ASR x50

KONGSBERG

AIS SPACE RECEIVER

ASR x50 is the 4th generation SAT-AIS receiver from Kongsberg and part of the extended lifetime product series. The receiver is a reconfigurable SDR based receiver, designed to support simultaneous on-board AIS decoding and digital sampling. ASR x50 has, through new enhanced algorithms, multi-antenna support and superior dynamic range, an improved end-to-end performance. It is designed for a 7+ year lifetime and takes vessel detection via AIS to the next level.

Innovative technology

This generation SAT-AIS receiver from Kongsberg is the latest achievement of years of continuous innovations resulting in highest decoder performance, multi-antenna support, built-in redundancy, low power, miniaturized housing, large mass memory and improved lifetime. The end-to-end performance exceeds existing SAT-AIS receivers, where the superior sensitivity of the ASR x50 makes the receiver capable of detecting even AIS class B vessels. Reconfigurable software-defined radio (SDR) technology is used, enabling support for future enhancements in algorithms or changes in AIS/VDES standards.

Vessel detection performance to the next level

Kongsberg started working with AIS twenty years ago and is the AIS equipment manufacturer with the broadest experience. ASR x50 is Kongsberg's 4th generation AIS Space Receiver and builds on this foundation of expertise. A multiple set of decollision algorithms is optimised for best possible vessel detection in high-density and medium-density areas. ASR x50 will give the end user a giant leap in vessel detection compared with existing SAT-AIS receivers.

Space grade using latest technologies

The extended lifetime series from Kongsberg is designed for a lifetime of 7 + years in LEO.

ASR x50 uses the latest generation EEE parts from best-in-class manufacturers. This enables Kongsberg to design for leading capabilities at low power and miniature size. All EEE parts have been carefully selected and extensively tested. Active components have been subject to heavy ion, proton and Co-60 test campaigns to ensure radiation tolerant design.

Applications

- Primary or secondary payload on nano or micro satellites for LEO.
- Secondary payload on SAR and larger earth observation satellites.

FEATURES

- Extended lifetime
- Next generation algorithms and processing capabilities
- Leading vessel detection performance
- In-orbit reconfigurable SDR design with proven heritage
- Simultaneous on-board and sampling modes
- High reliability with built-in redundancy
- Radiation tolerant by design
- Multi antenna support
- Excellent immunity against unwanted signals
- Large on-board mass memory
- Superior dynamic range
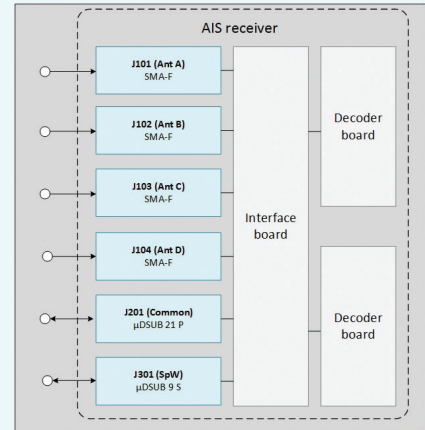
TECHNICAL SPECIFICATIONS

ASR X50

PERFORMANCE

Frequency range	156 to 163 MHz
Sensitivity	< -126 dBm @ 20 % PER
Noise figure	< 2 dB (nominal)
Dynamic range	-126 dBm to -40 dBm
Blocking	-10 dBm outside 154 to 166 MHz
	+20 dBm above 300 MHz
	+30 dBm above 1000 MHz
Doppler shift	± 5.5 kHz
Eb/NO (non-colliding)	6 dB @ < 10 % PER
	4 dB @ < 80 %
C/I (colliding)	5 dB @ < 10 %
	4 dB @ < 50 %
	3 dB @ < 85 %
Frequency resolution	1 Hz
AIS frequencies	Channel 87B, 88B, 75 and 76
AIS message support	All AIS messages defined in ITU-R M.1371-5
Memory capacity cycle	100 min. sampling + 100 % OBP duty cycle
Sampling resolution	Configurable (16 bits as default)

INTERFACES

RF	2 antenna support
	4 antenna support (option)
RS-422/RS-485	115.2 kbps, 230.4 kbps, 460.8 kbps and 921.6 kbps[1]
LVDS	20 Mbps (option)
PPS input	RS-422/RS-485
Redundancy control	RS-422/RS-485
Connectors	
Antennas	Bulkhead SMA, female
Power	Micro D-subminiature
Serial	Micro D-subminiature

WEIGTH AND DIMENSIONS

AIS receiver	1.3 kg, 51 mm x 140 mm x 168 mm

POWER SPECIFICATIONS

Input voltage	9 to 18 VDC
	24 to 32 VDC (option)
Power consumption	From 4.5 W dependent on configuration selected

ENVIRONMENTAL SPECIFICATIONS[2]

Operating temperature	-20 °C to +60 °C
First natural frequency	> 1000 Hz
Design lifetime	7+ years in LEO

[1]   *Support up to 10 Mbps upon request.*

[2]   *Environmental specifications are based on LEO orbit (400 to 750 km). Operation in other orbits under different conditions may produce different results.*

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Specifications subject to change without any further notice.

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