

# THALES



## Multi-Mode Receiver

### NAVIGATION

MMR is part of our TopFlight Line, which encompasses comprehensive solutions dedicated to communication, navigation and surveillance.

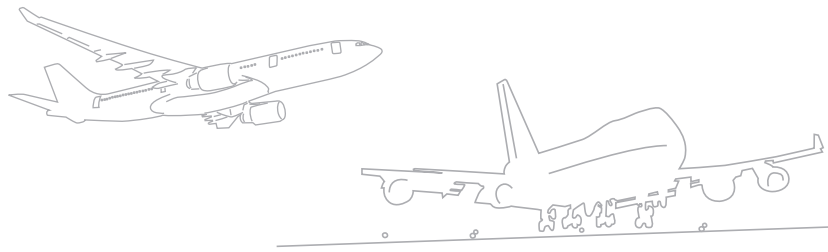
New satellite-based systems such as GNSS give today's aircraft an unprecedented ability for high-precision navigation and landing.

The instrument landing system (ILS), still the Cat. III precision landing system par excellence, has nonetheless encountered integrity problems due to FM interference and multipath reflection, degrading landing capabilities under low-visibility conditions.

The microwave landing system (MLS), another precision landing system, offers a viable Cat. III B landing alternative to ILS in certain geographical areas.

The GNSS landing system (GLS) is a new precision landing system, that is part of the CNS/ATM strategy to give Precision Approach capability to increasing number of runway ends worldwide.

Airlines will soon have number of precision-landing possibilities at airports around the world, depending on whether these airports are equipped with ILS, MLS or GLS.



# >> MULTI-MODE RECEIVER NAVIGATION

## TECHNICAL DATA

<b>FREQUENCY BAND</b>	108-112 MHz for ILS localizer 329-335 MHz for ILS glide slope 5 GHz for MLS 108-118 MHz for GLS VHF Data Link 1575.42 MHz for GPS receiver			
<b>CHANNEL SPACING</b>	for Data Link: 50 kHz (compliant 25 kHz)			
<b>MODULATION</b>	AM DPSK 10 kbps/15kbps D8PSK 31.5 kbps			
<b>WEIGHT</b>	< 5.4 kg			
<b>FORM FACTOR</b>	3 MCU per ARINC 600			
<b>POWER REQUIREMENTS</b>	115 V / 400 Hz			
<b>TEMPERATURE</b>	- 55°C to + 70°C			
<b>COOLING</b>	Forced air per ARINC 600 specifications			
<b>MTBF</b>	> 30 000 FH			
<b>REFERENCE DOCUMENTS</b>	ARINC 755, ARINC 743A ARINC 710, ARINC 727 ARINC 600, ARINC 429			
<b>GENERAL</b>	ED 46B ED 47B ED 72A ED 36A ED 88 ED 14D ED 12B ICAO Annex 10 FM immunity	DO 195 DO 192 DO 208 DO 253 DO 160D DO 178B	TSO C36e TSO C34e TSO C129a MLS GLS GLS GLS	ILS loc ILS glide GPS

## BASIC FEATURES

- Meets ARINC 755 standards
- Digital MMR: Digital Signal Processing (DSP)
- 200 ms power interrupt transparency
- Highly modular design for strong scalability
- Dual channel of processing (different hardware & software) for increased integrity
- DO160D HIRF and lightning requirements
- Full equipment monitoring

### ILS

- Standard replacement for ARINC 710 ILS, incorporating ICAO Annex 10 FM immunity
- Cat. I to Cat. III B high integrity/reliability design
- Dual or triplex autoland architecture



### GNSS

- Permanent "en route" GNSS mode
- Primary means of navigation
- 15 tracking channels (upgrade capacity to 24 channels)
- ASIC already designed to support SBAS/GBAS and GLONASS
- SBAS: WAAS, EGNOS, MSAS capability
- FANS compliant



### MLS

- Cat. I to Cat. III B high integrity/reliability design
- ILS "look alike" interface, with autopilot and display systems
- Dual or triplex autoland architecture



### GLS

- GBAS: LAAS (differential GNSS) Cat. I to Cat. III B high integrity/reliability design
- GLS Cat. I (software upgrade only)
- GLS data link receiver
- ILS "look alike" interface with autopilot and display system
- Dual or triplex autoland architecture



## OPERATIONAL BENEFITS

Thales has designed a 100%-digital system, the TLS755 Multi-Mode Receiver, that integrates all onboard reception functions needed for precision navigation and landing. Right from the beginning, Thales designed in full scalability for the TLS755, through a highly modular design that allows this unit to keep pace with all applications, including the Satellite Based Augmentation System (SBAS), Ground Based Augmentation System (GBAS) and MLS. Because of Thales breadth of expertise, all functions on the TLS755 – ILS, GNSS, MLS, GLS – were developed in-house, for guaranteed compatibility.

**As of today, Thales MMR is the only MMR with an MLS certified function.**



**Thales - Aerospace Division**

Commercial Aircraft Solutions  
105, av du Général Eisenhower - BP 1147 - 31036 Toulouse Cedex 1 - France  
Tel.: +33 (0)5 61 19 65 00 - Fax: +33 (0) 5 61 19 66 00  
www.thalesgroup.com/aerospace