

## SERIES II OPV - OPTIMISED PROTECTION VARIANT

### Radio Spec Sheet

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The Mimomax Optimised Protection Variant (OPV) is an ultra spectrally efficient, very low latency, low jitter tele-protection and SCADA solution for Critical Network Infrastructure. It achieves very low bit error rates and latencies as low as 5.05ms, to provide highly reliable, near real time and low error data services.

### KEY FEATURES

- ▶ *Very low latencies*
  - *5.05 ms in a 25 kHz channel*
  - *8 ms in a 12.5 kHz channel*
- ▶ *Low nominal inter-symbol jitter rate typ <50ns*
- ▶ *Very low bit error rates <1 x 10<sup>-7</sup>*
- ▶ *Very high data throughput rates*
  - *Up to 240 kb/s raw data rate in a 25 kHz channel*
  - *Up to 120 kb/s raw data rate in a 12.5 kHz channel*
- ▶ *Point-to-Point*
- ▶ *UHF licensed spectrum*
- ▶ *Tele-protection & SCADA solution*
- ▶ *User settable frequency & programmable power*
- ▶ *Ethernet, Serial & Audio interfaces*
- ▶ *Built-in Multiplexer*
- ▶ *Built-in Duplexer*
- ▶ *Advanced software features*
- ▶ *Long range data transmission*
- ▶ *Rack, pole & wall mountable*

# SERIES II OPV - OPTIMISED PROTECTION VARIANT SPECIFICATIONS

RF General		
RF Bands	400 MHz	900 MHz
RF Frequency Range (1)	369 to 470MHz(1)	806 to 960MHz
RF Frequency Band Splits	369-390 MHz 420-430 MHz 440-450 MHz 450-470 MHz	806-869 MHz 852-933 MHz 896-960 MHz
Configuration	2 x 2 MiMO	2 x 2 MiMO
Supply Voltage	(Non-Isolated) 10.5V DC to 32V DC	
Nominal Channel Bandwidth	12.5 kHz & 25 kHz (50 kHz future)	
Modulation Options (Software Configurable)	16 & 64 QAM	
Gross Data Rate	25 kHz/16QAM 12.5 kHz/16QAM 12.5 kHz/64QAM	160kb/s 80kb/s 120kb/s
Latency	25 kHz/16QAM(2) 12.5 kHz/16QAM(3) 12.5 kHz/64QAM(3)	5.05ms 9.8ms 8ms
Maximum Power Consumption	92W Max (at 13.8V) 72W Typical	
Ambient Temp Range	-25°C to + 60°C	
Symbol Rate	2 x 20k symbols / second	
Mounting	2U high Rack Mount Pole Mount Unit Wall Mount Unit	
RF Mounting Dimensions (W x H x D)	Rack Wall/Pole	440 x 84.5 x 382 mm <i>box size</i> 481 x 86 x 392 mm <i>incl. protrusions</i> 262 x 393 x 86.5 mm <i>radio unit only, excl. mounting</i>
Weight	6.8kg <i>radio unit only, excl. mounting</i>	

Receiver		
Modulation	16/64 QAM	
Typical RF Sensitivity for 10-4 BER	25 kHz 12.5 kHz	-103/-97 dBm -106/-100 dBm
Typical RF Sensitivity for 10-7 BER	25 kHz 12.5 kHz	-101/-95 dBm -104/-98 dBm
Frequency Step Size	5 kHz & 6.25 kHz Adjustable	
Frequency Accuracy and Stability	≤1.5 ppm	

Transmitter		
Modulation	16/64 QAM	
RF Power Output	2 x +30dBm (typ 1W) Average	
RF Power Control Range	>20 dB	
Frequency Step Size	5 kHz & 6.25 kHz Adjustable	
Frequency Accuracy and Stability	≤1.5 ppm	

Duplexer (Internal)		
RF Bands	400 MHz	900 MHz
Bandwidth	>300 kHz (Stop Band)	>4 MHz (Pass Band)
Tx / Rx Split	5 MHz min	24-76 MHz
Stop Band Attenuation	>70dB	
Insertion Loss	<2dB	

**Important:** Specifications are subject to change without prior notice

Internal Digital Interfaces (Data & Analogue)	
<b>ETHERNET</b>	
Format	10/100BaseT
Connector	RJ45
Ethernet Supported Bit Rates	Up to 128kb/s(4)
<b>SYNCHRONOUS SERIAL</b>	
Format	RS422, RS530, V.35, X.21, HSSI, V.11 OR G.703 (at 64kbp/s), Fibre C37.94
Connector	RJ45
Input clock(4) Transmit clock	Internal or external
Supported bit rates (5)	64 & 128kbps - X21 & RS530 64kbps - G.703 & C37.94
Output clock(6) Receive clock	Internal Sync'ed to data stream
Nominal inter-symbol jitter	Typ <50ns
<b>FIBRE</b>	
Format	C37.94 Single mode, Multimode
Connector	ST
<b>ASYNCHRONOUS SERIAL</b>	
Format	Single & Dual(7)RS232
Connector	RJ45
Baud Rate	300- 115 200 baud

## External Network Interfaces via Interface Hardware

FOUR WIRE AUDIO	
Format	2 x 4 wire 600 Ω ports
Coding	32 kbps ADPCM(8)
Connector	RJ45

SUB MUX	
Format	2 x RS422, X.21 4 x RS232 (V.24) 1 x C37.94 Fibre

Compliances		
RF Bands	400 MHz	900 MHz
Radio Performance	FCC 47CFR part 90 FCC: XMK-MMXRUDHB002 IC Canada RSS-119 8587A-RUBFDHB2 ACMA AS/NZS 4768 & AS/NZS 4295-2004 & EN 300 113 EN 302 217 EN302 217-2-2 V1.2.3 & EN302 326-2 V1.2.2 EN 302-113 EN 300-113-2 V1.4.1	FCC 47CFR part 101 XMR-MMXRUPRX003 IC Canada RSS-119 8587A-RUPQRSB3
EMC	AS/NZS/CISPR22 EN 301 489 EN 301 489-1 V1.8.1 & EN301 489-4 V1.3.1 FCC 47CFR part 15 ICES-003	
Environmental	EN 300 019 Sections 3.3 & 4.2H	
Safety	EN 60950 (2006)	

- (1) Other frequencies available on request
- (2) Meets CAT I, II & III Protection Requirements
- (3) Meets CAT II & III Protection Requirements
- (4) Input from connected equipment
- (5) 128kbp/s is the maximum total data rate, shared between Serial & Ethernet ports (NB: Clocks are defined from the perspective of the connected equipment, i.e. Tx Clock is an input)
- (6) Output from connected equipment
- (7) The Dual RS232 does not include hardware flow control
- (8) Other CODECS also available on request