

# **Mimomax Backhaul and Linking Solutions**

## Ability to support multiple channels

with more than 10 P25 Channels and 13 DMR channels in 25 KHz

Ultra-Low latency of typically only 8ms in 25KHz channels

#### Super reliable communications

with low jitter of 50 ns & achievable Bit Error Rate (BER) of 1 x 10  $^{\mbox{-}10}$ 

#### Long range paths

via the ability to use lower orders of modulation to provide fade-resistant paths greater than 100km

#### Remote diagnostic

to minimize need for on-site technician visits

#### Sophisticated compression & quality of service (QoS)

to maintain criticality of voice communications.

#### **TESTIMONIAL**

"We needed a radio vendor who could provide links which could cover long hops where there are no available intermediate sites. As the Mimomax radios are dual polarization, the design of the radio lends itself to these long-haul links – we now have links running successfully up to 80 kilometres."

IAN MCNALTY | SNR SECONDARY SYSTEMS COMMS OFFICER - ERGON ENERGY



### LMR Backhaul & Linking Solutions



Figure 1 : Ubiik Mimomax NDL Linking in a 5+1 Channel P25 Trunking System

		P25		DMR		Analog
	Modulation	Number of Trunked Channels	Residual Ethernet BW	Number of Trunked Channels	Residual Ethernet BW	Number of Trunked Channels
75 kHz	QAM256	32 Channels	130 kbps	45 Channels	184 kbps	6 Channels
	QAM64	26 Channels	108 kbps	35 Channels	138 kbps	6 Channels
	QAM16	20 Channels	104 kbps	25 Channels	110 kbps	6 Channels
	QPSK	10 Channels	91 kbps	15 Channels	62 kbps	6 Channels
50 kHz	QAM256	25 Channels	58 kbps	30 Channels	138 kbps	6 Channels
	QAM64	18 Channels	149 kbps	25 Channels	92 kbps	6 Channels
	QAM16	12 Channels	126 kbps	15 Channels	119 kbps	6 Channels
	QPSK	5 Channels	74 kbps	8 Channels	53 kbps	6 Channels
25 kHz	QAM256	10 Channels	154 kbps	13 Channels	143 kbps	6 Channels
	QAM64	8 Channels	111 kbps	11 Channels	95 kbps	5 Channels
	QAM16	5 Channels	78 kbps	7 Channels	65 kbps	3 Channels
	QPSK	2 Channels	44 kbps	3 Channels	35 kbps	1 Channels (with E&M) 2 Channels (no E&M)
12.5 kHz	QAM256	5 Channels	77 kbps	7 Channels	64 kbps	3 Channels
	QAM64	4 Channels	55 kbps	5 Channels	49 kbps	2 Channels
	QAM16	2 Channels	44 kbps	3 Channels	35 kbps	1 Channels (with E&M) 2 Channels (no E&M)
	QPSK	N/A	N/A	1 Channel	19 kbps	1 Channels (no E&M)

Figure 2: Minimum number of trunked of conventional voice channels supported, by modulation rate

**ADAPTIVE MODULATION** – when running at QAM256, the Tornado radio uses a software feature enabler called M-CAM to boost performance. By scanning the RF channel conditions, M-CAM enables the radio unit to transverse between QPSK and the maximum modulation available to optimize data throughput. **RESIDUAL BANDWIDTH** – as noted in the table, in addition to supporting multiple voice channels, the residual bandwidth can be used for other applications such as the transfer of data from sites or assets.

ANALOGUE TO DIGITAL – via a modified ADPCM vocoder, Ubiik Mimomax has the ability to simultaneously link multiple tone transparent, analogue voice channels and provide IP for linking digital radio channels. When digital base stations are used in analoque mode, two or more concurrent G711 voice streams can be transported while also providing IP connectivity.