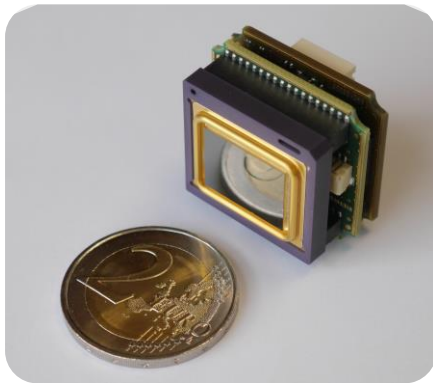


The VGA Smart Thermal Imaging Camera Modules One of the Most Compact and Lightest High Resolution of Uncooled InfraRed Camera OEM in the World

- Best Embedded Solution for Core Engine Camera Integrator -



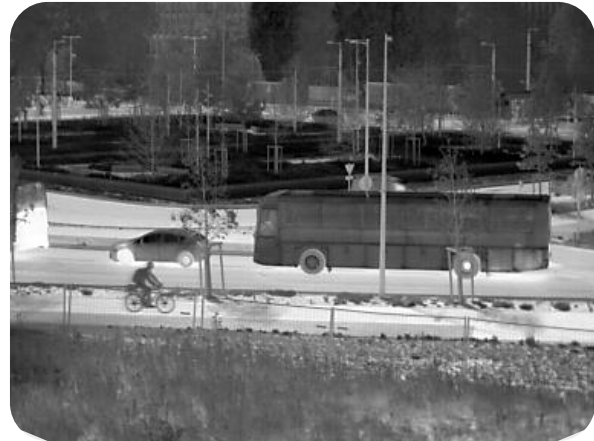
SmartIR640 is an affordable compact and a featherweight thermal imaging camera module especially designed for simply being integrated into the customer sub-system, enabling a high image quality with low-power consumption, providing an agility of configurations and addressing the medium volumes application makers

SmartIR640 is the plug and play perfect core engine, thanks to **easy to use USB 3.0 or USB 2.0 interface** with 16 bits streaming video. This thermal imaging camera includes the software that performs in real time recording sequence, single image capture and display

SmartIR640 is ready to integrate in your application thanks to a DLL providing high level services (Configuration, Acquisition, Processing)

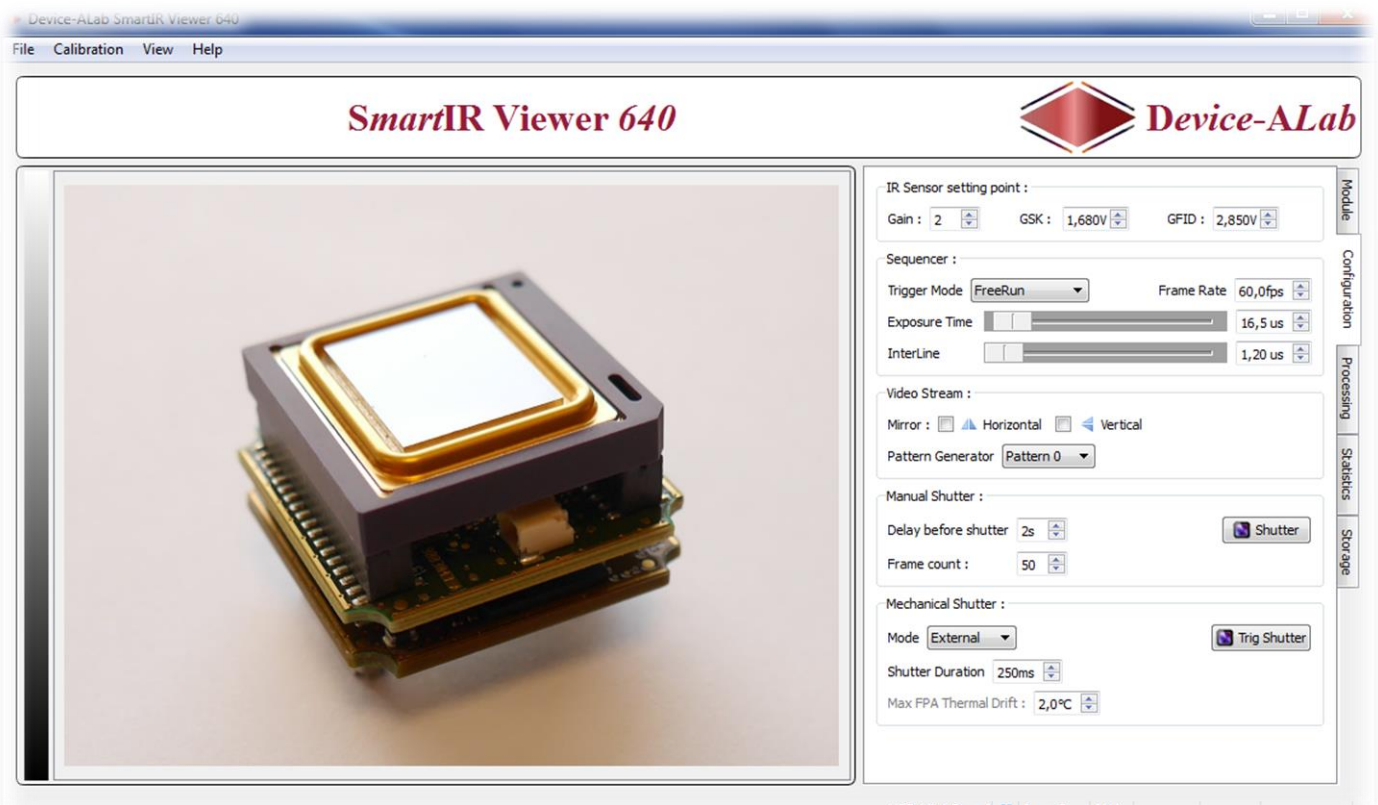
SCOPE OF USE

UAVs, UGVs and Robotics
Handheld Thermal Imaging
Temperature Measurement
Surveillance, Security and Maritime Cameras
Night Vision Goggles and Sights
Automotive and Aircraft Safety Vision
Machine Vision Inspection



SMARTIR VIEWER (GUI)

SmartIR Viewer 640 is an incredible powerful tool to manage and optimize the module settings



Calibration wizard (up to 8 maps: gain and/or offset tables)

Easy and fast Import/Export of gain, offset & data to Matlab; ImageJ, Excel, ...

BPR (Bad Pixel Replacement); NUC (Non Uniformity Correction); AGC (Automatic Gain Correction) management can be done by just clicking

Free SDK (Software Design Kit): for easy integration into your applications

Compatible with **Windows & Linux**

KEY TECHNICAL SPECIFICATIONS

SYSTEM FEATURES	SmartIR640	DESCRIPTION
Camera resolution	640x480 pixels	Micro-bolometer technology with 17µm pixel pitch SmartIR640E fits to PICO640-046; PICO640-046+; PICO640S+ detectors
Spectral response (LWIR)	8 – 14 µm	
NETD (F/1 ; 300K ; @30 Hz)	< 50 mK < 40 mK or < 30 mK	Standard performance grade Can be optimized on demand, with dedicated P/N. Refer to NETD Performance Grade section
Power consumption	< 1100 mW	@ 30 Fps
Interfaces: Standard USB 3.0 (micro-USB type B female, USB 2.0 compliance)	RAW 16 bits digital output Camera control	Plug & Play to any host controller system (PC or Computer Board) USB 2.0 compliant up to 50 Fps
Option DF12 -30 DP (Female)	Camera control Video synchronisation	See camera control features
No Shutter	Yes	
Mechanical Shutter	Optional	
Shutterless	Optional	
Camera control (both USB and UART on DF12-30 DP)	Free run	Exposure mode
	External sync mode	
	Automatic management of shutter Enable external control of shutter Image tagged if shutter enabled	
	Adjustable IR setting point (Exposure time, Gain, ...)	
	Power consumption management: Standby power mode Deep standby power mode	Video disable and wakeup for fast time to image Video disable, detector powered off
User Configuration Storage	Up to 8	On module
Storage Calibration Table	Up to 8	On module
Time to image	< 6 s	Time from power on at USB power supply
Image Optimization	BPR, NUC, Image enhancement, AGC	Configuration dependant
Full Frame Rates	120 Hz	Adjustable frame rate: from 9 to 120Hz (USB 3.0 required); 120 Hz on-demand
Standard Frame Rates	30 Hz	
Exportable Frame Rates	9 Hz	
Image Flip	yes	On module
Qualification grade	Industrial (Standard grade) Military (MIL-STD-810G)	
Operating temperature range	-20°C ; +60°C (Standard grade) -40°C ; +70°C (Military grade)	
Size : Length x Width x Height	30 x 30 x 24 mm ³	With mechanical casing excluding optic and Shutter
Weight	< 16g < 40g	Excluding optic and mechanical casing Only excluding optic
Demo Graphical User Interface	Windows	SmartIR Viewer adjusts all image parameters in GUI. GUI compatible
SDK (for USB)	Windows or Linux	Windows only SDK compatible with Windows, Linux of Operating System

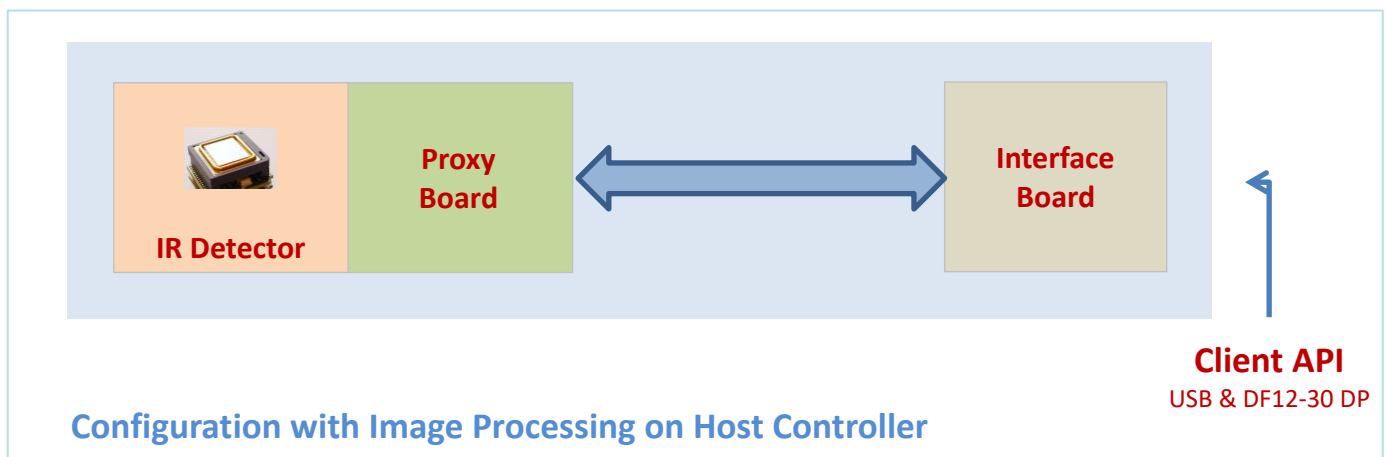
Technical characteristics described in this data sheet are for information only and are not contractual. Because of ongoing product enhancements, specifications are subject to change without notice. SmartIR640-Specsheetrev8 © May 2021 - All rights reserved.

CONFIGURATION OF ENGINE CORE

SmartIR640 is developed using a modular concept and architecture.

Thanks to its SDK, SmartIR640-USB consists in embedding the processing into the Host Controller mainly for UAVs, UGVs and Machine Vision applications.

For handheld and portable application, a Processing Board can be added to the previous stack (see figure below), allowing to embed the optimized and just needed processing to the aimed application.



ORDER YOUR OWN AND GET IT!

VGA MODEL (With housing and standard qualification and standard performance grade)	VIDEO SPEED	LENS	DIMENSION/WEIGHT	PART NUMBER (Configuration with image processing on Host Controller)
SmartIR640-USB No Shutter	30 Hz	35 mm; HFOV: 16.9°; F/1.14	38 x 38 x 58 mm ³ / 86 g	M640-0001AVAI-CAUH3- AOM
SmartIR640-USB No Shutter	30 Hz	25 mm; HFOV: 25°; F/1.20	38 x 38 x 58 mm ³ / 96 g	M640-0001AIAI-CAUH3- AOM
SmartIR640-USB No Shutter	30 Hz	16.7 mm; HFOV: 37.5°; F/1.25	38 x 38 x 46 mm ³ / 70 g	M640-0001AHAI-CAUH3- AOM
SmartIR640-USB No Shutter	30 Hz	7.5 mm; HFOV: 90°; F/1.40	30 x 30 x 34 mm ³ / 60 g	M640-0001AGAI-CAUH3- AOM
SmartIR640-USB No Shutter	9 Hz	35 mm; HFOV: 16.9°; F/1.14	38 x 38 x 54 mm ³ / 86 g	M640-0001EVAI-CAUH3- AOM
SmartIR640-USB No Shutter	9 Hz	25 mm; HFOV: 25°; F/1.20	38 x 38 x 54 mm ³ / 96 g	M640-0001EIAI-CAUH3- AOM
SmartIR640-USB No Shutter	9 Hz	16.7 mm; HFOV: 37.5°; F/1.25	38 x 38 x 35 mm ³ / 70 g	M640-0001EHAI-CAUH3- AOM
SmartIR640-USB No Shutter	9 Hz	7.5 mm; HFOV: 90°; F/1.40	30 x 30 x 34 mm ³ / 60 g	M640-0001EGAI-CAUH3- AOM
SmartIR640-USB No Shutter	30 Hz	No	30 x 30 x 24 mm ³ / 38 g	M640-0001AXAI-CAUH3- AOM
SmartIR640-USB No Shutter	9 Hz	No	30 x 30 x 24 mm ³ / 38 g	M640-0001EXAI-CAUH3- AOM
SmartIR640-USB Shutter	30 Hz	35 mm; HFOV: 16.9°; F/1.14	40 x 38 x 58 mm ³ / 115 g	M640-0002AVAI-CAUH3- AOM
SmartIR640-USB Shutter	30 Hz	25 mm; HFOV: 25°; F/1.20	40 x 38 x 58 mm ³ / 125 g	M640-0002AIAI-CAUH3- AOM
SmartIR640-USB Shutter	30 Hz	16.7 mm; HFOV: 37.5°; F/1.25	40 x 38 x 46 mm ³ / 100 g	M640-0002AHAI-CAUH3- AOM
SmartIR640-USB Shutter	30 Hz	7.5 mm; HFOV: 90°; F/1.40	40 x 30 x 34 mm ³ / 94 g	M640-0002AGAI-CAUH3- AOM
SmartIR640-USB Shutter	9 Hz	35 mm; HFOV: 16.9°; F/1.14	40 x 38 x 58 mm ³ / 115 g	M640-0002EVAI-CAUH3- AOM
SmartIR640-USB Shutter	9 Hz	25 mm; HFOV: 25°; F/1.20	40 x 38 x 58 mm ³ / 125 g	M640-0002EIAI-CAUH3- AOM
SmartIR640-USB Shutter	9 Hz	16.7 mm; HFOV: 37.5°; F/1.25	40 x 38 x 46 mm ³ / 100 g	M640-0002EHAI-CAUH3- AOM
SmartIR640-USB Shutter	9 Hz	7.5 mm; HFOV: 90°; F/1.40	40 x 30 x 34 mm ³ / 94 g	M640-0002EGAI-CAUH3- AOM
SmartIR640-USB Shutter	30 Hz	No	40 x 30 x 24 mm ³ / 65 g	M640-0002AXAI-CAUH3- AOM
SmartIR640-USB Shutter	9 Hz	No	40 x 30 x 24 mm ³ / 65 g	M640-0002EXAI-CAUH3- AOM

Note of Part numbering:

A0 are summarized below in table of compatibility version.

The last digit means the **maturity level** of the device. For example: **S** refers to engineering Sample.

M refers to Mass production unit which is **MIL-STD-810G** qualified.

PERFORMANCE GRADE

SmartIR640 offers three performances grades:

FEATURES	Standard Grade	High Grade	Ultra-High Grade
NETD	<50mK	<40mK	<30mK
Operability	>99.5%	>99.8%	>99.8%
Bad line	<=1 outside 320x240 central area	0	0
Bad column	<=1 outside 320x240 central area	0	0

Operability is the number of valid pixels, including defective line or column.

These defects are corrected by the core but can appear during operation depending on conditions.

COMPATIBILITY VERSION

RELEASE VERSION	RELEASE DATE	NEW FEATURES
A0	July 2019	Operating System : Windows & Linux (1)

Note (1): Windows (x86; x64) or Linux on Embedded Platform ARM9, Libc 2.x with x>=13 or Linux_x86, Linux_x64 on Platform (Intel and AMD)

WHAT'S IN THE BOX

Module of Thermal Imaging Camera

SmartIR viewer (GUI)

ICD (mechanical drawings)

SDK for developers

Documentation (user's guide)

Downloadable on Device-ALab website through customer access

General Notices:

This OEM module is intended only for product evaluation, development or incorporation into other product or sub-system. It is not a finished end-product fit for general consumer use. As such, this module is without the scope of the European Union (EU) directives concerning electromagnetic compatibility (EMC).

The products described herein are subject to French Government Export Controls except the products of lower or equal than 9 Hz frame rates.