COMPENDIUM OF R70/R80D PAYLOADS

COMPANY CONFIDENTIAL / INTERNAL USE

DECEMBER 2021

CONTENTS

R70/R80D

Flexible/Modular Design + Rugged Environmental Tolerances + Edge of Network AI + Multi-modal Sensing = Precise operation in contested domains and all-weather conditions.

Carbon Fiber + Magnesium IP-Rated Airframe

- Compact design is deployable in minutes by a single operator
- IP-54/MIL-810 rated

4x Redundant Batteries

- Maintains safe flight, even under single battery failure
- < 99Wh batteries enable transport on commercial aircraft
- Provides backup power under Tethered Flight

2x Redundant Navigation Systems

- Maintains safe flight in high-risk operating environments, even under complete subsystem failure

Front-Facing EO/IR Camera

- Provides ISR when carrying non-optical payloads and situational awareness for safe flight in urban and BvLOS operations
- Primary forward colllision avoidance sensor

Onboard TX2 Processor

- Maximum edge of network compute power for AI & autonomy
- Developer access via ECE

Modular Propulsion System

- Optimize R70 for different missions by simply switching arms and props

4x Computer Vision Cameras

- Provides autonomous launch and recovery in close quarters (e.g. between buildings) or from moving platforms (e.g. boats)
- Enables position hold in contested electromagnetic environments (e.g. GPS denied)
- Provides sensing input for lateral collision avoidance

Multi-Use Payload Architecture

- Future proof – Payload Development Kit enables FLIR, partners, and users to quickly develop and deploy sophisticated, integrated payloads

Accessory Port

- Provides mechanical integration for auxiliary hardware (e.g. Tether, Parachute, etc); Block 2 airframe only

Laser Altimeter

- Maintains consistent altitude over uneven terrain for safe BvLOS operations

ONE PLATFORM, MANY MISSIONS

The SkyRaider’s expanded carrying capacity, open payload architecture, and dynamic and responsive flight control, provides an unprecedented level of flexibility in a single VTOL aircraft.

TELEDYNE FLIR

EO PAYLOADS

EO PAYLOADS

HDZ00M30 (TELEDYNE FLIR)

IMAGING PAYLOAD

HDZoom 30

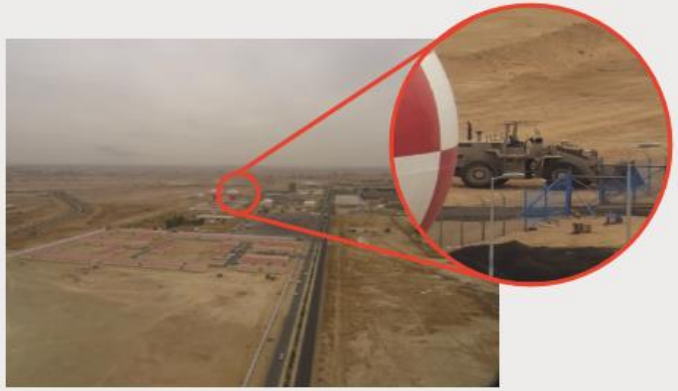
Long-Range Zoom

See Without Being Seen. Read a license plate from 1,000 feet with the FLIR HDZoom 30 which delivers up to 30x optical zoom and 60x enhanced digital zoom for eyes-on-target at distances up to 3 miles (5 km).

PERFORMANCE SPECIFICATIONS

SHUTTER TYPE	Mechanical
IMAGE STILLS	20 Megapixels (5184 x 3888 pixels)
ZOOM	30x Optical 60x Digital
FIELD OF VIEW	68.6° to 2.6° (30x), 1.3° (60x)
VIDEO RESOLUTION	1080p60 H.264 HD Recorded
REMOVABLE MEMORY	SDHC, SDXC
VIDEO METADATA	Embedded STANAG 4609 KLV Metadata
GIMBAL STABILIZATION	3-Axis
RANGE OF MOTION	Roll: +/- 20° Pitch: +20 to -120° Yaw: +/- 20°
ENVIRONMENTAL TOLERANCES	All-weather operations, IP-53 compliant
WEIGHT	24 oz (670 g)

ACTUAL IMAGE FROM 300 METERS



ACTUAL IMAGE FROM 2KM

EO PAYLOADS

HD40-XV (TRILLIUM ENGINEERING)

trillium

TRILLIUM HD40-XV

Continuous zoom EO

APPLICATIONS

- IMMEDIATE ISR
- CLANDESTINE OPERATIONS
- TARGETING
- SITUATIONAL AWARENESS
- EVENT OVERWATCH
- FORCE PROTECTION
- ADVANCED OBJECT RECOGNITION
- BORDER SECURITY
- CRITICAL INFRASTRUCTURE PROTECTION

Fully integrated, stabilized, high-performance EO payload for R70/R80D

Utilizing the payload development kit, Trillium Engineering has integrated its HD40-XV EO payload onto the R70/R80D platform. The payload's 33x optical zoom visible camera provides long distance ISR while providing sharp, clear actionable imagery in support of the mission.

As a member of the R70/R80D third-party payload ecosystem, the HD40-XV reflects our commitment to offering customers an extended range of capabilities, payloads and sensor options.

The modularity of the system permits interoperability and rapid exchange of payloads across SkyRanger R70 and R80D SkyRaider platforms while leveraging continuously evolving aircraft performance, intelligence and set of available accessories.

FEATURES

CONTINUOUS ZOOM EO AND SUPERIOR STABILIZATION PERFORMANCE

Industry leading detection, recognition and identification ranges.

RICH AND EXPANDING FEATURE SET

With multiple embedded NVIDIA TX2 processors, the R70/R80D is a flying supercomputer with an engine for real-time AI at the network edge, including object detection and classification and support for AI development with third-party vendors.

Teledyne FLIR
Defense Technologies

www.teledyneflir.com

TELEDYNE | trillium

SPECIFICATIONS

Camera	
Shutter Type	Global
Zoom	33x Optical
Field of View	60° - 2.1°, Digital to 1.0°
Video Resolution	720p
Removable Memory	No
Gimbal Stabilization	
	2 axis
Controllable Ranges of Motion	
Roll	+/- 0 degrees
Pitch	+30/-80 degrees
Yaw	+/- 180 degrees
Video Metadata	
	Embedded STANAG 4609 KLV Metadata
Environmental Performance	
	All weather operations IP-54 compliant
Weight	
	36 oz (1030g)
Operating Temperature	
	-20C to +50C (-4F to 122F)
Additional System Features	
	Geopointing User Defined Object Tracking Moving Target Indication Target Coordinates, Heading, Speed AI-based People/Vehicle Detection and Classification

Zoom Performance: Comparative imagery across 1-66x zoom range

EO PAYLOADS – LOW LIGHT

STORMCASTER-L (TELEDYNE FLIR)

ULTRA LOW-LIGHT ISR, TRACKING AND MAPPING

FLIR StormCaster-L

The FLIR StormCaster-L ultra low-light imaging payload offers unmatched ISR, tracking and mapping performance during twilight and nighttime operations.

As a member of our next generation payload family, the StormCaster-L reflects a leap in scalable payload performance offering a 7x improvement in line of sight stabilization, enhanced range of motion and a dramatically increased geolocation accuracy - all in a rugged, low SWaP-C package.

The modularity of the StormCaster payload family facilitates interoperability and rapid interchange of payloads across SkyRanger R70 and R80D SkyRaider platforms while leveraging continuously evolving aircraft performance, intelligence and a set of available accessories.

FEATURES

FULL COLOR ULTRA LOW-LIGHT 4K/12MP EO IMAGING

Crisp, sharp imagery provides critical intelligence under demanding lighting conditions.

STABILIZATION PERFORMANCE

Permits clandestine operation by increasing aircraft standoff range.

RICH AND EXPANDING FEATURE SET

With multiple embedded NVIDIA TX2 processors, the R70/R80D is a flying supercomputer with an engine for real-time AI at the network edge, including object detection and classification and support for AI development with third-party vendors.

APPLICATIONS

IMMEDIATE ISR

CLANDESTINE OPERATIONS

TARGETING

SITUATIONAL AWARENESS

EVENT OVERWATCH

FORCE PROTECTION

CRITICAL INFRASTRUCTURE PROTECTION

BORDER SECURITY

ADVANCED TARGET RECOGNITION

SPECIFICATIONS

Low Light Imager	
Resolution	4240 x 2832 max, 12.2 MP
Fields of View	39° optical, 11° with digital zoom
Gimbal	
Line-of-sight Stabilization	< 0.3 mRad
Stabilization	3 axis (pitch, roll, yaw)
Vibration Isolation	6 axis passive on aircraft
Controllable Ranges of Motion	
Roll	+/- 0 degrees
Pitch	+20/-90 degrees
Yaw	+/- 180 degrees
Slew Rate	
	60 deg/s
Weight	
	1.3Kg (2.9 lbs)
Dimensions	
	196mm (W) x 201mm (L) x 239mm (H) 7.7" (W) x 7.9" (L) x 9.4"(H)
Operating Temperature	
	0C to 45C
Additional System Features	
	Geo-pointing User Defined Object Tracking Moving Target Indication Digital Image Stabilization Target Coordinates, Heading, Speed AI-based People/Vehicle Detection & Classification (Q2 2020)

License plate ID at 0.06 lux

ISR at 0.06 lux

Color discrimination : > 1hr before sunrise

TELEDYNE FLIR

IR PAYLOADS

IR PAYLOADS

STORMCASTER-T (TELEDYNE FLIR)

TELEDYNE

STORMCASTER-T

Continuous zoom LWIR imaging

APPLICATIONS

- IMMEDIATE ISR
- CLANDESTINE OPERATIONS
- TARGETING
- SITUATIONAL AWARENESS
- EVENT OVERWATCH
- FORCE PROTECTION
- ADVANCED TARGET RECOGNITION
- BORDER SECURITY
- CRITICAL INFRASTRUCTURE PROTECTION

The StormCaster-T continuous zoom LWIR payload supports detection, recognition, identification and target acquisition day or night, with maximum range and time on station. Its continuous zoom lens permits long distance ISR while providing sharp, clear actionable imagery in support of the mission.

As a member of our next generation payload family, the StormCaster-T reflects a significant leap ahead in scalable payload performance offering a 7x improvement in line of sight stabilization, enhanced range of motion and a dramatically increased geolocation accuracy - all in a rugged, low SWaP-C package.

The modularity of the StormCaster payload family facilitates interoperability and rapid interchange of payloads across SkyRanger R70 and R80D SkyRaider platforms while leveraging continuously evolving aircraft performance, intelligence and set of available accessories.

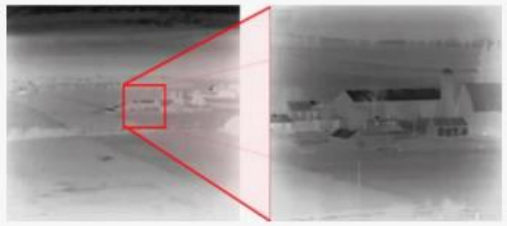
FEATURES

CONTINUOUS ZOOM IR AND SUPERIOR STABILIZATION PERFORMANCE

Industry leading detection, recognition and identification ranges.

RICH AND EXPANDING FEATURE SET

With multiple embedded NVIDIA TX2 processors, the R70/R80D is a flying supercomputer with an engine for real-time AI at the network edge, including object detection and classification and support for AI development with third-party vendors.



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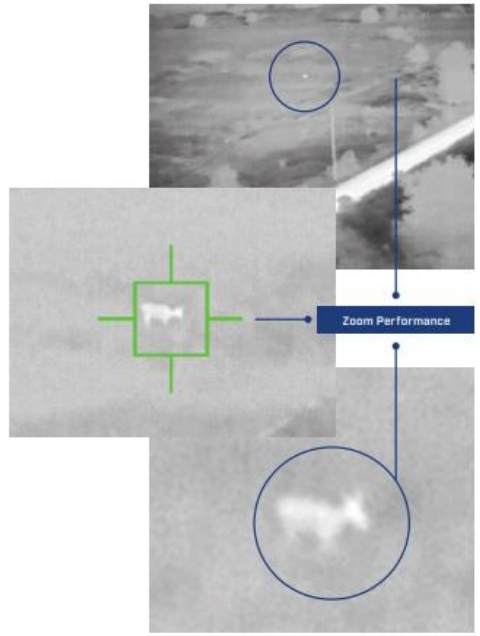
SPECIFICATIONS

Thermal Imager	
Sensor	Boson, 12µm, 60Hz
Resolution	640 x 512
Fields of View	31° to 6° optical continuous zoom 2° with digital zoom
Gimbal	
Line-of-sight Stabilization	< 0.3 mRad
Stabilization	3 axis (pitch, roll, yaw)
Vibration Isolation	6 axis passive on aircraft
Controllable Ranges of Motion	
Roll	+/- 0 degrees
Pitch	+20/-90 degrees
Yaw	+/- 180 degrees
Slew Rate	
	60 deg/s
Weight	
	1.0 Kg (2.2 lbs)
Dimensions	
	196mm (W) x 159 (L) x 223mm (H) 7.7" (W) x 6.2" (L) x 8.7"(H)
Operating Temperature	
	-20° C to 45° C (-4° F to 113° F)
Additional System Features	
	Geo-pointing User Defined Object Tracking Moving Target Indication Digital Image Stabilization Target Coordinates, Heading, Speed AI-based People/Vehicle Detection & Classification (Q2 2020)



Zoom Performance:
Comparative Imagery for
15mm to 75mm continuous zoom

TELEDYNE FLIR

EO/IR PAYLOADS

EO/IR PAYLOADS

EO/IR MK-II (TELEDYNE FLIR)

IMAGING PAYLOAD

EO/IR Mk-II

High-Fidelity Infrared

The FLIR EO/IR Mk-II delivers high-fidelity daylight and thermal imagery in a weather-resistant, 3-axis stabilized gimbal.

PERFORMANCE SPECIFICATIONS

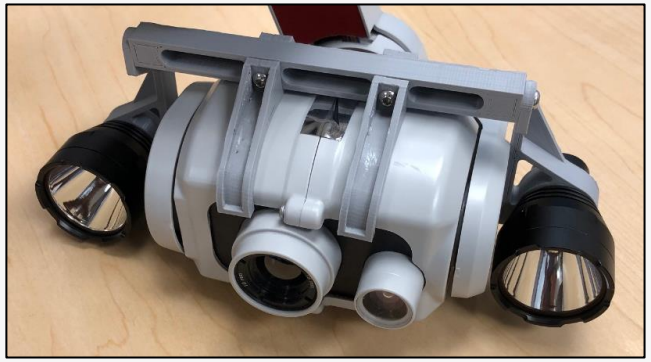
MAKE & MODEL	SONY FCB_MA132 + FLIR TAU2
IMAGE STILLS	EO: 13 Megapixels (4192 x 3104 pixels) IR: (640 x 512 pixels)
FIELD OF VIEW	EO: 58° IR: 45° (13mm) or 32° (19mm)
ZOOM	4x Digital
VIDEO RESOLUTION	640 x 512, 8.33 FPS H.264 Recorded
COLOR PALETTES	White-hot, Black-hot, Rainbow, Ironbow
GIMBAL STABILIZATION	3-Axis
RANGE OF MOTION	Roll: +/- 20° Pitch: +/- 60° Yaw: +/- 20°
VIDEO METADATA	Embedded STANAG 4609 KLV Metadata
DIGITAL ENHANCEMENTS	Active Contrast Enhancement (ACE) Digital Detail Enhancement (DDE) Information Based Histogram Equalization (IBHEQ) Isotherms
ENVIRONMENTAL TOLERANCES	All-weather operations, IP-53 compliant
WEIGHT	20 oz (575 g)

CAPTURE DAYLIGHT AND THERMAL IMAGERY AT THE SAME TIME.

Ideal for both day and night operations, the EO/IR Mk-II imaging payload provides:

- Enhanced thermal (IR) imagery in a range of color palettes – white-hot, black-hot, rainbow, and ironbow
- Secure HD 1080p video streaming to the pilot and remote personnel anywhere in the world
- Choice of IR lenses – 19 mm focal length (tactical applications) and 13 mm (thermal mapping or SAR applications)
- Advanced radiometric temperature measurement, accurate to +/- 90° F (50° C)

EO/IR Mk-II with Spotlight Attachment



EO/IR PAYLOADS

FORWARD EO/IR BLOCK 2 (TELEDYNE FLIR)

Front-mounted EO/IR payload, including image fusion. Provides day and night situational awareness when carrying non-optical payloads, and secondary view-angle ISR.

IMAGING & OPTICAL	
EO Camera Optics	Sunny SYD1201A, EFL 3.7mm, 80° HFOV, F/# 2.8
EO Camera Sensor	Sony IMX412, 4056x3040 pixels, 1.55mm pitch, 4-lane MIPI
EO Camera Video	Full resolution @ 60Hz See IMX412 datasheet for more options
IMU	ICM20602, I2C or SPI (selectable)
IR Camera Optics	EFL 6.3mm, 34° HFOV, F/# 1.0
IR Camera Sensor	Boson 320x256 pixels, 12mm pitch, USB video and CCI
IR Camera Video	Full resolution @ 60Hz or 30Hz

TELEDYNE FLIR

TARGETING PAYLOADS

TARGETING PAYLOADS

STORMCASTER-DX (TELEDYNE FLIR)

StormCaster-Dx is a multi-role, low SWAP, laser target designator payload designed to provide STANAG compliant terminal guidance of laser guided bombs, missiles and precision artilleries from an sUAS (eg: R80D SkyRaider), UGV or manned platforms on the battlefield.

Available only to select government agencies

TELEDYNE FLIR

CBRNE PAYLOADS

CBRNE PAYLOADS

MUVE C360 (TELEDYNE FLIR)

TELEDYNE

MUVE™ C360

Integrated Multi-Gas Detector for Unmanned Aerial System

The MUVE™ C360 is a multi-gas detector completely integrated with an unmanned aerial system (UAS) to provide real-time continuous monitoring of chemical hazards while on the move. The sensor block boasts 8-channels, which includes a photoionization detector (PID), Lower Explosive Limit (LEL) detector, and six other sensors. The integrated snorkel is designed to negate the effects of rotor wash, extending past the propellers to sample the unperturbed air. The MUVE C360 sensor block quickly latches to a proprietary integration dock mounted to the UAS. The calibration station features the same dock, so the operator can easily connect for routine sensor verification. Sensor readouts are prioritized based on alarm conditions and are displayed real-time on the pilot's interface in the Mission Control Station (MCS) application. The MUVE C360 is a time-saving, game-changer for emergency responders, industrial safety officers, and environmental monitoring experts.

ASSESS THE SCENE FROM A SAFE DISTANCE

Before putting the health and safety of your team at risk, fly the C360 into the scene to gather initial assessment of hazards

- 8-channel sensor delivers broad hazard coverage
- Analyze air quality surrounding active scenes prior to entry
- Select proper PPE before entering scene
- Locate leak source and track incident progression

SIGNIFICANTLY REDUCE THE TIME TO ACTION

Deploy the C360 on scene in the time it takes the average responder to suit up

- Cover difficult terrain from the air to assess hazards
- Quickly draw a perimeter to assess and map hazards
- Preset alarm thresholds to make quicker decisions on-scene
- Understand the flow of hazardous vapors at the source, but also in the air

FULLY INTEGRATED SITUATIONAL AWARENESS

Get a comprehensive overview of an active scene including visuals and chemical identification

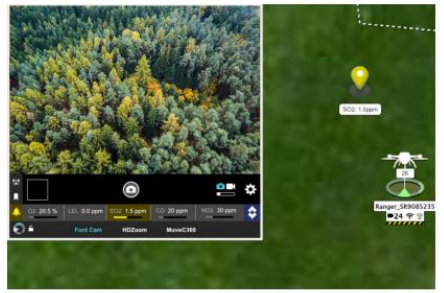
- Mission Control Station application provides plug-and-play control of the C360, flight operations, and other on-board sensors
- Analyze, log, and access complex data in an easy-to-understand visual overlay
- Install with click-in simplicity via onboard integration dock

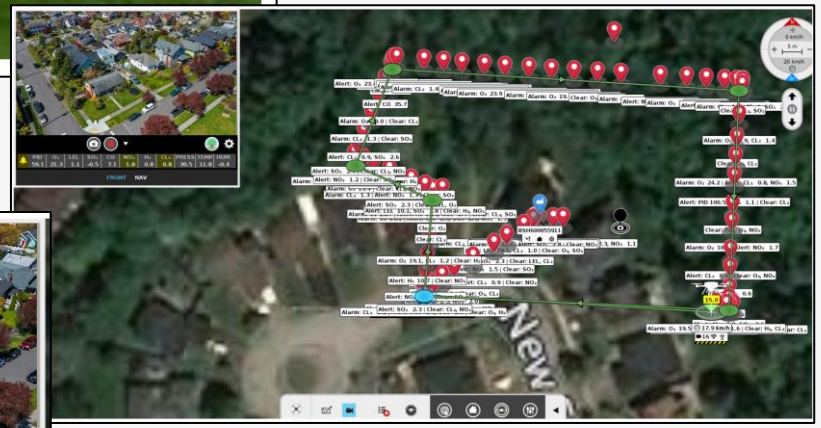
Teledyne FLIR
Defense Technologies

www.teledyneflir.com

SPECIFICATIONS

Sensor Block Technology	
Sensors	CO, Cl_2, O_2, NO_2, H_2S, SO_2, LEL
PID	VOC 10.6 eV (ppm)
FLIR Calibration Station	Proprietary automatic calibration design, includes tubing and power adaptor
Sampling & Analysis	
Sample Introduction	Actively pumped via integrated snorkel
Sampling Rate	300 ml/min minimum
Sampling & Analysis	Real-time detection
System Interface	
Display & Alerts	Mission Control Station (MCS)
Wireless Range	Determined by the UAS range
Data Storage	Sensor data and flight information logged on tablet
Training Requirements	<30 mins for operator; 4 hours for advanced user
Power	
Input Voltage	12V SkyRanger R70; 12V Calibration Station
Battery Specification	Powered by the UAS
Cold Start Time	90 seconds from cold start
Environmental	
Operating Temp	-4 to 122 °F (-20 to 50 °C)
Operating Humidity	10 to 93%, non-condensing
Storage Temp	-22 to 158 °F (-30 to 70 °C)
Protection	IP43-rated
Physical Features	
Dimensions (L x W x H)	6.5 x 2.3 x 2.0" (16.51 x 5.84 x 5.08 cm) - C360 only
Total Payload Weight	1.5 lb (680.39 g) - C360 with dock and snorkel
Integration Dock	Proprietary quick-connect mount for UAS and FLIR Calibration Station





CBRNE PAYLOADS

MUVE B330 (TELEDYNE FLIR)

TELEDYNE FLIR

PRE-RELEASE VERSION

MUVE™ B330

Continuous Biological Detector and Collector

The MUVE B330 is a Continuous Biological Detector and Collector purpose designed for unmanned aerial systems (UAS) to provide real-time continuous monitoring of biological threats while on the move. The B330 leverages the legacy design and performance of the IBAC product line in a SWAP optimized configuration. The Aeryon SkyRanger serves as the platform for the initial deployment of the MUVE B330 payload. The payload is designed to be intuitive, easy to use, and require minimal maintenance. Sensor display is provided via Aeryon's Mission Control Station (MCS) piloting interface. Alarming conditions and collector status will be displayed to the Pilot to not only alert them to a threat, but also provide positive confirmation that a sample is being collected. The MUVE B330 provides next level protection to combat forces by identifying threats remotely and down range.

ASSESS THE SCENE FROM A SAFE DISTANCE

When dangerous conditions exist or are anticipated utilize the MUVE B330 to fly in for an initial assessment.

- Continuous air sampling provides real-time feedback of conditions
- Allows for informed decision making prior to approaching a hazardous scene
- Locate source of threat and track progression as the scene unfolds

SIGNIFICANTLY REDUCE TIME TO ACTION

Rapidly deploy the SkyRanger with B330 payload in a matter of minutes.

- Cover difficult terrain from the air to assess threat
- Quick assessment of threat perimeter can be made
- Alarm will initiate upon detection of hazardous conditions
- Automated sample collection upon alarm indication

FULLY INTEGRATED SITUATIONAL AWARENESS

Gather a comprehensive overview of an active scene utilizing visuals and B330 indications.

- Mission Control Station (MCS) application provides plug-and-play operation of the MUVE B330 payload
- Visually display threats on the map within MCS using easy to understand pin drops
- Analyze, log, and access complex data in an easy-to-understand visual overlay

TELEDYNE FLIR

PRE-RELEASE VERSION

SPECIFICATIONS

General	MUVE B330
Technology	UV Laser Induced Fluorescence (LIF)
Sampling & Analysis	
Sample Introduction	Airborne particles; triggered aerosol sample collector
Sample Phase	Aerosol; flow rate 4.0 L/min (0.14 ft3/min)
Threats	Spores, vegetative bacteria, viruses, and toxins; particle size: 0.7 – 10 microns
Sensitivity	<100 particles/L of air
Sampling & Analysis	Continuous sampling when in operation
Sample Collection	Integrated sample collection
System Interface	
Display & Alerts	Aeryon Mission Control Station (MCS)
Outputs	Alarm Status, Diagnostics Status, Collector Status
Data Storage	16 GB internal storage
Training Requirements	<8 hrs
Power	
Input Voltage	16-36 VDC
Power Consumption	10W (normal operation), 12W (collector running)
Cold Start Time	<5 mins
Environmental	
Operating Temp (ambient)	-26 to 120 °F (-32 to 49 °C)
Operating Humidity	5% to 99%, non-condensing
Storage Temp	-38 to 126 °F (-39 to 52 °C)
Integrated Sample Collector Specifications	
Sampling Method	Dry collection
Power Consumption	2 watts
Max Flow Rate	30 L/min
Particle Size	1 to 10 microns
Collection Media	Sample Disk
Sample Recovery	Sample extraction from sample disk in vial with liquid buffer

General	MUVE B330
Communication	Ethernet
Physical Features	
Dimensions (L x W x H)	7.6 x 7.6 x 8.5 in (19.3 x 19.3 x 21.6 cm)
Weight	3.17 lbs (1.44 kg)
Enclosure	Windform® SP (Composite polyamide based, carbon filled)

CBRNE PAYLOADS

MUNIN RADIATION DETECTOR (NORSE ASSET SOLUTIONS)

NAS
NORSE ASSET SOLUTIONS

MUNIN Radiation identification system is here to monitor radiation in an easier, safer and more accurate way then ever before.
The kit is modular and portable, intended for simultaneous detection, measuring, logging and automatic reporting of radiating isotopes at sea or on land.
The sensor utilize a special MILSPEC AES 256/128 encrypted datalink to communicate its location and measured values in real time to the operations center running our NAS Kolibri software to analyze, visualize, and store the test results.
The test results is then uploaded to the respected authorities for further actions and future reference.

The HUGIN sensor is a lightweight radiation detector designed to be mounted on the SkyRanger R70 UAS or alternatively a UGV/Robot for a wide range of applications where radiation detection, measurement, and nuclide identification is needed.
This includes environmental surveys, military reconnaissance, Radiological Dispersal or Exposure Device (RDD or RED) detection, hospitals/industry, fire hazards and nuclear power plant emergency response.

FEATURES

- Real-time, instant Detection, Measurement and Identification
- Wide dose rate range: from natural background to high accident levels
- Light and robust
- Simple and fully automated use
- Light weight means R70 has longer flight time
- 1000 times more sensitive that most of the GM-based sensors for other drones
- Extrapolation of the measurements at ground level
- Count rate per radionuclide
- Integrated Neutron detector

RADIOLOGICAL PERFORMANCE

Detectors NaI(Tl) dia 32 mm*51 mm or LaBr3(Eu) dia 25 mm*32 m
+ 2 GM tubes (mid and high range)
Energy range: from 20 keV to 3 MeV
Dose rate measurement range: 0,001 µSv/h to 10 Sv/h (0,1 µR/h t
1000 R/h)
Detection capability: better than 0,1 µSv/h (10 µR/h) increase in 2s
Real-time nuclide identification: better than 0,5 µSv/h (50 µR/h)
Spectrometry: 1024 channels
Acquisition rate: 0,5 second
Spectroscopy range: up to 100 µSV/h (10 mR/h)

ENVIRONMENTAL CHARACTERISTICS

Temperature Range: operation from -20 °C to 50 °C.
Humidity: 93% HR at 30 °C.
Weight: 1000g
Protection level: IP65.

NEUTRON DETECTOR

Detector Type Semiconductor based detector
Gamma-ray Reject Rate < 1-cpm at 50 mR/h with a Cs-137 Source.
Neutron Sensitivity 2.4 cps/nv ±0.08 cps/nv [30% Th. Eff.]
Measured Cf-252 Response 1.417 cps

NAS
NORSE ASSET SOLUTIONS

The NAS Kolibri software is programmed to gather, analyze and visualize collected readings from field on a base-station computer as well as a reach back function to a central HQ.
Kolibri can also be connected to a AIS transponder to gather vessel information in a maritime operations, from this information the software will visualize the targeted ship, its smoke plum as well as its heading and speed.
GPS location from the R70 is utilized for visualization and mapping of the dose rates (including extrapolated at ground level), nuclide identification, and count rate for each nuclide. Kolibri has the capability to draw maps with interdiction/hazardous areas in easily understandable colors (GREEN, YELLOW, RED) showing the stored radiation at an area at the time of measurement.

Kolibri software installed on a base station computer. Provides real time processing including ground dose rate calculation and nuclide identification, display, mapping, and data storage.

Kolibri live view GUI

- Session (every session name is user defined)
- Online/Offline map (showing read values in color, center drone and center vessel)
- Vessel info (IF AIS is used)
- All available targets (IF AIS is used)
- Values (live high and low dose rate and Neutron count)
- Wind (direction and speed)
- Graph (Customizable timed graph showing high & low gamma and neutron count)

CBRNE PAYLOADS

HUGIN SULFUR EMISSION SNIFFER (NORSE ASSET SOLUTIONS)

HUGIN Sulfur Emission sniffer system is here to meet IMO 2020 regulated emission testing of maritime vessels.

The kit is modular and portable, intended for simultaneous detection, measuring, logging and automatic reporting of multiple airborne gas types in a maritime environment.

The sensor utilize a special maritime AES 256/128 encrypted datalink to communicate its location and measured values in real time to the operations center running our NAS Kolibri software to analyze, visualize, and store the test results.

The test results is then uploaded to the respected maritime authorities for further actions and future reference.

TELEDYNE FLIR

ELINT PAYLOADS

ELINT PAYLOADS

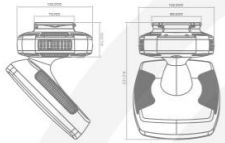
ECHO/NESIE (ROBOTIC CENTRE)

Available only to select government agencies

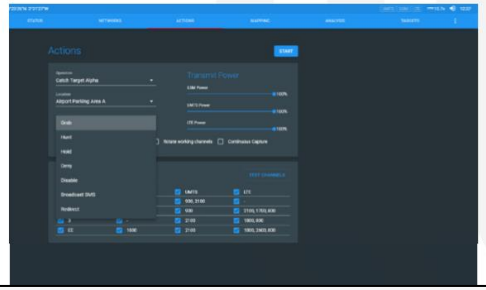
Robotics Centre brings the Smith Myers award winning NESIE™ software suite to the FLIR SkyRanger™ R70 and R80D SkyRaider™ platforms with **ECHO**. ECHO extends the FLIR next generation payload family with a fully integrated low SWaP-C package for the automatic surveying and emulation of real mobile phone networks for the identification, geolocation and interrogation of mobile phone handsets and subscribers.

ECHO is comprised of a Software Defined Radio coupled with proprietary 2G, 3G, and 4G (5G in development) Macro-Cell Protocol Stacks covering all global cellular frequencies.

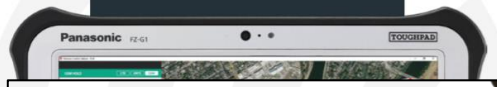
ECHO can be used as a stand-alone system or in combination with other Smith Myers supported platforms (e.g body-worn, backpack, vehicle mounted, and fixed and rotary wing manned aircraft) networked together to a central command centre for full situation awareness.



ECHO supports Smith Myers' common web-based multiplatform user interface with no requirement for re-training between platforms. Hosted on the **ECHO**, there is no need for any specialist software on the control laptop/tablet/phone. The user interface is accessed by Ethernet and/or Wi-Fi and can be displayed on any screen that can host a web browser.

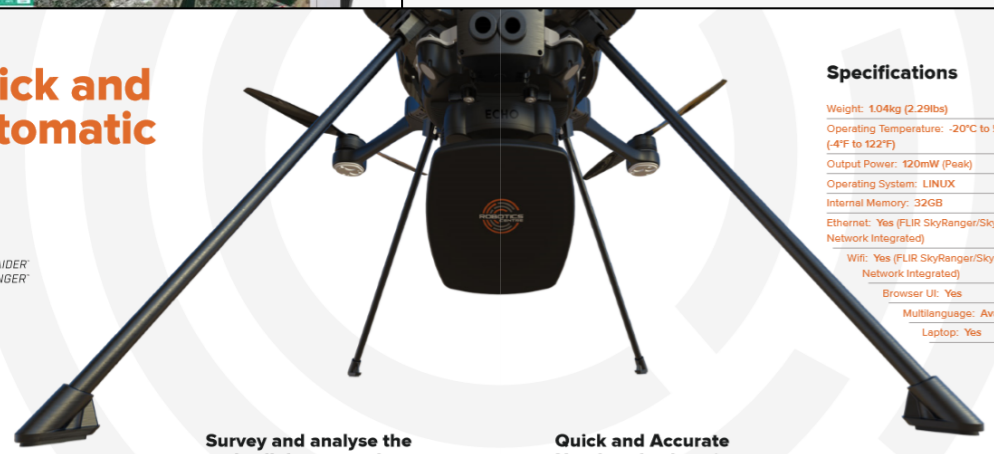


ECHO features **ECHO CNX™** a FLIR Mission Control System (MCS) plugin designed to provide SkyRanger R70 and R80D SkyRaider pilots enhanced target discovery, acquisition, and geolocation during **ECHO** missions.



Quick and Automatic

R80D SKYRAIDER™
R70 SKYRANGER™



Specifications

- Weight: 1.04kg (2.29lbs)
- Operating Temperature: -20°C to 50°C (-4°F to 122°F)
- Output Power: 120mW (Peak)
- Operating System: LINUX
- Internal Memory: 32GB
- Ethernet: Yes (FLIR SkyRanger/SkyRaider Network Integrated)
- Wifi: Yes (FLIR SkyRanger/SkyRaider Network Integrated)
- Browser UI: Yes
- Multilanguage: Available
- Laptop: Yes

Automatic Configuration and Transmit

Using the Smith Myers SDR, **ECHO** is designed to act like a cellular handset and a base station in one. This negates the need for an additional receiver, and integrates the survey data with the required transmit parameters. Using live or historical survey information, **ECHO** is able to emulate the real network, effectively turning the system into a base station that is able to interact with cellular handsets in the same way as the real mobile network operator.

Survey and analyse the real cellular network quickly and automatically

ECHO offers users the ability to receive clear data transmitted by 2G (GSM), 3G (UMTS), and 4G (LTE) cellular networks (5G in development) in the area of operation. This survey data is in-turn used to emulate the real network automatically without the need for any operator analysis or intervention. Or, if required, the network survey data can be analysed and modified with full manual configuration in real-time. All survey data can be stored for future use or analysis and **ECHO** allows for the import/export of survey data across equipment.

Quick and Accurate Handset Geolocation

While interacting with the handset, **ECHO** offers the ability to accurately geolocate the handset using a number of different geolocation techniques. Three separate geolocation techniques are available to offer greater redundancy and allows the operator to select the technique that best suits the operational location and scenario quickly and automatically. Geolocated handsets are shown on the map in real-time and the operator can quickly choose whether to map single or multiple handsets using our mass-mapping algorithm. It is even possible to draw a geofence over an area of specific interest thus ignoring handsets outside the geofence.

Quickly and automatically identify cellular handset(s) of interest

ECHO can quickly identify and locate cellular handsets with industry leading speed. The system offers our users a full suite of interrogation and analysis tools that are available for use in real-time as the system is in full operation concurrently. Results can be cross-referenced in real time during an operation and **ECHO** automatically compares live results to those from past operations highlighting any pertinent information to the operator automatically.

ELINT PAYLOADS

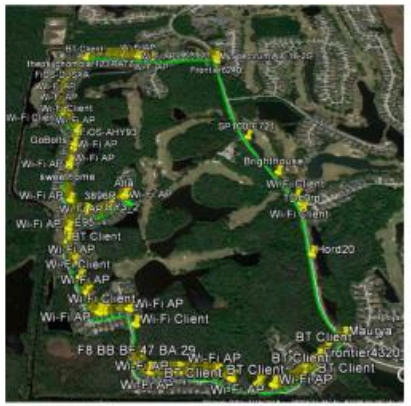
Available only to select government agencies

TELEDYNE FLIR

TETLEY PILEDRIVER (G3 TECHNOLOGIES INC.)

DESCRIPTION

Tetley PileDriver is an extremely low SWaP, autonomous WIFI & Bluetooth survey, collection, & correlation system that can be deployed in multiple scenarios. It fits easily into a backpack o r large cargo pocket and c an b e used a s a light weight payload on drones. Tetley PileDriver can collect and correlate dual band Wi-Fi a/b/g/n/ac, Bluetooth® Classic, and Bluetooth® Low Energy devices as well as Hotspot 2.0 IMSI over Wi-Fi and export them into .kml or .csv file formats for seamless use with existing mapping and analysis tools. Supports import of .db3 file s for IMSI correlati on. Tetley PileDriver collects packets and puts them into a database for packet analysis to be used in situational awareness scenarios. Tetley PileDriver can deliver correlated device ID's to a single device by looking at Bluetooth® and Wi-Fi MAC addresses and matching them to one device make, model, UUID, and OUI (vendor ID). If the device ID is unknown but there is a known pattern of life for at least 2 locations, Tetley PileDriver can determine the device identity and provide notifications to the user when that ID is detected in subsequent collections. Tetley PileDriver can be configured to run at pre-configured time intervals and provide the user with notifications in the event a unique device ID appears at each location with the user while filtering out known white-listed devices. Tetley PileDriver supports remote connectivity for leave behind capability.



SPECIFICATIONS

	Size	Weight	Power
Backpackable	5.25"L x 3.35"W x 2.0"H (without antennas or battery pack)	1.1 lbs.	7-20 VDC

factory for current specifications.

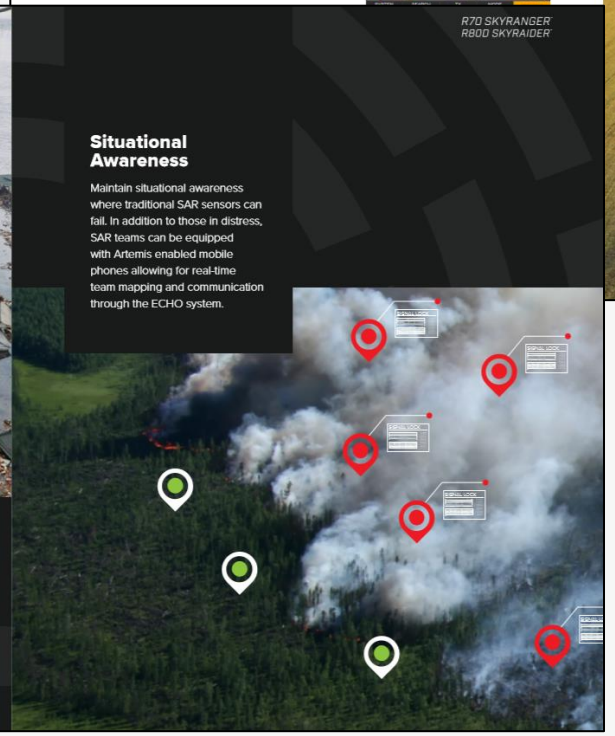
G3 Technologies, Inc.
PROVIDING NEXT GENERATION WIRELESS SOLUTIONS
g3ti.net | +1.410.290.8110
60 | Columbia, MD 21046 | www.g3ti.net

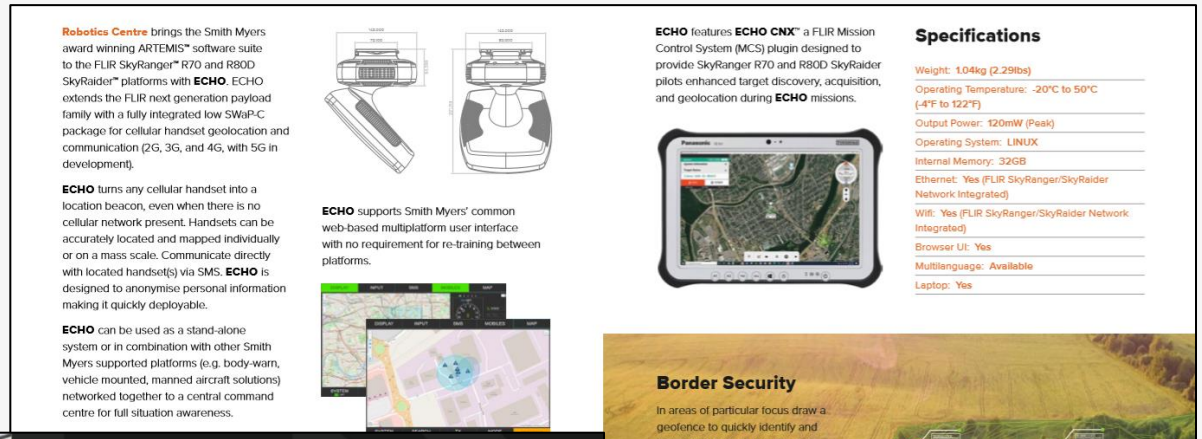
TELEDYNE FLIR

SECURITY/SAR PAYLOADS

SECURITY/SAR PAYLOADS

ECHO/ARTEMIS (ROBOTIC CENTRE)





TELEDYNE FLIR

RADIO INTERPOSERS

RADIO INTERPOSERS

CORDIS ARRAY II (RADIONOR COMMUNICATIONS AS)

CORDIS ARRAY II

The Cordis Array II (CRE2) product family meets the demands for tactical operations where digital high capacity communication and reliable data transfer are crucial for efficient and safe missions. The system operates in C-band and is field proven with high data rate communication over long distances. Phased array technology with electronic beam-steering gives significant advantages for tactical wireless links with high mobility.

Robust with encryption
The CRE2 with phased array technology enables high speed, high capacity and extremely robust data, voice and video transfer between multiple nodes in ad hoc networks. The CRE2 portable units can handle obstructions and provide stable performance in both close-by operations as well as line-of-sight distances exceeding 30 kilometers[1]. Extra TRANSEC is provided by digital beam-forming. COMSEC is provided by AES-256 link encryption in hardware.

Connecting remote nodes
The CRE2 connects troops with a high capacity digital communication system. QoS handles low latency data streams and high priority sensor data. The system can transfer encrypted feeds with live video, location data and other network traffic, binding together tactical units in a network centric system that increases operational efficiency.

Aeryon SkyRanger R70 expansion payload
The CRE2-144-R70 is an ultra light phased array expansion payload that can be attached between the Aeryon SkyRanger R70 UAS and standard payloads and provide military tactical link capabilities as well as unmatched range with the CRE2 phased array technology.

IP connectivity
CRE2 technology supports complex operations that may involve a large number of information nodes and several information streams floating between the network nodes. End-to-end IP connetivity makes integration and management flexible and cost-efficient. The result is an interoperable and seamless solution for data exchange, scalable for the future deployments.

Easy to operate
CRE2 provides an ad hoc tactical network with no need for base stations, infrastructure or equipment in order to operate. This makes it a simple solution to use and maintain, enhancing efficiency in coordinated operations.

[1] *CRE2-144-R70 to CRE2-189 at 7 Mbps*

CRE2-144-R70

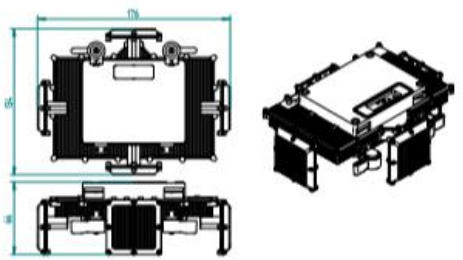
Preliminary information

Features

- *Expansion payload module for Aeryon SkyRanger R70*
- *Fits between the SkyRanger R70 and standard payloads*
- *C-band phased array tactical wireless radio*
- *IP centric/ad hoc network operations*
- *AES-256 link encryption hardware*
- *Unmatched bandwidth and range*
- *Low weight*
- *Compatible with fielded tactical equipment*
- *Easy to install and operate*

Technical specifications

Electrical parameters:	
Wireless technology	: Phased array
Data interface	: Ethernet 10/100baseT
Wireless parameters:	
Available data capacity	: 15 Mbps
Wireless encryption	: AES-256
Mechanical parameters:	
Size	: 176 × 134 × 66 mm
Weight	: 290 g
EMC:	
Radiated emissions	: MIL-STD-461F RE102
Conducted emissions	: MIL-STD-461F CE102
Radiated emissions, spurious & harmonics	: MIL-STD-461F RE103
Environmental:	
Ambient temp. range	: -40 °C to +40 °C



Aeryon SkyRanger R70

Aeryon SkyRanger R70 with the CRE2-144-R70 attached

Specifications subject to change without further notice

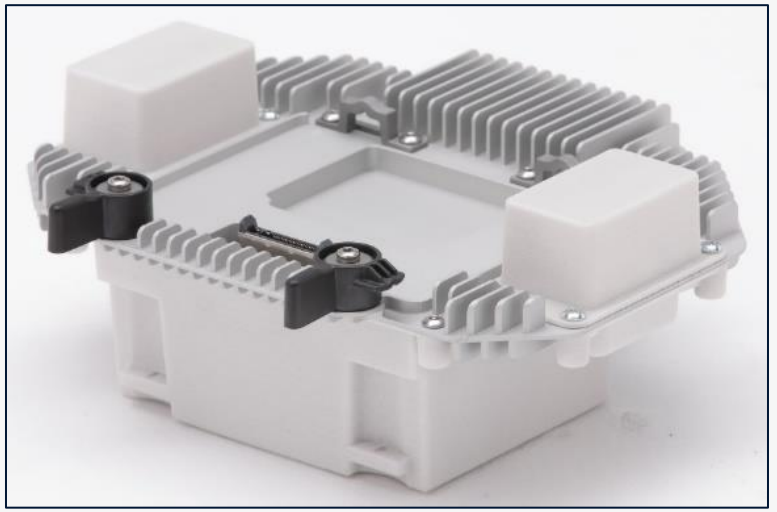
Radionor Communications AS
Tel: +47 72 81 05 00
E-mail sales: contact@radionor.no
www.radionor.no

radionor
August 2019

RADIO INTERPOSERS

SILVUS TACTICAL MESH RADIO (TELEDYNE FLIR)

The Silvus Radio Interposer is a modular accessory which enables the aircraft to utilize a tactical mesh network radio as its primary command and control link. This further enables the R70 to distribute time sensitive situational awareness to users on the tactical network.



Key Specifications:

- User Selectable Power up to 4W
- Software Defined Frequency Bands
  - S-Band (2200-2500 MHz) & C-Band (4400-4940 MHz)
- Max Range: 8km S-Band & 5 km C-Band*
- Mesh Network Capable with multi-hop C2 and Video Distribution
- AES256 Encryption
- Weight: 413g (0.9 lbs)
- IP54

Expected Release Q3 2022

TELEDYNE FLIR

COMMS RELAY PAYLOADS

COMMS RELAY PAYLOADS

TACTICAL RADIO ADAPTER KIT (TELEDYNE FLIR)

The tactical radio adapter kit (TRAK) will enable the R70\R80D platform to host many of the commonly deployed MANET radios while tethered. These radios include:

- TrellisWare
- Silvus
- Persistent Systems
- Thales
- Harris

TRAK - Single Radio Configuration

TRAK - Dual Radio Configuraion

Tactical Radio Adapter Kit (Radios not included)

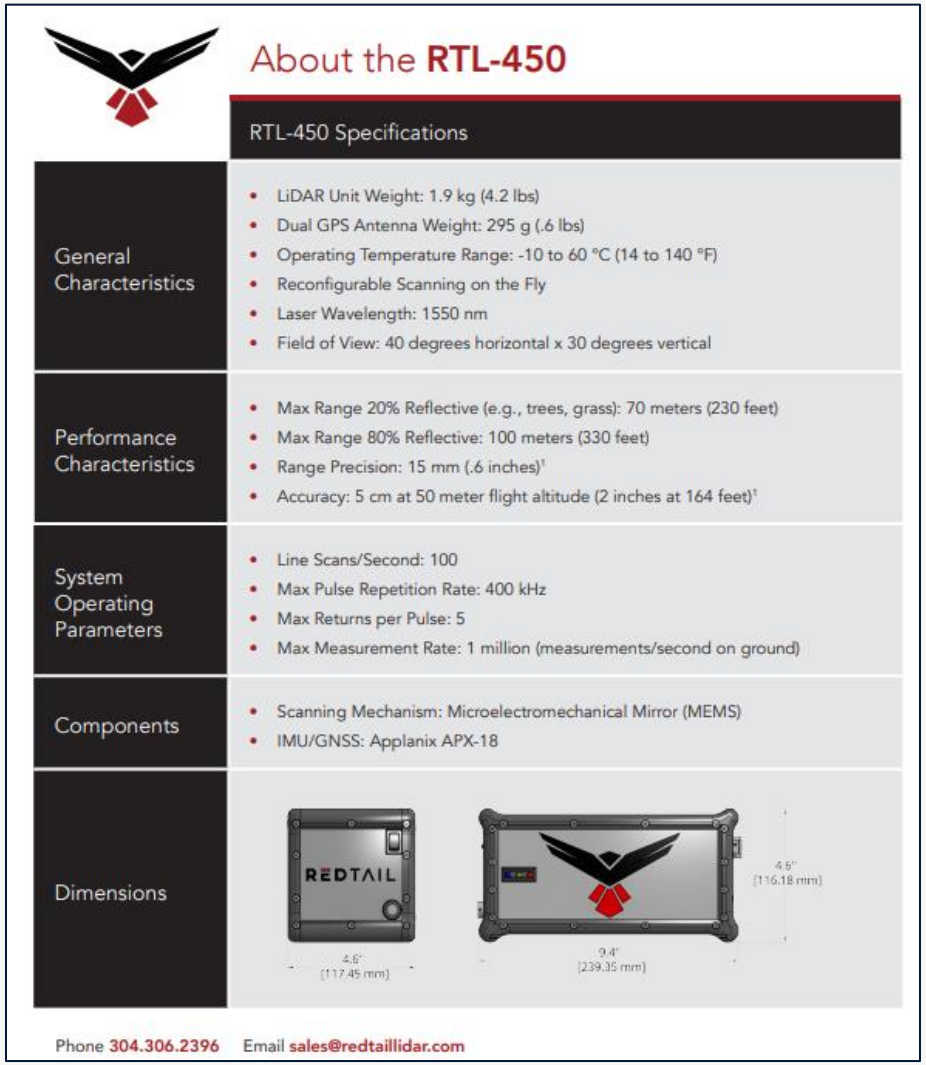
Expected Release Q4 2022

TELEDYNE FLIR

LIDAR PAYLOADS

LIDAR PAYLOADS

RTL-450 (REDTAIL LIDAR SYSTEMS)



[UAV LiDAR Systems for 3D mapping | RedTail LiDAR Systems]

LIDAR PAYLOADS

RTL-450 (REDTAIL LIDAR SYSTEMS)

The RTL-450 integrated onto the Teledyne FLIR SkyRaider.

[RedTail Delivers LiDAR System to DoD's Explosive Ordnance Disposal Community - LIDAR Magazine]

[UAV LiDAR | 4D Tech Solutions, Inc.]

LIDAR PAYLOADS

SURVEYOR ULTRA (YELLOWSCAN LIDAR)

Surveyor Ultra

HIGH-DENSITY AND LONG-RANGE UAV LIDAR

YellowScan Surveyor Ultra LiDAR system is suited for high speed UAV (VTOL fixed-wing or helicopter) and long-range needs due to its high-density specifications. With the 360° Field of View of the Velodyne VLP-32 laser scanner, YellowScan Surveyor Ultra is matching vertical mapping and mobile mapping needs when combined with Fly&Drive.

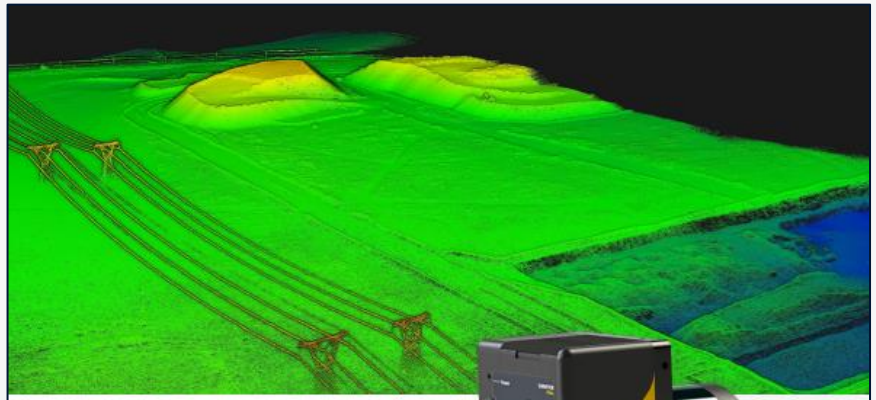
- **Integrated Laser Scanner:** Velodyne VLP-32
- **Scan Rate:** 600K points/s, up to 2 returns
- **AGL Altitude:** 80m
- **FOV:** 360 °
- **Precision:** 10 cm
- **Accuracy:** 5 cm
- **Weight:** 1.7 kg
- **Mount:** DJI M300, M600, car mount, custom mounts available

[Reliable UAV LiDAR systems for Drone 3D laser mapping | YellowScan (yellowscan-lidar.com)]

USACE-ERDC is currently working with (Surveyor Ultra), as well as VX20 series, Mapper+, and Explorer models

LIDAR PAYLOADS

SURVEYOR ULTRA (YELLOWSCAN LIDAR)



YellowScan Surveyor Ultra.

The high density and long range UAV LiDAR solution

YellowScan Surveyor Ultra provides the highest point density from YellowScan's product range.

It combines long range, high density and lightness which makes it ideally suited for high speed UAVs such as VTOL or helicopter drones.

Technologies inside

applanix

Velodyne LiDAR

Key differentiators

- High point density
- Maximized range
- Productivity solution
- Optimized for fixed-wing used

Integrations

- Multirotor drones
- Helicopter drones
- Fixed-wings
- Land vehicles

Technical specifications.

Scanner	Velodyne VLP-32
Wavelength	903 nm
Precision[1][3]	10 cm
Accuracy[2][3]	5 cm
Scanner field of view	360°
Shots per second	600k
Echoes per shot	Up to 2
GNSS-Inertial solution	Applanix APX-15 UAV

General characteristics.

Weight	1.7 kg (3.75 lbs) battery included
Autonomy	1.2 hours typ.
Power consumption	19 W
Operating temperature	-10 to +40 °C
Size	L 18 x W 10.5 x H 14 cm

(1) Precision, also called reproducibility or repeatability, accounts for the variation in successive measurements taken on the same target.
(2) Accuracy is the degree of conformity of a measured position to its actual (true) value.
(3) One σ @ 50 m, nadir.

Package includes.

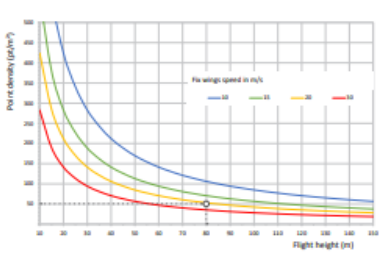
✓ **Hardware:**
- YellowScan Surveyor Ultra
- Charger and 2 batteries
- GNSS antenna and cable
- 2 USB flash drives
- Documentation

✓ **Services:**
- Boresight calibration certificate
- 1-year warranty
- In-person training
- Worldwide technical and operational support

✓ **Software:**
- Applanix POSPac UAV, to post-process GNSS and inertial data for highest accuracy
- YellowScan CloudStation, to generate and visualize your georeferenced point cloud

⊕ **Optional:**
- Mounting bracket with single or dual Sony α6000 camera for DJI M600
- YellowScan LiveStation, the real-time in-flight LiDAR monitoring kit (software + 2 radio-modems)
- Warranty and technical support extensions
- YellowScan Fly & Drive

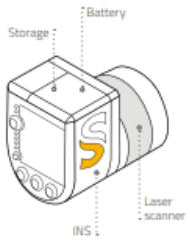
Typical mission parameters.



FLIGHT SPEED **18 m/s**

ALTITUDE **80 m**

SWATH **340 m**



LIDAR PAYLOADS

HOVERMAP (EMESENT)

MAPPING SPECIFICATIONS

SLAM mapping	Simultaneous Localization and Mapping (SLAM) based LiDAR mapping +/- 0.03% drift
LiDAR range	0.40 m to 100 m
LiDAR accuracy	+/- 30 mm
Mapping accuracy	+/- 20 mm in general environments +/- 15 mm in typical underground and indoor environments +/- 5 mm for close range scanning
Angular field of view	360° x 360°
LiDAR data acquisition speed	Single Return Mode: up to 300,000 points/sec Dual Return Mode: up to 600,000 points/sec
Maximum data capture traveling speed	Vehicle: 40 km/h; flight: 5 m/s above ground, 2 m/s underground or confined spaces
Start / stop scanning while walking or hovering	Yes
Outputs	Full resolution point cloud, decimated point cloud, trajectory file
Point cloud file format	.las, .laz, .ply, .dxf
Point cloud attributes	Intensity, range, time, return number (strongest & last) and ring number
Processing parameters	Pre-set profiles with 20+ adjustable parameters
USB3	High-speed data offload
Storage	480 Gigabytes – approximately 12 hours of sensor data
Operating temperature	0-50°C

PHYSICAL SPECIFICATIONS

Weight	1.8 kg
Input voltage	12 - 50V, powered from a battery or auxiliary power input
Deployment	Drone/UAV, backpack, vehicle, tether, ground robot
Supported drones	DJI M210, DJI M300, Acecore Zoe
Quick release mount	Yes

AUTONOMY SPECIFICATIONS

Flight modes	Pilot Assist: Non-GPS flight, position hold and assisted flight, collision avoidance, regulated flight speed. Autonomous Waypoint Mode: Autonomous navigation to waypoints
AL2 waypoint types	2D, 3D, planar, height
AL2 navigation modes	Guided exploration, local and global path planning
Autopilot compatibility	DJI, ArduPilot (Acecore Zoe)
Omnidirectional collision avoidance	360° x 360°; range 1.2 to 40 m; size of an obstacle > 2 mm wire

INCLUDED ACCESSORIES

Handle

Universal carbon fiber mounting plate with appropriate drone mount

OPTIONAL ACCESSORIES

Colorization kit (hardware and software)

Vehicle mounts

Protective cage

Hard case backpack

[Emesent – Autonomy technology for industrial drones.]

LIDAR PAYLOADS

CL-360XR (TELEDYNE OPTECH)

TELEDYNE FLIR

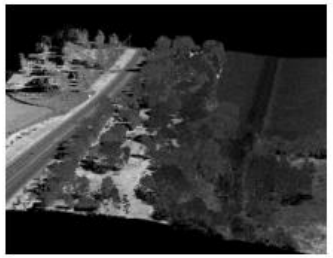
CL-360XR and CL-360HD

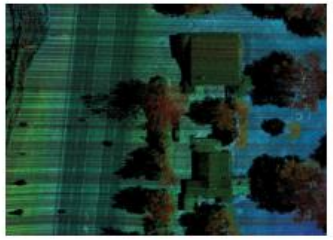
NEW

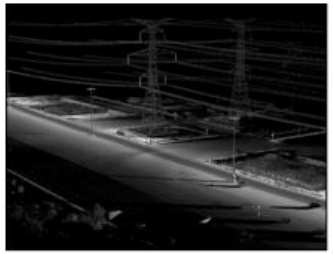
360-Degree Long-Range Survey Grade Lidar Scanner

The CL-360 delivers optimal survey-grade lidar sensor performance for use in the highest accuracy airborne, uav or mobile applications. The CL-360 features long-range detection of low-reflectance targets, survey-grade accuracy and precision, industry leading scanner speed for appealing point distribution, tight laser beam divergence for vegetation penetration and high definition point registration in a reliable and compact form-factor.

The CL-360XR is designed for airborne applications where long-range detection and vegetation penetration performance is demanded. The CL-360HD is designed for UAV and mobile applications where point density, precision and value are key requirements. Both the CL-360XR and CL-360HD share common hardware and software interfaces.







CL-360XR and CL-360HD
Technical Specifications

NEW

Parameters	CL-360XR			CL-360HD	
LASER PULSE REPETITION FREQUENCY (PRF)	**50 kHz**	**200 kHz**	**500 kHz**	**200 kHz**	**500 kHz**
Max Range Capacity[2]					
@ 10% target reflectivity	610 m	310 m	195 m	205 m	130 m
@ 20% target reflectivity	750 m	435 m	250 m	290 m	185 m
@ 50% target reflectivity	750 m	740 m	250 m	490 m	250 m
Typical Operating Altitude[3]					
@ 10% target reflectivity	390 m	195 m	125 m	130 m	85 m
@ 20% target reflectivity	480 m	275 m	160 m	185 m	120 m
@ 50% target reflectivity	480 m	470 m	160 m	315 m	160 m
Range Accuracy, 1sigma[1]	10 mm	5 mm	5 mm	5 mm	5 mm
Range Precision, 1sigma[1]	4 mm	4 mm	4 mm	4 mm	4 mm
LASER					
Wavelength	1550 nm				
Laser Safety Classification	1				
Beam Divergence (1/e²)	0.3 mrad				
Beam Footprint at 1/e²	8.1 mm @ 5 m, 8.5 mm @ 10 m, 11 mm @ 25 m, 17 mm @ 50 m, 31 mm @ 100 m				
RETURNS					
Range Measurement Principle	Time of Flight				
Sample Collection Rate	Up to 2 Mhz				
Intensity Measurement	12bits raw measurement, >16 bits normalized for range				
Minimum Range	1.5 m				
Number of Returns	Up to 4 (first 2 and last 2)				
Range Resolution	2 mm				
Minimum Target Separation	0.7 m (discrete)				
SCANNER					
Field of View	360 deg				
Scan Speed	50-250 lines/second				
Angular Step Width	0.036 – 1.8 deg				
Angular Measurement Resolution	0.001 deg				
GENERAL					
Input Voltage	11-36 V				
Power (Typical)					
@ 100 Hz Scan Speed	35 W				
@ 200 Hz Scan Speed	38 W				
@ 250 Hz Scan Speed	40 W				
ENVIRONMENTAL					
Operating Temperature[4]	-10°C to +40°C				
Storage Temperature	-20°C to +50°C				
Ingress Protection	IP64				
Vibration	DO-160H Section 8, Category S, Curve M				
Shock	DO-160H Section 7, Category A, Standard Shock				
Weight	3.5 kg				
Dimensions	310 mm L x 160 mm W x 116 mm H				
INTERFACES					
Connector 1	Power, PPS, NMEA (SGPZDA)				
Connector 2	1 GigE Ethernet for realtime data and control				
Data Storage	240 GB				
API	Windows (Intel x86-64), Linux (Intel x86-64), Linux (Arm Cortex-A8)				

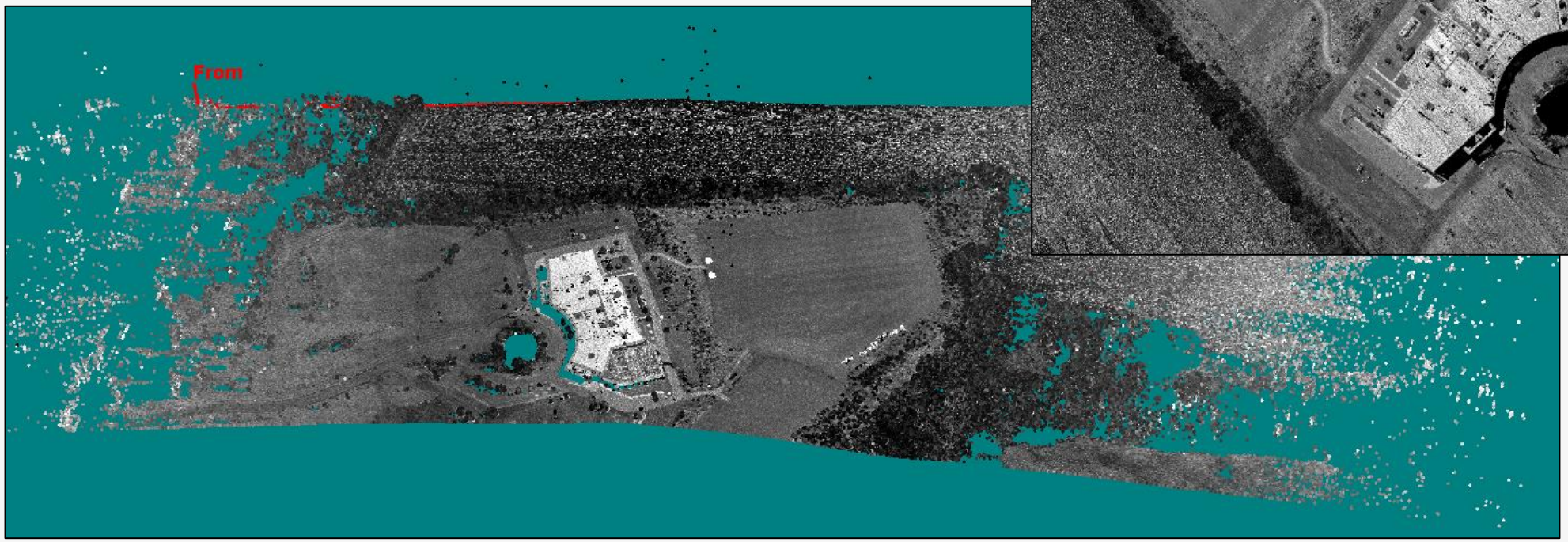
1. Teledyne Optech Test Conditions, contact for details.
2. Nadir +/- 45 deg field of view, +/- 5 deg roll.
3. Target size >= laser footprint, perpendicular angle of incidence, 23 km clear visibility.
4. Maximum +50°C case temperature. Airflow necessary over heatsink fins to ensure case temperature not exceeded.

CE CLASS 1 LASER PRODUCT Class 1 Laser Product

LIDAR PAYLOADS

CL-360XR (TELEDYNE OPTECH)

- Flights at 200Khz laser pulse rate and 500Khz laser pulse rate at 120m AGL.

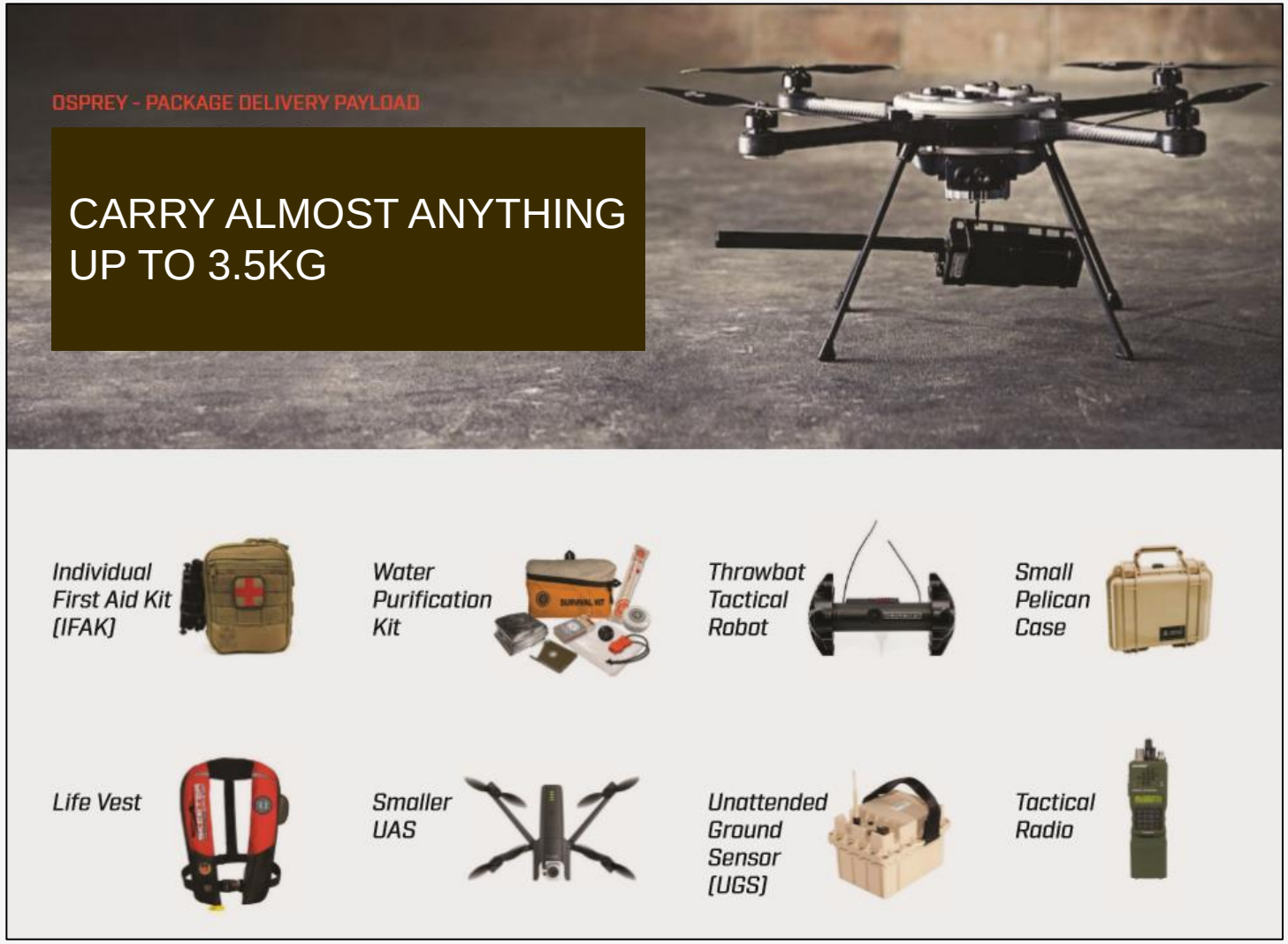


TELEDYNE FLIR

DELIVERY PAYLOADS

DELIVERY PAYLOADS

OSPREY (TELEDYNE FLIR)



TELEDYNE FLIR

USER-DEVELOPED PAYLOAD SUPPORT

SUPPORT FOR USER-DEFINED CUSTOM PAYLOADS

Application Development Kit

Provides partners and integrators access to a full suite of aircraft and payload controls

Create custom flight scripts & behaviors

Integrate C2 & video into 3rd party systems

- C/C++ headers and supporting libraries
- Compatible with Linux and Android
- Direct aircraft and payload controls
- Aircraft Telemetry
- Ability to perform control hand-off between applications (ADK to ADK / ADK to MCS)

PDK & MCS Plug-ins

Allows 3rd parties to integrate custom sensors onto the platform

Allows 3rd parties to customize the FLIR MCS GCS to add their own map overlays, custom buttons and controls

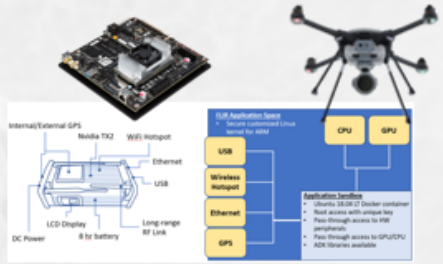
PDK

- Aircraft interface CAD models & electrical schematics
- Up to 100W power
- Software APIs for aircraft telemetry, etc.
- Access to aircraft network for data transmission to ground/sandbox over ethernet/serial

MCS Plug-Ins

- P4J applet architecture
- Load customized UX elements into the FLIR GCS
  - Simple map overlays
  - Render elements in the Video Panel
  - Create custom buttons/elements and link them to a PDK payload/Sandbox for control and config

Embedded Compute Environment



Allows 3rd parties to run their own software directly on FLIR hardware (aircraft CPU and base station CPU/GPU)

- Real-time processing of PDK data 'at the edge'
- Onboard autonomy via ADK support
- Access all available payload and network interface
- Docker Container with Ubuntu 18.04 LT
- Developer root permissions to docker allows installation of needed drivers/libraries and running custom code.

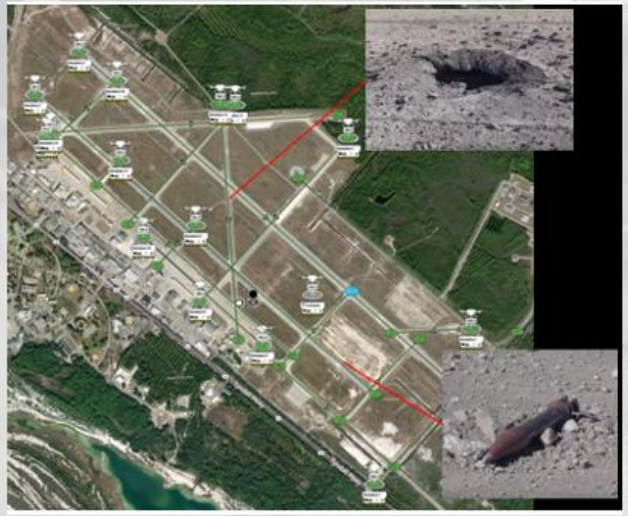
SUPPORT FOR USER-DEFINED CUSTOM PAYLOADS

Application Development Kit

ATAK

Native plugin within ATAK (USG owned software for C4I, 100K+ daily users)

USAF RADAS Integration



Rapid battle damage assessment and repair using 16 autonomous SkyRangers for collaborative mapping

Collins Aerospace PPSS

Triggered Patrol Persistent Surveillance System integrated sensors automatically send co-ordinates to SkyRanger UAS to help get eyes on potential intruders quickly.

SUPPORT FOR USER-DEFINED CUSTOM PAYLOADS

PDK– Payload Development Kit

The PDK is a hardware and software package which enables 3rd party developers to integrate a sensor or appliance onto SkyRanger/SkyRaider aircraft. The PDK provides customers and developers the freedom and flexibility to create custom payloads for their specific applications while still providing the security, reliability and integrated experience they have come to expect from SkyRanger/SkyRaider systems.

The PDK provides:

- Access to up to 100W of power from the aircraft
- Access to the aircraft's secure, RF link to the ground
- Access to aircraft GPS NMEA data
- Access to aircraft telemetry data
- Payload authentication
- Detailed Electro-mechanical details
- C/C++ header files

PDK does not currently support gimballed payloads or having more than one PDK payload connected at a time.

What: Payload Development Kit (PDK)

When: Available Now

How: Developer Portal with license agreement
https://www.flir.ca/products/udk/

Pricing: Free license to SkyRaider/SkyRanger customers
(other developers / partners evaluated as needed).

What's in the box?

A Document outlining
- Software APIs, with sample code
- Electro-mechanical specifications and constraints
- Verification and Validation tests and procedures

Electrical Schematics
- Altium files for a reference payload PCB*.
  *Can be used as-is, or modified for a customized design

Mechanical CAD Files
- Payload bay on the underside of aircraft
- Payload mechanical interface
- Payload center of gravity constraints and keep outs

Payload Development Kit

PDK– What comes with it?

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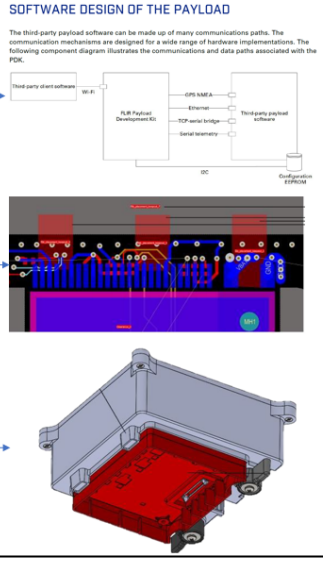


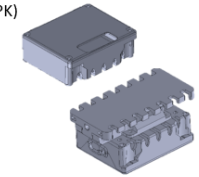
Developer ID / Payload ID
- Developer specific, FLIR signed key that gets programmed into the payload EEPROM
- Used for all payloads built by dev

PDK– Rapid Payload Prototype Kit

The RPP Kit is designed to **kickstart** PDK development by providing a fully functional, aircraft compatible, hardware interface. All electrical interfaces are present and exposed to headers for quick prototyping. The included plastics provide a solid aircraft interface, secure mounting points for your external hardware, and cut-outs to easily access PCB connections, even while the payload is connected to an aircraft.

What: PDK Rapid Prototype Kit (RPK)

When: Available Now



The RPPB package provides:

- An aircraft compatible PCB interface board
- Ethernet connection with header
- USB /Serial connections with headers
- Programmable EEPROM
- Aircraft compatible plastic PCB mount with
  - Provisions for secure mounting points
  - Cut-outs for PCB interface access
- CAD models to aid 3D printing of additional mounts
- Electrical schematics for PCB interface board

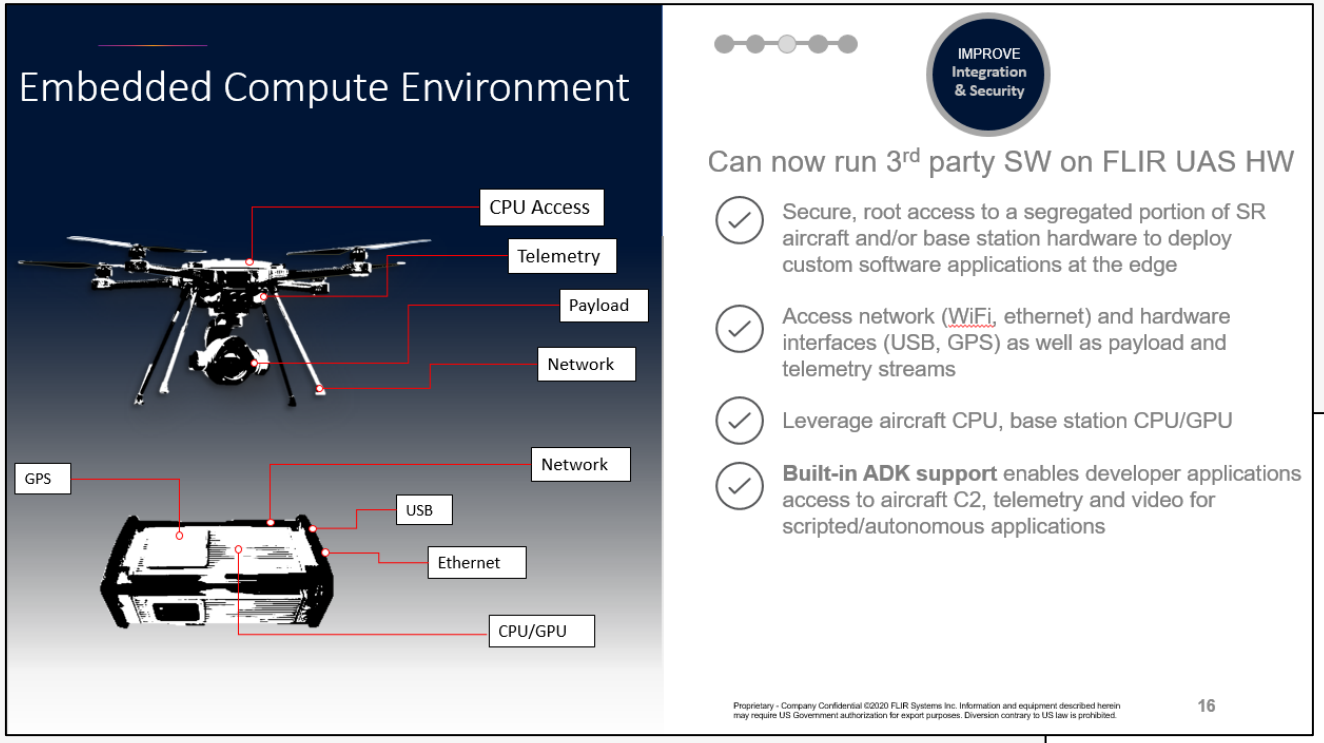
What's in the box?

A Document outlining
- PCB specifications
- Enclosure Specifications
- Sample code

Payload Prototyping PCB
- Payload PCB with headers for available interfaces
- Altium files for the Payload PCB

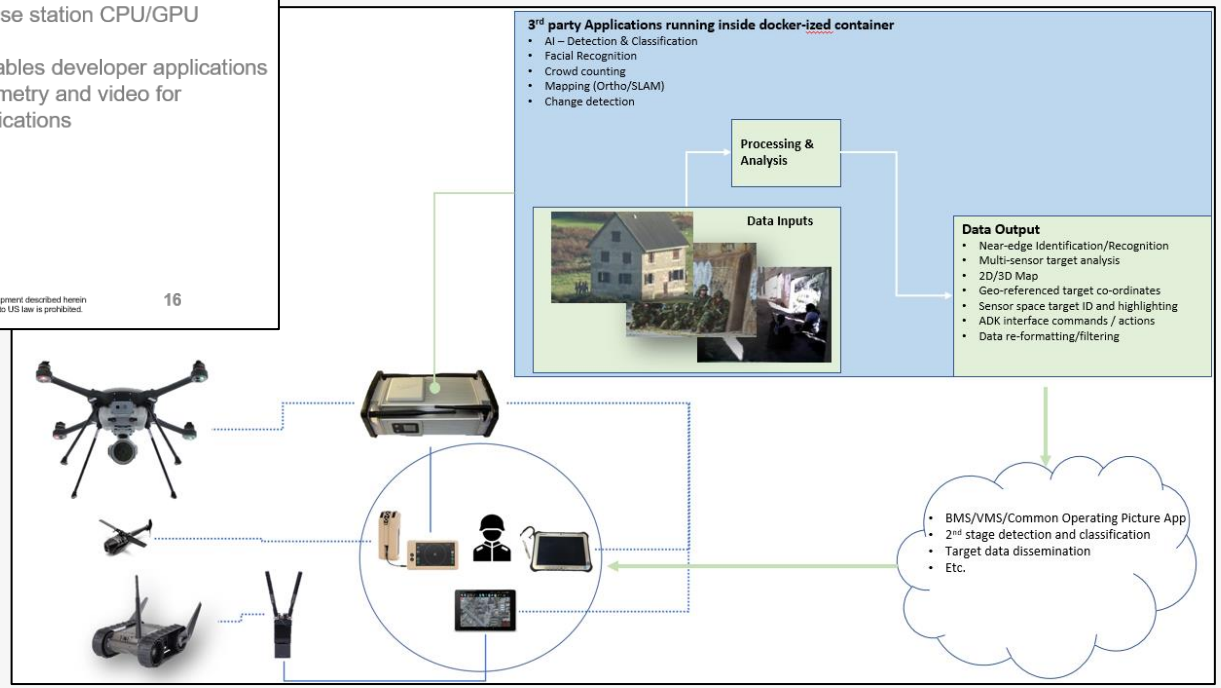
Payload Prototyping Plastics
- Plastics to mount PCB with attach points for prototyping
- CAD files for 3D printing / modification

SUPPORT FOR USER-DEFINED CUSTOM PAYLOADS



Embedded Development Kit

Aircraft and Multi-platform Support



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