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| STANDARD  |         | CODING MODULATION |  | DATA RATES & CHARACTERISTICS |    |    |   | MILITARY MODERN SOFTWARE PACK |   |   |   |
|---|---------|-------------------|--|------------------------------|----|----|---|-------------------------------|---|---|---|
|   |         |                   |  | M2                           | M3 | M4 |   |                               |   |   |   |
| MIL-STD-188-110B  | PSK/QAM | U                 | 12800 bps  | •                            | •  | •  | • | •                             | • | • | • |
| APPENDIX C  | PSK/QAM | C                 | 75, 150, 300, 600, 1200, 2400, 4800, 9600 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4539   | PSK/QAM | C                 | 12800 bps  | •                            | •  | •  | • | •                             | • | • | • |
| MIL-STD-188-110B  | PSK/QAM | U                 | 12800 bps  | •                            | •  | •  | • | •                             | • | • | • |
| MIL-STD-188-110A § 5.3  | PSK     | C                 | 75, 150, 300, 600, 1200, 2400 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4415   | PSK     | C                 | 4800 bps   | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4415   | PSK     | C                 | NATO robust: 75 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4285   | PSK     | C                 | 75, 150, 300, 600, 1200, 2400 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4285   | PSK     | U                 | 1200, 2400, 3600 bps   | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4529   | PSK     | C                 | 75, 150, 300, 600, 1200 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4481 PSK   | PSK     | U                 | 600, 1200, 1800 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4481 PSK   | PSK     | C                 | 300 bps  | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4481 FSK   | FSK     | U                 | Single channel: 75 bps   | •                            | •  | •  | • | •                             | • | • | • |
| STANAG 4481 FSK   | FSK     | U                 | Multi-channel: 75 bps selectable carrier   | •                            | •  | •  | • | •                             | • | • | • |
| FSK VARIABLE  | FSK     | U                 | Data Rates: 50, 75, 100, 150, 200, 300, 400, 600, 1200 bps<br>Mark & Space Frequency: 350 to 3000 Hz | •                            | •  | •  | • | •                             | • | • | • |
| <b>GENERAL</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Carrier capture range ±200 Hz, Sync-on-Data   |         |                   |  |                              |    |    |   |                               |   |   |   |
| All WAVEFORMS   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Frequency tracking of up to 75 Hz changing at 3.5 Hz per second (triangular sweep)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Comprehensive BIT (Built-In-Test), Continuous error detection   |         |                   |  |                              |    |    |   |                               |   |   |   |
| PRESETS   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 20 Factory Presets, 10 Custom Presets   |         |                   |  |                              |    |    |   |                               |   |   |   |
| AGC CONTROL   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Transceiver AGC control is necessary for optimum performance of QAM W/Fs  |         |                   |  |                              |    |    |   |                               |   |   |   |
| REMOTE CONTROL  |         |                   |  |                              |    |    |   |                               |   |   |   |
| All W/Fs and 2G ALE settings are remote controllable via Remote Control Port  |         |                   |  |                              |    |    |   |                               |   |   |   |
| AUTOBAUD  |         |                   |  |                              |    |    |   |                               |   |   |   |
| All PSK waveforms except for STANAG 4285 & 4529, Sync-on-Data capability.   |         |                   |  |                              |    |    |   |                               |   |   |   |
| TONE EXCISION   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Narrowband Interference cancellation of up to 4 signals   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>SOFTWARE OPTION</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>CHARACTERISTICS</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Automatic Link Establishment 2 <sup>nd</sup> Generation (2G ALE)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Occupancy Detection: MS 110A/B, S 4285, S 4415, S 4529, S 4481, FSK, 8-FSK, SSB Voice   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Protocol: Calling, AMD, DTM, Excluding: DBM, AQC-ALE  |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Link Quality Analysis (LQA)   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Scanning (2 or 5 channels per second)   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Selective Calling   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Automatic Sounding  |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Automatic Hand-Off to Internal Modem  |         |                   |  |                              |    |    |   |                               |   |   |   |
| The unit may already support a particular radio protocol. If not, the radio control protocol must be made available to RapidM for integration & testing.  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>ALE 2G</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Automatic Link Establishment 2 <sup>nd</sup> Generation (2G ALE)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Synchronous: Data Rate: 50, 75, 100, 150, 200, 300, 400, 600, 1200, 1800, 2400, 3200, 3600, 4800, 6400, 8000, 9600 bps, Full Duplex, 5/6/7/8 bit data, 1, 2 stop bits, Flow ctrl: CTS/RTS, data polarity: norm / inv. |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Asynchronous: 75 to 115200 bps, Full Duplex, 5/6/7/8 bit data, 1, 2 stop bits, Flow ctrl: CTS/RTS, data polarity: norm / inv.   |         |                   |  |                              |    |    |   |                               |   |   |   |
| RS-485 Multi-drop, RS-232D (DE9 connector, male):   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Data Rate: 1200 to 115200 bps, 1 or 2 stop bits, 8 bit character lengths  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Flow Control CTS/RTS, Protocol: RM4 Control Protocol (proprietary)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>ETHERNET</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Data & Control, 10/100 Base T, RJ 45 connector, embedded TCP/IP Stack, Protocol: RM4 Ctrl Protocol  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>F/PANEL</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| 8 bi-colour status LED indicators on front panel:   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • DTE, REM Ctrl / LAN, RADIO Ctrl connection status   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Mail (AMD), Modem & ALE, Voice call activity status, Power indicator  |         |                   |  |                              |    |    |   |                               |   |   |   |
| RS-232 (DE9 connector): 75 to 115200 bps, 1 or 2 stop bits, 7/8 bit character lengths.  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Supports for various radio control protocols are built-in. See the RapidM 2G ALE Product brochure for more details.   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>RADIO CONTROL PORT</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Input Audio: 600 Ohm balanced, -20 to +15 dBm without adjustment  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Output Audio: Balanced, -40 to +10 dBm (PMP) adjustable into 600 ohm load   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Keyline: Open collector to ground (<45 volts, 50 mA) & non-polarized contact closure (<45 V, 200 mA)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>INTERFACES</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| RS-422 balanced, RS-423, RS-232 unbal., MIL-STD-188-114 compatible & EIA 530A compliant (DB25 connector)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Half & Full Duplex operation, Sync, standard async and high-speed mode supported:   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Synchronous: Data Rate: 50, 75, 100, 150, 200, 300, 400, 600, 1200, 1800, 2400, 3200, 3600, 4800, 6400, 8000, 9600 bps, Full Duplex, 5/6/7/8 bit data, 1, 2 stop bits, Flow ctrl: CTS/RTS, data polarity: norm / inv. |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Asynchronous: 75 to 115200 bps, Full Duplex, 5/6/7/8 bit data, 1, 2 stop bits, Flow ctrl: CTS/RTS, data polarity: norm / inv.   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>DTE (DATA) PORT</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| RS-485 Multi-drop, RS-232D (DE9 connector, male):   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Data Rate: 1200 to 115200 bps, 1 or 2 stop bits, 8 bit character lengths  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Flow Control CTS/RTS, Protocol: RM4 Control Protocol (proprietary)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>REMOTE CONTROL PORT</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Data & Control, 10/100 Base T, RJ 45 connector, embedded TCP/IP Stack, Protocol: RM4 Ctrl Protocol  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>F/PANEL</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| 8 bi-colour status LED indicators on front panel:   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • DTE, REM Ctrl / LAN, RADIO Ctrl connection status   |         |                   |  |                              |    |    |   |                               |   |   |   |
| • Mail (AMD), Modem & ALE, Voice call activity status, Power indicator  |         |                   |  |                              |    |    |   |                               |   |   |   |
| RS-232 (DE9 connector): 75 to 115200 bps, 1 or 2 stop bits, 7/8 bit character lengths.  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Supports for various radio control protocols are built-in. See the RapidM 2G ALE Product brochure for more details.   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>RADIO CONTROL PORT</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Input Audio: 600 Ohm balanced, -20 to +15 dBm without adjustment  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Output Audio: Balanced, -40 to +10 dBm (PMP) adjustable into 600 ohm load   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Keyline: Open collector to ground (<45 volts, 50 mA) & non-polarized contact closure (<45 V, 200 mA)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>INSTALLATION</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>WEIGHT</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 1.7 kg (approx.)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>COLOUR</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Black powder coat   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>SIZE</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 41.1 x 212.7 x 159.0 mm (h x w x d),<br>Front panel height: 44.1 mm   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>POWER</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| 87 to 267 V AC, 47 to 440 Hz  |         |                   |  |                              |    |    |   |                               |   |   |   |
| 6 to 36V DC   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 1 unit in 1/2 19" Rack slot   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 2 units side-by-side on shelf   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>RACK MOUNTING</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>ENVIRONMENTAL</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>TEMPERATURE</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| -30°C to +70°C (operating);   |         |                   |  |                              |    |    |   |                               |   |   |   |
| 0 to 90% non-condensing   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>HUMIDITY</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| MIL-STD-810E Method 516.4,  |         |                   |  |                              |    |    |   |                               |   |   |   |
| Procedure 1, Funct. (40G, 11 ms)  |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>SHOCK</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| MIL-STD-810E Meth. 514.4, Cat. 9,   |         |                   |  |                              |    |    |   |                               |   |   |   |
| Shipboard   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>VIBRATION</b>  |         |                   |  |                              |    |    |   |                               |   |   |   |
| EMC   |         |                   |  |                              |    |    |   |                               |   |   |   |
| MIL-STD 461-E   |         |                   |  |                              |    |    |   |                               |   |   |   |
| <b>SAFETY</b>   |         |                   |  |                              |    |    |   |                               |   |   |   |
| IEC/EN 60950  |         |                   |  |                              |    |    |   |                               |   |   |   |