OVERVIEW

Telerad solution for N+M redundancy enables to create flexible architectures to integrate back-up units alongside main units. Cost effective solutions exist both for receiver and transmitter units operating on analog interfaces. They can be used to secure the transition toward a full-IP redundancy.

- Full analog solution to secure transition toward VoIP
- Optimized for small to middle size systems
- Complete integration with monitoring
- Easy deployment
- Flexible configuration:
  - from 1 to 16 main radios
  - 1 or 2 backup radio
- Compatible with radios of 9000 series of 1st and 2nd generation (1G and 2G)
- Size: 2U 19’ rack
- Outstanding audio quality ensuring no degradation at system level
- High MTBF
- Remote monitoring and maintenance via JBUS and SNMP
This flexible architecture takes full advantage of our software radios capabilities to enable system design of backup solutions according to system needs: number of frequencies, failure rate, and site configuration.
### N+M ADVANTAGES

**Cost effective solution for main/standby configuration**

Higher MTBF with N+2 configurations

Since backup units are multichannel, they can take over for any main unit in the system. Thus, the availability of the system is improving, which gives a lower failure rate/higher MTTCF.

#### MTBF between 1+1 and N+2 configurations

![MTBF Graph](image)

#### Critical failure probability over 20 years between 1+1 and N+2 configurations

![Failure Probability Graph](image)

### SYSTEM DESIGN

**System integration in radio architecture**

Redundancy unit integrates fully between VCS links and radio units with no impact on audio quality. Redundancy system auto-diagnostic algorithms help to detect broken connections and to calibrate analog links.

Redundancy unit monitors radio failures under JBUS and/or SNMP protocols. It fully integrates alongside external monitoring systems with few impacts on external monitoring and control.

#### Antenna Sharing

Issues with antenna system have been taken into account. TELERAD takes advantages of its expertise in systems design to propose efficient architectures that deal with co-siting issues both for transmitters and receivers. Design can be precisely tailored to customer needs to optimize cost and radio performances.
REDUNDANCY UNIT CHARACTERISTICS

ENVIRONMENT:
Size: 2U – 19-inch rack
Power supply: 24 VDC: 21 V to 31 V – Power supply from radios
Reliability:
- High MTBF
- Failback configuration in case of redundancy unit failure
Interfaces:
- 600 Ω differential audio inputs and outputs
- Relay inputs and outputs for discrete signals: PTT, Call
- JBUS, SNMP and RS482 for monitoring and configuration

HIGH QUALITY AUDIO SIGNAL:
Frequency response:
Audio level variation < 1 dB between 300 Hz and 3500 Hz
Audio distortion:
Audio distortion < 0.5 % between 300 Hz and 3500 Hz
Audio level:
- Inputs between 0 dBm and -10 dBm
- Outputs between 0 dBm and -10 dBm

SYSTEM EASY DEPLOYMENT & INTEGRATION:
Auto configuration:
- Algorithm for automatic detection of radios on JBUS links
- Algorithm for automatic calibration of analog link with radios and VCS
Auto diagnostic:
Algorithm for automatic detection of broken or faulty links.
Built In Test: in case of failure unit fail back in default configuration
Easy maintenance on radio:
Enables to force a radio offline to perform maintenance
Reporting to Supervision:
- SNMP server
- JBUS slave
- RS232 terminal
- Reports current state of switching matrix and radios availability