

COVERAGE SOLUTIONS FOR CRITICAL COMMUNICATIONS

Based on Software Defined Radio



AVOIDING COVERAGE GAPS IN TETRA NETWORKS



Phone: + 34 932237900

Fax: + 34 932237901

Adress: Camí de la Pellería nº 12, 08915 Polígono Industrial Bonavista Nord
Badalona, Barcelona, SPAIN

www.adtelecom.es

TETRA REPEATERS: Line RIT-ECHO

SOLUTIONS FOR THE EMERGENCY COMMUNICATIONS COVERAGE

The European Union has established the standard TETRA (Terrestrial Trunked Radio) with the goal of satisfying the needs of voice and data radio services. The standard regulates the radio-communication systems of security forces: police, fire-fighters and civil defence. The regulation assures the compatibility between radio networks in different countries. That enables the collaboration between squads of different countries in emergency situations.

The standard requires the presence of signal in all the public areas and those susceptible of requiring the help of security forces in case of accident or catastrophe. It is then required the presence of TETRA signal in road tunnels, metro, high-capacity parking and sport facilities among many others. AD TELECOM has developed a broad range of TETRA Repeaters to cover the needs of coverage enhancement. The networks mentioned below have been chosen AD TELECOM's equipment to enhance their area of coverage:

- RESCAT networks covering the whole territory of Catalonia.
- AIRPORT OF BARAJAS, in Madrid
- FERROCARRILS DE LA GENERALITAT DE CATALUNYA, the suburban train of Catalonia.
- DEPARTAMENTO DE INTERIOR DEL PAÍS VASCO: Internal Security of the Basque Country.
- CIRCUIT OF JEREZ: Racing circuit located close to Jerez de la Frontera.



- The system RIT-ECHO stands out from other repeaters for the echo cancellation provoked by the coupling between the transmitting and the receiving antenna. The signals provided by the Base Station or a user are received, amplified and transmitted again, the antennas being located in the same tower.
- The coupling is cancelled by means of digital signal processing (DSP) algorithms that permit to work in stable conditions with a gain 20dB higher than the isolation between antennas. That represents an essential improvement regarding other repeaters that do not include cancellation (which require a gain 10dB below the isolation between antennas to avoid oscillation problems).
- Each channel is amplified and filtered (30 KHz bandwidth channel filtering), avoiding the amplification of possible unwanted signals in the band.
- Automatic Gain Control per time-slot, which permits to balance the levels of signals coming from users located at different distances from the receiver.
- It permits the time-slot silencing with Automatic Level Control in the absence of traffic, benefiting the base station sensibility.
- It permits full remote configuration.
- It complies with ETSI standards and regulations, as well as all other applicable organisms (TS 101789-1 from ETSI being especially relevant in this particular case).

TETRA REPEATERS: Line RIT-ECHO

SOLUTIONS FOR THE EMERGENCY COMMUNICATIONS COVERAGE

SPECIFICATIONS			
Frequency bands		<i>Uplink Band</i>	<i>Downlink Band</i>
		380—385 MHz	390—395 MHz
		385—390 MHz	395—400 MHz
		410—415 MHz	420—425 MHz
		415—420 MHz	425—430 MHz
		450—455 MHz	460—465 MHz
		455—460 MHz	465—470 MHz
Duplex distance between carrier frequencies		5 MHz	
Number of channels		From 1 to 6 channels	
Bandwidth of the channel filter		90 kHz, 45KHz and 30KHz, OFF	
Delay	Without filter	3.5us	
	90KHz	12us	
	45KHz	20us	
	30KHz	27us	
Gain		Configurable from 60 to 80 dB	
Antenna to antenna (RX-TX) isolation		>60 dB	
Maximum input power		-20 dBm	
Output repeater power (downlink) according to ETSI TS 101789-1		1 channel	+36dBm
		2 channels	+33dBm
		4 channels	+30dBm
		6 channels	+27dBm
Output repeater power (uplink) according to ETSI TS 101789-1		1 channel	+20dBm
		2 channels	+17dBm
		4 channels	+14dBm
		6 channels	+12dBm
Spurious emission level		< -36 dBm	
Noise figure		<7 dB	
Remote control system		WEB Server, SNMP agent	
Local maintenance		USB, Ethernet	
Working temperature range		-25°C to +55°C	
Cooling		Convection	
Power Supply		90 - 240 VAC 50Hz/60 Hz	
Consumption		< 100 W	
Protection		IP65	
Dimensions		450 x 380 x 200 mm	
Weight		20 Kg	

SOLUTIONS FOR THE EMERGENCY COMMUNICATIONS COVERAGE

TETRA REPEATERS: Line RIT-ECHO

SOLUTIONS FOR THE EMERGENCY COMMUNICATIONS COVERAGE

LOCAL CONFIGURATION / SUPERVISION

The local configuration/ supervision are carried out by means of a USB connection to a computer. All system parameter can be configured with the provided control software, as well as monitoring the state and alarm information of the equipment.

REMOTE SUPERVISION

Remote supervision of coverage enhancers is done by the GPRS communications modem (integrated in the system) or Ethernet. The system incorporates a Web Server (which permits the configuration and monitoring of all parameter of the equipment using a Web Navigator) and agent SNMP (which permits the integration in a SNMP manager). The SNMP agent enables the configuration and monitoring of the system parameter, as well as sending asynchronous TRAPS alarms to the SNMP manager.

The visible information is:

- Input and Output Power.
- Gain, isolation and Gain/Isolation ratio
- Channel frequency, bandwidth of the channel filter
- State alarms of the power amplification
- Message indicating that the door is open.
- State of the modules RX, TX, and DSP.



www.adtelecom.es

COVERAGE SOLUTION FOR CRITICAL COMMUNICATIONS

Phone: +34 932237900

Fax: +34 932237901

Camí de la Pellería 12, Polígono Industrial Bonavista Nord
08915 Badalona, Barcelona, SPAIN

SOLUTIONS FOR THE EMERGENCY COMMUNICATIONS COVERAGE