AlphaWave
Narrowband Radio Modems
WIRELESS SOLUTIONS
FOR SYSTEM CONTROL APPLICATIONS

ETSI

FC Federal Communications Commission

AW*200Tx*™: OEM VHF 200—235 MHz

DSP based OEM Radio Modem with Built-in wireless link Monitoring and Management Tools:

- Both Licensed and Unlicensed operation modes
- 50 miles Maximum Distance Range
- Data Speed over the air 38400 bps at 25 kHz and 19200 bps at 12.5 kHz
- Programmable Output Power (10 mW to 1 W)
- Advanced Forward Error Correction (FEC)
- RS-232 compatible serial interfaces with RTS/CTS flow control support
- Data Speed over the serial ports 300 to 115200 bps
- Testing, monitoring and control of the unit over the air
- *AlphaWave* SuperScan® - automatic search and select for best frequency/channel

ArWest Communications Corp. exceeds established standards within the SCADA and outdoor telemetry markets with the release of *AlphaWave***400Tx** (*AW400Tx*™) series DSP based integrated wireless modem, the first in a series of next generation Narrow-Band products. The **AW400Tx**™ radio modem provides a high-speed Point-to-Point and Point-to-Multipoint wireless data transfer at up to 38.4 kbps.

AW software (**AWare™**) supports user selectable modulation techniques (GMSK/DBPSK, QPSK, 8PSK, or 16QAM), which allows the user to achieve the highest data speed for a given range (up to 50 miles). It also includes a selectable error correction, which improves the functioning of the radio modem under interference.

The unmatched features of *AW* include data scrambling, frequency hopping, user selectable transmit output power level, low power consumption sleep modes, auto-scanning for base and plug-and-play installation for remote terminals.

Mechanical Drawings

AW supports two separate Application Data and Maintenance RS-232 serial ports. Without data link interruption the radio parameter settings can be changed through the unit's Dedicated Maintenance serial port.

The built-in software tools provide the wireless link testing, units' status and error statistics monitoring as well as units' settings change over the air.

The software of the *AW* radio modem resides in a flash memory. The updating of the radio modem programs is entirely software-based. The flash memory is re-programmable through an RS-232 interface or over the air.
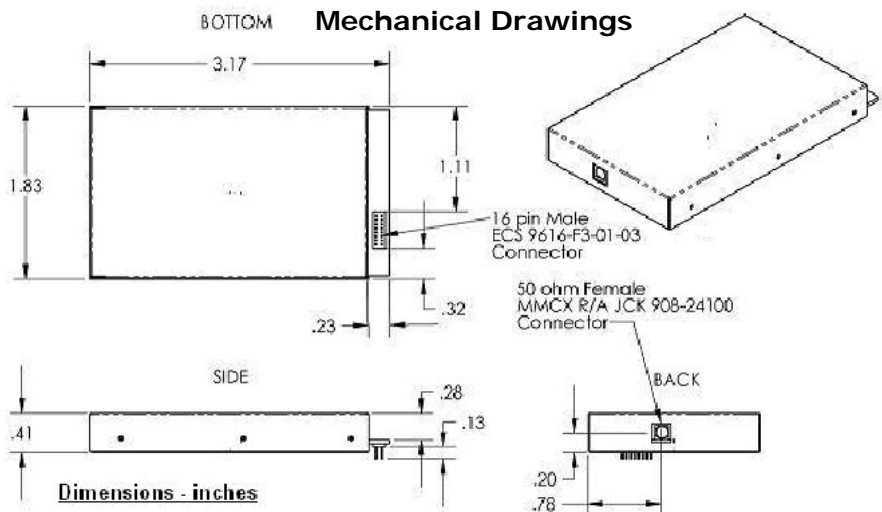
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ARWEST

AW*200Tx*™

General Radio Specifications

Parameter	Specification		
Operating Frequency Range	220 - 235 MHz		
Modulation Technique	GMSK/DBPSK, DQPSK, D8PSK and D16QAM		
Media Access Control Protocols	Time Division Duplex (TDD) Time Division Multiplex Access (TDMA)		
Supported User Interfaces	Serial Asynchronous (TTL compatible)		
Supported Comms. Protocols	Transparent Receiver		
Maximum Distance Range	50 miles / 80 km		
Occupied Bandwidth	6.25 kHz, 12.5 kHz or 25 kHz		
Data Rate	25 kHz	12.5 kHz	6.25 kHz
GMSK/DBPSK	9600	4800	2400
DQPSK	19200	9600	4800
D8PSK	28800	14400	7200
D16QAM	38400	19200	9600
System Gain (Antenna not incl.)	145 dBm	146 dBm	146 dBm
End to End delay	60 ms		

Transmitter Specifications

Parameter	Specification
Output Power	10 dBm to 30 dBm in 1 dB steps [Max Output for ETSI unlicensed = 27 dBm]
Output power control accuracy	± 1dB (normal conditions), +2.0 dB to -3.0 dB (extreme conditions)
Nominal Output Impedance	50 Ohms
Carrier Frequency Stability	±1.5 ppm initial stability over temp with ±3.0 ppm aging/year
Max. Frequency Error	±1.0 kHz (normal conditions), ±1.5 kHz (extreme conditions)
Adjacent Channel Power (Conducted) 25/12.5/6.25 kHz CS	< 70 / 60 / 50 dBc
Spurious Emission (Conducted)	-36 dBm @(9 kHz – 1GHz) -30 dBm @(1GHz – 4 GHz)
Spurious Emission (Radiated)	-36 dBm @(9 kHz – 1GHz) -30 dBm @(1GHz – 4 GHz)

Receiver Specifications

Parameter	Specification
Noise Figure	5 dB
Nominal Input Impedance	50 Ohms
Receiver Sensitivity (@BER 1x10^{-4}, over temperature −30°C to +60°C) 25/12.5/6.25 kHz CS	-115 / -116 / -117 dBm
Rx AGC Dynamic Range	-119 to −34 dBm
Co-Channel Rejection 25/12.5 kHz CS	-8 / -12 / -16 dB
Adjacent Channel Selectivity 25/12.5/6.25 kHz CS	70 / 60 / 50 dBc

Environmental Specifications

Parameter	Specification	
Temperature	Operating	−30°C to +60°C (ETSI 300-019-1-3 Class 3.1 (E).
	Storage	−40°C to +85°C
Environmental	OEM Product – characteristics dependent on housing	
Dimensions (H x W x D)	3.19″ x 1.82″ x 0.5″ (81mm x 46mm x 13mm)	
Weight	2 oz (57 g)	
Power Supply Voltage	Regulated 3.3 VDC from external power source	
Power Consumption (Average)	4W/2.5W/1.6W/0.05W – 100% DC/with 30% DC/with 10% DC/Sleep Mode	
Housing/Color	No Housing – OEM board plus shield, only	
Antenna Connector	Huber/Suhner: 85 MMCX 50-0-1 (female)	
User Interface Connector / Power Connector	16 pin Male Connector (ECS 9616-F3-01-03)	
Altitude	-1,000 m below sea level to 8,500 m above sea level	

Compliance

Parameter	Specification
ETSI / FCC / Industry Canada	ETSI 300-113 / FCC Part 90 / RSS-210
UL	UL 1419
UL Hazardous Locations	Class 1, Div 2; Groups A, B, C, and D; hazardous locations
FM	Approved