Frequency bands

UHF – HH	865-925 MHz
UHF – H	470-520 MHz
UHF – L	407-470 MHz
VHF – H	146-174 MHz
VHF – L	68-88 MHz

Channels managements

Bandwidth	12,5/20/25 KHz
Number of channels	199

Commutation band (without duplexer)

Band	TX	RX
UHF – H	50 MHz	50 MHz
UHF – L	63 MHz	63 MHz
VHF – H	28 MHz	28 MHz
VHF – L	20 MHz	20 MHz

Climatic conditions

Functioning temp.	-25 / +55° C
Storage temp.	-40 / +70° C

Power supply

Nominal voltage	12/24/48 Vcc
Protections	Reverse Voltage Over Voltage Under Voltage
Transmission consumption	55 W @20W RF
Reception consumption	8 W

Dimension

Rack	128 x 426 x 280 mm 19" x 84 TE x 280 mm
Single transceiver	½ Rack 19"

Special functions

- Frequency synchronism recovery from many source: audio tone, GPS, digital, external source
- Time synchronism recovery from GPS (pps) for automatic adaptive line equalization
- Multi-channels audio voting system
- Multi-receivers assembly
- Digital diversity receiver with soft diversity reception
- Powerful Remote control
- Start up auto calibration and internal test
- SIP/RTP-IP standrad interfacing

Transmitter

Module output power	1/5/10/15/20/25 W
RF protection to high temperature	85°C +/- 5°C progressively reducing the RF power
Available modulation	FM, PM, GFSK,4FSK
Modulation bandwidth	300 .. 3400 Hz
Synthesis step	4/5/6,25/10 KHz
Transmitting duty cycle	Continuous 100%
ROS protection	Min.10' in short or open circuit
Adjacent channel noise	-75 dBc @25KHz -65 dBc @12.5KHz
FM distortion	< 1.5 %
Noise	-56 dBp @25KHz -50 dBp @12.5KHz

Receiver

Maximum sensitivity	-115 dBm @20 dBp SINAD -121dBm @5% BER (with diversity)
Operating maximum input	-10 dBm
Maximum input without permanent damages	+20 dBm
Reception mode	FM, PM, GFSK,4FSK
Received signal band	0..3400 Hz +/- 1 dB
Synthesis step	4/5/6,25/10 KHz
Co-channel protection	8 dB @25 KHz 12 dB @12.5KHz
Adjacent channel selectivity	73 dB @25 KHz 62 dB @12.5 KHz
Blocking protection	80 dB
Intermodulation protection	75 dB
Intercept 3° order IP3in	+15 dBm
Distortion	<2 %
Noise	-53 dBp @25 KHz -47 dBp @12.5 KHz -60 dBp (with voice search option)

Some specifications may change without prior notice.

For more information please contact your local Radio Activity representative:

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Designed & Manufactured in Italy

DMR DIGITAL MOBILE RADIO ASSOCIATION

Radio Activity ∞ Solutions

Ideal building block to realize multisite radio networks

RA-XXX

Base station/Repeater

Professional infrastructure for
Digital Mobile Radio

Designed & Manufactured in Italy

Radio Activity RA - XXX Base Station/Repeater

Main Features

- DUAL MODE DMR/ANALOG FOR EASIEST MIGRATION
- DESIGNED FOR IP MULTISITE SIMULCAST
- SOFT DIVERSITY RECEPTION
- FULL LINUX CORE
- SIP/RTP-IP PORTS FOR AUDIO AND DATA APPLICATIONS
- POWERFUL REMOTE CONTROL
- FULL SW REMOTE UPGRADABILITY
- BUILT-IN DIGITAL AND ANALOG VOTING SYSTEMS
- COMPACT MODULAR DESIGN
- VERY LOW POWER CONSUMPTION
- 100% TX DUTY CYCLE
- NO FANS NEEDED

Customer oriented technology

About Us

Radio Activity S.r.l. is a young and dynamic electronic engineering company with its headquarters in Milan. The Company carries out design and production of wired and wireless equipment and systems for the professional telecommunications market.

The R&D engineering team is composed of engineers who have completed more than 20 years of experience in this field at major telecommunications companies.

The deep expertise in the design and implementation of radio frequency hardware and complete mastery of techniques for programming DSP devices (Digital Signal Processing), allow us to tackle complex projects and offer customized solutions to the real needs of the Customer.

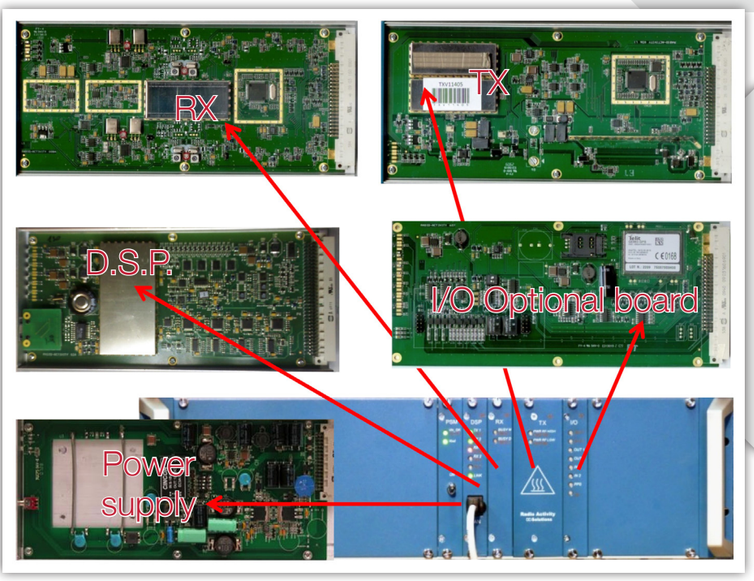
Radio Activity has developed advanced techniques for analog and digital simulcast radio networks and numerous products for data transmission and centralization of communications.

The Company is a crux of a network of partners each specialized in different technological areas. Only the strategic know-how is maintained inside with high level of skills on its core business. Production activities are entrusted to factories specialized in the assembly of electronic circuit boards and mechanical assembly.

Besides of course hardware and software design, we control the choice of valuable components and final testing of equipment and network. This will guarantee the continuous updating of the used components and total quality control of external processes.

SYSTEM RESILIENCE AND REDUNDANCY

The entire radio system is designed to automatically react to failure situations and seek the configuration of minimum possible disruption (progressive degradation). An "**Alias Master**" station operates normally as a Slave base station until the Main Master is present in the IP network. When the main Master disappears from the IP network, every base station change the registration to the "Alias Master" automatically restoring the network functionality.



Flexible solutions
for any user's needs

WIDE RANGE OF APPLICATIONS FOR OPERATIVE CENTERS: IP DMR GATEWAY, SIP BASED AUTOMATIC ROAMING BETWEEN NETWORKS, AUTOMATIC PHONE BRIDGE, ZVEI /DMR CONVERTER, GPS POSITIONING, AUDIO RECORDER, . . .

RA-XXX Base Station Family

The RA-XXX is designed to maximize the performances in terms of simplicity, flexibility, power consumption, reliability and cost.

The strong investment made in the design of equipment, the continuous hardware and software updating and the widespread deployment in the field (over 1500 installations in Italy and abroad), guarantees the highest quality and reliability of our systems over time. Radio performances are at the top of the category and meet widely as required by national and international directives.

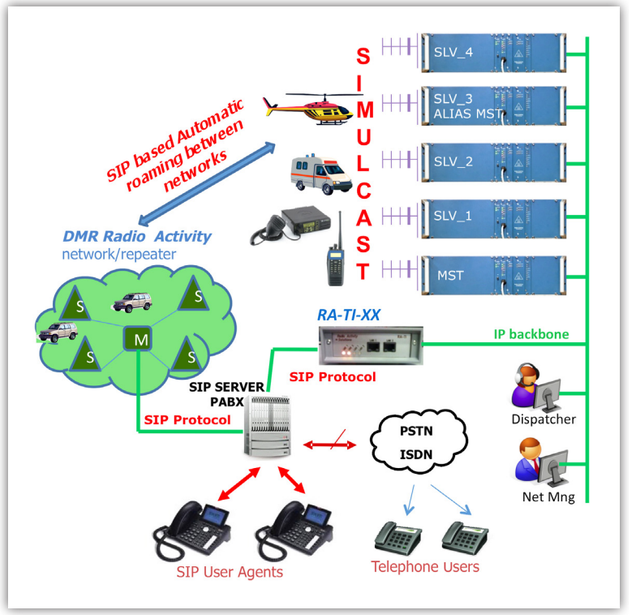
Most critical functions are automatically set-up by the equipment. This fact guarantees a drastic simplification in installation and maintenance operations that require few manual adjustment on the apparatus.

The stations are modular, based only on 5 different modular units (PSM, TX, RX, DSP, I/O), which allow you to make all network and link configurations simply by combining necessary "blocks" and setting their parameters.

Thanks to the full digital design, the group and absolute delay are perfectly matched. With the help of the GPS integrated receiver, the stations equalize automatically phase and amplitude of the analog and digital signals even in the presence of variations in the response of the link.

ALGORITHMS FULL INCLUSIVE

The RA-XXX have on board all the necessary algorithms (voting system, equalization, protocol coherence, ...) to ensure a perfect operation in any geometry of use and on any carrier transport (IP, SDH/PHD on fiber optic or microwave link, XDSL modem on copper pair, UHF narrowband, ...). In the base stations **many different timing/synchronization systems** (GPS, OCXO, digital signals correlation, super-audio tone, digital strings, external clock) are implemented with automatic backup between the sources. The precision in timing and synchronization, the high performance graphic equalization and the built-in algorithms guarantee an optimal functionality even overlap areas.



"Soft Radio" Design

The transceivers were developed using the technique known as "soft radio" in which all the mo-demodulation and filtering processes are achieved through algorithms included in Digital Signal Processing (DSP) devices. The receiver system implement a "soft diversity reception", a receiving technique based on the vector treatment of the incoming signals extremely useful in any digital mobile communication system.

The processor inside uses the open source operative system LINUX in the "full" version. It manages the IP communications and it runs applications for the local and remote control and managing of the radio. LINUX allows to operate down to the physical level giving "stability" of performances hard to perform in a Windows or proprietary operative system. Integrating a real computer in the base station allows to implement easily a variety of applications for audio and data communications and for control purpose.

Thanks to the LINUX core, the RA-XXX is an "IP native" transceiver which is targeted at high level of performance in a distributed elaboration system. The main control and communication interface of the RA-XX is a standard IP Ethernet, one of the most common and cheap in the communications world.