

MXC ADS-B GROUND STATION

MXC (Mode-S eXtended squitter Capability) is a high performance ADS-B (Automatic Dependent Surveillance Broadcast) Ground Station for en-route, terminal and airport surveillance applications, compliant with the 1090 MHz Mode-S Extended Squitter standard.

SYSTEM DESCRIPTION

Taking advantage of the wide experience gathered in ADS-B technologies, systems and applications since mid 1990s, SELEX Sistemi Integrati has designed and developed the MXC as fail-safe, modular system that fulfils stringent operational requirements and maintains growth possibilities through hardware and software upgrades.

MXC receives and processes broadcasted messages over the 1090 MHz RF channel extended squitter (DF17/18), which contain identification, position, altitude, velocity, and other airborne derived data. MXC distributes the collected surveillance information to ground ATM systems (e.g. Tracker, Surveillance Data Processing Systems, Flight Data Processing Systems), using the ASTERIX CAT. 21 standard formats over LAN or WAN communications infrastructures.

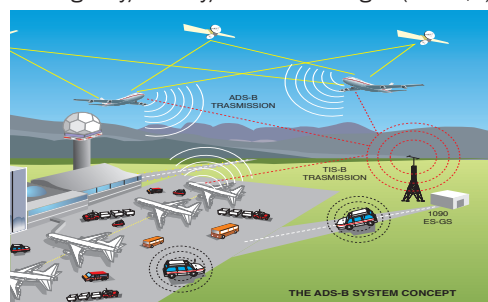
MXC can be perfectly integrated with the other systems for

cooperative ATC surveillance (Mode A/C/S secondary radars and multilateration system).

TECHNICAL FEATURES

The MXC makes use of advanced receiver and innovative processing of signals transmitted by the targets. These characteristics guarantee high reliable detection of cooperative targets, also in the most demanding traffic scenarios.

- Surface Position messages (BDS0,6)
- Airborne Position messages (BDS0,5)
- Velocity messages (BDS0,9)
- A/C Identification & Type messages (BDS0,8)
- A/C Operational Status messages (BDS6,5)
- Emergency/Priority/Status messages (BDS6,1)



In addition, the MXC is also capable to receive and decode other Mode S defined messages transmitted by aircraft in reply to interrogations made by Mode S radars:

- DF 4, 5 (surveillance altitude/identity reply)
- DF 11 (All Call Reply/Acquisition Squitter)
- DF 20, 21 (Comm-B altitude/identity reply)

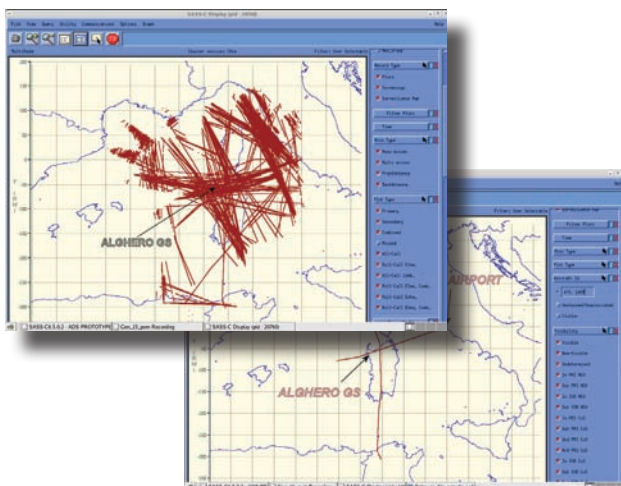
After decoding, information received for each target are assembled, formatted in standard ASTERIX CAT 21 messages and distributed to ground users which have subscribed to the MXC service.

ASTERIX messages can also directly feed a local tracker hosted on board the MXC.

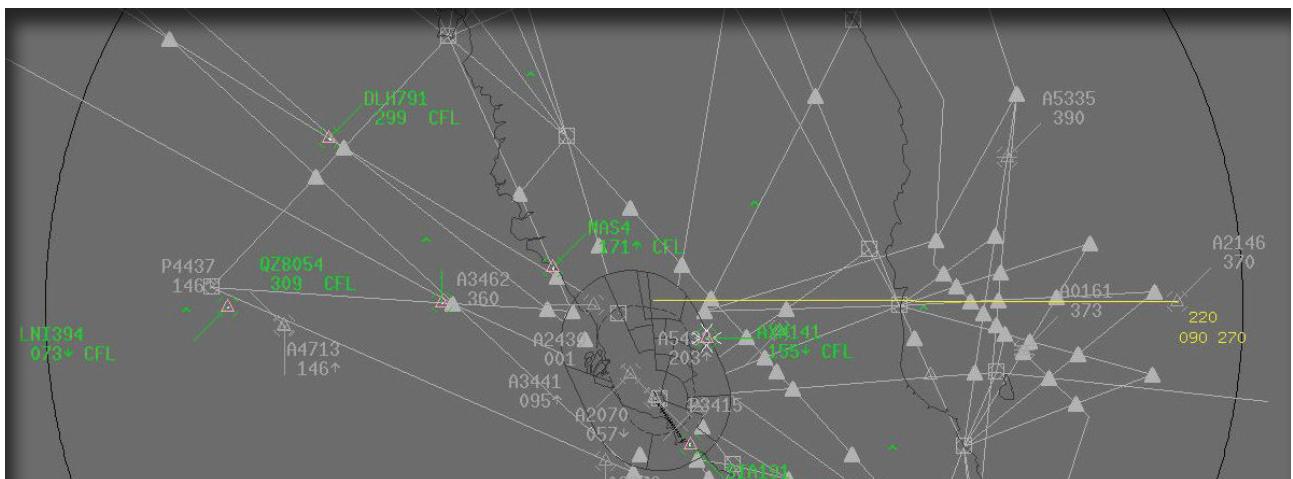
The basic MXC configuration includes:

- 1090 MHz Receiver unit
- Low Noise Amplifier
- High gain antennas (sectorised or omnidirectional)
- Ground-station Data Processing (GDP)
- UTC time reference subsystem via GPS receiver
- Ground-station Maintenance Monitor (GMM)

OPTIONAL SUBSYSTEMS



ADS-B Data SASS-C Analysis



ADS-B Presentation

The modular design allows for easy system expansion as well as specifically tailored MXC configurations, which extend the capability of the basic system with additional data link technologies and/or applications. Features that can be added to the basic MXC configurations are:

- a 1090 MHz transmitter, which enables the MXC to broadcast TIS-B (Traffic Information Surveillance Broadcast) messages
- a VDL Mode 4 base transponder, which makes the MXC capable to support the dual link concept, while maintaining the same interface with the ATM systems

MXC SPECIFICATION & PERFORMANCE

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|-------------------------|--|
| Operating Frequency | 1090 MHz |
| Data Formats | ASTERIX CAT21/CAT23 CAT22/CAT62 |
| Capacity | Up to 600 targets |
| Mode-S downlink formats | DF 17/ 18, DF 4/5, DF 11, DF 20/21 |
| Coverage | up to 250 NM - 360° |
| Availability | 99.9% |
| Continuity | > 99.98% per hour of flight |
| MTBF | >20000 hours |
| Applicable Standards | - ICAO Annex 10 - RTCA DO-260A (and Change 1) - RTCA DO-260 - ED-129 (ADS-B GS TS from WG51 SG4) - VDL 4 SARPs - ETSI EN 301 842-1 - ETSI EN 301 842-2 |