

**INTRODUCING
RFEYE NODE PLUS**
Full 100 MHz I/Q record & stream capability

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



www.crfs.com



**EXTRAORDINARY
RF TECHNOLOGY**

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.



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.



RF recording (I/Q capture)

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



Networked for multiple users & missions

Multiple users have multi-mission capabilities and can fully manage EMSO and user interaction.



Advanced signal intercept

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



IP67-rated ruggedized against water & dust

Designed for outdoor deployment, RFeye Nodes operate in -30°C – +55°C environments.



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.



100 MHz IBW wideband RF monitoring

Quickly sweep from 9 kHz to 40 GHz with a high probability of intercept.



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 (inc heatsink)	200 x 50 x 130 mm 7.9 x 2.0 x 5.1 inches 2.8 kg (6.3 lbs)
+ noses / end plates	5.2 kg (11.6 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 (inc heatsink)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 4.2 kg (9.3 lbs)
+ noses / end plates	6.6 kg (14.5 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 (inc heatsink)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 4.2 kg (9.3 lbs)
+ noses / end plates	6.6 kg (14.5 lbs)

100MHZ I/Q & STREAM SENSOR



RFEYE NODE PLUS 100-18

New (2025) receiver with faster processing, enhanced capture, detection, POI, and full 100 MHz I/Q recording (to in-built SSD), plus streaming over a 10GigE interface.

SIZE & WEIGHT (W, H, D)

Node (inc heatsink)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 4.2 kg (9.3 lbs)
+ noses / end plates	6.6 kg (14.5 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 (inc heatsink)	200 x 50 x 192 mm 7.9 x 2.0 x 7.6 inches 4.2 kg (9.3 lbs)
+ noses / end plates	6.6 kg (14.5 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 (including embedded heatsink)	222 x 52 x 187 mm 8.8 x 2.0 x 7.4 inches 1.95 kg (4.3 lbs)
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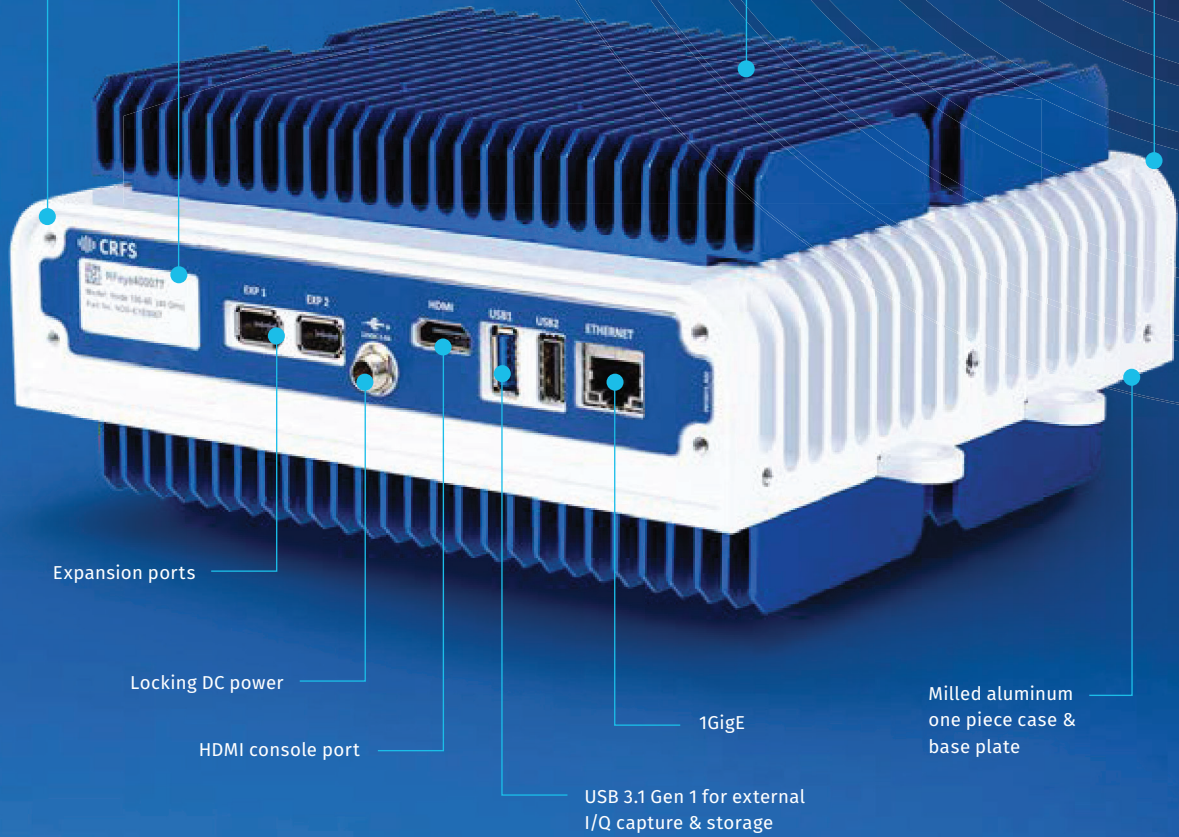
RFEYE NODE IN DETAIL

Ruggedized protection & anti-tamper fixings

Unique ID model & serial number

Graphite heatsink interface for excellent thermal transfer

Durable powder coat finish



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



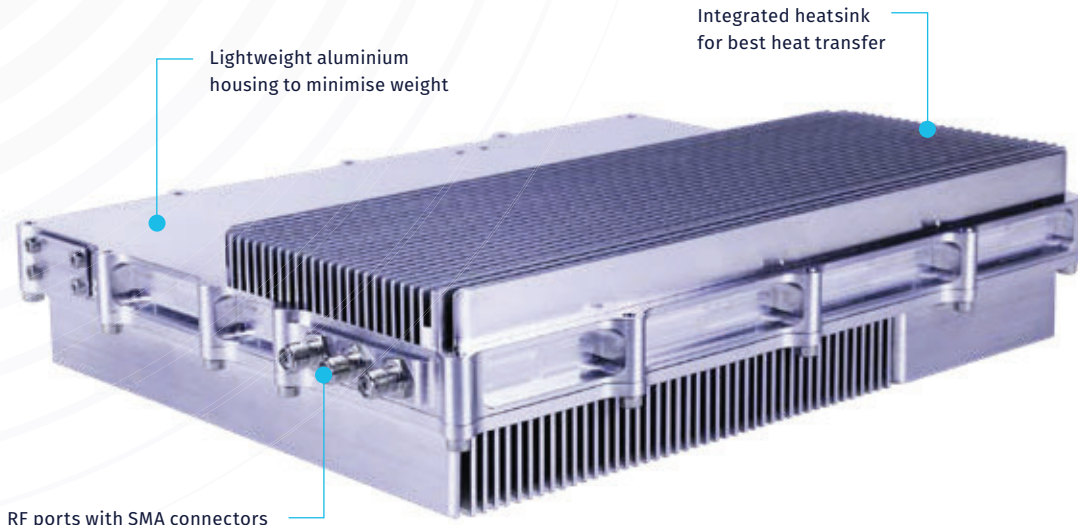
Weatherproof RF connectors



IP67-rated: Ruggedized against water & dust

All RFEYE Nodes are designed for outdoor deployment in extreme environments and operate between -30°C and $+50^{\circ}\text{C}$. The MIL-spec I/O connectors, weatherproof RF connectors, and sealing gaskets provide IP67-rated protection.

RFEYE NODE 100-18 LW IN DETAIL

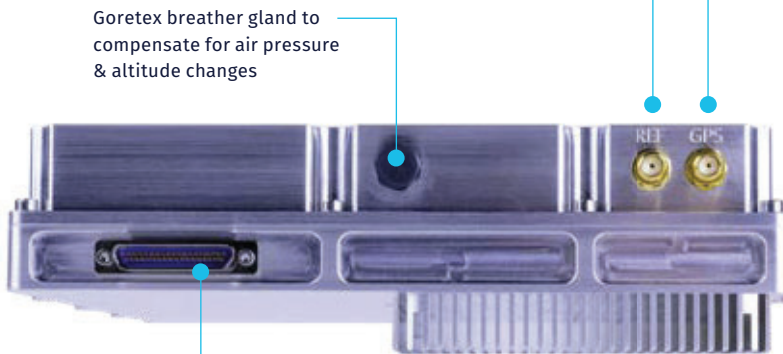


Lightweight aluminium housing to minimise weight

Integrated heatsink for best heat transfer

RF ports with SMA connectors

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



Goretex breather gland to compensate for air pressure & altitude changes

10MHz Ref input port

GPS / GNSS antenna port

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

D-type connector for:

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

PACKAGE ACCESSORIES



LW-Node wire-ended integration connector



LW-Node main breakout loom (DC power, RJ 45 Ethernet, USB 3.1 Expansion port, Fan)

Guidance for integrators

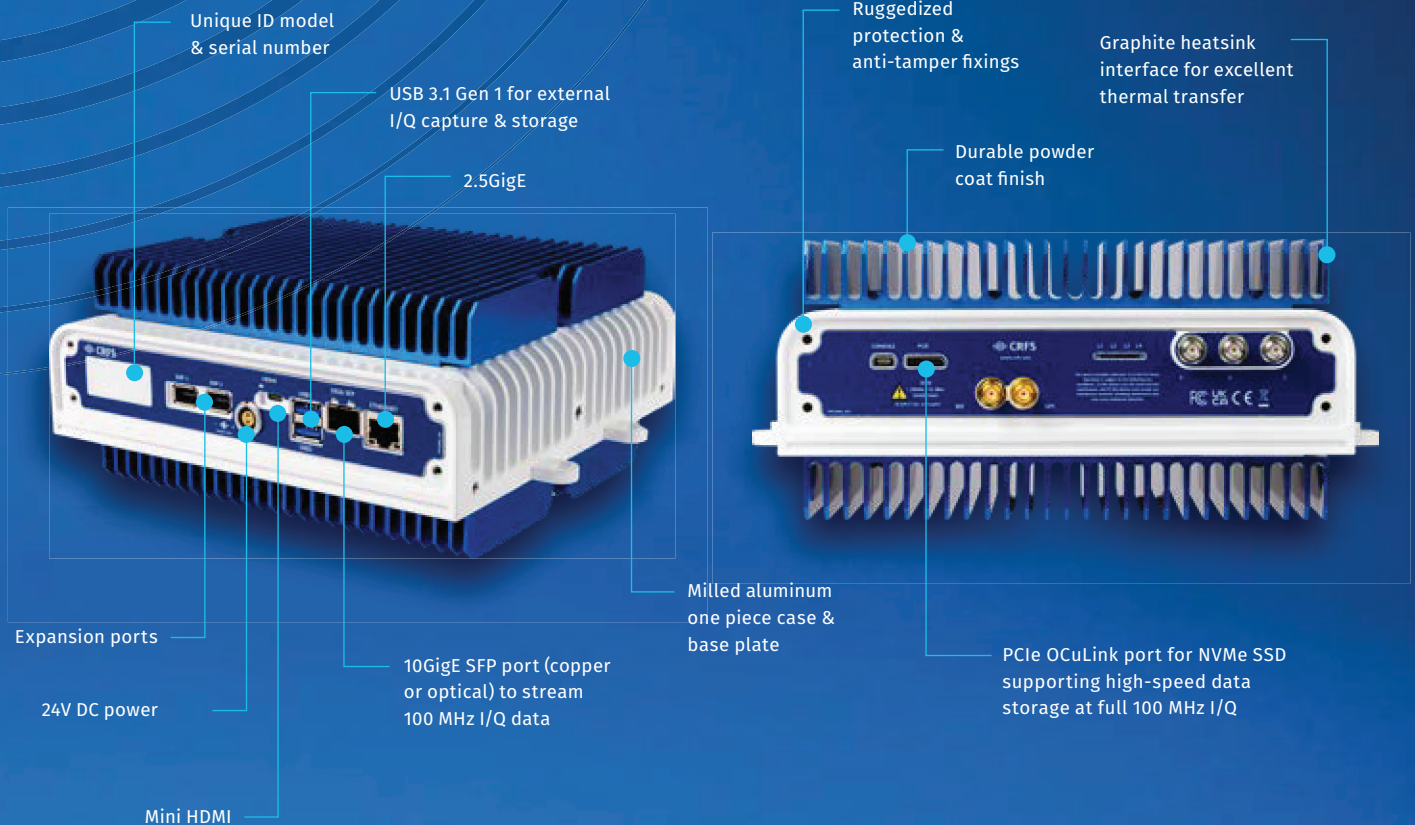
Physical: CRFS can supply CAD drawings or loan a space model. You must allow for mount point vibration damping. **Operating environment:** Sensor is sealed to IP67, provided the correct connectors are fitted. **Power:** Limits are +10v to +30V DC. **RF:** We can provide guidance on RF measurements, antenna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

RFEYE NODE PLUS IN DETAIL

NEW NETWORK
& RF ENDS

ENHANCED

- On-board processing
- Capture, detect & POI
- Full 100 MHz I/Q record
- Full 100 MHz I/Q stream
- Signal intelligence



UNIQUE NOSES OR END PLATES

For fast SSD storage and I/Q data handling.

- ✓ New hatch for SSD
- ✓ NVMe drive attached to PCIe port
- ✓ SSD capacity up to 16TB
- ✓ Supports full rate 100 MHz I/Q recording up to 8 hours
- ✓ Node Firmware 2.25 or newer



MIL-spec I/O connectors



Weatherproof RF connectors and SSD hatch



IP67-rated: Ruggedized against water & dust

All RFEYE Nodes are designed for outdoor deployment in extreme environments and operate between -30°C and +50°C. The MIL-spec I/O connectors, weatherproof RF connectors, and sealing gaskets provide IP67-rated protection.

RFEYE NODE SPECIFICATIONS

	RFEYE NODE 40-8	RFEYE NODE 100-8	RFEYE NODE 100-18	RFEYE NODE 100-18 LW	RFEYE NODE PLUS 100-18	RFEYE NODE 100-40
Frequency range	9 KHz - 8 GHz	9 KHz - 8 GHz	9 KHz - 18 GHz	9 KHz - 18 GHz	9 KHz - 18 GHz	9 KHz - 40 GHz
Noise figures at maximum sensitivity	6-10 dB typical	6-10 dB typical	6-17 dB typical	6-17 dB typical	6-17 dB typical	8-18 dB typical
Phase Noise at 1 GHz (20 KHz offset)	-110 dBc/Hz	-129 dBc/Hz	-129 dBc/Hz	-129 dBc/Hz	-129 dBc/Hz	-129 dBc/Hz
Instantaneous bandwidth (BW)	40 MHz	100 MHz	100 MHz	100 MHz	100 MHz	100 MHz
Sweep rate	245 GHz/s	280 GHz/s	390 GHz/s	390 GHz/s	390 GHz/s	232 GHz/s
Node weight (inc heatsink)	2.1 kg (5 lbs)	4.2 kg (9.3 lbs)	4.2 kg (9.3 lbs)	1.95 kg (4.3 lbs)	4.2 kg (9.3 lbs)	4.2 kg (9.3 lbs)
GNSS bands	L1	L1	L1	L1 / L2 & L1 / L5	L1 / L2 & L1 / L5	L1
GNSS disrupted environments	-	Yes (Holdover option)	Yes (Holdover option)	Yes (Holdover option)	Yes (Holdover option)	Yes (Holdover option)
Local I/Q storage bandwidth (sustained gapless I/Q data)	20 MHz	25 MHz*	25 MHz*	25 MHz*	100 MHz	25 MHz*
I/Q streaming bandwidth (sustained gapless I/Q data)	10 MHz	12.5 MHz*	12.5 MHz*	12.5 MHz*	100 MHz (550 MBps / 4 Gbps)	12.5 MHz*
IO interface	1GIGE	1GIGE	1GIGE	1GIGE	2.5GIGE / 10GIGE SFP	1GIGE
Colors	White	Green or White	Green or White	Silver	Green or White	Green or White

*Node 100-x can record / stream 100 MHz I/Q data for a small number of seconds (not sustained gapless). Node Plus can record / stream 100 MHz I/Q data for hours.

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 DEEPCVIEW

**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 IN THE FIELD



RFeye Outdoor Kit



RFeye Mini Outdoor Kit



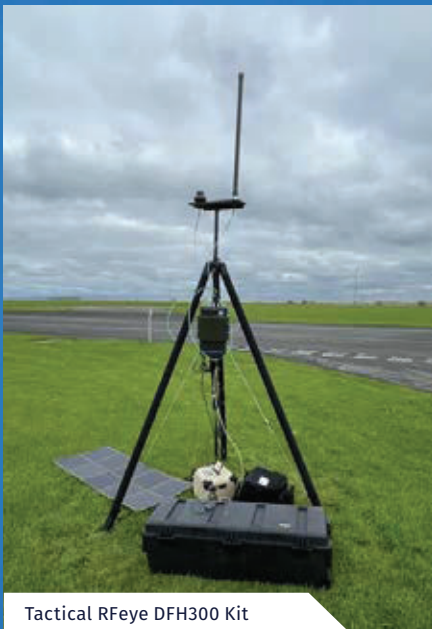
RFeye Mini Outdoor Kit



RFeye DFH300 and the V-TRACK SR18C Command Center



TEKEVER AR-5 with RFeye Node 100-18 LW Integration



Tactical RFeye DFH300 Kit



A150 DF & Geolocation Vehicle



N18 Dismounted Surveillance System

PERFORMANCE & FLEXIBILITY

RFeye Nodes can be deployed in the following ways:

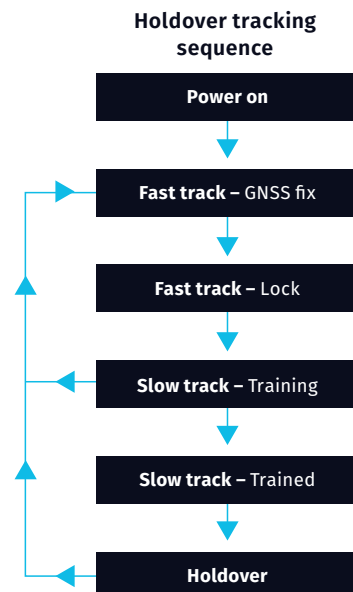


HOLDOVER MODULE (OPTIONAL ADD-ON)

The Holdover module is an optional add-on. It is designed to ensure the RFeye Node continues to receive an accurate timing reference, even when the internal GNSS receiver is compromised, jammed, or blocked by poor weather conditions.

Once calibration training is complete, the Holdover module can provide accurate timing to within 1.5 μ s for over eight hours. There is an automatic switch between GNSS and the Holdover module.

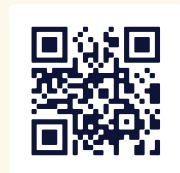
Fast track mode is activated within minutes of power-on, achieving optimal holdover stability after a seven-day training period with uninterrupted GNSS lock. This process requires temperature variation of less than 1°C per minute within an operating range of -10°C to 50°C, and a total temperature change of $\Delta T < \pm 2^\circ\text{C}$.



FURTHER READING

CRFS DEPLOYMENT LIBRARY

View RF technology deployments by application or customer type.



WHITEPAPER: KEY RADIO PARAMETERS FOR SPECTRUM MONITORING RECEIVERS

Radio receivers are at the heart of spectrum management operations. Understand their importance and their minimum recommended values.



**EXTRAORDINARY
RF TECHNOLOGY**

CRFS creates deployable technology to detect, identify and geolocate signals in complex RF environments. With a leading position in the US, Europe and a global reach, our systems are used worldwide by regulatory, military, system integrators, government security agencies and corporates. They require actionable spectrum intelligence across the widest possible frequency range, in both congested and contested environments. They rely on our highly sensitive RF sensors, accurate transmitter geolocation, signal captures, classification and real-time RF intelligence to fulfil EMSO and electronic warfare support missions.



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