

## UNIVERSAL DATA RADIO WITH T/R DIVERSITY

# UDR-24

## APPLICATIONS

- Navy and Marine applications
- replacement for obsolete radios
- Military data communication



## KEY FEATURES

- frequency range 225 to 400 MHz (option: 225 to 512 MHz)
- 40 W output power (0.4W to 40W programmable)
- 18 to 36 Vdc isolated power supply (STANAG 1008 compliant)
- highly modular hardware and software design allows easy upgrade and maintenance
- software and firmware upgradability via Ethernet network
- built-in high-Q tracking filters - no external tuned RF filters are required
- fast TDMA mode for nearly-realtime remote control applications
- adaptive data rate control & time slot allocation; rf data rate of several 100 kBit/s is possible\*
- \*depends on link quality and multi-channel mode permission
- easy radio equipment reconfiguration by software-defined radio architecture
- software controlled 'smart' diversity combiner minimizes fading effects
- integrated transmit antenna diversity switch for redundant TX block transmission
- built-in continuous operating status monitor, 'over-the-air' BITE monitoring
- Ethernet 100Base-TX LAN port / TCP and UDP Protocol
- downward compatibility and interoperability with existing RDM20 radios (optional)

Dimensions

19" plug-in, 3 HU, depth: 450 mm

## DESCRIPTION

The UDR-24 combines the latest digital radio technology and sophisticated rf hardware for maximum performance and flexibility. Via the serial ports or LAN interface the radio can be easily re-programmed with various modulation schemes (GMSK, PSK, QAM, OFDM, etc.) as well as appropriate error correcting codes (Golay, Reed-Solomon, Viterbi, Turbo Codes etc.). Due to this programmability the UDR-24 is interoperable with many existing radio standards like LINK11/16.

Redundant TX block transmission over two antennas guarantees omnidirectional transmission characteristics on ships with antenna placement problems. If this mode is not required, various antenna combinations can be set by software. A 'smart' diversity combiner is implemented in software for excellent performance even under serious RF link conditions.

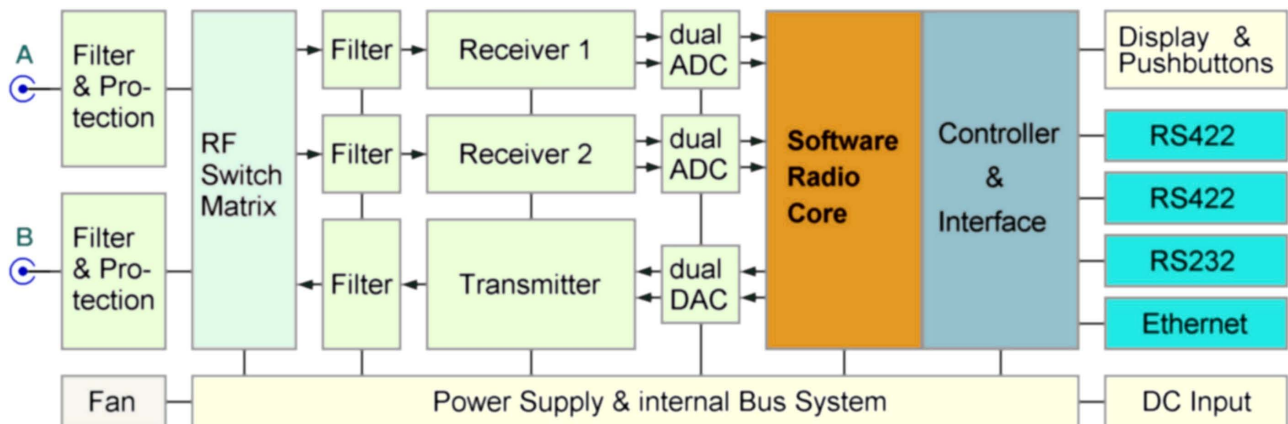
The built-in continuous operating status monitor measures forward & reflected RF power, supply current & voltages, base plate & module temperatures, RSSI and diversity status and several other values. All status monitor results are available 'over-the-air' so the whole status of all members of the radio network can be displayed in realtime.

Strictly modular hardware design allows easy module replacement without any additional adjustments: all module interface characteristics are standardized.

The UDR-24 is backwards compatible with existing RDM20 radios. The main difference is that no external high power RF filter is required: this will add several dB to the RF link budget. All RX and TX filters are integrated in the radio.

AES Rijndael encryption and intelligent anti-jamming algorithms makes the system proof against both tampering and eavesdropping.

## BLOCK DIAGRAM



## SPECIFICATIONS

### GENERAL

Description	Universal Data Radio Transceiver
Device Type	UDR-24

### RF SECTION

Frequency Range (standard)	225 to 400 MHz
(optional)	225 to 512 MHz
Synthesizer Step Width	8.33 kHz, 12.5 kHz and 25 kHz
Antenna Impedance	50Ω (max.VSWR = 1.5:1)
Reference Oscillator Stability	< 0.3 ppm (-20°C to +55°C)
Aging	< 4 ppm @ 20 years
Calibration	by software
Modulation Type (standard)	OFDM
(optional)	BPSK, QPSK, QAM, FM / GMSK

### RECEIVER (2 Channels)

Sensitivity ((S+N)/N=10dB)	-114 dBm (@ RDM20-mode)
Noise Figure	≤ 6 dB (4 dB typ.)
Image & Spurious Rejection	≥ 80 dB
Maximum Input Level	13 dBm (1Vrms)
Local Oscillator Radiation	≤ -90 dBm

### TRANSMITTER

RF power output (@ FM)	40 W (0.4 W to 40 W adjustable)
Harmonic & Spurious Rejection	≥ 80 dBc
Antenna Mismatch Protection	no damage into infinite VSWR
	all phases (software controlled)
Overtemperature Protection	automatic derating

### INTERFACES

LAN	Ethernet 100Base-TX
Serial Interface 1 & 2 (optional)	RS422 / RS485
Serial Interface 3 (optional)	RS232

### POWER SUPPLY

Supply Voltage	18 to 35 Vdc (isolated)
Power Consumption	< 360 W @ 40 W TX Power
Reverse Polarity Protection	max. 47 Vdc (no time limit)

### ESD PROTECTION

Peak Voltage (IEC 1000-4-2)	± 8 kV (contact discharge)
Peak Voltage (MIL 883C-3015.7)	± 15 kV
Peak Current (all I/O pins)	20 A (8/20 μs)
Power Supply Transients	STANAG 1008 compliant
EMI / EMC	MIL-STD-461

### ENVIRONMENTAL

Operational Temperature	-20°C to +55°C (case temp.)
	-40°C to +85°C (with derating)
Storage Temperature	-40°C to +85°C
Humidity	≤ 95% RH
Vibration (sine)	1.6 mm (4 to 12.5 Hz)
Shock (½ sine)	100 g peak (30ms)
Magnetic Field	≤ 60 mT
Cooling	2 software controlled fans

### PHYSICAL CHARACTERISTICS

Dimensions	19" plug-in, 3 HU, depth: 450 mm
Weight	< 25 kg
Power Supply Connector (J3)	Amphenol-Air LB 1331-E-303-MS
Antenna Connectors (J1 + J2)	N femal
LAN Connector	M23 circular

### MANAGEMENT

Windows / Linux	radio programming tool
Web Browser	embedded HTML server