

## AUDIO DISTRIBUTION WITH QUANTUM CODECS

Advantages of using Quantum Codecs in Audio Distribution

### INTRODUCTION

Now that IP networks are becoming more reliable and widespread, it is time to think about eliminating costly dedicated lines with RF or satellite links and replacing them with efficient and much lower cost installations.

Prodys has the most advanced technology to make the most of dedicated or shared IP networks (Internet) and to avoid the inherent disadvantages of IP technology, such as the lack of synchronism in the sending of IP packets. This is achieved thanks to the proprietary BRAVE transmission protocol that allows, among other things:

- Management of an automatic receive buffer capable of adjusting to the lack of synchronism to achieve the lowest possible delay.
- Packet recovery through forwarding of lost IP packets.
- Establishment of redundant connections to ensure transmission integrity in unreliable networks.
- Real-time monitoring of communications.



### OPERATING MODES

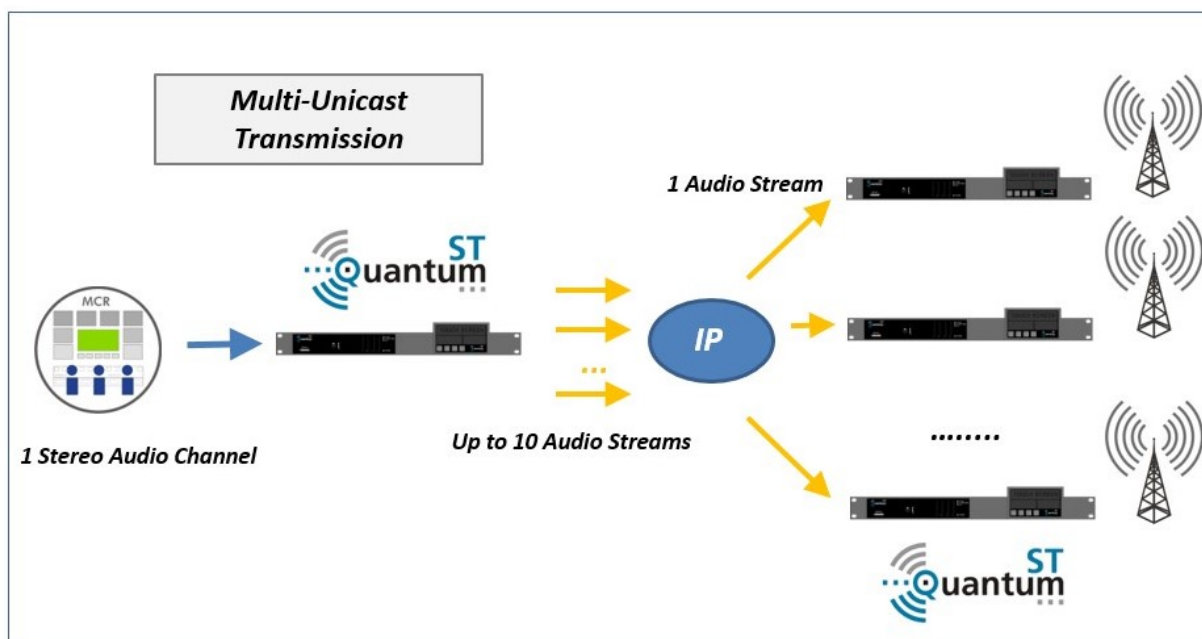
In addition to these tools available in the BRAVE protocol, Prodys Quantum devices have different working modes that make them very flexible when adopting different network topologies.

#### Point-to-point Mode

Allows audio to be sent from one point to another, in one or both directions, using the IP unicast protocol.

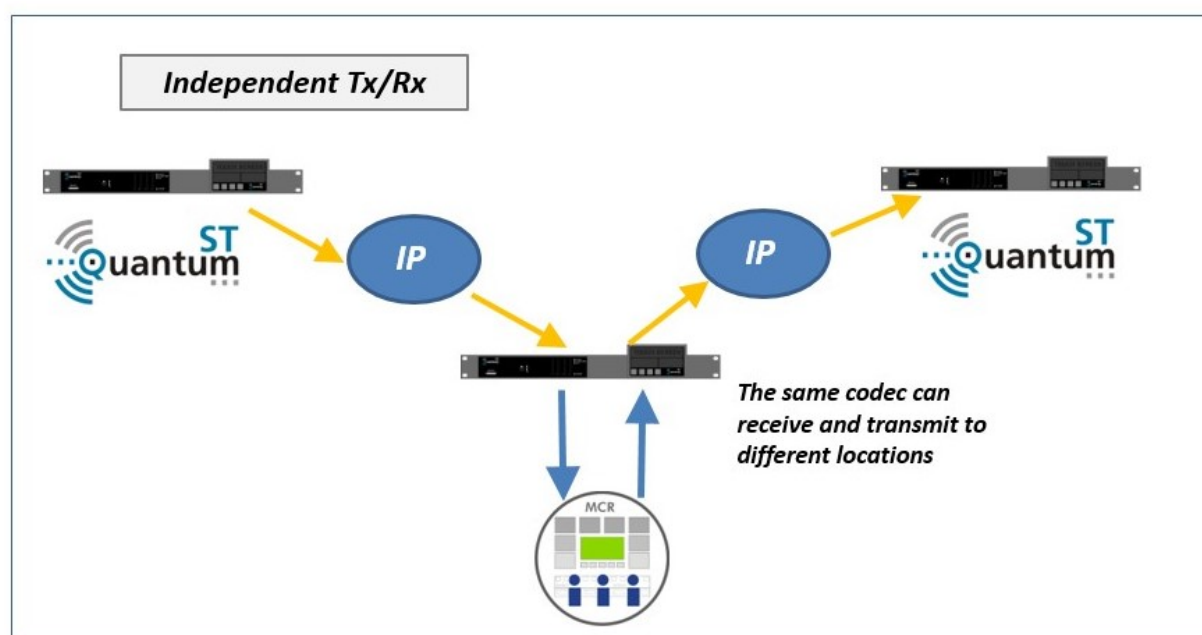
## Point-to-Multipoint Mode

It allows the same audio program to be sent from one location to up to 10 different destinations, unidirectionally, using the proprietary Multi-Unicast protocol. On dedicated lines it is possible to use the Multicast protocol for transmission to any number of destinations.



## Independent TX/RX Mode

It allows the same codec to send audio to one destination and receive audio from another. This configuration allows for greater savings in the number of equipment required and greater flexibility in contribution networks.



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## QUANTUM CODECS FOR AUDIO DISTRIBUTION

Prodys has a complete range of rack equipment to adapt to different scenarios.:

### Quantum ST

This is the basic Prodys audio codec. It allows the encoding and decoding of one or two stereo signals. It has analogue, digital and AES67 (optional) inputs and outputs.



### Quantum One and Quantum 3U Multicodecs

They are modular units that allow a high concentration of audio channels in a minimum of space. The Quantum One is a single rack unit that can house up to 8 stereo channels. The Quantum 3U is a 3 rack unit which can house up to 28 stereo channels. We can highlight the following advantages of this type of equipment::

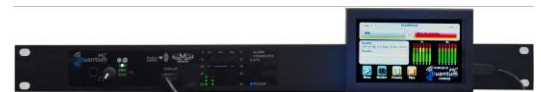
- It is a modular system, which facilitates maintenance (all modules are hot removable) and spare parts management.
- The AES67 AoIP option allows you to minimise the wiring of audio inputs and outputs, as all channels are concentrated on a single cable.
- It allows to grow according to the needs of the moment, maintaining the same rack space.
- Allows interchangeable elements between racks.



### Quantum MC

It is a multi-channel IP codec that allows the transmission of 5.1 audio signals (i.e. 6 mono audio in phase) synchronised over the Internet between two devices.

Equally, this product could be used as an efficient low-delay bidirectional 6-voice/audio channel between two production centres.



### QLST

It is the most economical and smallest option. It allows the encoding of a stereo channel with analogue or digital input and output audio.

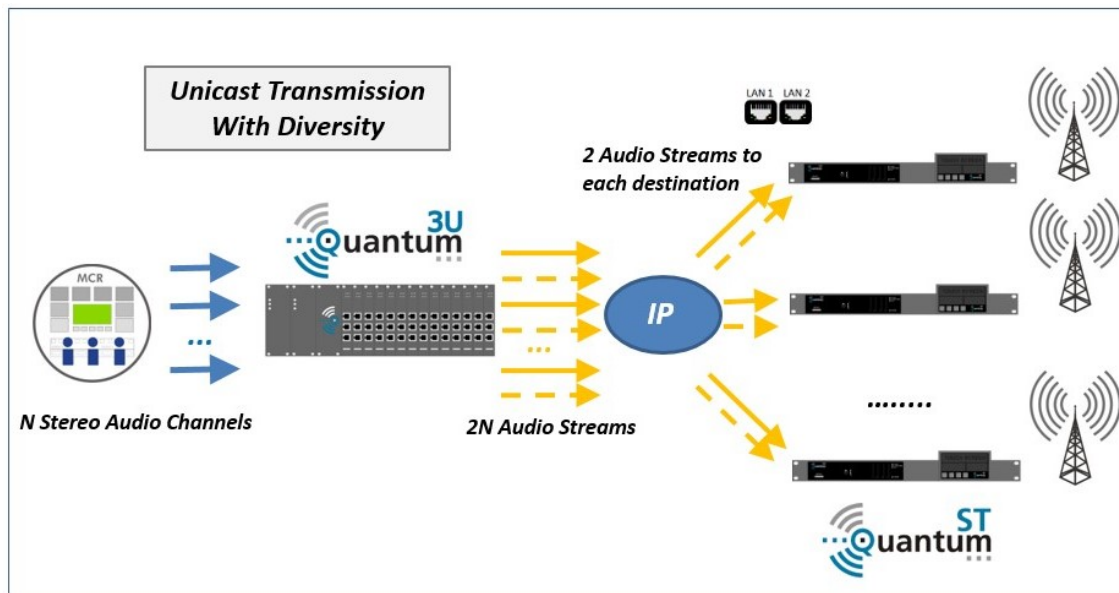


## REDUNDANCY

A very important element in the design of an audio distribution network is to have as many redundant elements as possible, without increasing the cost. Some of these elements that contribute to secure transmissions include:

### Connection

The Quantum codecs have two Ethernet ports that allow them to transmit and receive the audio stream over two different networks, in what we call Diversity mode. In this mode, the audio stream is duplicated and sent by each interface, so that every IP packet has a copy sent by another path, so that a packet loss in one of the interfaces is easily corrected by the packets sent by the other. The great advantage of this way of working compared to more traditional backup solutions is that it does not affect the quality of service as there is no interruption in the outgoing audio.



### Redundant Power Supply

All units, except the QLST, have the possibility of installing a redundant power supply that would switch automatically in case of failure of the main power supply. In the case of the Quantum 3U, the installation of the power supplies can be done hot-swappable, without interrupting the operation of the equipment.

### Two Audio Outputs in parallel

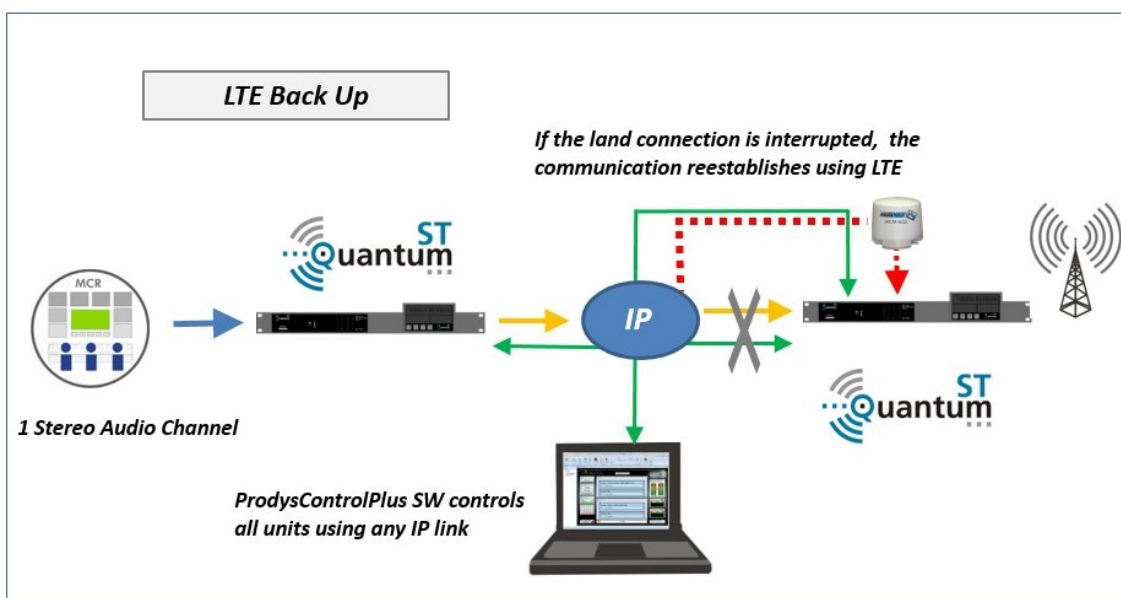
The devices have one analogue and one digital AES/EBU output. When an AoIP interface is available, a third parallel output is added via that network. (Not available on QLSTs).

## File Backup

It is possible to have a pre-recorded audio file on a USB memory stick connected to the receiving equipment that can be played in a loop when a break in communication is detected. (Only available in Quantum ST units).







## Backup LTE

In installations subject to the interruption of land lines (due to natural disasters, for example), Quantum ST equipment offers the possibility of making a backup connection using one or more LTE modems when the service interruption is detected. The modems connected to the receiving equipment not only re-establish the lost connection, but also allow remote control of the equipment via the ProdysControlPlus management software, even if the equipment has lost landline connectivity.





## REFERENCES

SRG SSR	Switzerland	
HBS	Switzerland	
VRT	Belgium	
BBC	UK	
NOS	Netherlands	
WDR	Germany	
Deutschland Radio	Germany	
DR	Denmark	
RNE	Spain	
O2	Czech Republic	
Swedish Radio	Sweden	
NENT Group	Sweden	
ORF	Austria	
RAI	Italy	
NEP Group	USA	
Qatar Radio	Qatar	
RTM	Malaysia	
NHK	Japan	
RRI	Indonesia	
SABC	South Africa	
NBC	Namibia	



BBC Wales



SRG SSR



NEP Group

# MAIN FEATURES OF QUANTUM CODECS

	QLST	QUANTUM ST	QUANTUM ST DUO	QUANTUM ONE	QUANTUM 3U	QUANTUM MC
<b>Form factor</b>						
19" half rack	●					
19" rack		●	●			●
19" rack modular				● (1U)	● (3U)	
<b>Protocols &amp; applications</b>						
BRAVE: 1x stereo /mono	●	●	●	●	●	●
BRAVE: 2x stereo			●	●	●	
BRAVE: 5.1 (6 ch mono)						●
SIP: 1x stereo /mono	●	●	●	●	●	
SIP: 2x stereo			●	●	●	
RTP: 1x stereo /mono	●	●	●	●	●	
<b>Streaming protection</b>						
BRAVE: Diversity	●	●	●	●	●	●
BRAVE: FEC	●	●	●	●	●	●
BRAVE: Active Recovery	●	●	●	●	●	●
SIP: FEC (RFC2733)	●	●	●	●	●	
SIP: Diversity Streaming EBU3368	●	●	●	●	●	
<b>Streaming interfaces</b>						
Audio over 1x LAN	●	●	●	●	●	●
Audio over 2x LAN	●	●	●	●	●	●
Audio over 4x 3G/4G			●			●
<b>Audio interfaces</b>						
Analog inputs	1x st	1x st	2x st	8x st	28x st	
AES3 digital stereo input	●	●	●	●	●	
USB digital stereo audio	●	●	●			
Headphone output		●	●			●
AES67 / DANTE / Ravenna		●	●	●	●	●
<b>Compression Algorithms</b>						
OPUS	●	●	●	●	●	●
Enhanced Aptx	●	●	●	●	●	●
Uncompressed (16, 20, 24bit)		●	●	●	●	●
G.711		●	●	●	●	●
G.722	●	●	●	●	●	●
MPEG L2	●	●	●	●	●	●
MPEG-4 AAC LC, LD, HE, ELD		●	●	●	●	
<b>Management</b>						
Touch panel	●	●	●			●
Web Browser	●	●	●	●	●	●
ProdysControlPlus	●	●	●	●	●	●
<b>Powering</b>						
VAC	●	●	●	●	●	●
Redundant VAC		●	●	●	●	●

● Standard

● Option