BLACKLAB

The Next-Generation CEMA and SIGINT Family of Small SWAP Sensors

LEONARDO DRS

BLACKLAB

BlackLab from Leonardo DRS is the next generation of networked Cyber Electromagnetic Activities and SIGINT sensors. The system provides mission-critical Intelligence to the warfighter by rapidly detecting and locating a wide range of threat signals, monitoring signals of interest, and supporting real-time analysis of the signal environment.

A single BlackLab sensor can combine the effects of electronic support (ES) and electronic attack (EA) capabilities operated from a single user interface. The system's light weight, low power consumption, field programmability, and multiple deployment configurations make it well suited for a wide range of operational scenarios.

All configurations support signal detection, wideband direction finding (DF), and precision time-stamped data collection supporting TDOA/FDOA geolocation operations. BlackLab is also compatible with Leonardo DRS' geo-services suite of signal classification consisting of DF and TDOA geolocation engines, plus JICD 4.2 based command and control (C2), and data sharing for JICD enterprise operations.

BLACKLAB RADIOHEAD WITH ULTRA-LOW SWAP FOR COMMS & NON-COMMS SIGNALS

The BlackLab Radiohead can be configured to be worn on the body, mounted to a vehicle, mast, or drone. The Radiohead configuration includes USB 2.0 and USB 3.2 Gen 2 rugged ports which are typically used with tactical communications and user interface devices.

These ports are directly compatible with typical dismounted communication devices and user interface devices such as tablets and smart phones. A rugged USB extender is also available for long standoff when the sensor must be mounted to a mast or to keep operators at a safe distance in shelter.

BLACKLAB HIGHLIGHTS

- Modular Open Radio Frequency Architecture (MORA) design compliant with CMOSS and SOSA standards.
- Extreme frequency range antenna array that covers HF, VHF, UHF and SHF.
- Addresses modern, frequency agile ES requirements by utilizing multi-channel, wideband direction finding which enables detection of extremely short duration frequency agile or non-comms signals.
- Detect, locate, and make an I/Q recording on a removable storage device of the target for downstream analysis.

BLACKLAB CONFIGURATIONS

BLACKLAB MANPACK

With an antenna width of 6 inches and height of 7 inches, this BlackLab Manpack configuration is equipped with a wideband SDR and GPU processor in a chassis that is environmentally sealed. Included is a removable drive for TS/SCI loads, GFE tactical radio, 2590 battery and USB 3.1 smartphone interface.

BLACKLAB TACTICAL VEHICLE RF SENSOR

In this configuration, the BlackLab sensor provides comms and radar signal detection, geolocation, signal recognition and threat alerts. This low SWAP payload, weighing approximately 14 lbs., for persistent hoist is qualified for direct environmental exposure including extended sun loading.

BLACKLAB AT-THE-HALT MAN PORTABLE KIT

The at-the-halt mast kit utilizes a 3, 4 or 5 meter, deployable rolled mast to achieve elevation advantage. The rolled mast is quick and easy to deploy yet lightweight and compact for transport. The BlackLab antenna and radiohead, without battery, is positioned at the mast head.

BLACKLAB DRONE RF SENSOR

The drone RF sensor weighs 12 lbs. with low power consumption, which allows the system to fly for indefinite periods of time from a wide range of platforms. This configuration is optimal for operations requiring extended range and long user interface standoff.

BLACKLAB COMPONENT DETAILS

Product	Highlights	MORA/CMOS ANT	RFC	RFD
BlackLab CMOSS Radioheads				
BlackLab Processing Radiohead	Active DF Antenna, 4DF + 1 omni HF/VHF/UHF/SHF Up to 500 MHz IBW internally processed & VDB C2 Embedded CPU + GPGPU (w/ DRS ES/DF/GEO)	X	X	X
BlackLab Digital Radiohead	Active DF Antenna, 4DF + 1 omni HF/VHF/UHF/SHF Up to 500 MHz IBW, low NF, preselect filters 40 GbE ML2B and VDB C2	X	X	X
BlackLab Analog Radiohead	Active DF Antenna, 4DF + 1 omni HF/VHF/UHF/SHF Up to 500 MHz IBW, low NF, preselect filters MORA SPM Controller	X	X	X
BlackLab CMOSS VPX Components (to be combined with Analog Radiohead)				
3U VPX 4 CH Rx Digital Tuner, 1 Channel Exciter	HF/VHF/UHF/SHF 100 MHz IBW TX Exciter Supports 10G/40G or Pcle V49 MORA DIG Stream		X	X
3U VPX CPU+GPGPU Card with Application Processing	HF/VHF/UHF/SHF 2x10G or 1x40G or PCle ML2B 8 COU Cores, 512 CUDA cores, 32GB RAM Includes DRS ES/DF/GEO SPF + APS			

SS/SOSA Components) RFT SDC SPF APS DRX DTX ARX ATX VPS	Antenna Form Factor	Size	Weight (lbs)
X X X X X	4 CH DF; 1 CH Omni	ANT: 7"H x 6.1" Dia SDR: 9.5" x 8" x 3.2"	~14
X X X	4 CH DF; 1 CH Omni	ANT: 7"H x 6.1" Dia SDR: 9.5" x 8" x 3.2"	~12
X	4 CH DF; 1 CH Omni	ANT: 7"H x 6.1" Dia	~4
X X X X X X X	4 CH Rx; 1 CH Excite	3U VPX Card	< 2
X X X X X	4 CH DF; 1 CH Omni	3U VPX Card	< 2

BLACKLAB MAJOR COMPONENTS

RADIOHEADS

The BlackLab Radioheads are receive only, ultra-low SWAP, rugged, MORA/CMOSS compliant devices. The Radioheads' versatility allows them to be mounted on a wide variety of platforms including soldier-borne, drones, masts, small vehicles, large vehicles, and team portable/fixed site. Complete with four RF channels and extreme frequency coverage of HF, VHF, UHF and SHF, these devices support comms and non-comms signal receive and conditioning of up to 500MHz of instantaneous bandwidth.

3U VPX CARDS

The 3U OpenVPX cards align with the latest CMOSS payload profile and provide MORA/CMOSS compliant signal processing and firmware in a single ultra-low SWAP form factor. The 3U VPX cards act as digital receive or digital transmit endpoints. Bundled with the Leonardo DRS application processing and software layer, the cards can perform wideband signal detect, DF, and signal classification. The application processing and software utilize the MORA/CMOSS processing ports to control the BlackLab Analog Radiohead and BlackLab 3U VPX using signal port control messages. They also receive ML2B Vita 49.2 data and convert the data to floating points for GPU processing.

OUR COMMITMENT TO MORA

We are committed to developing Modular Open RF Architecture (MORA) systems to enable pacing technology advancements that improve lifecycle costs resulting in low-risk solutions for our customers. We serve as committee chairman for multiple VITA standards and are leading participants of the CMOSS and SOSA efforts. This critical involvement ensures our products are interoperable across all military branches and program offices.

SOSA Sensor Open Systems Architecture

CMOSS

VITA Open Standards, Open Markets

BLACKLAB MANPACK

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