



OPV - OPTIMISED PROTECTION VARIANT

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
 - 5.05ms in a 25kHz channel
 - 8ms in a 12.5kHz channel
- ~ Low nominal inter-symbol jitter rate typ <50ns
- ~ Very low bit error rates <1 x 10⁻⁷
- ~ Very high data throughput rates
 - Up to 240kb/s raw data rate in a 25kHz channel
 - Up to 120kb/s raw data rate in a 12.5kHz 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

BENEFITS

Highly Reliable

Near Real Time

Very Adaptable

Robust

Secure

Scalable

Future Defensive

Environmentally Sound



OPV PRODUCT SPECIFICATIONS

| RF General | | |
|--|--|---|
| RF Bands | 400MHz | 900MHz |
| RF Frequency Range | 369 to 470MHz ⁽¹⁾ | 806 to 960MHz ⁽¹⁾ |
| RF Frequency Band Splits | 369-390MHz 420-430MHz 440-450MHz 450-470MHz | 806-869MHz 852-933MHz 896-960MHz |
| Configuration | 2 x 2 MiMO 2 x 4 MiMO | 2 x 2 MiMO |
| Supply Voltage | (Non-Isolated) 10.5V DC to 32V DC | (Isolated) 10.5V DC to 64V DC |
| Nominal Channel Bandwidth | 12.5 kHz & 25 kHz (50 kHz future) | |
| Modulation Options <i>(Software Configurable)</i> | 16 & 64QAM | |
| Gross Data Rate | 25 kHz/16QAM | 160kb/s |
| | 12.5 kHz/16QAM | 80kb/s |
| | 12.5 kHz/64QAM | 120kb/s |
| Latency | 25 kHz/16QAM ⁽²⁾ | 5.05ms |
| | 12.5 kHz/16QAM ⁽³⁾ | 9.8ms |
| | 12.5 kHz/64QAM ⁽³⁾ | 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 | 440 x 84.5 x 382mm <i>box size</i> 481 x 86 x 392mm <i>incl. protrusions</i> |
| | Wall/Pole | 262 x 393 x 86.5mm, <i>radio unit only, excl. mounting</i> |
| Weight | 6.8kg <i>radio unit only, excl. mounting</i> | |

Receiver

| | | |
|-------------------------------------|---------------------------|------------|
| Modulation | 16/64QAM | |
| Typical RF Sensitivity for 10-4 BER | 25 kHz | 99/94dBm |
| | 12.5 kHz | -102/97dBm |
| Typical RF Sensitivity for 10-7 BER | 25 kHz | -98/92dBm |
| | 12.5 kHz | -101/95dBm |
| Frequency Step Size | 5kHz & 6.25kHz Adjustable | |
| Frequency Accuracy and Stability | ≤2ppm | |

Transmitter

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

Duplexer (Internal)

| | | |
|-----------------------|-------------------------------|-----------------------------|
| RF Bands | 400MHz | 900MHz |
| Bandwidth | >500kHz <i>(Stop Band)</i> | >4MHz <i>(Pass Band)</i> |
| Tx / Rx Split | 5MHz min | 24-76MHz |
| Stop Band Attenuation | >70dB | |

- (1) Other frequencies available on request
 (2) Meets CAT I, II & III Protection Requirements
 (3) Meets CAT II & III Protection Requirements

Internal Digital Interfaces (Data & Analogue)

| | | |
|--|---|--|
| ETHERNET | | |
| Format | 10BaseT | |
| | 10/100BaseT (900MHz) | |
| Connector | RJ45 | |
| Ethernet Supported Bit Rates | Up to 128kb/s ⁽⁴⁾ | |
| SYNCHRONOUS SERIAL | | |
| Format | RS422. V.35, X.21, HSSI, V.11 OR G.703 (at 64kbp/s), Fibre C37.94 | |
| Connector | RJ45 | |
| Input clock ⁽⁵⁾ <i>Transmit clock</i> | Internal or external | |
| Supported bit rates | 32 to 128kbp/s ⁽⁴⁾ | |
| Maximum internal clock error | +/- 20ns | |
| Supported external clock error | +/- 3% | |
| Output clock ⁽⁶⁾ <i>Receive clock</i> | Internal <i>Sync'ed to data stream</i> | |
| Nominal inter-symbol jitter | Typ <50ns | |
| FIBRE | | |
| Format | Fibre C37.94 | |
| Connector | ST | |
| ASYNCHRONOUS SERIAL | | |
| 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 600Ω ports | |
| Coding | 32kbps 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 | 400MHz | 900MHz ⁽⁹⁾ |
| Radio Performance | ACMA <i>AS/NZS 4768 & AS/NZS 4295-2004</i> | ACMA <i>AS/NZS 4768 & EN 300 113</i> |
| | FCC 47CFR part 90 <i>FCC: XMK-MMXRUDHB002</i> | FCC 47CFR part 101 |
| | RSS-Gen <i>RSS-119</i> IC Canada <i>8587A-RUBFDHB2</i> | RSS-Gen <i>RSS-119</i> |
| | EN 302 217 <i>EN302 217-2-2 V1.2.3 & EN302 326-2 V1.2.2</i> | |
| | EN 302-113 <i>EN 300-113-2 V1.4.1</i> | |
| EMC | AS/NZS/CISPR22 EN 301 489 <i>EN 301 489-1 V1.8.1 & EN301 489-4 V1.3.1</i> FCC 47CFR part 15 ICES-003 | |
| Environmental | EN 300 019 <i>Sections 3.3 & 4.2H</i> | |

- (4) 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)
 (5) Input from connected equipment
 (6) Output from connected equipment
 (7) The Dual RS232 does not include hardware flow control
 (8) Other CODECS also available on request
 (9) Designed to be compliant with listed standards