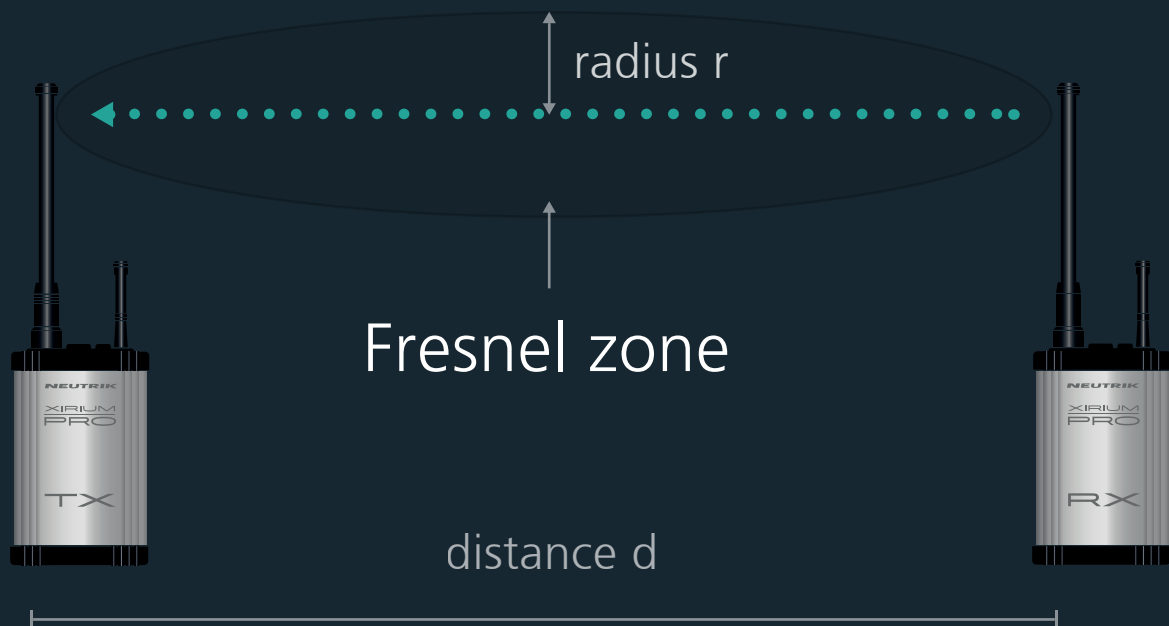


Repeater as a redundant RF path

Antenna height + distance

Consider the Fresnel zone, which is an ellipsoid shaped area between wireless devices. XIRIUM PRO TX and RX units should be free of any obstacles within the Fresnel Zone. Maintaining proper antenna height becomes essential to ensure trouble-free communication between XIRIUM PRO devices.

To define an area that is free of obstacles, use the following chart to estimate proper antenna height.



This chart lists the radius of an ellipsoid for specific distances between TX and RX antennas:

distance d	150 ft	300 ft	900 ft	1500 ft	3000 ft
radius r	2,7 ft	3,8 ft	6,6 ft	8,5 ft	12 ft

Any wireless RF system design employing XIRIUM PRO should consider the height of the antennas and the distance between devices. For a setup with a single transmitter and a number of receivers the minimum distance between the TX and any RX should be 10 feet*.



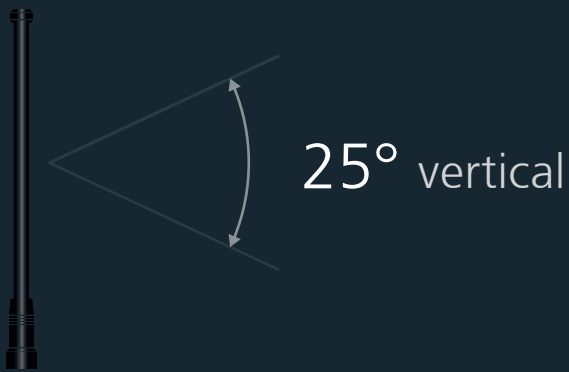
When these factors are properly addressed, consistent links can be established.

* This is appropriate for a transmission power setting of -3 dB with the 6 dBi antenna. For shorter distances enter Advanced Mode in the Xirium PRO app to enable the RF attenuator on the RX.

Antennas

Neutrik offers a variety of antennas. For a transmitter or a repeater one of these 2 omnidirectional antennas with fixed vertical radiating angles must be used:

6 dBi

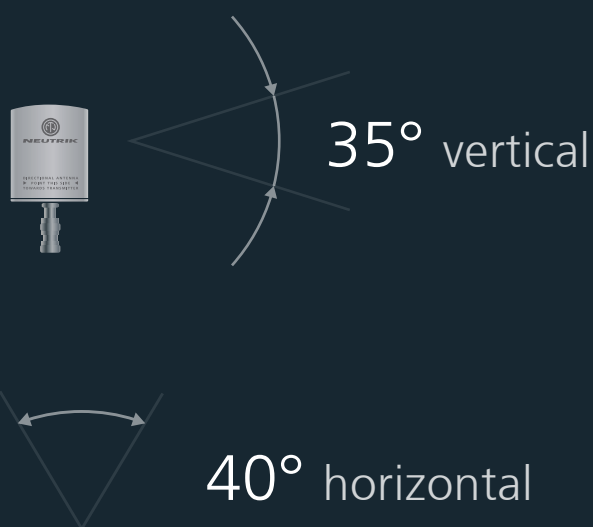


9 dBi



For receivers with audio modules inserted, Neutrik recommends the use of a directional antenna. It helps the RX focus on the TX signal, and can minimize disturbances from other systems. An N-type adapter is provided with the antenna to mount it directly on the device.

14 dBi



Use this antenna in combination with an antenna cable (e.g. Neutrik's NKXPA-5) as a remote antenna setup:

18 dBi



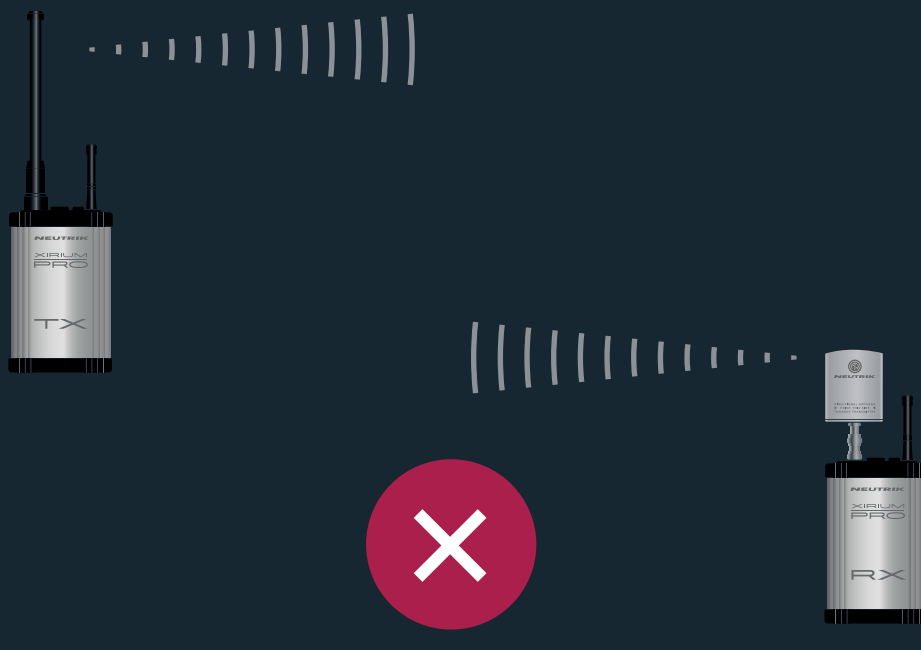
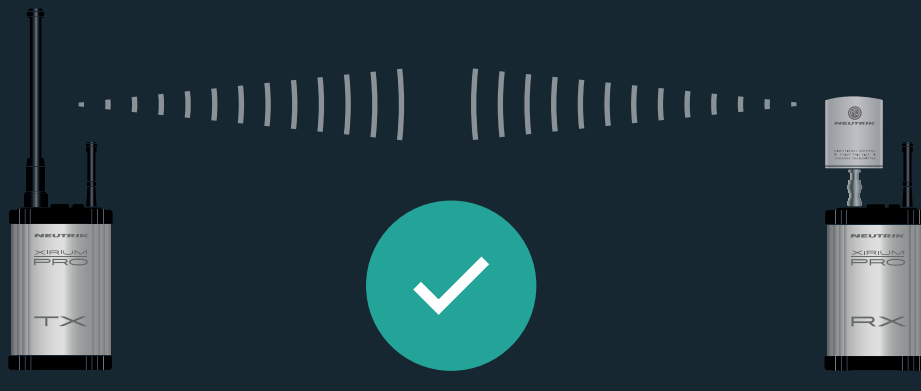
18° vertical



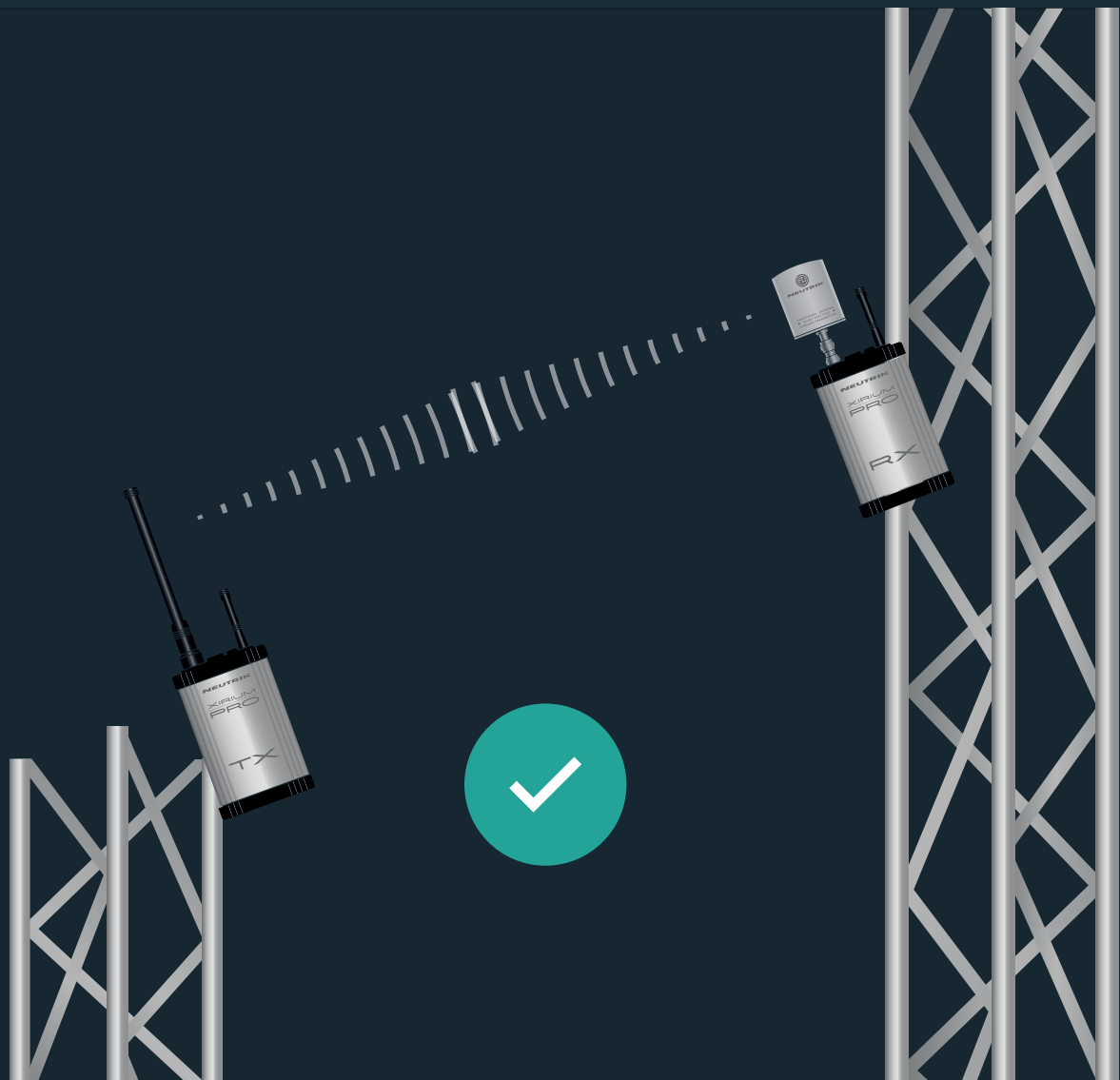
18° horizontal

Due to RF regulations, directional antennas NXPA-14-40-35 and NXPA-18-18-18 may only be used with audio module equipped receivers, not with repeaters or transmitters.

Please make sure that the antennas of each device are at the same height with respect to each other (this is not the same as having equal height from ground-level).



Here, antennas are shown at different heights, but are aligned at the same angle with a clear line-of-sight.*



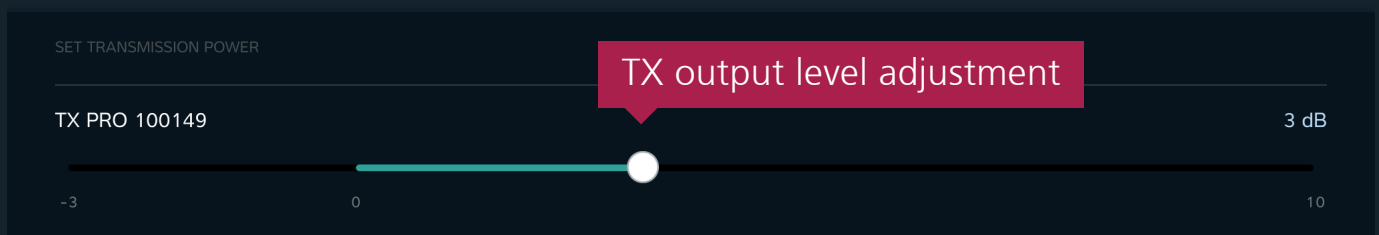
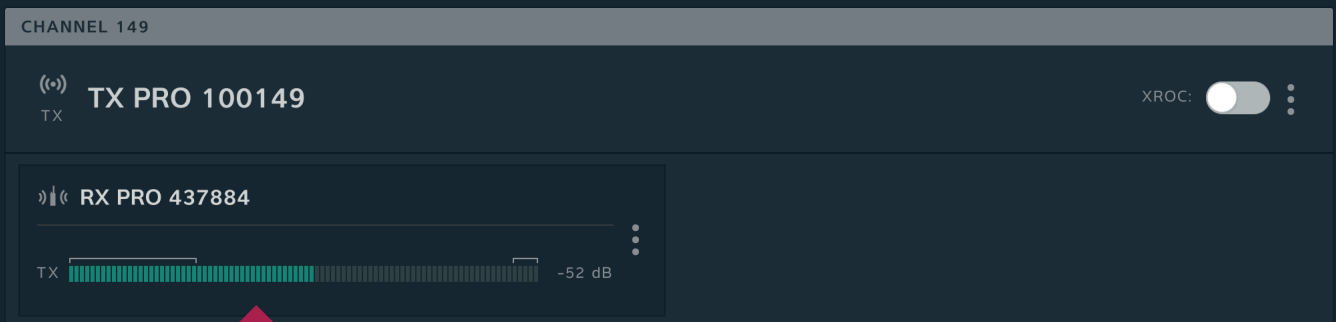
*Angled positioning is only permitted if devices are set to UNII-3 band channels (149-165), or used indoors. If the transmission uses the lower UNII-1 band channels (40-48), in an outdoor location, a parallel/horizontal positioning of the devices, with antennas in a vertical position is required in order to comply with FCC regulations.

Transmission Power Control

The RF transmission power of XIRIUM PRO transmitters and repeaters is adjustable. The default setting uses a moderate output power level, which is effective for short distance links. A minimum distance of 10 feet should always be maintained between a transmitter and a receiver.

To adjust the transmission power on a transmitter or a repeater, navigate to the EDIT page, and increase (typically for outdoor use), or decrease (typically for indoor use or short distances) the transmission power accordingly. Using the app in network mode allows monitoring of the RX reception signal quality while adjusting the transmission power.

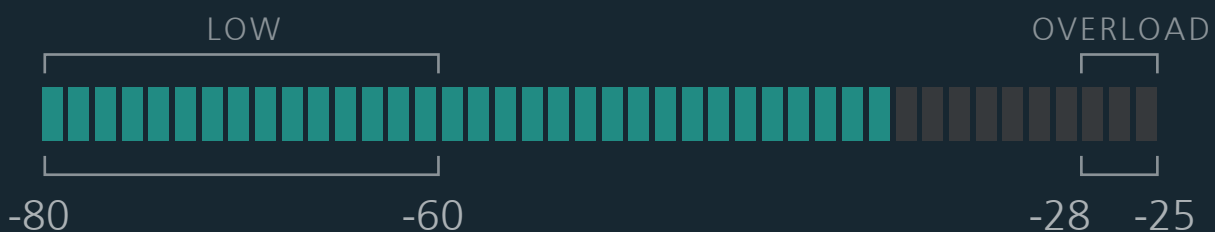
< Transmission Power



Signal quality display

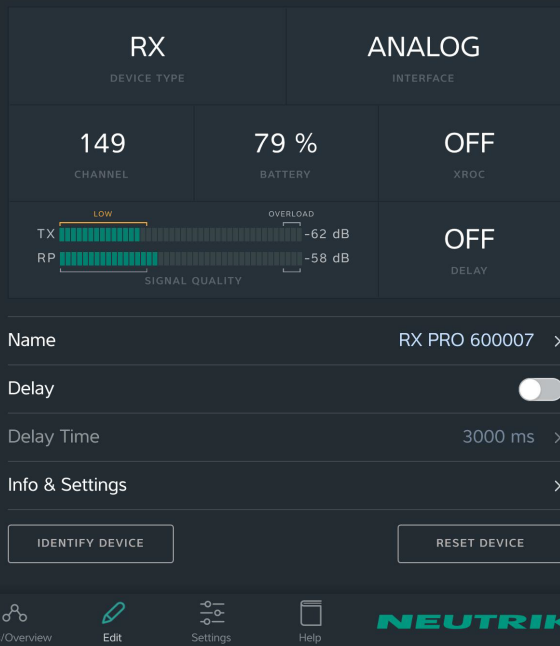
The Signal quality bar displays both RSSI level and packet loss. The number of bars (left to right) refers to the RSSI level (Received Signal Strength Indicator), whereas the color of the bar meter displays the packet loss. Green bars indicate low packet-loss, amber bars indicate moderate to bad packet loss, and red bars indicate critical packet loss.

RSSI level should remain between the “low” and “overload” areas. The colour of the bars should be green!



Good signal quality is not only measured by having the highest RSSI level. It's more important to have low packet loss (i.e. green bars). When necessary, engage the RX -30 dB attenuator in the app by setting it to ON.

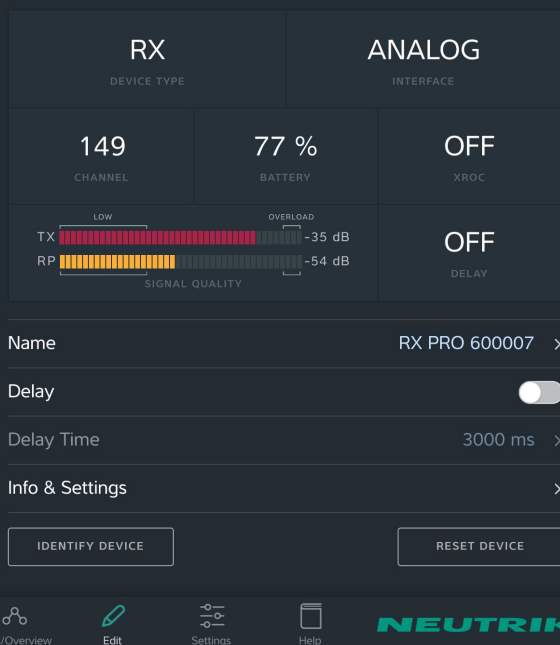
RX PRO 600007



Example 1

Although the RSSI level from the TX is low (indicated by the amber colored low bar and bracket), the packet-loss is good (green). The solution to improve the transmission path would be to increase the TX transmission power. No relocation of the devices is necessary.

RX PRO 600007



Example 2

The RSSI level is good from the TX. The transmission power of the repeater could be increased slightly. The colors of the signal bars indicate a critical (TX) and moderate/bad (RP) packet-loss. In this example, relocating the devices should be considered.



An improper RSSI level can be modified by increasing or decreasing the transmission power!

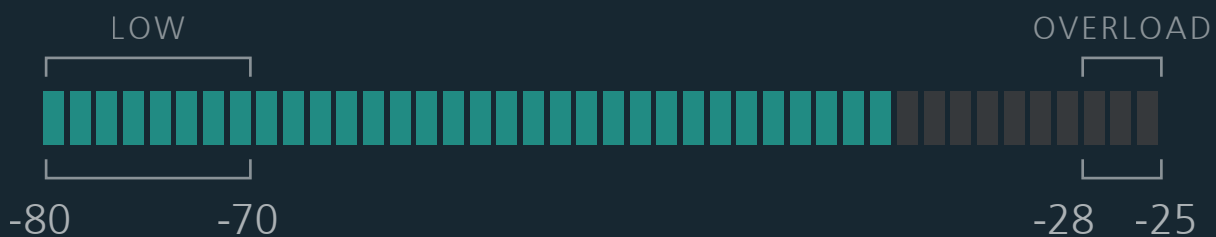


If packet-loss is high, the position of the device(s) should be modified in height and/or distance!

XROC mode

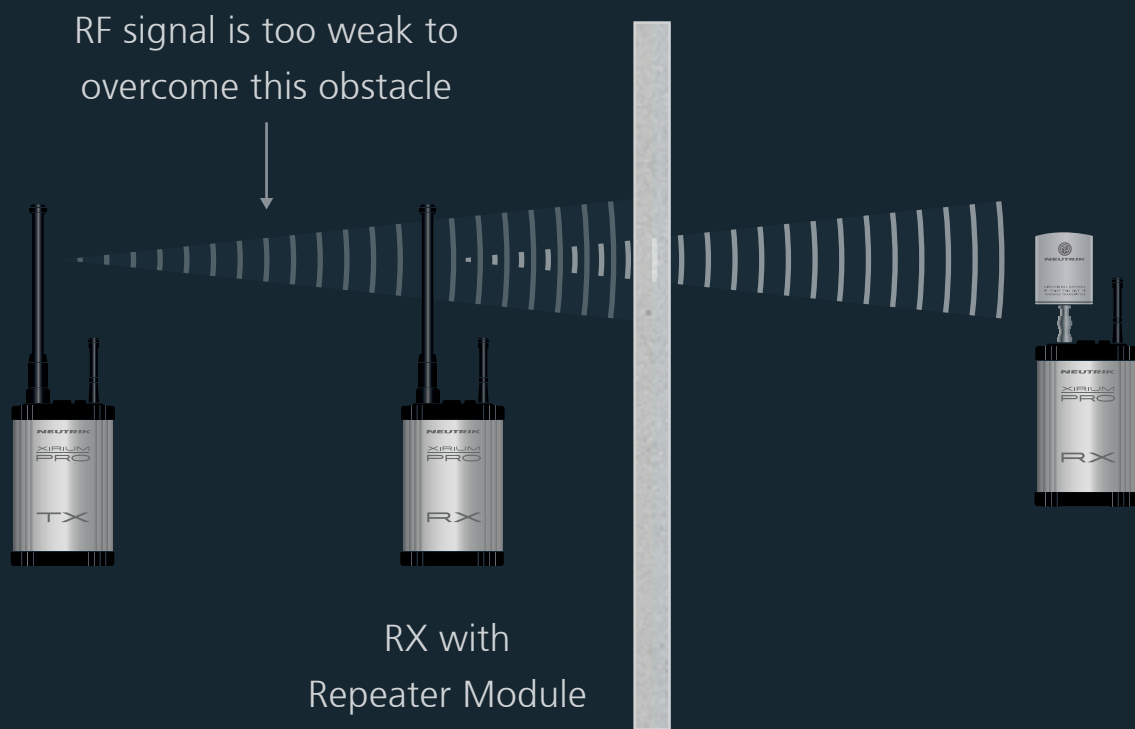
When a Transmitter is sending a single audio channel, consider activating XROC mode. XROC stands for “Extreme ruggedized one channel”. XROC mode employs a different modulation technique, which alters the data-rate. This creates a wireless link which is less susceptible to RF interference, while still maintaining the studio quality and zero compression of the audio signal. To properly measure the signal quality with XROC mode on, the RX signal strength meter (RSSI) will scale to display a smaller “low” area, adjusting for the increased headroom XROC mode provides.

XROC mode may be switched on and off individually from any TX in the Edit menu.



Overcoming obstacles

The use of a repeater (RX base station with Repeater module installed), will provide a redundant RF path, allowing audio transmission from a second location. The use of a repeater also helps overcome RF signal barriers, such as walls, glass, and corners. Only one repeater may be used with a transmitter.

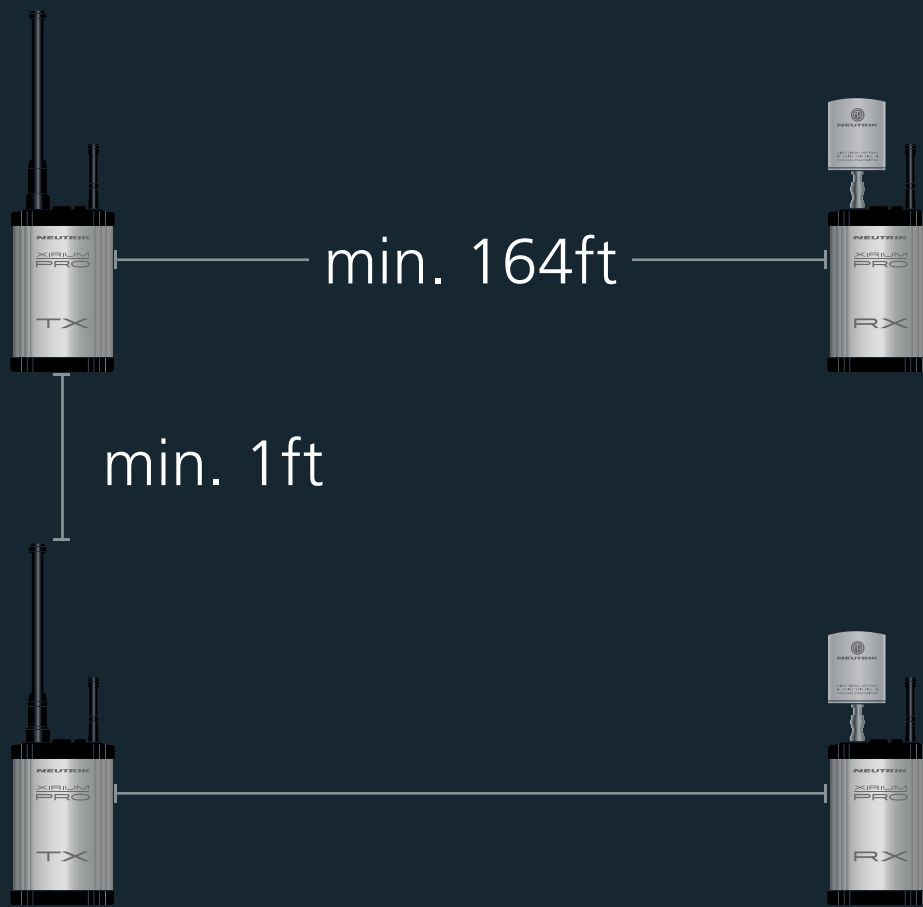


Repeater as a wallbreaker

Multiple Transmitters

When using more than one transmitter, review the following design considerations:

- Adjust the transmission power of each XIRIUM PRO transmitter equally. This will prevent one TX from overpowering another TX. If overpowering should occur, it may interrupt the audio signal of a TX set to a lower-power.
- Maintain one unoccupied (empty) RF channel between transmitters. The XIRIUM App performs this function automatically. If the transmitter channel is selected manually, the user must make sure to assign it to a nonadjacent channel.
- Maintain a distance of at least 1 foot vertically between each transmitter. A good practice, is to place the transmitters above one another, with a distance of 1 foot from the end of the antenna of one TX, to the bottom of the next TX.
- When multiple transmitters are used the recommended distance between TX and RX increases from 10 feet to 164 feet. This distance compensates for higher overall RF power levels when multiple transmitters are used in close proximity to one another.
- The ideal RSSI level for a setup with multiple transmitters is between -60dB and -50dB. To achieve these levels adjust the transmitter output power or change the distance between TX and RX units.
- In general, engaging the RX -30db RF attenuator in the app, and increasing the transmission power of the TX, can improve link quality between devices as well rejecting unwanted RF interference.



Enjoy using the XIRIUM PRO system!