



ALPHA WAVE NARROWBAND RADIO MODEMS WIRELESS SOLUTIONS

AW400Rx



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

- Data Speed over the air 38400 bps at 25 kHz and 19200 bps at 12.5 kHz
- Advanced Forward Error Correction (FEC)
- UART serial interface with RTS/CTS flow control support
- Data Speed over the serial port 9600 to 115200 bps
- Testing, monitoring and control of the unit over the air
- AlphaWave SuperScan® - automatic search and select for best frequency/channel

The AW400Rx radio receiver provides a high-speed wireless data transfer at up to 38.4 kbps. Receiver supports user selectable modulation techniques (GMSK, 4FSK, DBPSK, DQPSK, D8PSK, or D16QAM), which allows the user to achieve the highest data speed for a given range. It also includes a selectable error correction, which improves the functioning of the radio link under interference.

AW400Rx can receive data from ArWest, Pacific Crest, and Satel transmitters. The unmatched features of radio include data scrambling, frequency hopping and low power consumption sleep modes.

AW400Rx supports two separate Application Data and Command modes of single UART 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 firmware of the AW400Rx 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 UART interface or over the air.

AW400Rx

General Specification

- Input Voltage: 3.6 V ± 5 %
- Power Consumption: max 1 W
- Operation Temperature: -40°C ... +60°C
- Storage Temperature: -40°C ... +80°C
- Dimensions: L: 80 mm x W: 46.5 mm x H: 7.6/9.5 mm
- Weight: 40 g

Features

- DSP-Modem
- Multi-Modulation Technologies
- Zero-IF Technologies
- 406 - 470 MHz Frequency Range
- Up to 115200 bps Data Rate
- Embedded Firmware Compensation for Operation at Extremely Low and High Temperatures
- Compact Design

External Connectors:

RF Connector

J2 is Antenna Input / Output Connector: MMCX RIGHT ANGLE PCB JACK, AMPHENOL P/N 908-24100.

Main Connector (J1)

16-Lead Header Connector, ECS Corp. P/N 9616-D1-01-03

PIN #	Signal Designator	Signal name	Description	I/O	Comments
1	GND	GND	Ground	-	Signal and Chassis Ground
2	DSP UART 1	TXD	Transmitted Data	TTL Input	Serial Data Input
3	DSP UART 2	RXD	Received Data	TTL Output	Output for received serial data
4	DPORT5	DTR or DP/MP	Data Terminal Ready	TTL Input	Control line can be used as a backup method for entering Command mode: (0V) - Data Mode, (3.3V) - Command Mode An internal 10K pull-down enables Data Mode if this signal is left unconnected.
5	DPORT1	CTS	Clear to Send	TTL Output	Used to control transmit flow from the user to the radio: (0V) - Transmit buffer not full, continue transmitting (3.3V) - Transmit buffer full, stop transmitting
6	TTL1	SLEEP	Sleeps/wakes radio Receive only	TTL Input	In sleep mode, all radio functions are disabled consuming less than 50µA. An internal 10K pull-down wakes up the radio if this signal is left unconnected. At wake up, any user programmed configuration settings are refreshed from flash memory, clearing any temporary settings that may have been set: (3.3V) - Sleep Radio; (0V) - Wake Radio As an option could be used as TTL Input Line 1.
7	DPORT3	DCD	Data Carrier Detect	TTL Output	Used by remotes to indicate that the remote has successfully acquired the signal from base station: (0V) 1 - Carrier detected (synchronized) (3.3V) 0 - No carrier detected (not synchronized)
8	DPORT4	RTS	Request to Send	TTL Input	Gates the flow of receive data from the radio to the user on or off. An internal 10K pull-down enables data receive if this signal is left unconnected. In normal operation, this signal should be asserted: (0V) - Receive data (Rx) enabled (3.3V) - Receive data (Rx) disabled
9	DPORT2	DSR	Data Set Ready	TTL Output	Used to control transmit flow from the user to the radio: (0V) 1 - Receive buffer has data to transfer; (3.3V) 0 - Receive buffer is empty
10	RES CONT	RESCONT	Reset the radio	TTL Input	Reset the radio by shortening this pin to the ground.
11	TTLO1	TTLOUT1	TTL Output Line 1	TTL Output	Reserve line
12	TTLO2	TTLOUT2	TTL Output Line 2	TTL Output	Reserve line
13	-	-	-	-	-
14	-	-	-	-	-
15	-	-	-	-	-
16	VCC36	PWR	Power Supply	External	Regulated positive 3.6 V DC from ext. Power Supply.

General Radio Specifications

Component	Details
Frequency Range	406 - 470 MHz
Channel Spacing	25/20/12.5/6.25 kHz
Carrier Frequency Stability	±1 ppm
Modulation	GMSK/4FSK/DBPSK/DQPSK/ D8PSK/D16QAM
Communication Mode	Simplex
Supported User Interfaces	Serial Asynchronous (TTL compatible)
Supported Comms. Protocols	Transparent Receiver

Radio Receiver Specifications

Component	Details
Receiver Sensitivity for DBPSK (BER 1x 10 ⁻⁴)	-113 dBm for 25 kHz Channel Spacing -113 dBm for 20 kHz Channel Spacing -114 dBm for 12.5 kHz Channel Spacing -114 dBm for 6.25 kHz Channel Spacing
Receiver Sensitivity for DQPSK (BER 1x 10 ⁻⁴)	-110 dBm for 25 kHz Channel Spacing -110 dBm for 20 kHz Channel Spacing -111 dBm for 12.5 kHz Channel Spacing -111 dBm for 6.25 kHz Channel Spacing
Receiver Dynamic Range	-119 to -10 dBm

Modem Specification

Component	Details
Interface DSP	UART (serial port)
Interface Connector	16-lead Connector
Data Speed of Serial Interface	9600 - 115200 bps
Data Rate of Radio Interface (25 kHz Channel Spacing)	9600 bps - DBPSK/GMSK 19200 bps - DQPSK 28800 bps - D8PSK 38400 bps - D16QAM
Data Rate Radio Interface (20 kHz Channel Spacing)	7500 bps - DBPSK/GMSK 15000 bps - DQPSK 22500 bps - D8PSK 30000 bps - D16QAM
Data Rate Radio Interface (12.5 kHz Channel Spacing)	4800 bps - DBPSK/GMSK 9600 bps - DQPSK 14400 bps - D8PSK 19200 bps - D16QAM
Data Rate Radio Interface (6.25 kHz Channel Spacing)	2400 bps - DBPSK 4800 bps - DQPSK 7200 bps - D8PSK 9600 bps - D16QAM
Forward Error Correction (FEC)	Reed-Solomon Error Correction
Data scrambling	Yes

Compliance

Parameter	Specification
FCC	FCC Part 90
Industry Canada	RSS-210
ETSI	ETSI EN 300 113-2, ETSI EN 301 489-1, ETSI EN 301 489-5

