INTRODUCING THE RF SENSOR

RFEYE NODE

9 kHz – 40 GHz

Portable & rugged high-performance RF sensor for real-time 24/7 spectrum monitoring & geolocation of transmitters

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CRFS | EXTRAORDINARY **RF TECHNOLOGY**

CR-005310-MD

RFEYE NODE
AT A GLANCE

RFeye Nodes are state-of-the-art superheterodyne receivers designed to support military and commercial applications without physical, location, or infrastructure constraints. The RF sensors are ideal for high-performance ITU-compliant spectrum monitoring, military spectrum operations, signal analysis, and data streaming from 9 kHz – 40 GHz.

These fourth-generation high-performance RF sensors have in-built edge processing to reduce the bandwidth of backhaul data.

Automate wide area and close proximity signal monitoring, interference detection, identification, geolocation, and reporting.

Continuously monitor the spectrum in real-time 24/7. Record I/Q data with digital analysis for signal classification. Stream in Vita-49 for third-party demodulation.

BENEFITS

Intelligent RF sensor
High-performance, intelligent RF sensor with in-built edge processing, reducing backhaul data bandwidth.

Networked for multiple users & missions
Multiple users have multi-mission capabilities and can fully manage EMSO and user interaction.

Superior RF performance
Excellent phase noise, low noise figure, superb spurious free dynamic range, with FPGA technology and card design supporting integration and exploitation of the SDR and computer platform.

Small, light, fast
RFeye Nodes can be deployed on masts, tripods, within building ceiling tiles, and as drone payloads for fixed, mobile and tactical in-field deployments.

Advanced signal intercept
Multi-stage pre-selection filtering and intelligent AGC support superior signal extraction in contested and noisy environments.

9KHz 40GHz

100 MHz IBW wideband RF monitoring
Quickly sweep from 9 kHz to 40 GHz with a high probability of intercept.

RF recording (I/Q capture)
Record and capture in high fidelity. Stream wider signals high-definition I/Q for SIGINT.

IP67-rated ruggedized against water & dust
Designed for outdoor deployment, RFeye Nodes operate in -30°C – +55°C environments.

Easy installation, set-up, & operation
COTS optimized, RFeye technology is easy to connect and install and does not require recalibration.

Gateway to powerful software & APIs
CRFS hardware works with a software suite to monitor, capture, analyze, and geolocate signals of interest for complete spectrum visibility.

RFEYE NODE
COMPARISON

ENTRY LEVEL SENSOR

RFEYE NODE 40-8

Competitively priced entry-level high-performance RF sensor for mobile spectrum monitoring and geolocation of transmitters up to 8 GHz (40 MHz IBW).

SIZE & WEIGHT (W, H, D)	
Node (only)	200 x 50 x 130 mm 7.9 x 2.0 x 5.1 inches 2.1 kg (5 lbs)
+ noses / heatsinks	4.5 kg (10.7 lbs)

MID-RANGE SENSOR

RFEYE NODE 100-8

Entry-level high-performance RF sensor for mobile spectrum monitoring and geolocation of transmitters up to 8 GHz 100 MHz IBW).

SIZE & WEIGHT (W, H, D)	
Node (only)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 2.9 kg (6.4 lbs)
+ noses / heatsinks	5.8 kg (12.8 lbs)

MOST POPULAR SENSOR

RFEYE NODE 100-18

Portable and rugged high-performance RF sensor for wideband spectrum monitoring and geolocation of transmitters up to 18 GHz (100 MHz IBW).

SIZE & WEIGHT (W, H, D)	
Node (only)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 2.9 kg (6.4 lbs)
+ noses / heatsinks	5.8 kg (13.7 lbs)

40 GHz SENSOR

RFEYE NODE 100-40

High-frequency wideband RF sensor. Portable, rugged, and high-performance for real-time 24/7 spectrum monitoring and geolocation of transmitters up to 40 GHz (100 MHz IBW).

SIZE & WEIGHT (W, H, D)	
Node (only)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 3.5 kg (8 lbs)
+ noses / heatsinks	6.2 kg (13.7 lbs)

LIGHTWEIGHT SENSOR

RFEYE NODE 100-18 LW

Lightweight RF sensor for integration into autonomous systems and wideband spectrum monitoring and geolocation of transmitters up to 18 GHz.

SIZE & WEIGHT (W, H, D)	
Node (only)	222 x 52 x 187 mm 8.8 x 2.0 x 7.4 inches 1.95 kg (4.3 lbs)

RFEYE NODE
IN DETAIL

NOSES OR END PLATES

Noses or end plates are fitted on the front and back for outdoor deployments.

- Precision hex mount gasket weather seal
- Goretex Breather gland and altitude protection
- Cable strain-relief, and cable management

MIL-spec I/O connectors and SSD hatch

Weatherproof RF connectors

IP67-rated ruggedized against water & dust

All RFeye Nodes are designed for outdoor deployment in extreme environments and operate between -30°C and +55°C. The MIL-spec I/O connectors, weatherproof RF connectors and sealing gaskets provide IP67-rated protection

RFEYE NODE 100-18 LW
IN DETAIL

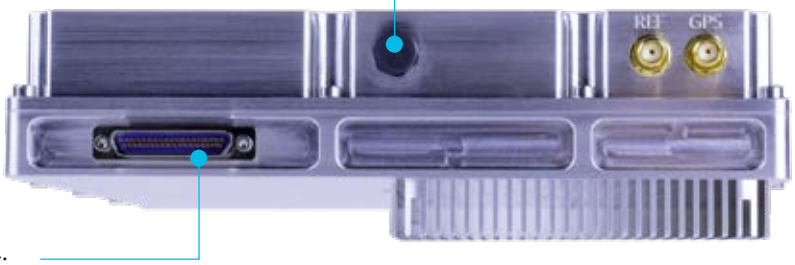
- Allows up to 3 antennas for different frequency bands
- All 3 ports support 9kHz to 18GHz

GPS / GNSS antenna port

- Supports bands L1, L2, L5
- Multi-constellation

10MHz Ref input port

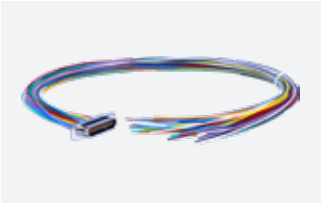
Goretex pressure valve
to prevent condensation
in harsh conditions



D-type connector for:

- GigE Ethernet / POnE power
- DC power
- USB 2
- USB 3
- HDMI
- Fan power output

PACKAGE ACCESSORIES



LW-Node main
breakout loom

LW-Node wire ended
integration connector
(DC power, RJ 45 Ethernet, USB 3.1,
Expansion port, Fan Header)

Guidance for integrators

Physical: CRFS can supply CAD drawings or loan a space model. You must allow for mount point vibration damping. **Operating environment:** Sensor is sealed to IP67 provided the correct connectors are fitted. **Power:** Limits are +10v to +30V DC. **RF:** We can provide guidance on RF measurements, antenna choice, filter choice and RF cables. **SSD storage:** Optional external hard drive. **Data connection:** Ethernet connection with Ethernet switch possible. **SSUS:** Provides easy access to RF sensor (Node) operating and software updates. More information is available from the RFeye Node 100-18 LW data sheet.

RFEYE NODE **ADVANTAGES**

100 MHz IBW wideband frequency monitoring

RFeye Nodes quickly sweep from 9 KHz to 40 GHz ensuring high probability of intercept. 100 MHz IBW ensures you never miss a signal and supports I/Q data capture. Smart attenuators reduce the power of an RF signal without appreciably distorting its wavelength, which is particularly useful to distinguish between close-in signals and noise. In any operating environment, users can more reliably automate wide area, close-proximity monitoring, interference detection, geolocation, and reporting.

Superior RF performance

RFeye Nodes use the latest superheterodyne RF technology, microwave components, and configuration for superior sensitivity, frequency stability, and selectivity. The in-built EDGE processing reduces backhaul bandwidth requirements. Excellent phase noise, low noise figure, and superb free spurious dynamic range is coupled with FPGA technology and card design, enabling easy integration and exploitation of the SDR and computer platform.

Small, light, fast

Now in its fourth generation, RFeye Nodes are optimized for SWaP (size, weight, and power). These RF sensors are designed to be more agile, mobile, powerful and to maximize functional density within constrained spaces. RFeye Nodes are renowned for their small form factor, fast and intelligent processing, and low power consumption. This makes them suitable for fixed, mobile, tactical in-field, and integration deployments.

Networked for multiple users and missions

One RFeye Node can be deployed to monitor multiple tasks. RFeye Nodes can also be networked, with multiple users and multi-mission capabilities, to effortlessly manage full EMSO (military and commercial) and user interaction. Networks can be joined together to provide wide area monitoring over an entire country or can be integrated into other networks, including Command and Control systems.

INTEGRATION & APIs

By leveraging CRFS' Application Programming Interface (APIs), customers can seamlessly integrate the capabilities of CRFS software into their proprietary systems, thereby automating tasks, which would otherwise have to be performed manually.

- EMP APIs allow users to manage non-synchronous tasks control on the Node, such as spectrum sweeps.
- GMP APIs allow users to manage synchronous tasks across multiple Nodes, such as geolocation.

CRFS APIs are designed with four key features that collectively enhance the usability, efficiency, and effectiveness of APIs in terms of system integration and communication.

- RESTful APIs use standard HTTP methods
- The JSON open data format allows interoperability between different systems and platforms
- Event streams allow for real-time data processing and notifications
- Clear schemas allow APIs to be easily integrated into larger systems

A GATEWAY TO **POWERFUL SOFTWARE**

All CRFS customers have access to software to monitor, capture, analyze, geolocate, and report signals of interest. Our complimentary software suite provides teams with the tools to achieve complete spectrum visibility.

RFEYE SITE

Real-time spectrum monitoring & geolocation toolkit

- Desktop application including all the essential functionality needed for full spectrum operations, turning spectrum data into RF intelligence
- Features include: Real-time spectrum visualization; geolocation (PoA, AoA, TDoA, 3D TDoA, Hybrid), spectrum monitoring, I/Q data (capture, stream, visualize), propagation modelling tool; simulation and training engine, spectrum overlays and spectrum measurements

RFEYE MISSION MANAGER

Automated spectrum management & near-time incident reporting

- Desktop application allowing technical and non-technical operators to automate EMSO missions set up in RFeye Site
- Features include: Clear views of the RF environment, visualizations of authorized transmitters, operating zones, geofencing, incidents and alarms; signal detectors, network status and diagnostics; I/Q capture; spectrum monitoring; geolocation; schedule scans, tasks, sweeps, surveys and reports
- Automate and manage multi-user, multi-mission tasks, with ease

RFEYE DEEPVIEW

Forensic signal analysis software with 100% probability of intercept

- Developed for signal analysts, EW, SIGINT and RF Test Engineers, an easy user interface makes it accessible to non-technical RF operators too
- Long duration wideband I/Q recording, analyse, replay and export signal fragments for DEMOD. ‘On-the-fly’ signal analysis enables unique spectrum situational awareness and intelligence
- Features include: Live-preview mode; I/Q snippet output; statical signal analysis and isolation; signal exploration and visualization; I/Q analysis; full dataset spectrogram; query signals; stream in VITA-49

RFEYE NODE **SPECIFICATIONS**

	RFEYE NODE 40-8	RFEYE NODE 100-8	RFEYE NODE 100-18	RFEYE NODE 100-40	RFEYE NODE 100-18 LW
Frequency range	9 kHz - 8 GHz	9 kHz - 8 GHz	9 kHz - 18 GHz	9 kHz - 40 GHz	9 kHz - 18 GHz
Noise figures at maximum sensitivity	6-10 dB typical	6-10 dB typical	7-21 dB typical	8.5-16 dB typical	7-21 dB typical
Phase Noise at 1 GHz (20 kHz offset)	-110 dBc/Hz	-130 dBc/Hz	-126 dBc/Hz	-126 dBc/Hz	-126 dBc/Hz
Instantaneous bandwidth (IBW)	40 MHz	100 MHz	100 MHz	100 MHz	100 MHz
Sweep rate	245 GHz/s	280 GHz/s	390 GHz/s	232 GHz/s	390 GHz/s
Node weight (ex noses / heatsink)	2.1 kg (5 lbs)	2.9 kg (6.4 lbs)	2.9 kg (6.4 lbs)	3.5 kg (8 lbs)	1.95 kg (4.3 lbs)
GNSS bands	L1	L1	L1	L1	L1, L2, L5
GNSS disrupted environments	–	Yes (Holdover option)	Yes (Holdover option)	Yes (Holdover option)	Yes (Holdover option)

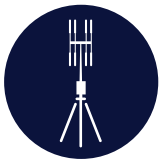
PERFORMANCE **& FLEXIBILITY**

RFeye Nodes can be deployed in the following ways:

Outdoors

Outdoor kits

Fixed masts / towers



Tripods

DF / RFeye Array

Ships & USVs

Tactical & mobile

RFeye Stormcase

RF recorders

V-Track

Airborne

Fixed wing drones

Rotary drones

Tethered drones

Tethered balloons

In-building

TSCM

Data centres

SCIFs

CRFS

EXTRAORDINARY **RF TECHNOLOGY**

CRFS is an RF technology specialist for defense, national security agencies and systems integration partners. We provide advanced capabilities for real-time spectrum monitoring, situational awareness and electronic warfare support to help our customers understand and exploit the electromagnetic environment.