CR-005072-DS-3

TRL-9

INTEGRATED VEHICLE SOLUTIONS

TACTICAL SPECTRUM MONITORING & GEOLOCATION SOLUTIONS

CRFS

EXTRAORDINARY
RF TECHNOLOGY

www.crfs.com

MOBILE SPECTRUM MONITORING & TACTICAL GEOLOCATION DEPLOYMENTS

Tactical and mobile deployments now include fitting RFeye technology into custom vehicles and rapidly deployable dismounted systems.

With V-Track, you can operate a squad of vehicles and sensors working independently or networked together to monitor, record, and capture signals of interest or conduct direction finding and TDoA localization.

Operators can quickly deploy covert mobile systems and dismounted systems, which can be complemented with drones carrying the same RF technology (sensors) as a payload. This will improve combat intelligence and ISR management, allowing units to record RF signals and make complex decisions in real-time.

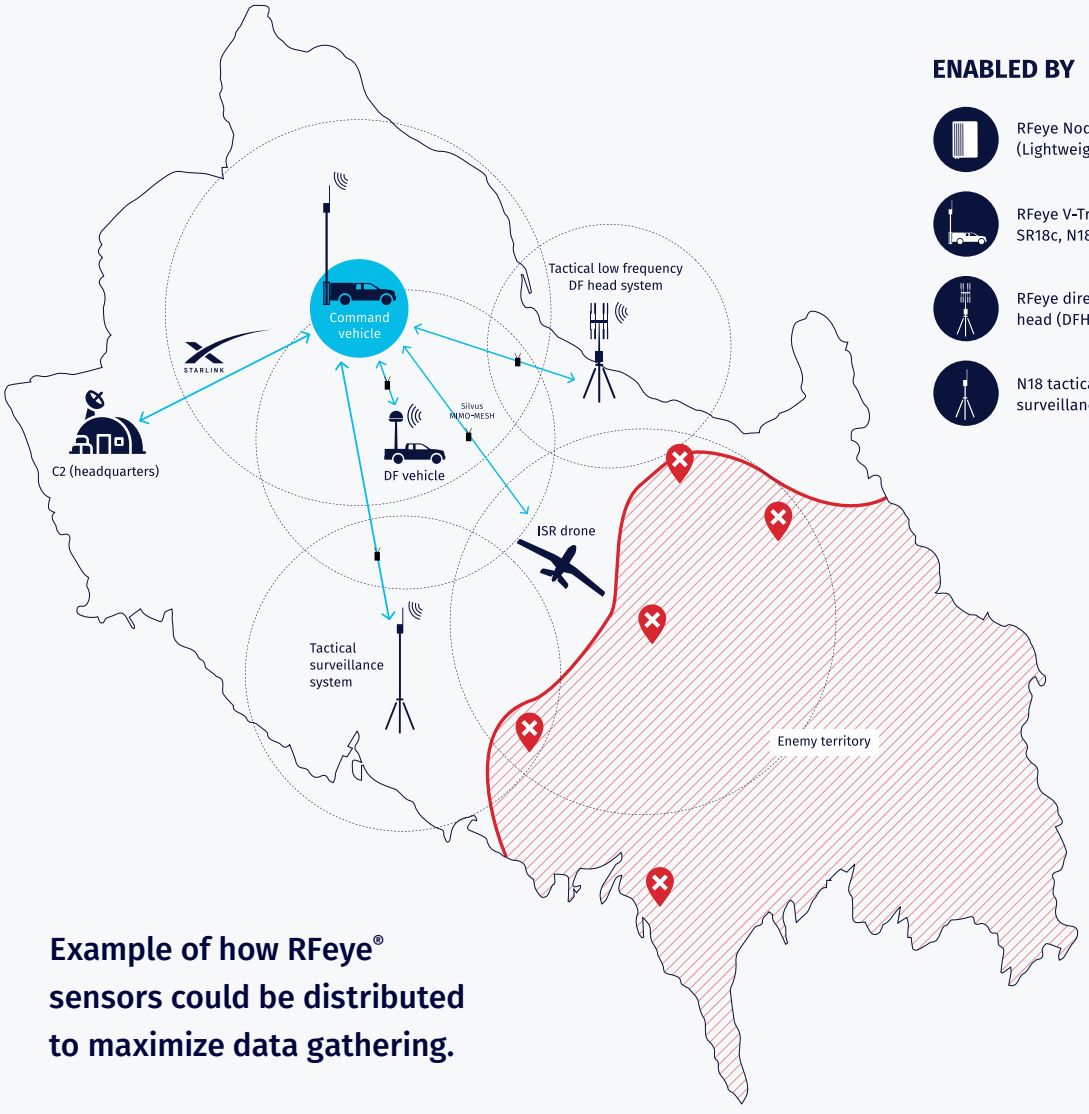
CONCEPT OF OPERATIONS

- >> Automated search, detection, classification, recording of radio signals, and store or stream (VITA 49) for demodulation and decoding
- >> Real-time direction finding and TDoA geolocation of radio emitters
- >> Detection, monitoring, and determination of coordinates for EW superiority (VHF range, navigation system jamming signals, drone detection etc)
- >> Manage COMINT / build a situational awareness or intelligence picture
- >> Real-time RF intelligence and transfer (vehicle-to-vehicle, vehicle-to-dismounted system, vehicle-to-command center)
- >> Acts or operates as part of a COMMINT system
- >> EW and ISR intelligence, supporting joint land and air missions

V-TRACK OPERATES AS A FULLY AUTONOMOUS COMINT SYSTEM OR AS PART OF A COMINT NETWORK

V-Track is an ISR integration solution supporting command and control, intelligence-gathering, surveillance, target acquisition, and reconnaissance.

Operators can efficiently synchronize and integrate their planning and operational efforts for all data-gathering activities by ensuring that RF intelligence is processed, analyzed, and shared with the right person at the right time and in the correct format. Additionally, operators can rely on secure communication links between vehicles, vehicle-to-dismounted systems, vehicle-to-command centers, and interconnected land-air networks. This setup allows for the swift and secure exchange of real-time RF intelligence, enhancing their ability to make informed decisions.



Example of how RFeye® sensors could be distributed to maximize data gathering.

V-TRACK OPTIONS

A150 DF & GEOLOCATION VEHICLE

The A150 integrated system is a rapidly deployable AoA, TDoA, and hybrid turnkey solution for static and mobile direction finding and geolocation operations. With no need for recalibration, the system provides exceptional accuracy in extreme environments and operates either independently or networked.

DIRECTION FINDING (DF) UNIT

Vehicle

Type	4WD pickup truck
Vehicle effective range	400 miles
Operating time with mast deployed	8 – 10 hours

Mast

Type	Telescopic, pneumatic
Max height	5 meters
Deployment time	10 minutes

Local control

Control unit	Rugged laptop
OS	WIndows 11
Realtime software	RFeye Site
Backhaul options	MANET radio, satcom, cellular
Precision timing	GNSS with anti-jam CRPA

ARRAY 150

DF AND GEOLOCATION

Direction finding method

Angle of Arrival (AOA)	6-way switched array

Geolocation frequency range

AOA DF	500 MHz – 18 GHz
Time Difference of Arrival (TDOA)	9 kHz – 18 GHz (optional omni antenna)

DF coverage and accuracy

Polarization sensitivity	All linear (circular polarized Rx antennas)
Azimuth coverage	360°

ARRAY 150 SYSTEM

I/O

Auxiliary RF inputs	2 x N-type
Omni antennas (option)	2 x external / 1 x internal (option)
Network	1 x 1 GigE, with POnE
GPS antenna input	SMA active (+3.3 VDC)

Data storage

Internal SSD inside radome	1 TB SSD

Size, weight, and power *(excl. radome)*

Dimensions (Ø, h)	650 mm x 420 mm (25.59 in x 16.53 in)
Weight	28 kg (61.7 lbs)
DC power	12V DC (max +30V DC)
POnE	56V

Power consumption

Typical	40 W (55W max)

Environmental

Operating temperature	-30 – +50°C (-22 – 122°F)
Storage temperature	-40 – +71°C (-40 – 160°F)
Ingress protection	IP55 Nominal

RECEIVER

Frequency

Range	9 kHz – 18 GHz

Sweep speed

Sweep	390 GHz/s @ 2 MHz RBW

Noise figures at maximum sensitivity

9 kHz – 83 MHz	11 dB typical
83 MHz – 1 GHz	9 dB typical
1 GHz – 2.9 GHz	8 dB typical
2.9 GHz – 5.9 GHz	7 dB typical
5.9 GHz – 10 GHz	9.5 dB typical
10 GHz – 15 GHz	12 dB typical
15 GHz – 16 GHz	13 dB typical
16 GHz – 17 GHz	18 dB typical
17 GHz – 18 GHz	21 dB typical

Signal analysis

Instantaneous bandwidth	100 MHz
Tuning resolution	1 Hz

Internal frequency reference

Initial accuracy @ 20°C	±0.1 ppm typ.
Stability over temperature	±0.3 ppm
Ageing over 1 day	±0.04 ppm

Sampling

Resolution	16 bits per channel (I&Q)
Rate	125 MS/s I&Q

V-TRACK OPTIONS

N18 SURVEILLANCE RECEIVER VEHICLE

The N18 integrated mobile ground vehicle is designed to dynamically deploy an RFeye Node to a height of 20 meters in under 40 minutes. It allows operators to create RFeye Node networks and monitoring stations in challenging conditions. RFeye Nodes are intelligent RF sensors (receive, record, and process) that operate in real-time with RFeye Site software.

SURVEILLANCE RECEIVER UNIT

Vehicle

Type	4WD pickup truck
Vehicle effective range	400 miles
Operating time with mast deployed	8 – 10 hours

Mast

Type	Telescopic, pneumatic
Max height	20 meters
Deployment time	30 – 40 mins (3 personnel)

Local control

Control unit	Rugged laptop
OS	WIndows 11
Realtime software	RFeye Site
Backhaul options	MANET radio, satcom, cellular
Precision timing	GNSS with anti-jam CRPA

NODE 100-18*

Frequency

Range	9 kHz – 18 GHz

Noise figures at maximum sensitivity

9 kHz – 83 MHz	11 dB
83 MHz – 1 GHz	9 dB
1 GHz – 2.9 GHz	8 dB
2.9 GHz – 5.9 GHz	7 dB
5.9 GHz – 10 GHz	9.5 dB
10 GHz – 15 GHz	12 dB
15 GHz – 16 GHz	13 dB
16 GHz – 17 GHz	18 dB
17 GHz – 18 GHz	21 dB

** 40 GHz also available*

Phase noise at 20kHz offset (typical)

Receiver input at 1 GHz	-126 dBc/Hz.
Receiver input at 5 GHz	-121 dBc/Hz.
Receiver input at 18 GHz	-110 dBc/Hz.

Sweep speed

Sweep speed at 2 MHz RBW	390 GHz/s typical

RF Signal inputs

Instantaneous bandwidth	100 MHz
Tuning resolution	1 Hz

Sampling

Resolution	16 bits I&Q
Rate	125 MS/s I&Q

Internal frequency reference

Initial accuracy @ 20°C	±0.1ppm typical
Stability over temperature	±0.3 ppm typical
Ageing over 1 day	±0.04 ppm per year

Size, Weight, and Power (Node in Mini-ODK)

Dimensions of Node (w, h, d)	8.7 x 16.3 x 4.7 in 220 x 415 x 120 mm
Weight of RRH	22 lbs / 10 kg
Power consumption of RRH	40 W typical

Environmental (RRH)

Operating temperature range	-30 – +50°C (-22 to 122°F)
Storage temperature range	-40 to +71°C (-40 to 160°F)

V-TRACK OPTIONS

SR18C COMMAND CENTER

The SR18C integrated vehicle is a flexible, field-deployable RFeye SenS Remote system that acts as a command center for the V-Track RFeye Node network. It is a dynamic platform that uses the full bandwidth fiber I/Q streaming provided by the RFeye SenS Remote for long-duration, high-fidelity RF monitoring and signal analysis.

COMMAND CENTER

Vehicle

Type	4WD pickup truck
Vehicle effective range	400 miles
Operating time with mast deployed	8 – 10 hours

Mast

Type	Telescopic, pneumatic
Max height	20 meters
Deployment time	30 – 40 mins (3 personnel)

Command center

Server	Integrated 19" rack
OS	Linux
C2 software	RFeye Mission Manager
Backhaul options	MANET radio, satcom, cellular
Precision timing	GNSS with anti-jam CRPA

REMOTE RADIO HEAD (RRH): R-18 OPTION*

Frequency

Range	9 kHz – 18 GHz

Noise figures at maximum sensitivity

9 kHz – 83 MHz	11 dB
83 MHz – 1 GHz	9 dB
1 GHz – 2.9 GHz	8 dB
2.9 GHz – 5.9 GHz	7 dB
5.9 GHz – 10 GHz	9.5 dB
10 GHz – 15 GHz	12 dB
15 GHz – 16 GHz	13 dB
16 GHz – 17 GHz	18 dB
17 GHz – 18 GHz	21 dB

** 40 GHz also available*

Sweep speed

Sweep speed at 2 MHz RBW	390 GHz/s typical

RF Signal inputs

Instantaneous bandwidth	100 MHz
Tuning resolution	1 Hz

Sampling

Resolution	16 bits I&Q
Rate	125 MS/s I&Q

Internal frequency reference

Initial accuracy @ 20°C	±0.1ppm typical
Stability over temperature	±0.3 ppm typical
Ageing over 1 day	±0.04 ppm per year

Size, Weight, and Power (RRH)

Dimensions of RRH (w, h, d)	8.7 x 16.3 x 4.7 in 220 x 415 x 120 mm
Weight of RRH	22 lbs / 10 kg
Power consumption of RRH	40 W typical

Environmental (RRH)

Operating temperature range	0 – +50°C (32 – 122°F)
Storage temperature range	-40 – +71°C (-40 – 160°F)

SERVER RACK UNIT

Node server (Node functionality)

Operating system	Linux (CRFS Core)
Processor	Intel Xeon
Connectivity (to RRH)	Fiber optical cable to RRH
Connectivity (to DeepView server)	10GigE

DeepView server (Recording functionality)

Operating system	Windows 10 / 11
Processor	Intel Xeon
Connectivity (to Node server)	10GigE

Size, Weight and Power (Server rack unit)

Form-factor of 19" server rack unit	Rugged shock-mount case 5U
Dimensions (w, h, d) of server rack unit	24.4 x 15.4 x 39.4 in 620 x 390 x 1000 mm
Weight of server rack unit	121 lbs / 55 kg (approx.)

Storage and record times (hours)

Disc capacity	25 MHz IBW	50 MHz IBW	100 MHz IBW
30 TB (removable) *	56	28	14
2 x 30 TB (fixed) *	112	56	28

** 30 TB SSD drives limited to 25.5 TB usable capacity each*

Signal analysis software

RFeye DeepView software (included)	Windows 10 / 11 based

V-TRACK OPTIONS

N18 TACTICAL SURVEILLANCE (POP-UP) SYSTEM

This rugged tactical surveillance (pop-up) system can be stored on a V-TRACK vehicle and deployed as an unmanned ISR station. It enables operators to extend the base of their TDoA networks without personnel being fixed in one location.

TACTICAL SURVEILLANCE RECEIVER UNIT

System

Type	Dismounted
Transportation required	Pickup truck
Operating time with mast deployed	10+ hours

Mast

Type	Telescopic, assisted lift
Max height	15 meters
Deployment time	30 minutes

Local control

Control unit	Rugged laptop
OS	WIndows 11
Realtime software	RFeye Site
Backhaul options	MANET radio, satcom, cellular
Precision timing	GNSS with anti-jam CRPA

NODE 100-18*

Frequency

Range	9 kHz – 18 GHz

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Sweep speed

Sweep speed at 2 MHz RBW	390 GHz/s typical

RF Signal inputs

Instantaneous bandwidth	100 MHz
Tuning resolution	1 Hz

Sampling

Resolution	16 bits I&Q
Rate	125 MS/s I&Q

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Environmental (RRH)

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CRFS SOLUTIONS

For EW superiority and ISR missions, CRFS offers a range of integrations and a turnkey solution for tactical and mobile spectrum monitoring and DF capabilities.

01 Integrate CRFS technology into vehicles or trailers

02 Purchase a rugged vehicle already integrated with RF sensors

CRFS | EXTRAORDINARY RF TECHNOLOGY

CRFS is an RF technology specialist for the defense industry, 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.

CRFS provides TRL-9 solutions:

- >> Fleet of vehicles (make / model agnostic)
- >> Covert missions
- >> Rapidly deployable field equipment
- >> Self-sufficient systems
- >> Independent power systems
- >> Secure interconnectivity
- >> Real-time geolocation in two dimensions (two vehicles)
- >> TDoA - improved resolution and range (three vehicles or two plus dismounted system)
- >> 3D TDoA – three-dimensional TDoA and detection of airborne threats
- >> RFeye UAS integration (combined land-air ISR)
- >> RFeye sensors (Nodes – up to 40 GHz)
- >> RF antennas (30 MHz – up to 40 GHz)
- >> Anti-jam GNSS receiver
- >> MANET interference avoidance
- >> Integrated Silvus MIMO radio wireless mesh comms
- >> RFeye Site software
- >> RFeye Mission Manager software
- >> RFeye Deepview software
- >> Toughbook (ruggedized)

RF sensor / RFeye Node
8, 18 and, 40 GHz options with 100 MHz IBW

DF & geolocation
500 MHz – 18 GHz
DF with 100 MHz IBW

RF Recorder
High fidelity I/Q long-duration RF recording

Dismounted system
Tactical & mobile secure in-field deployments

Low Frequency Head
30 – 300 MHz for TDoA and AOA geolocation

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