ISS Aerospace Sensus M4 with RFeye Node 100-18 LW integration kit

EXTENDING YOUR LINE-OF-SIGHT & RADIO HORIZON

>> RF SENSOR PAYLOAD

>> VARIABLE HEIGHT ANTENNA

>> TETHERED DRONE BY ISS AEROSPACE

An easily deployable tool to extend capabilities for air, maritime, and land operations. This compact, lightweight RF sensor and high-performance tethered drone will enhance spectrum monitoring, tactical surveillance, geolocation, signals intelligence, and over-the-hill reconnaissance to enable rapid decision-making.

IN BRIEF

- Proven new generation RF sensor
- Less weight extends mission time
- Enhances RF superiority: air-to-air, air-to-ground, ground-to-ground
- Signal detection, monitoring, and geolocation
- High fidelity (I/Q data) record, capture, stream
- Enhances 2D TDoA and 3D TDoA networks
- Deployed in 8-minutes
- Airborne (100 m / 328 ft) in 60 seconds
- Cost-effective solution for tactical deployments
- Payload integration kit
- Supports rapid decision-making

||||| **CRFS** | EXTRAORDINARY **RF TECHNOLOGY**

OVERVIEW

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Supplied by CRFS the RFeye Node 100 LW (lightweight) RF sensor is an advanced real-time spectrum monitoring, geolocation, and I/Q record system. It uses high technology readiness level (TRL) government off-the-shelf and commercial off-the-shelf (GOTS and COTS) components and open architecture to provide a robust communications and situational awareness capability for military and commercial operators.

The benefits of integrating an RF sensor as a payload onto a tethered UAS:

- Improved line-of-sight (LOS)
- Increased observation radius
- Variable height antenna that can be used anytime and anywhere
- Large information collection cone
- Zero RF emissions from drone (owing to tether) Note: there are emissions from the operator
- Additional data receive / process and storage capacity
- Standalone or networkable (C2 or sub-system connectivity)
- Reduced training compared to complex UAS systems

The ISS Aerospace SENSUS M8 UAV is a ruggedized and automated ISR drone designed for autonomous flight in difficult-to-access areas and challenging weather environments. Deployed in the toughest environments across the globe, the platform offers important operational features:

- Rapid set-up and launch
- Maximum altitude of 100m (328 ft), overcoming TDoA blind spots
- Variable Height Antenna (VHA) quickly extends ground-based networks
- Maintains precise static position or fixed altitude operation
- Transport with truck / trailer combination
- Operates in GNSS-disrupted environments

Operators can also integrate the lightweight RF sensor and tethered drone with CRFS' V-Track (fully autonomous COMINT system) or as part of a COMINT and EW network.

Using a tethered drone removes common interference and signal emitter challenges.

ISS Aerospace Sensus M4

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KEY ISS CUSTOMERS INCLUDE

UK: MOD, Royal Corps of Signals, Metropolitan Police, Thames Valley Police

Netherlands: Anti Terror Police

Kuwait: Ministry of Interior - Vital & Oil installations Police

TETHERED DRONE PLATFORM

SENSUS M4-T

TETHERED ISR, EW, RF & REBRO PLATFORM

- 50 hours flight time per launch
- Autonomous ascent/descent flight profiles
- Universal Avionics Architecture (UAA)
- Agnostic control architecture
- RF silent – command & control over tether
- Integrated emergency battery
- High-speed TCP/UDP/IP datalink
- Modular payload rails and tether anchor points
- Precision landing capability (+/- 10 cm)
- IP54 ingress protection and 14 m/s wind resistance

SAFE-T2 (GROUND) TETHER STATION

- 100 m (328 ft) + automated winch reel
- Power transmission
- Ruggedized (IP54)
- High-speed data transfer
- Peli Protective Case

GROUND CONTROL STATION

- Peli-based portable and rugged GCS
- Bespoke size options available
- Integrated i7 PC for data/control
- Haptic and easy-to-use UAV control interface
- 17" 1000 NITS display screen
- Mil-spec data/power in/out

ISS AEROSPACE SENSUS M4-T SPECIFICATIONS

Flight

Micro tether length	100 m / 328 ft
Tether data transfer speed	100 MB/s
Max. flight time	50 hrs
Operating temperature (min/max)	-19°C to +55°C
Wind resistance	14 m/s
Operation in gusts of wind	35 km/h (21.7 mph)
Horizontal flight accuracy	1 m standard, up to 0.1 m with GNSS-denied add-ons
GNSS	GPS, Glonass, Beidou, Galileo
Flight operating altitude	0 - 2 000 m
Flight modes	Auto or manual
Payload limitations	4 kg to 50 m 3.5 kg to 100 m

Physical characteristics

Enclosure rating	IP54
Drone dimensions	770mm x 735mm (1,055mm span motor to motor)
Empty weight (including emergency battery and air tether unit)	8 kg
Maximum payload	4 kg

Security

Smart emergency battery	Inflight charging and self-heating
Flight companion processor redundancy with failsafes	No single point of failure
Parachute	Can be included as an option

GCS – Ground Control Station

CPU	Intel i7, 32GB

I/O Multipin Connector

Screen	17" HD
Protection	IP54
Autonomy	14 hours battery as standard, can be increased or plugged into separate source

SAFE-T 2.3 TETHER STATION SPECIFICATIONS

SAFE-T 2.3

Dimensions (without feet)	414 x 670 x 261 mm (16 x 26 x 10 in)
Weight	22 kg (48.5 lbs)
Cable length	100 m (330 ft)
Power source requirements	1230 VAC, 50-60 Hz, 4 kW min for power source, 120 VAC, 50-60 Hz, 3 kW min for power source, 1,2 kW output limit, 30mA differential circuit breaker needed
Power supply cable	Type E
Micro-tether management	10 pre-sets, smart pre-programmed laws and reset function
Wi-Fi connectivity	Protocol 802.11 ac/a/b/g/n, Encryption AES 128, Security WPA/WPA2. 2412.0-2484.0MHz - / 5.150GHz-5.7250GHz / <20dBm (EIRP)
Ingress protection level	IP54

Data - data speed	80 Mb/s minimum (up to 200 Mb/s, depends on the packet size)
Data - data connectors	Ethernet RJ45 (Air Module and Safe-T), Compatible with MP002461 and MP002462 shielded, Field installed cable end screw for IP connexion
T-Manager - Remote control	Control power & torque and winch & alarm settings
T-Manager - Remote monitoring	Winch temperature, speed and length, power consumption, alarm values

Micro tether configuration (26g/m)

Total weight	2600 g (5,7 l bs)
Tensile strength	150 daN
Diameter	2.9 mm
230 V – Max continuous power	2200 W (128)
230 V – Peak power 3 s	2500W
120 V – Max continuous power	1850 W
120 V – Peak power 3 s	1850 W

CRFS RF SENSOR PAYLOAD BUNDLE

1) CRFS integration kit for ISS Aerospace Sensus M4-T, **2)** RFeye Node 100-18 LW sensor,
3) LW Node wire-ended integration connector, **4)** LW Node main breakout loom, **5)** CRPA Anti-jam antenna,
6) Omni passive antenna to 18 GHz, **7)** V / UHF passive blade antenna to 512 MHz, **8)** 1TB SSD data drive

1

Integrated payload
Total weight 4kg

2

RFeye Node 100-18 LW sensor

3

**LW Node wire-ended
integration connector**

4

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

5

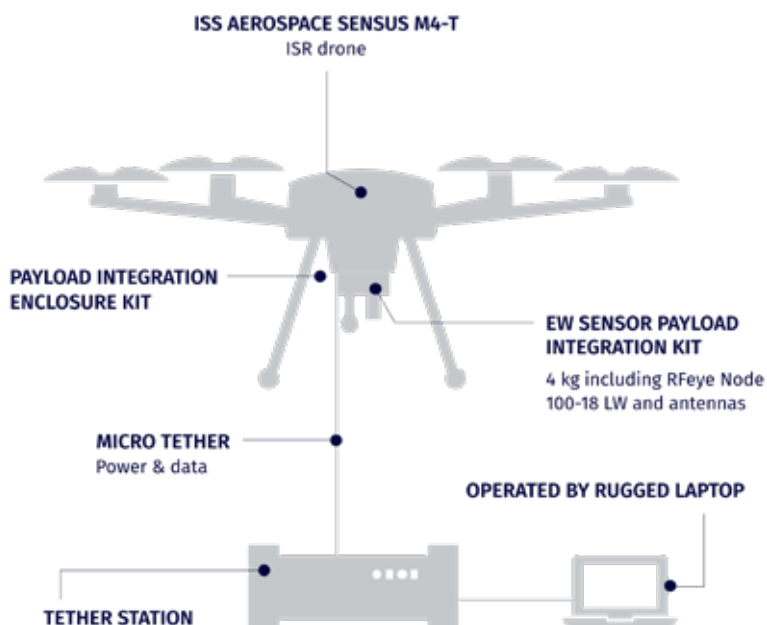**CRPA Anti-jam antenna**

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**Compact wideband
omni passive antenna**
108g (500 MHz – 18 GHz)

7

V/UHF blade antenna
450g (30 MHz – 512 MHz)

8

**External 1TB SSD 2.5
inch data drive**
W x H x D (88x153x12mm)
Weight (130g)

ISS AEROSPACE SENSUS M4-T
ISR drone

**PAYLOAD INTEGRATION
ENCLOSURE KIT**

**EW SENSOR PAYLOAD
INTEGRATION KIT**
4 kg including RFeye Node
100-18 LW and antennas

MICRO TETHER
Power & data

OPERATED BY RUGGED LAPTOP

TETHER STATION

OPTIONAL

Operator training:

- RF sensor equipment and set-up (1-day) and RFeye Site (2-day introduction)

CRFS software bundle:

- RFeye Site – real-time spectrum monitoring, geolocation, detectors
- RFeye DeepView – forensic signal analysis and I/Q record, stream
- EMP (API) – non-synchronous tasks (single RF sensor)
- GMP (API) – synchronous tasks (network of RF sensors)

RFEYE NODE 100-18 LW SPECIFICATIONS

Single channel receiver

Switchable RF inputs	3 x SMA connectors

Frequency

Range	9 kHz to 18 GHz

Noise figures at maximum sensitivity (typical)

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

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

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

Programmable sweep modes

Sweep speed at 2 MHz RBW	390 GHz/s typ.
Sweep speed at 61 kHz RBW	320 GHz/s typ.
User programmable modes	free run continuous, single timed, user trigger, adaptive
Trigger-on-event modes	user defined masks, actions alarms

Sampling

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

Third order intercept points with AGC

≤ 1 GHz	+20 dBm typical
> 1 GHz to ≤ 6 GHz	+15 dBm typical
> 6 GHz to ≤ 18 GHz	+20 dBm typical

Local oscillator

Re-radiation	≤ -90 dBm typical

Timing & Frequency references

Selectable	Internal, GNSS or external
GNSS constellations	4
GNSS bands	L1/L2 and L1/L5
External input	10 MHz ±10 ppm

Processor sub-system

CPU	Intel E3845 quad core

I/O Multipin Connector

Network	1 x 1 GigE, with POnE
Universal Serial Bus	1 x USB3.0, 1 x USB2.0
1 x expansion port configurable as:	1 x SyncLinc with < 10 ns RMS accuracy typical, trigger input, external peripheral control
GNSS antenna input	1 x SMA passive or active (3.3 VDC)

Data storage (option)

External flash disk	via USB interfaces

Size, weight and power

Dimensions (w, h, d) (Node only)	222 x 52 x 187 mm (8.8 x 2.0 x 7.4 inches)
Weight (Node only)	1.95 kg (4.3 lbs)
DC power	12 VDC (limits 10-30V)
Power On Ethernet (POnE)	56 VDC

Power consumption

Typical	40 W
Maximum	55 W

Environmental

Operating temperature	-30 to +50 °C (-22 to 122 °F)
Storage temperature	-40 to +71 °C (-40 to 160 °F)
Ingress protection	IP65 (minimum)

bsi. ISO 9001:2015 Quality Management

UK Certificate number: FS576625