4.3 XIRIUM PRO app
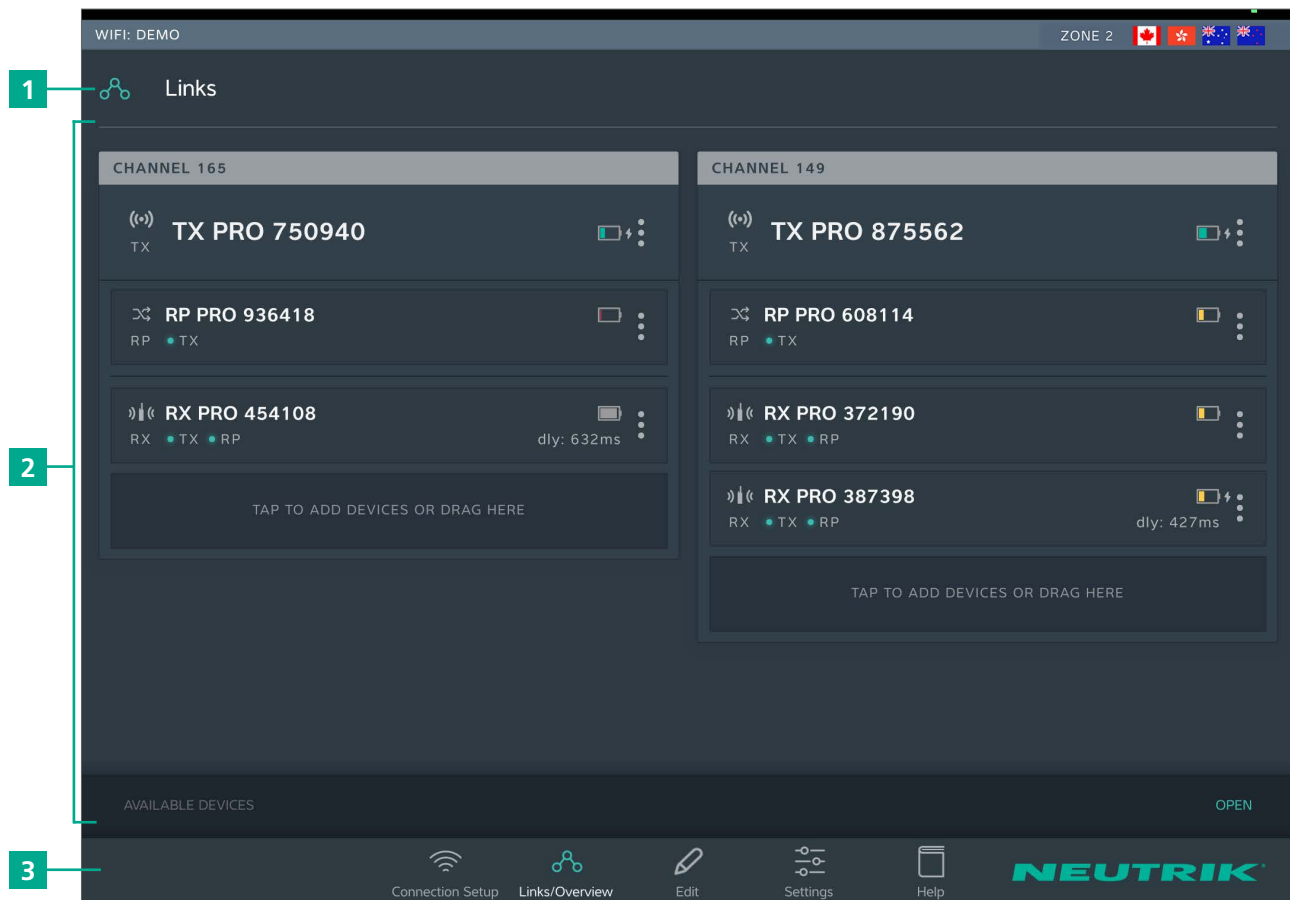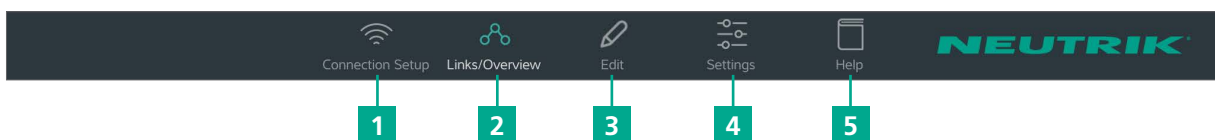
The XIRIUM PRO app enables convenient operation and control of the devices from a tablet.

4.3.1 Overview of operation elements

Pos.	Description
1	Page title
2	Operation and display area
3	Navigation bar

Navigation bar

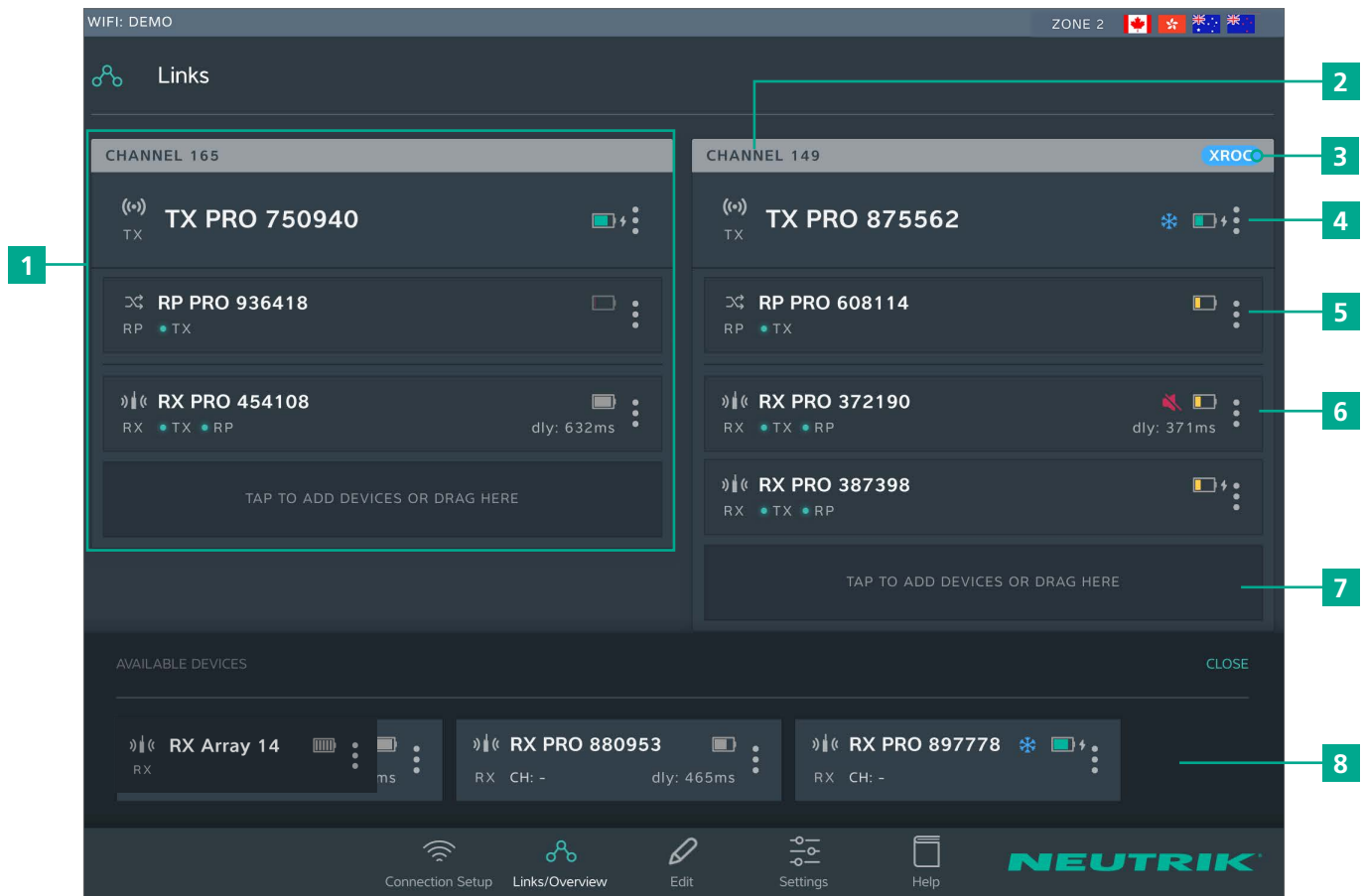| Pos.	Description		Pos.	Description
1	Connection setup button		4	Settings button
2	Links/Overview button		5	Help button
3	Edit button			

- Tapping a button opens the associated page.
- When the page is active, the pictogram is green and the text is white.

Symbols in the app

| Symbol	Description
((•)) TX	The displayed device is a TX.
⤨ RP	The displayed device is a RX with a repeater module.
)⊪(RX	The displayed device is a RX.
▬ ▭ ▭ ▬⚡	The battery level is between 40 % and 100 %. The battery level is below 40 %. The battery level is below 20 %. Connect the device to the mains supply. Animated display: Battery is charging.
• TX • TX • TX	The signal quality received from the TX is good, which refers to a proper RSSI level and a low packet loss. The signal quality received from the TX is critical. This is either due to a critical RSSI level or a critical packet loss. On Edit page the signal quality bar is monitored in detail. The signal quality received from the TX is bad. This is either due to a bad RSSI level or a high packet loss. On Edit page the signal quality bar is monitored in detail.
• RP • RP • RP	The signal quality received from the RP is good, which refers to a proper RSSI level and a low packet loss. The signal quality received from the RP is critical. This is either due to a critical RSSI level or a critical packet loss. On the Edit page the signal quality bar is monitored in detail. The signal quality received from the RP is bad. This is either due to a bad RSSI level or a high packet loss. On the Edit page the signal quality bar is monitored in detail.
⋮	Display device options button Tapping this button opens the options menu.
⚠	Indicates that a message with information is pending for this device. The information is displayed in plain text on the Edit page of the selected device.
🔇	Mute icon: Indicates, if RX is muted
🇨🇦	Zone indicator: Displays to which country settings the devices in use are programmed.
ADVANCED	Advanced mode indicator: Displays, if advanced mode is switched ON.
❄ LOW	Device temperature is LOW.
🔥 HIGH	Device temperature is HIGH.
dly: 800ms	Delay indicator: Indicates in the Links / Overview window if the delay on a RX is switched on.
RF: -30dB	RF attenuation indicator: Indicates in the Links / Overview window if the RF attenuation on a RX is switched on.

4.3.2 Links/Overview page

All devices that were added to the network via an access point are displayed on this page. The devices are grouped according to transmission path. Each transmission path is assigned to one transmission channel. In stand-alone mode, the Links/Overview page is inactive.

Pos.	Description	Pos.	Description
1	**Transmission path** This grouping displays all devices that are in one RF channel	6	**RX display** Each field represents one device. A minimum 1 RX is needed for each transmission path. • The display is highlighted in red when there is a poor connection to the TX, or none at all.
2	**Transmission channel**		
3	**XROC indicator** Is displayed when XROC mode is active for the RF channel	7	**Button for adding devices to transmission path** • Add a device: Use drag&drop to add a device from AVAILABLE DEVICES. • Add several devices: Tap button and select device from AVAILABLE DEVICES.
4	**TX display** 1 TX is needed for each transmission path		
5	**Repeater display** As an option, repeaters may be used. A maximum 1 repeater per RF channel is possible. • The display is highlighted in red when there is a poor connection to the TX, or none at all.	8	**AVAILABLE DEVICES** Displays all available devices which have not yet been assigned to a transmission path. Tapping OPEN/CLOSE opens/closes the display.

Device options menu
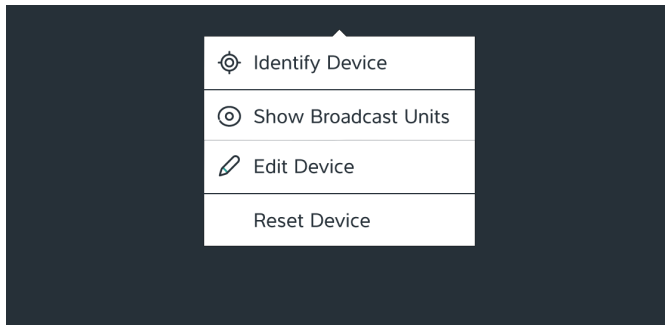
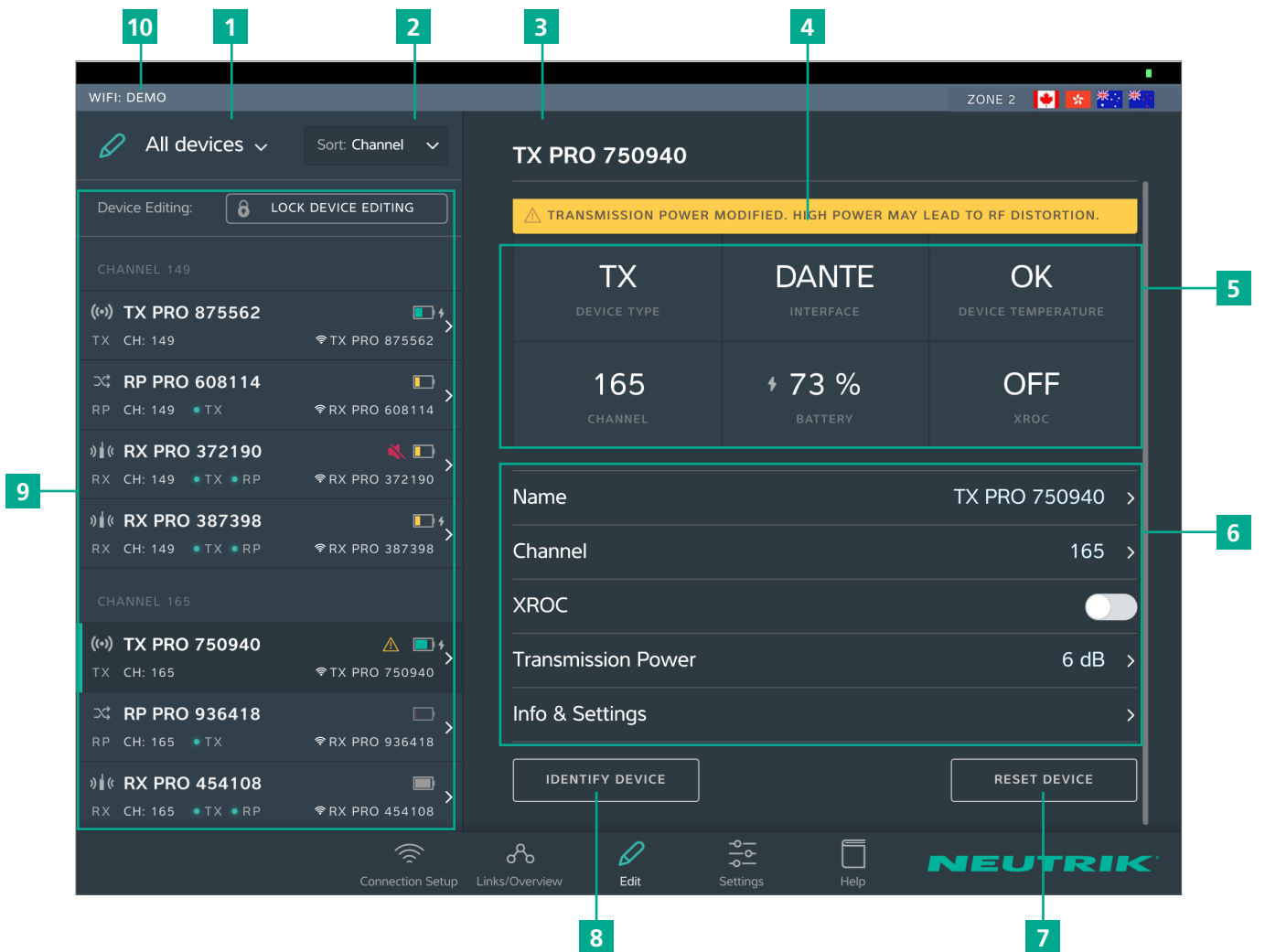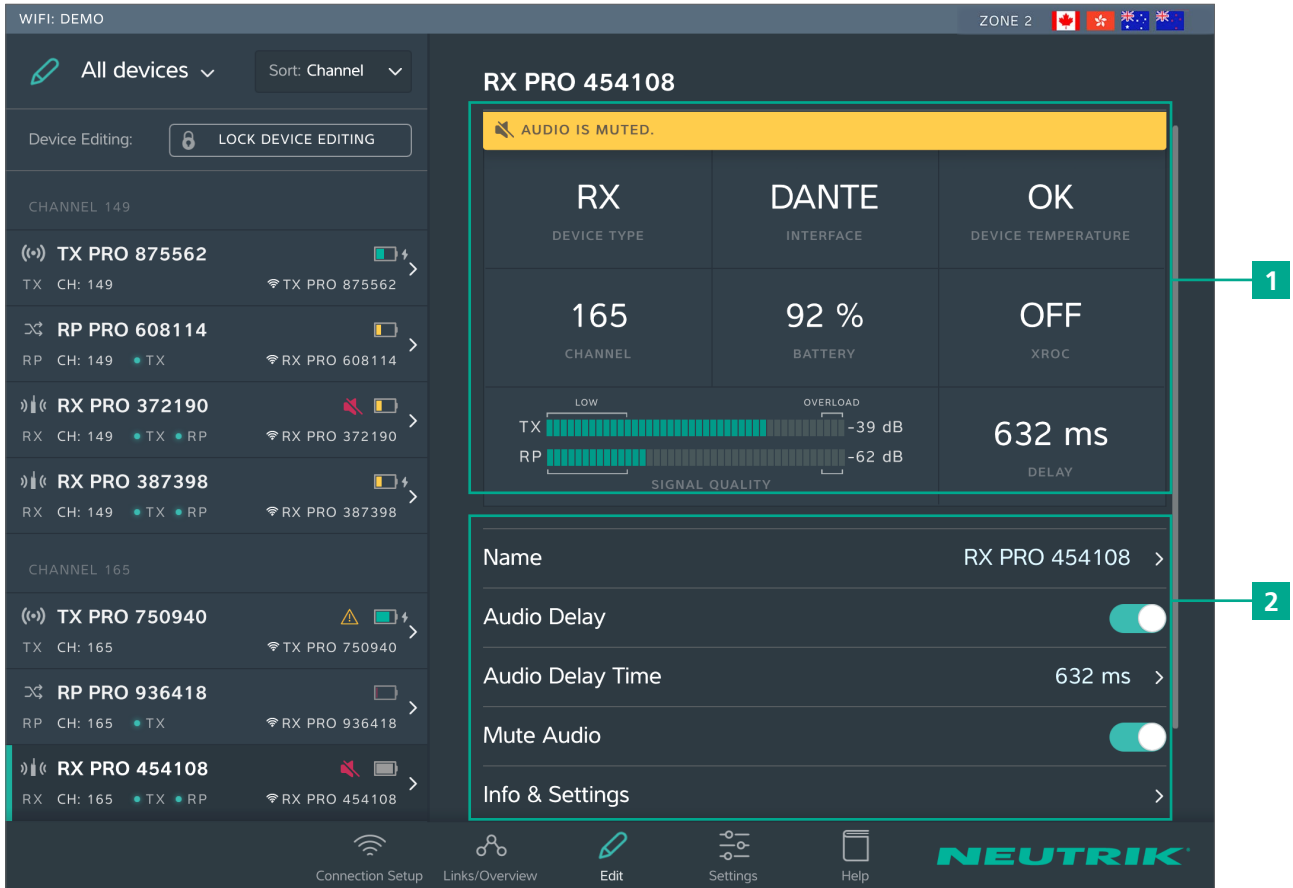| Description |
|---|
| **Identify Device**
Tap the button to identify a single device: The power LED of the device slowly flashes red for about 10 seconds. |
| **Show Broadcast Units**
Tap the button: The power LEDs of all devices which are assigned to the same channel slowly flash red for about 10 seconds. |
| **Edit Device**
Opens the Edit Device page so all properties of the device can be edited. |
| **Reset Device**
Reset device properties to factory state |

4.3.3 Edit page

Edit TX

Pos.	Description	Pos.	Description
1	**Filter devices drop-down menu** Only the devices that meet the filter criteria are displayed. • All Devices: List all devices. • Low Battery: Only list devices on which the battery is weak. • Out of Range: Only list devices that receive a poor signal, or none at all.	6	**Adjustable properties** Tapping on a property opens the associated sub-page. • Name: Opens the page for changing the device name. • Channel: Opens the page for changing the transmission channel. • XROC: Tapping this button toggles the XROC mode ON/OFF. • Transmission Power: Opens the page for adjusting the transmission power of the TX/repeater. • Info & Settings: Opens a page with information about the device.
2	**Sorting drop-down menu** Specifies the criteria for sorting the devices. • Channel: Devices are sorted according to channel. • Type: Devices are sorted according to type.		
3	**Device Name** Displays the device name entered by the user.	7	**Reset Device button** Resets the device to factory state.
4	**Note** Contains useful information for safe, trouble-free operation.	8	**Identify Device button** The power LED of the device selected will slowly flash for about 10 seconds.
5	**Device Properties** • Device Type: Device is a TX. • Interface: Indicates the module being used. • Device Temperature: Indicates the temperature of the device (low, ok or high) • Channel: Indicates the channel the device is transmitting on. • Battery: Indicates the battery charge status in %. • XROC: Indicates whether the XROC mode is ON/OFF.	9	**Overview of the connected devices** Lists all connected devices according the set filter and sorting criteria. The selected device is marked with a green bar and a dark background.
		10	Name of access point used

ℹ️ In standalone mode the Allow link button is shown on the Edit page. Tapping the Allow link button starts the connection process of the TX.

Edit RX

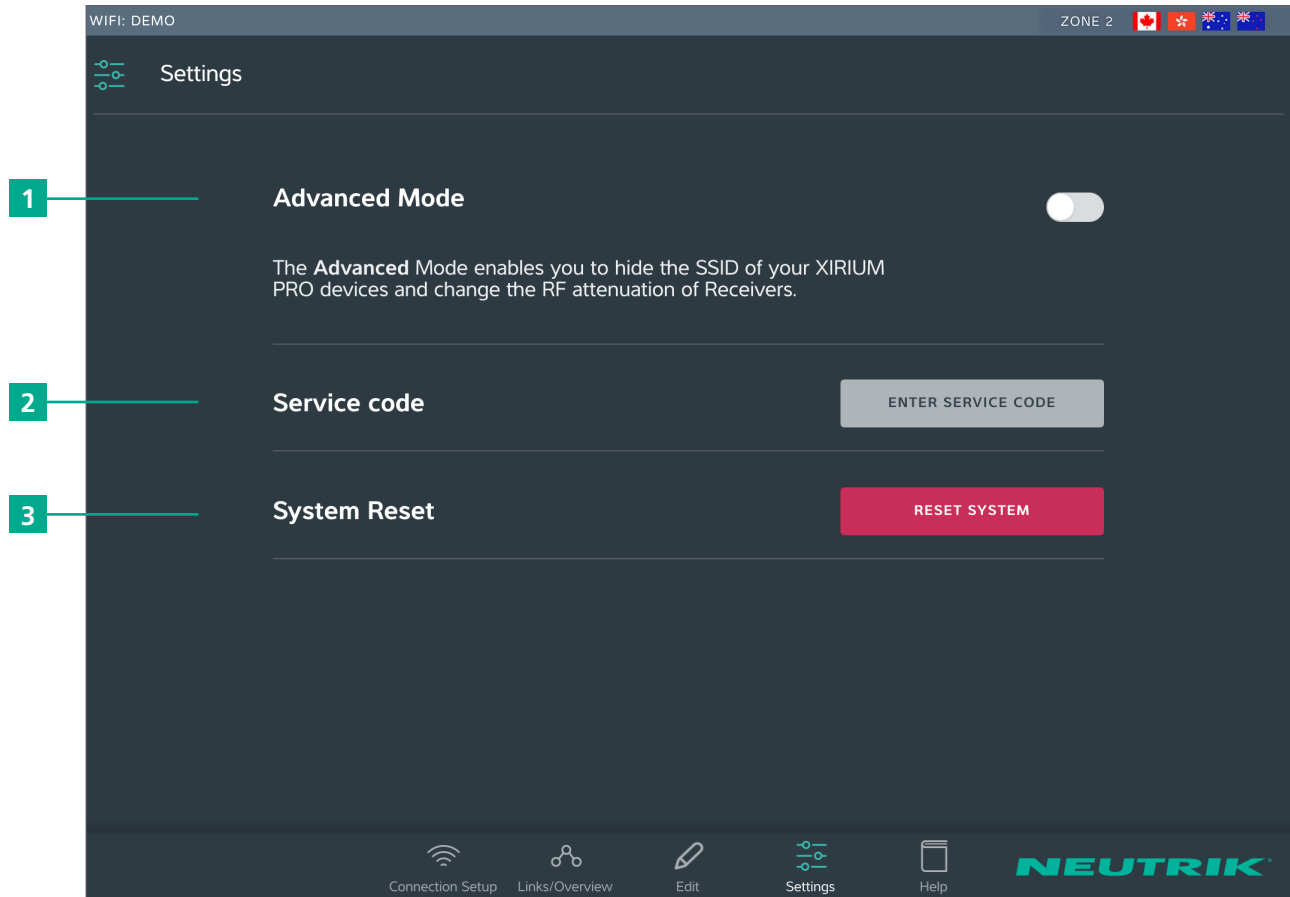| Pos.	Description
1	**Device properties** • Device Type: Indicates that the device is an RX. (for RX with repeater module: RP) • Interface: Indicates the module being used. • Device Temperature: Indicates the temperature of the device (low, ok or high) • Channel: Indicates the channel the device is assigned to. • Battery: Indicates the battery level in %. • XROC: Indicates whether the transmission path of the XROC mode is ON/OFF. • Signal quality: Indicates the signal quality of the signals received from the TX and/or repeater. Signal quality is a combination of RSSI Level and packet loss. • Delay: Indicates the set delay time in milliseconds, feet or meters, or indicates the delay is off.

Pos.	Description
2	**Settable properties** Tapping on a property opens the associated sub-page. • Name: Opens the page for changing the device name. • Audio Delay: Tap the button to activate/deactivate the delay. • Audio Delay Time: Opens the page for setting the delay time. • Mute Audio: Mutes this RX unit • Info & Settings: Opens a page with information about the device.

ℹ In standalone mode the Link button is shown on page Edit. Tapping the Link button links this RX to the TX.

4.3.4 Settings page

Pos.	Description		Pos.	Description
1	**Reset System button** Tapping this button opens a window with reset options.		3	**Reset System button** Tapping this button opens a window with reset options.
2	**Enter service code button** Opens entry field for service code (only for service personnel)			

4.3.5 Help page
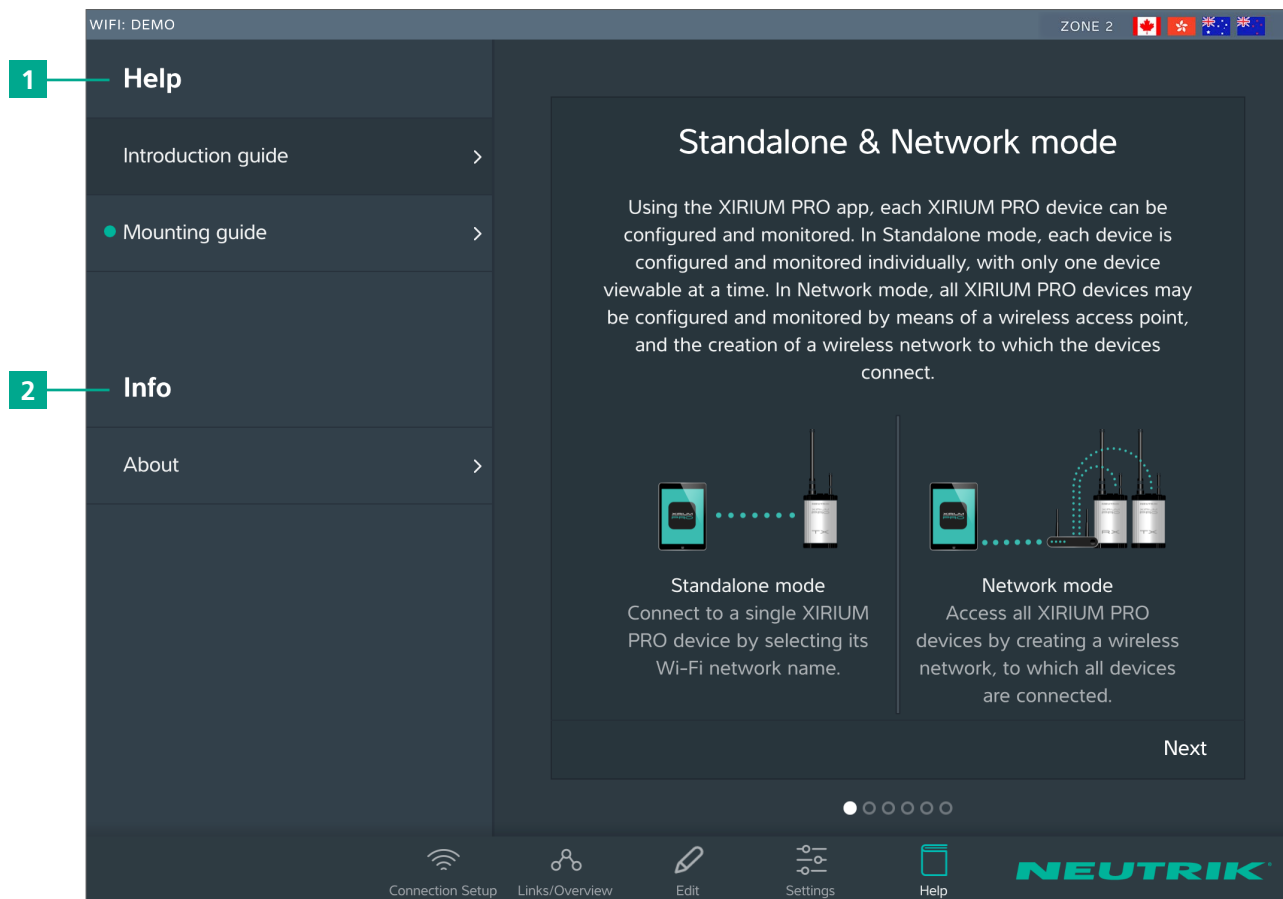
Pos.	De scription
1	**Help** Useful information for a proper XIRIUM PRO setup.
2	**Information about the software** Software Version:　Version of the installed app. Version Date:　　　Date app was issued

4.4 Getting started

The XIRIUM PRO system makes it possible to replace conventional cable connections between audio sources and audio sinks (referred to in short as "peripheral devices" below) with a robust radio connection.

With just 2 devices, the transmitter (TX) and the receiver (RX), an audio signal can be transmitted quickly and cost-efficiently. The XIRIUM PRO system transfers audio signals (LINE level) as well as digital audio signals (AES or DANTE) in studio quality with an extremely low latency time.

9 channels in the 5 GHz band are available for transmitting the audio signal. Up to two audio signals can be transmitted in one RF channel with no loss to audio quality. The distance between transmitter and receiver can be more than 3200 feet.[1] The actual distance between transmitter and receiver depends on the specific environmental conditions (line of sight, obstacles in the link, reflections, external RF signals, etc.).

Depending on the distance between transmitter and receiver, the transmission power may be manually controlled using the associated app in order to ensure the RSSI level remains in the "green range". In order to be able to establish a connection between TX and RX, the devices must be separated by a distance of at least 10 feet (using 6 dBi antenna and transmission power set to -3 dB).

	Channel	Medium frequency	
UNII-1 band	Ch 36	5180 MHz	Only allowed for **indoor use** with **23 dBm EIRP** (200 mW)[2]
	Ch 40	5200 MHz	
	Ch 44	5220 MHz	
	Ch 48	5240 MHz	
UNII-3 band	Ch 149	5745 MHz	Allowed for **outdoor use** with **36 dBm EIRP** (4 W)[2]
	Ch 153	5765 MHz	
	Ch 157	5785 MHz	
	Ch 161	5805 MHz	
	Ch 165	5825 MHz	

The XIRIUM PRO system has been designed with features to simplify use. Understanding these features will be helpful before the system is put into operation.

[1] This refers to one of the UNII-3 band channels only, since the lower channels of the UNII-1 band have a lower approved transmission power.

[2] The app takes care of the maximum EIRP setting as soon as you choose a different RF channel!

4.4.1 App

The app is the central control interface of the XIRIUM PRO system. Using the app, transmission paths and networks can be created and managed. The app provides information about the current status of the connected devices and transmission paths. The XIRIUM PRO devices can be connected to the app through 2 modes:

Network mode
Several devices connected to the app via an access point.

Stand-alone mode
Only 1 device is directly connected to the app.

> ℹ️ It is highly recommended to choose a 2.4 GHz channel according to prior agreement with event management. Uncoordinated usage of the 2.4 GHz channel may lead to connectivity issues in the 2.4 GHz transmission path due to high traffic. The audio transmission is not affected by the 2.4 GHz transmission path!

4.4.2 Repeater

A "repeater" is an RX equipped with a repeater module. The repeater is used in the following situations:
- Stabilizing transmission paths
  The repeater receives the signal from the TX and transmits a redundant signal to the RX. The redundant signal stabilizes the connection and reduces efferts caused by interferences.
- Overcoming obstacles
  If no line-of-sight connection is possible, obstacles such as walls, glass or even corners can be overcome with the repeater.
- Extending distances
  When a repeater is used, the distance between TX and RX can be doubled.


4.4.3 Signal quality bar

The signal quality bar displays both RSSI level and packet loss. The scale of the bar refers to the RSSI level (Received Signal Strength Indicator). It is recommend to have an RSSI level not appearing in the "low" and "overload" area.
The color of the bar displays the packet loss:
- Bar is displayed green: packet loss is low
- Bar is displayed orange: packet loss is critical
- Bar is displayed red: packet loss is high.
  A high packet loss increases the probability of losing audio.

Examples
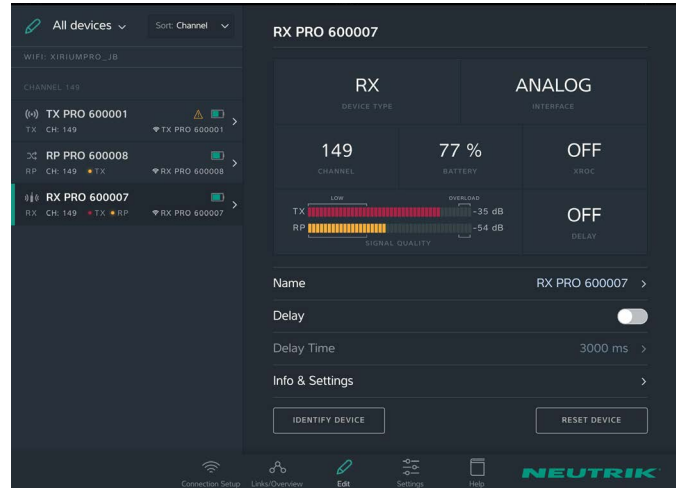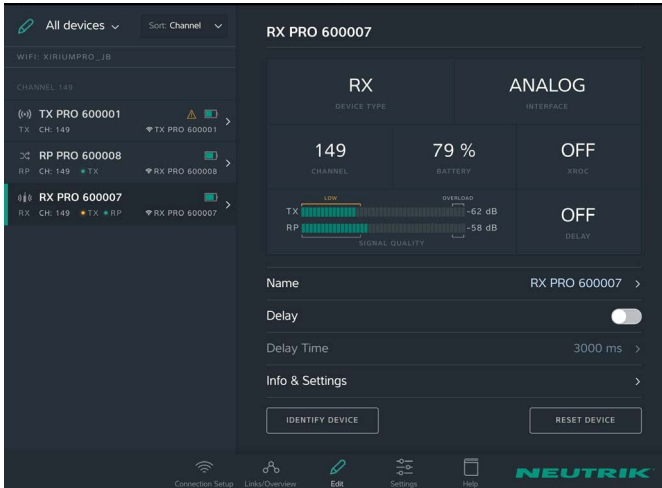
- • RSSI level received from the TX is critical.
- • The packet loss received from TX and RP is low.
  We recommend to increase the transmission power of the TX.

- • RSSI level received from TX and RX are OK
- • The color of the bars indicate a high (TX) and a critical (Repeater) packet loss.
 We recommend to relocate the devices and / or change the RF channel.

> **ℹ** An improper RSSI level can be modified by increasing or decreasing the transmission power.

> **ℹ** If the packet loss is high, the position of the devices have to be modified. Double-check if there are other devices operating on the some channel and change the RF channel.

4.4.4 Transmission power

Depending on the application, the transmission power should be adjusted with the app so the RSSI level on the receiver remains in the recommended range. However, the 10-foot minimum distance between the TX/RX must always be maintained. This minimum distance applies when the 6 dBi antenna and a transmission power of -3 dB are used. If the 9 dBi antenna and/or a higher transmission power are used, the minimum distance increases.
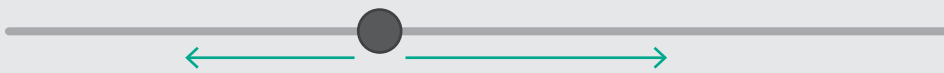
Decreasing transmission power
In indoor areas and over short distances.

Increasing transmission power
In outdoor areas and over longer distances.

4.4.5 XROC mode

If only 1 audio signal per RF channel is needed, we recommend using XROC mode. XROC stands for "Extreme Ruggedized One Channel". In XROC mode, only 1 audio signal at 6 Mbit/s is available for each RF channel. The connection between the devices is much more stable in XROC mode, because external influences do not interfere with the RF signal between the XIRIUM PRO devices as much. External influences include strong reflections of the RF signal in a room or from buildings, or external signals. The power consumption of the devices is higher in XROC mode.
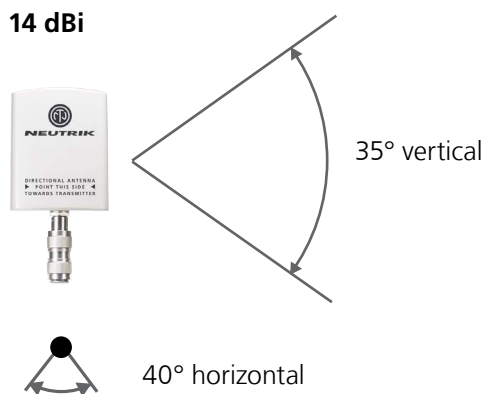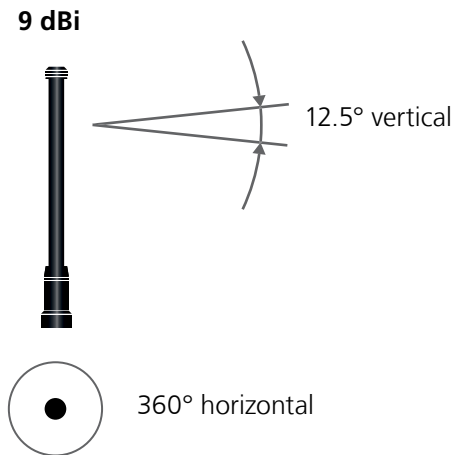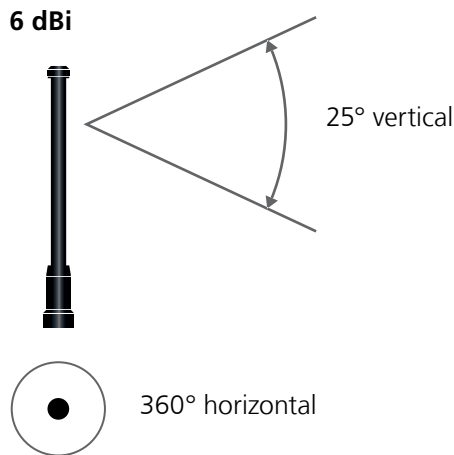

The increase in the performance range is illustrated in the RX signal quality bar, which displays a smaller "low" area when XROC mode is used.

> ℹ If XROC mode is enabled on a TX, only audio channel 1 is being transmitted. Therefore a linked RX will have no audio on channel 2.

4.4.6 Antennas

XIRIUM PRO uses omnidirectional antennas with fixed vertical radiating angles. Neutrik offers two different antennas: the standard 6 dBi antenna, featuring a 25° vertical angle, and an optional 9 dBi antenna with a 12.5° vertical angle.

6 dBi

25° vertical

360° horizontal

9 dBi

12.5° vertical

360° horizontal

14 dBi

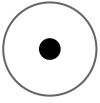

35° vertical

40° horizontal

For pure receivers!

For pure receivers Neutrik recommends to use a directional antenna. It helps focusing on the TX signal and avoids disturbances from other systems. There's an N-type adapter provided with the antenna to mount it directly on the device.

2 dBi

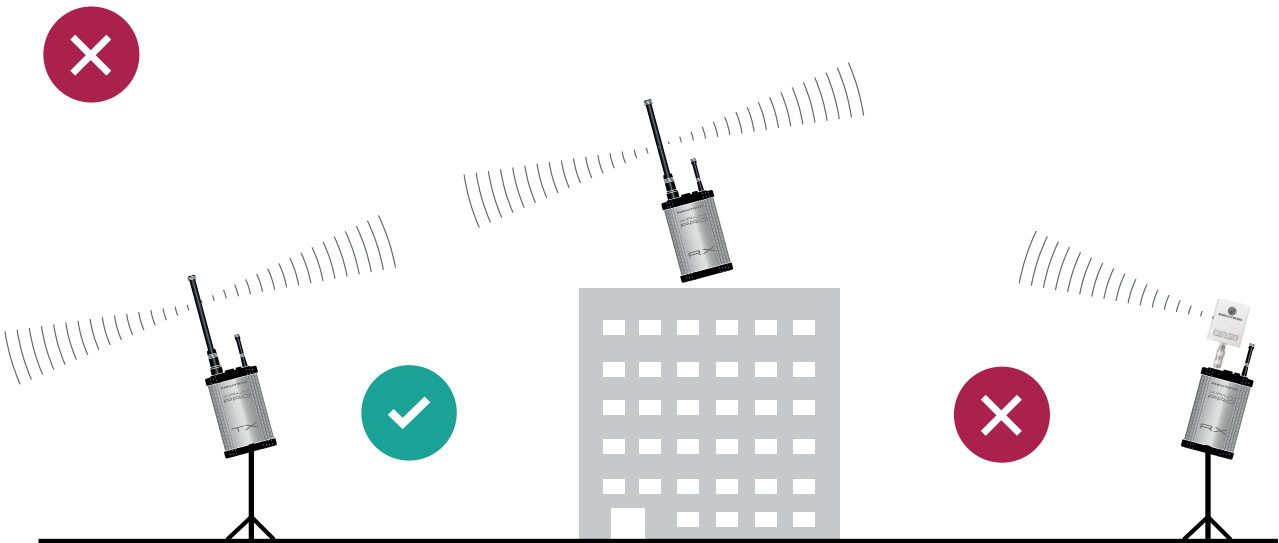360° vertival

360° horizontal

For receiver with a repeater module inserted!
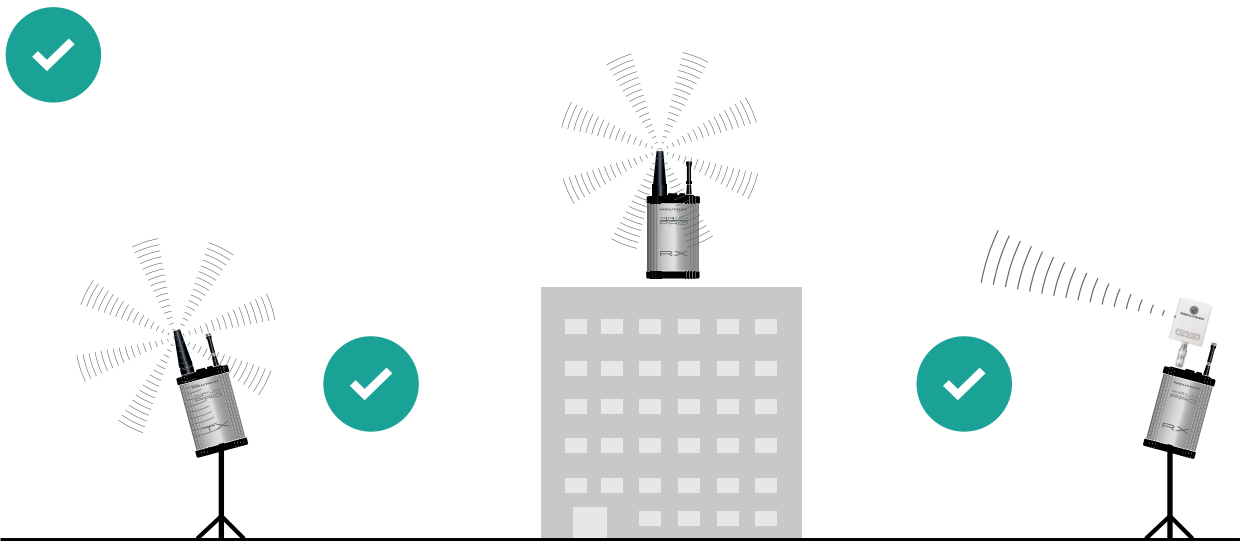
The 2 dBi omnidirectional antenna should be used for applications where a parallel alignment of the TX - RX antenna on the same height can't be established.
Due to a lower antenna gain, the transmission range is less.

Not correct positioning

Correct positioning

4.4.7 Remote antennas

If the 5 GHz antenna and the 2,4 GHz antenna need to be aligned differently in terms of angle, it's advisable to remote the 5 GHz link. For that purpose Neutrik offers an antenna cable (NKXPA-5) with a length of 5 meters and an attenuation of 4 dB. There is also an additional directional antenna available for such applications having a gain of 18 dBi. This antenna must be used only for pure receivers and not for any transmitting device, hence also not for a repeater. Like all other XIRIUM PRO antennas this antenna has a vertical polarization. It is necessary to gear this antenna in the correct angle towards the TX antenna. A correspondent graphical indication can be found on the backside of the antenna.

18 dBi (NXPA-18-18-18)

18° vertical

18° horizontal
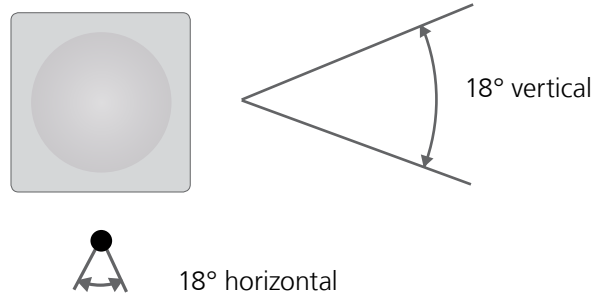
For pure receivers as a remote antenna.

4.4.8 Antenna combinations

These are possible antenna combinations for the XIRIUM PRO system:

- common setup
- point-to-multipoint

- NXPA-6-360-25 or NXPA-9-360-12.5

- NXPA-6-360-25 or NXPA-9-360-12.5

- setup with directional antenna on RX
- point-to-multipoint
- Focusing on the TX signal and avoid disturbances from other systems

- NXPA-6-360-25 or NXPA-9-360-12.5

- NXPA-14-40-35

- remote setup on RX
- point-to-multipoint
- different alignment of 2,4 GHz- and 5 GHz antenna required

- NXPA-6-360-25 or NXPA-9-360-12.5
- NKXPA-5
- NXPA-14-40-35
- NKXPA-5
- NXPA-18-18-18

- remote setup on TX + RX
- point-to-multipoint
- Option to mount the antennas outdoor and keep the devices indoor due to temperature reasons (< 0°C / > 50°C)
- Shorter range than with the other setups

ℹ For a remote setup of the TX antenna an adapter (NXPA-N-FF) is required.

- NKXPA-5
- NXPA-N-FF
- NXPA-6-360-25 or NXPA-9-360-12.5
- NKXPA-5
- NXPA-14-40-35
- NKXPA-5
- NXPA-18-18-18
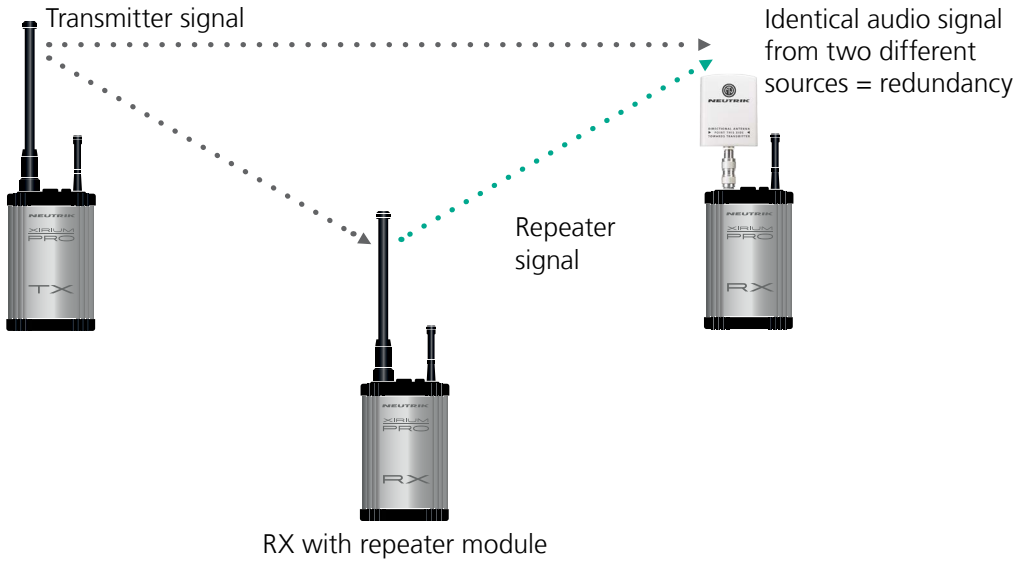
Transmitter

Repeater

Note!

Due to RF regulations it's not allowed to use the directional antennas on a transmitter or repeater!

4.4.9 Line-of-sight and redundant RF path

For a reliable wireless audio link, make sure all XIRIUM PRO devices have a line-of-sight connection. If a line-of-sight connection cannot be established, 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. Using a repeater can also eliminate the problem of the drop out zone. A repeater effectively provides a redundant RF path to all receivers within range. The RX receives identical audio signals from both the transmitter and repeater.

Transmitter signal

Identical audio signal from two different sources = redundancy

Repeater signal

RX with repeater module

4.4.10 Antenna height + distance

Consider the Fresnel zone, which is an ellipsoidal area between wireless devices. For XIRIUM PRO TX and RX devices, there should be no obstacles within the Fresnel zone. Maintaining proper antenna height is 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.

radius r

Fresnel zone
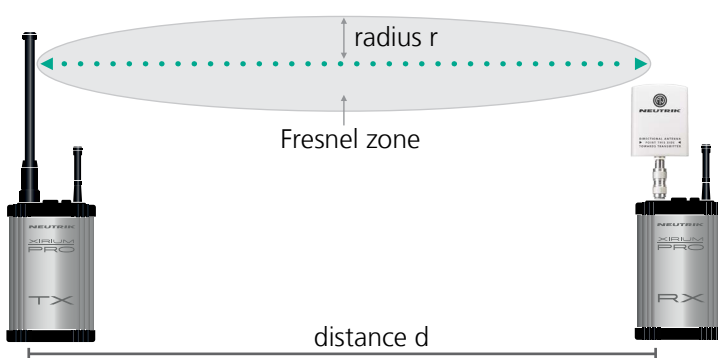
distance d

distance d	radius r
150 ft	2.7 ft
300 ft	3.8 ft
900 ft	6.6 ft
1500 ft	8.5 ft
3000 ft	12 ft

4.5 Selecting transmission channels

4.5.1 Automatic selection of transmission channels

A TX is assigned to channel 149 by default. If channel 149 is already occupied by a different TX, the device searches for the next free channel. The TX saves the last channel used. When switched on again, the TX uses the last channel used, as long as it is not occupied. If the TX changes the channel, all devices in the transmission path are assigned to the new channel.

4.5.2 Manual selection of transmission channels

The transmission channel can also be manually adjusted with the app. To guarantee a trouble-free process, the app prevents an adjacent channel from being selected. The transmission channel can be changed on the Edit page. More information in Section "Changing the transmission channel" on page 40.