



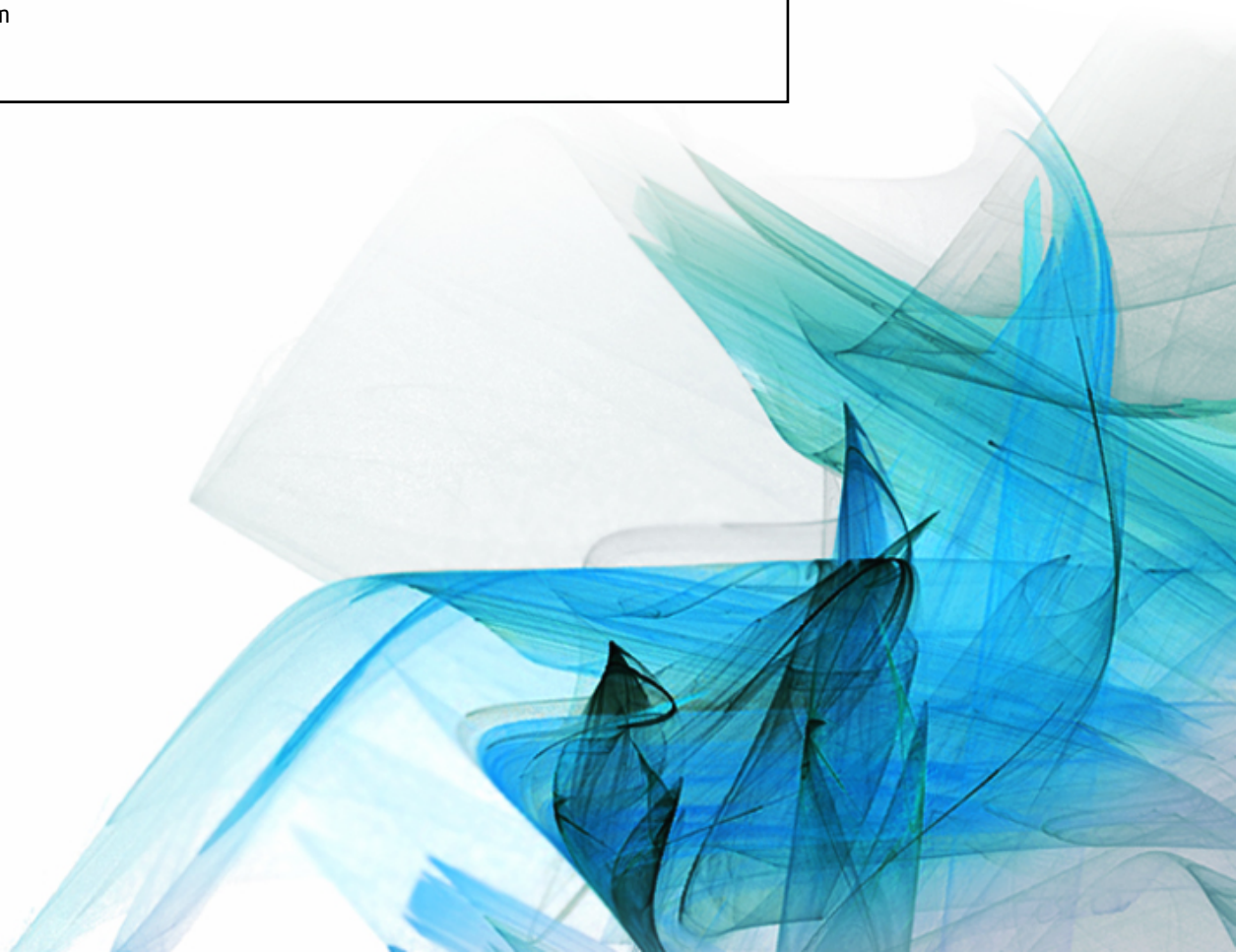
indra

AIBORNE DEFENSE SYSTEMS

ALR-400 RADAR WARNING RECEIVER

Defense and security systems in five continents

indracompany.com



ALR-400 RADAR WARNING RECEIVER



ALR-400

ALR-400 leading edge field proven wide-band digital reception technology brings enhanced survivability in today's operating theatre. A high reliability open architecture and versatile ground support tools also provide simple installation, reduced life cycle costs, increased operational availability and equipment sovereignty

Technical description

Mission

ALR-400 has been designed to ensure maximum survivability in today's complex high density environment by means of improved situation awareness in the presence of an increasing number and sophistication of radar systems. ALR-400 performs with complex waveforms such as frequency agile pulse-Doppler radars, in high pulse densities and detecting faint distant signals in the presence of strong nearby transmitters. Indra's radar warning receiver is suited for all missions, for both low altitude - short range and high altitude - long range engagements.

Capabilities

- Use of advanced Wide Band Digital Reception Techniques
- Effective identification of threats in high density scenarios, enabling automatic countermeasures
- Pulse to pulse Frequency measurement with the highest accuracy
- Wide Band multi CW scenarios capability.
- High sensitivity
- High AOA accuracy
- LPI radars detection capability
- Interfaces: MIL-STD-1553B (redundant), Serial Port RS-422, USB, ARIN-429, 100Base T fast Ethernet, special interfaces
- Reduced part count and intensive use of COTS
- Improved reliability, low life cycle costs and enhanced supportability
- Easy installation on a large variety of platforms
- Control and integration of a full self-protection suite
- Provides an open structure of libraries fully programmable in flight line without any kind of manufacturer or supplier dependency



Configuration

The ALR-400 is physically composed by the following elements:

Antenna Assembly

Set of spiral antenna as elementary receiving unit. Different configurations of Antenna Assemblies are available with different frequency coverages and packaging (including dual package). Provide a total azimuth range of 360 degrees.

Receiving Unit

Contains the resources to adapt and detect the received signals. Each unit is associated with one or two antenna assemblies.

Electronic Warfare Processor

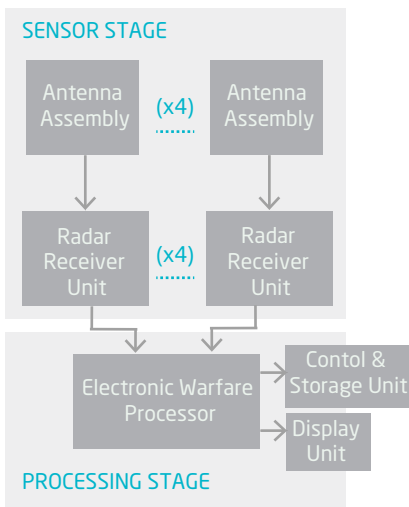
Contains all elements related with the process of EW data, Digital Receivers and processing board, and the necessary elements to interface with the platform. Provides EW suite controller functionality. Different mechanical and cooling variants are available.

Control and Storage Unit (optional)

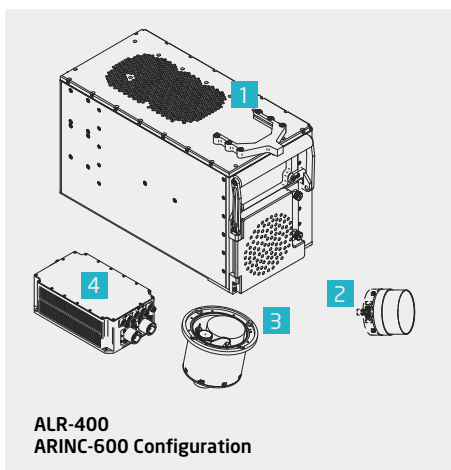
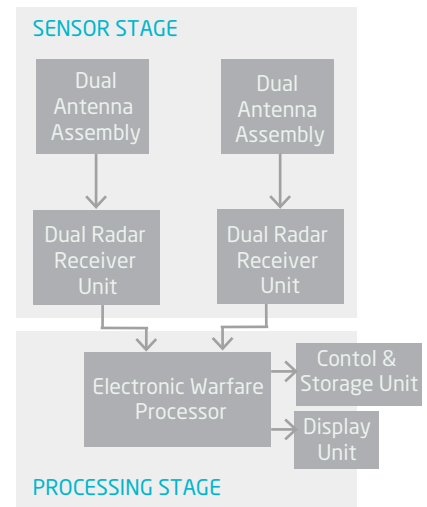
A cockpit unit which allows to control the system and to storage data (such as libraries, mission file or events).

Display Unit (optional)

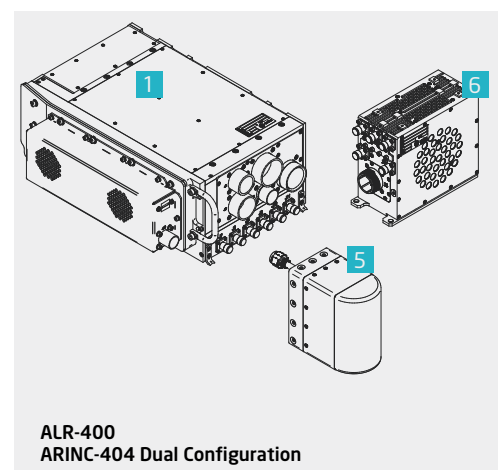
A cockpit element use to display threat information, the system status and control symbols.



System is modular and available in several configurations, so it can be adapted to different platforms.



- 1 EW Processor (external and self-cooled options available)
- 2 Antenna Assembly (E/J Band)
- 3 Antenna Assembly (E/K Band)
- 4 Radar Receiving Unit
- 5 Dual Antenna Assembly (E/K Band)
- 6 Dual Radar Receiving Unit



Operational features

The ALR-400 RWR has been designed to perform the following main functions:

Threat indication

- Threat displaying on different resources as HUD, TWI, DDI.
- Represents emitter identification through alphanumeric and graphic symbols.
- Polar AOA information.
- Emitter presentation according to its threat level.
- Pilot warning acoustic signals generated: PRF, Tones and synthetic voice.

Self-test function

- Auto checking of the operative state of the system, giving a complete diagnosis of each unit of the ALR-400 system.

Control of ECM subsystem

- When an emission is detected and identified as a threat, if it has associated the implementation of a certain ECM program, the ECM and emission data are transmitted to the corresponding countermeasures subsystem (either active or passive) through the provided interfaces.

Upload or download of emitter libraries and data stored during the flight

- Standard MLV, fast Ethernet auxiliary port, or cockpit control unit removable compact flash are valid ways to upload or download data.
- The system can also export the stored data during flight with a wide variety of recorded events. This capability supports a deep post mission analysis task.

Interface with other systems

- Interfaces with avionics systems (NAV data, interoperability, status, ...)
- Interfaces with other EW systems (data interface MIL-STD-1553B, serial ports, USB, ARINC-429, 100BaseT fast Ethernet)
- Capacity to interface with external DAC or to include embedded DAC functionality to support other EW sensor (Laser or Missile Warner Systems).
- The ALR-400 has enough spare processing capacity to perform other extra functions.

Technological advantages

- ALR-400 RWR is the best allied of the pilots to self protect the platform
- ALR-400 was designed for easy installation in a large variety of platforms (including fighters, transport aircrafts and helicopters) with several standard mechanical housing.
- The cooling system of ALR-400 makes it a good choice to operate even in explosive atmospheres
- Modular design, flexible HW Architecture
- High spatial accuracy and resolution
- Wide spatial coverage
- Multi CW scenarios capability
- LPI radar detection capability
- Improved sensitivity
- Improved dynamic range
- Flexible integration
- Logical ICD adapted to platform

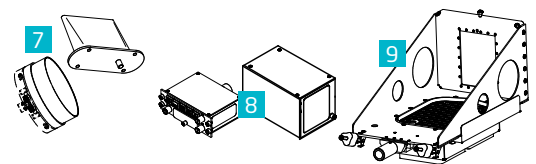
Baseline & Optional Extensions

Baseline system

- E/J Band

Extensions available

- Dual polarization antennae
- C/D Band (with/without DF)
- K Band
- Cockpit Control Unit & Displays
- Self-cooling



7 C/D Band Antennae

8 Cockpit Control Unit & Displays

9 Self-cooling



NH90 Helicopter



F/A-18 fighter



A400M Aircraft

Technical specification

Frequency coverage

From 0.5 to 42 GHz (configurable)

Reception Technique

True Wideband 4th generation Digital Receivers

Technology Readiness Level

TRL 9

Frequency accuracy

- 3 MHz for pulsed signals
- 1 MHz for CW

Probability of interception

100%

IP Modulation

- FMOP (chirp + and -, discrete shift, quadratic)
- PMOP (binary, barker and code detection)

Physical characteristics

ARINC-404 VERSION	W x H x D	WEIGHT
Antenna Assembly (E/I Band)	Ø 67x69,85 mm	0.2 Kg
Antenna Assembly (E/K Band)	configurable	---
Radar Receiver Unit	157x39,5x178,5 mm	1.85 Kg
Electronic Warfare Processor	208x124x332 mm	12.5 Kg
ARINC-600 VERSION	W x H x D	WEIGHT
Antenna Assembly (E/K Band)	Ø 101x88 mm	0.5 Kg
Radar Receiver Unit	117x70x250 mm	1.55 (min) / 2.15 (max) Kg
Electronic Warfare Processor	158x196,5x335,5 mm	11 Kg
DUAL PACKAGE VERSION	W x H x D	WEIGHT
DUAL Antenna Assembly (E/K Band)	90x150x149 mm	1.5 Kg
DUAL Radar Receiver Unit	72,5x136x182 mm	1.9 Kg
OPTIONS	W x H x D	WEIGHT
Blade Antenna (C/D Band)	90x150x149 mm	0.5 Kg
Cockpit Control Unit	145x46x136 mm	0.85 Kg
Display Unit	83x83x150 mm	1.25 Kg

Main standards

Environment specification	MIL-STD-810/E
Human engineering	MIL-STD-14272/D
Design safety	MIL-STD-544/N
EMI/EMC	MIL-STD-461/E
Power supply	According MIL-STD 1399 adaptable to the Customer

The physical characteristics shown below could be modified according to the requirements and installation constraints.



ISO 9001:2000



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