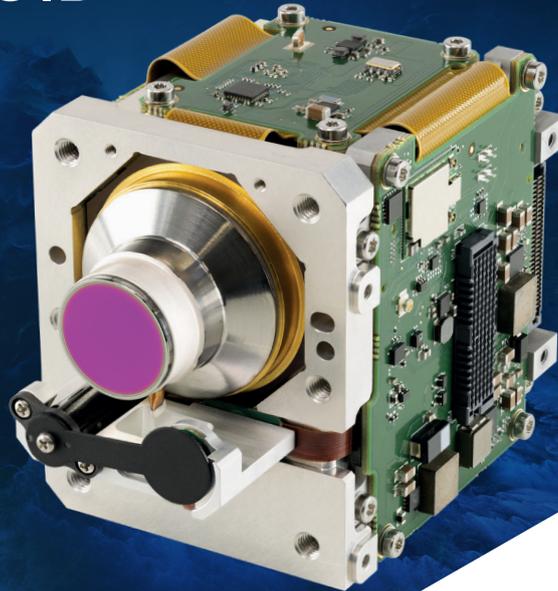


# FIREFLY

ELECTRONICS DIVISION

## CAMERA CORE HOT MWIR WITH ANDROID™



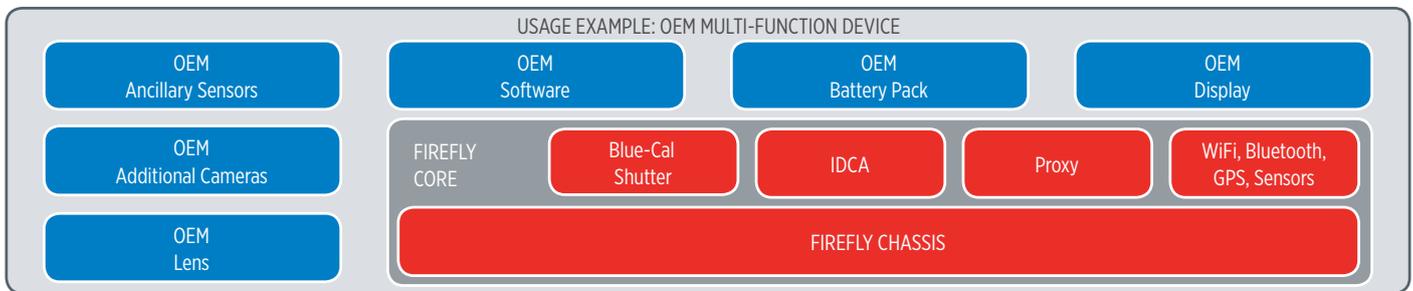
The Firefly Camera Core uses a high operating temperature (HOT) Mercury Cadmium Telluride (MCT) array with a resolution of 640 x 512 pixels on a 16µm pitch. Firefly provides all of the processing and interface requirements to drive a multi-functional hand held thermal imager, including additional camera channels, combined into an infrared camera core.

HOT technology enables cooled medium wave imagers to offer far superior performance in a more compact solution than uncooled imagers for long range, hand held and weapon mounted applications. Firefly based systems will provide greater Detection, Recognition and Identification (DRI) ranges in a package with lower Size, Weight and Power (SWaP). The unique power saving features ensure an image is available instantly throughout the mission. The revolutionary electronic architecture of Firefly brings a wealth of features adding new capabilities for the system integrator and end user.

Firefly is a native Android™ device and all image processing is performed in software with GPU acceleration. Firefly's software can be customised to meet the requirements of specific applications, for example; customised image processing, machine vision algorithms, or integration of pre-existing Android software libraries for capabilities such as augmented reality. The software based architecture allows additional functionality to be developed quickly and rolled out to units in the field.

Firefly has all of the functionality expected in an Android device, including integrated 3-axis accelerometer and gyroscope, GPS, Wi-Fi, Bluetooth and USB 3.0. These interfaces allow real-time streaming of video between Firefly units or other suitable systems. In addition a large number of GPIO's which can be configured as button inputs, digital control lines or configured as a number of standard interfaces including; I2C, SPI and RS232. These interfaces allow Firefly to control a wide range of peripheral devices such as laser rangefinders.

The presence of two additional camera channels allows Firefly to be used as the core of a multi-waveband imager. Combining multiple camera channels into one processing core allows image fusion and provides net SWaP-C savings. The combined software and hardware power management system allows Firefly to offer state of the art power efficiency.



## MAIN FEATURES

- › Medium waveband (3.7-4.95µm)
- › 640 x 512 format
- › 16µm x 16µm pixels
- › Negligible pixel blur
- › >160K operation
- › Long life linear cooling engine
- › 60 frames per second
- › Software Extensible (including OpenCL)
- › Android features
- › GPIO interfaces to control peripheral devices
- › 3 camera channels with image fusion
- › Bidirectional video streaming
- › WiFi, Bluetooth, Gigabit Ethernet, GPS

## KEY BENEFITS

- › Compact
- › Low power
- › Fast time to image
- › Instant image from standby
- › Rapid system development
- › Reduced through-life costs
- › All-in-one core for multi-function devices
- › Ideal augmented reality platform
- › Physical characteristics
- › Size 56 x 67 x 96mm (W x H x L)
- › Mass 550g

## TECHNICAL SPECIFICATION

### IDCA (INTEGRATED DETECTOR COOLER ASSEMBLY)

- › Spectral bandwidth: 3.7µm - 4.95µm
- › f-number: f/4
- › Cold stop: 19mm above FPA
- › NETD: 25mK (typical)
- › Operating temperature: >160K
- › Readout modes: IWR
- › Charge handling capacity: 7Me-
- › Frame rate: 60Hz
- › ADC resolution: 14 bits
- › Cooler operating life: >25,000h

### CAMERA CORE

- › Operating System: Android
- › Additional free camera channels: 2
- › Video outputs: HDMI, DSI
- › Networking interfaces: WiFi, Bluetooth, USB 3.0, Gigabit Ethernet
- › Peripheral interfaces: I2C, SPI, RS232, UART, user defined
- › Video streaming codecs: H.264, JPEG, lossless, All bidirectional, full screen or picture-in-picture display

- › Data storage: 10GB internal + SD card interface
- › Integrated sensors: 3-axis accelerometer and gyroscope, temperature, GPS
- › Man machine interface: Fully customisable by the system integrator
- › Power input: 5V - 12V
- › Power consumption: 5W steady state, 1W instant image standby

### IMAGE PROCESSING

- › Calibration: Integrated high-speed multi-point calibration
- › Automatic Gain and Offset (AGO): Histogram based, user configurable
- › Enhancements: Edge enhancement, local contrast enhancement, tone mapping, electronic image stabilization
- › Colour palettes: User defined 24bit RGB
- › Iconography: Vector, bitmap, and text overlays with transparency, Custom icons loaded from .png, Scaling and rotation, Network interface for displaying iconography
- › Distortion correction: Support for parametric correction of distortion in lens or display optics
- › Customisation: Proprietary processing algorithms can be provided by the system integrator

**For more information:**  
infomarketing@leonardocompany.com

**Electronics Division**  
First Avenue  
Millbrook Industrial Estate  
Southampton  
Hampshire SO15 0LG - United Kingdom  
T +44 (0) 2380 702300

This publication is issued to provide outline information only and is supplied without liability for errors or omissions. No part of it may be reproduced or used unless authorised in writing. We reserve the right to modify or revise all or part of this document without notice.

2019 © Leonardo MW Ltd

MM08532 07-19