RADIO GATEWAY FOR ATC AND AIR DEFENCE COMMUNICATION SYSTEMS

The GAT100 radio gateway converts legacy interfaces of radios already installed into an IP interface for voice and data connections, in order to meet customers' requirements for cost saving solutions when an IP technology is going to be deployed. The GAT100 radio gateway is a dual use, modular network element that allows integrating legacy VHF/UHF radio stations, with VCSs and IP networks compliant with EUROCAE ED136, ED137B and ED138, as required by Single European Sky concept, by using 4W/4WE&M and serial interfaces.

GAT100 can additionally provide the following functions for Air Defense applications:
- Radio control sharing between several VCSs and Network Management System (ONM-ATC) connected to the same equipment, in order to coordinate operational commands (e.g. frequency/mode change from VCSs) with Management commands (from ONM-ATC)
- Remote fill-gun capability through the DS102 management interface.

THE SYSTEM

The GAT100 radio gateway is structured as a 19" rack mountable shelf that holds up to 8 completely independent radio gateway boards. Each GAT100 board can be configured to manage:
- One radio equipment (transmitter, receiver, transceiver) or one transmitter + receiver pair
- Analogue 4W/4WE&M to VoIP transcoding and vice-versa, according to EUROCAE ED 137B.1 standard
- RS232/422/485 serial radio interface management, associated to the radio remote control and monitoring functionality, either by TCP tunnelling of serial protocol, or by implementing the radio protocol: in this case, GAT100 acts as a Mediation Device towards the Network Management System (e.g. ONM-ATC)
- Main/Standby radio changeover.

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GAT100 also provides 2 x IEEE802.3 100BaseT that allow IP connection redundancy over two different WANs towards the VCSs; the redundancy is transparently managed with respect to VoIP and O&M applications.

TECHNICAL FEATURES

Multiple VoIP Connectivity
GAT100 supports several simultaneous and independent VoIP communication channels (up to four channels each GAT100 module.

Conferencing
This configuration is available in case of multiple VCSs connected to the same GAT100 equipment. When the GAT100 radio gateway is configured in this operational, during the transmission from one VCS to the radio equipment, "uplink" packets can be routed to every VCS connected to GAT100 (instead of R2S messages), in order to provide the "conference" function.

IP interface configuration (second level title) It is possible to configure the following operational parameters on GAT 100 IP side:
- IP parameters (address – mask – default GW)
- Ethernet Bonding schemes:
- Changeover on port link down
- Changeover on ARP exchange
- SIP URI address
- DiffServ protocol QoS value. Default values are:
- EF for RTP packets
- AF41 for SIP packets and VCS-related operational datagrams
- CS0 for management datagrams.

Analogue lines configuration
Physical parameters like E&M voltage or AF line impedance are configurable by proper DIP switches on the GAT100 board. It is possible to configure the following analogue interface parameters:
- Squelch type : "E" line, 2040 Hz tone detection, speech detection
- Squelch thresholds setting
- AF line input/output level setting.

Interfaces
GAT100 modules are equipped with two IEE802.3 100BaseT interfaces that can be configured to work in bonding two analog interface for voice and 2 x RS232 plus 2 x RS422/485 for control/monitoring purpose. The usage of multiple serial lines on the same module is related to the control of two analogue radio equipment by the same module, e.g. one transmitter plus one receiver.

The analog interface can be configured to work in the following modes:
- E&M interface for PTT and Squelch is based on otocouplers
- PTT and Squelch can also be coded as in-band tones (2040 Hz).

Every module is equipped with an AUX connector, that can be configured in the following way:
- DS102 interface, when the GAT100 is configured as remote fill-gun equipment (Air Defense)
- 3 x pull-up interface + 1 x Open Collector interface for Input/Output signals management.

Power Supply
GAT100 modules are equipped with their own DC-DC converter, which accepts an extended range DC input (10 – 31V) and generating all the voltage supplies that the module requires.

Alternatively, each module can be directly supplied by the radio equipment to which it is connected. Every DC-DC conversion for each module is totally independent from the other ones.

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