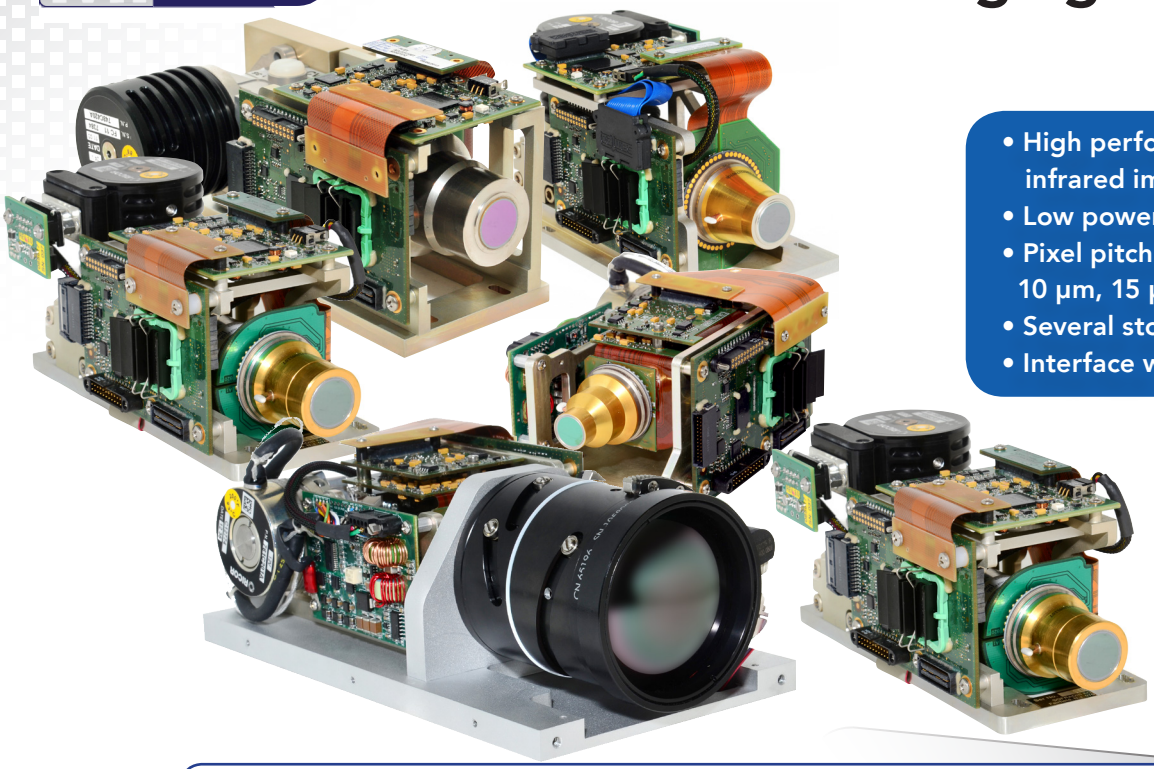
MiTIE™ Miniature Thermal Imaging Engines



- High performance MW and LW infrared imaging
- Low power dissipation, compact design
- Pixel pitch options: 10 µm, 15 µm, 30 µm
- Several stop diameter options
- Interface with multiple COTS optics

The MiTIE Series of miniature thermal imaging engines are designed for OEM and system integrators that wish to incorporate a small, lightweight, low power cooled camera engine into their electro-optical system.

The MiTIE cores are based on high performance Mercury Cadmium Telluride (MCT) or Indium Antimonide (InSb) Integrated Detector/Dewar/Cooler Assemblies and are available in several configurations having MW or LW spectral responses and in various array sizes.

The MiTIE cores include camera control and cooler electronics and produce corrected analog, HDMI, and 14-bit Camera Link digital video. Communication is via USB or Camera Link interface. Because of their, lightweight and low power consumption, the MiTIE camera cores are ideal for applications that have demanding SWaP (space/weight power) constraints.

FEATURES

On-board non-uniformity correction and BPR	Windows Graphical User Interface
14-bit Camera Link output	Plug-and-play OEM operation
Image processing functions include: binning, edge enhancement, histogram equalization, flip video, digital zoom	Available Software Options: • Desktop Analysis software • C++ Software Development Kit (SDK)
Connection kit facilitates testing	

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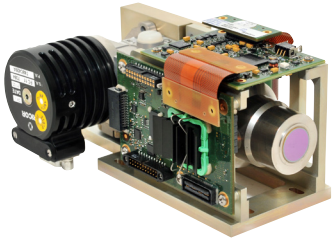
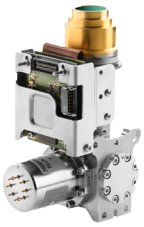
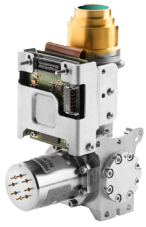
MiTIE™ Miniature Thermal Imaging Engines

≥ XGA MWIR ENGINES

	MiTIE MWIR-1280/15-Jupiter Engine	MiTIE MWIR-1280/10-Daphnis Engine	MiTIE MWIR-1024/10-Daphnis Engine
			
IDDCA	Jupiter	Daphnis HD	Daphnis XGA
Detector	1280×1024 MCT	1280×720 MCT	1024×768 MCT
Pixel Pitch	15 µm	10 µm	
Spectral Response	3.7-4.8 µm	3.7-4.8 µm	
NETD (typical)	19.36 mK @f2 @293K	20 mK	
Cold Shield	f/2, f/4.6	f/2, f/4	
Capacity	1.5 Me-, 4 Me-	0.7 Me-, 2.2 Me-	
QE	75%	80%	
Operability	99.8% typical		
INT Time Control	Tint min = 1 MC = 0.1 µs @10 MHz	Tint min = 25 MC = 0.6 µs @ 40 MHz	
Pixel Rate	40 MHz		
A/D	14-bit		
Readout	IWR	ITR	
Windowing	256 x 2	320 x 8	
Frame Rate (user-definable sub-windowing for higher frame rate)	30 Hz (full frame) 1KHz @ 256 x 142 >15KHz @ 256 x 2	60 Hz (full frame)	60 Hz (full frame)
Digital Output	HDMI, 14-bit Camera Link		
Video Output	NTSC or PAL output		
Operating Temperature Range	-40°C to +71°C		
Available Image Processing Functions	Non-Uniformity Correction, Bad Pixel Replacement, frame accumulation capability (63 frames), binning, edge enhancement, AGC, histogram equalization, gamma correction, symbology, flip video, digital zoom*		
Cooldown Time	7 minutes @ 20 C (K548 cooler)	4 minutes (RM3, K508, RM4) 5 minutes (RM2 & K563);	
Cooler	Rotary K548	Rotary RM2, RM3, RM4,	Rotary RM2, RM3, RM4
Power Consumption	14 - 27 W	9 - 14.5 W (RM2 / K563) 9 - 16.5 W (RM3 / K508) 10 - 19.5 W (RM4)	9 - 14.5 W (RM2 / K563) 9 - 16.5 W (RM3 / K508) 10 - 19.5 W (RM4)
Dimensions (W × H × L)	6.2" × 3.6" × 3.4"		
Comments		16:9 format, ideal for use in applications having significant horizontal aspect.	Same size as VGA-15µm systems. Significant range improvement with same optics.

* some exclusions for DAPHNIS

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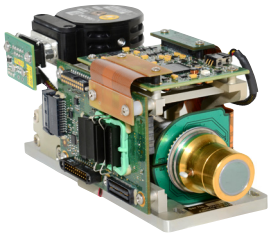
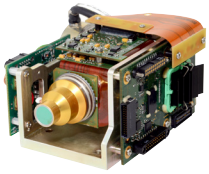
MiTIE™ Miniature Thermal Imaging Engines

VGA MWIR ENGINES

	MiTIE MWIR-640/15-Scorpio Engine	MiTIE MWIR-640/15-Leo Engine
		
IDDCA	Scorpio MW	Leo MW
Detector	640×512 MCT	
Pixel Pitch	15 µm	
Spectral Response	3.7-4.8 µm	
NETD (typical)	< 18 mK @f/2; 14.9 mK (typical)uuy	20 mK @f/4 25 mK @f5.5 (both typical)
Cold Shield	f/2.0, f/2.24, f/4	f/4.0, f/5.5
Capacity	5 Me-, 6.5 Me-	
QE	75%	
Operability	> 99.5% 99.8% (typical)	> 99.5% 99.9% (typical)
INT Time Control	Tint min = 1.5 MC = 150 µs @ 10 MHz	
Pixel Rate	40 MHz	22 MHz
A/D	14-bit	
Readout	ITR for 6.4 Me- gain; IWR for 5 Me- gain	
Windowing	Dynamic and user definable down to 160 × 1	
Frame Rate (user-definable sub-windowing for higher frame rate)	117 Hz (full frame) 1KHz @ 166 x 166 > 3.2KHz @ 160 x 1	65 Hz (full frame) 1KHz @ 160 x 60 > 1.77KHz @ 160 x 1
Adjustable Integration Time	< 3 µsec to 20 msec	
Digital Output	HDMI, 14-bit Camera Link	
Video Output	NTSC or PAL output	
Operating Temperature Range	-40°C to +71°C	
Available Image Processing Functions	Non-Uniformity Correction, Bad Pixel Replacement, frame accumulation capability (63 frames), binning, edge enhancement, AGC, histogram equalization, gamma correction, symbology, flip video, digital zoom	
Cooldown Time	< 5 minutes @ 20C (K508 cooler)	4 minutes @ 20C (K563 cooler)
Cooler	Rotary K508	Rotary K563 or RM2
Power Consumption	9.5 - 19.5 W (K508 cooler)	8.5 - 16.5 W (K563 or RM2)
Dimensions (L × W × H)	3"× 3"× 5.8"	4"× 2.5"× 5"
Comments		Available with 19-275mm CZ lens ƒ5.5

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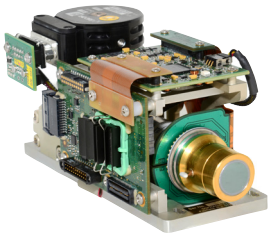
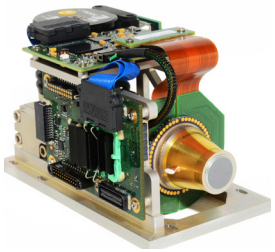
MiTIE™ Miniature Thermal Imaging Engines

LWIR ENGINES

	MiTIE LWIR-640/15-Scorpio Engine	MiTIE LWIR-320/30-Mars Engine
		
IDDCA	Scorpio LW	Mars LW
Detector	640×512 MCT	320×256
Pixel Pitch	15 µm	30 µm
Spectral Response	7.7-9.4 µm	7.7-9.4 µm
NETD (typical)	20 mK	17 mK
Cold Shield	f/2.0, f/2.24	f/2.0, f/4.0
Capacity	13.5 Me-, 27 Me- (binning mode)	12 Me-, 36 Me-
QE	70% average from 7.7 - 9.4 µm >85% from 7.7 - 8.5 µm	65% average from 7.7 - 9.4 µm >80% from 7.7 - 8.5 µm
Operability	> 99.5% 99.8% (typical)	> 99.5% 99.7% (typical)
INT Time Control	10 µs to full frame	600 ns to full frame
Pixel Rate	40 MHz	20 MHz
A/D	14-bit	
Readout	ITR	
Windowing	160 x 1	64 x 1
Frame Rate (user-definable sub-windowing for higher frame rate)	117 Hz (full frame) 1 kHz @ 185 x 185 14.6 kHz @ 160 x 1	244 Hz (full frame) 1 kHz @ 141 x 141 133 kHz @ 64 x 1
Adjustable Integration Time	< 3µsec to 20 msec	
Digital Output	HDMI, 14-bit Camera Link	
Video Output	NTSC or PAL output	
Operating Temperature Range	-40°C to +71°C	
Available Image Processing Functions	Non-Uniformity Correction, Bad Pixel Replacement, frame accumulation capability (63 frames), binning, edge enhancement, AGC, histogram equalization, gamma correction, symbology, flip video, digital zoom	
Cooldown Time	5 minutes @ 20C (K508 cooler)	< 6 minutes @ 20C (K508 cooler)
Cooler	Rotary K508	
Power Consumption	9 - 16.5 W (K508 cooler)	9 - 14 W (K508 cooler)
Dimensions (L × W × H)	3"× 3"× 6"	3"× 3"× 6"

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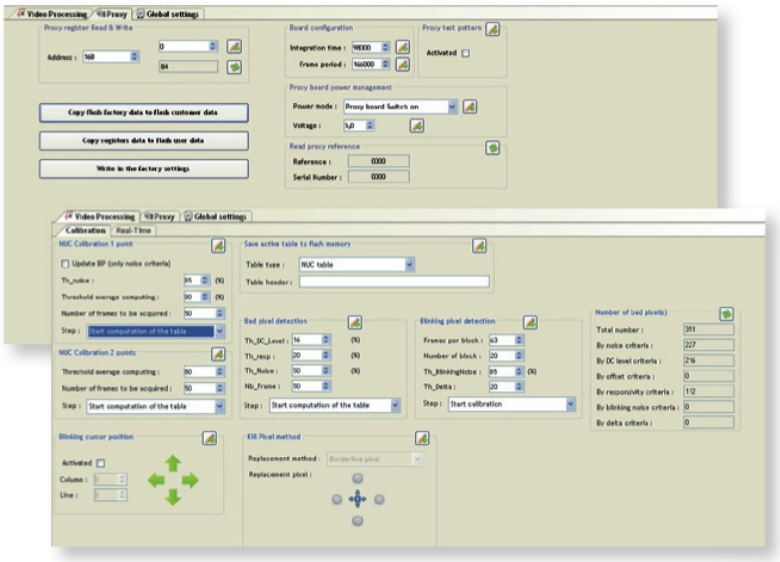
MiTIE™ Miniature Thermal Imaging Engines

MiTIE CONNECTION KIT



MiTIE Connection Kit: Ideal to easily attach MiTIE to a PC or frame grabber through standard connectors (including HDMI, USB, Camera Link and power). Includes interconnect cable to MiTIE electronics, AC Power Supply (not shown) and PC software Graphical User Interface.

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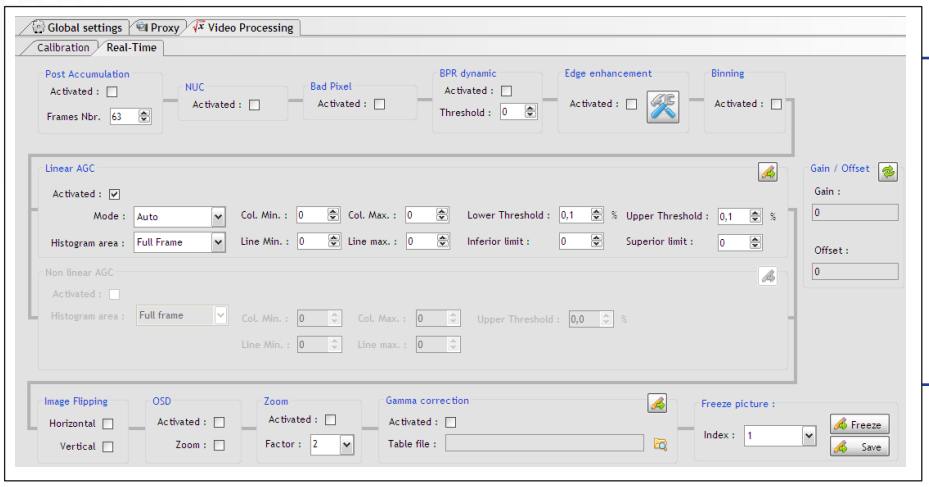
Desktop Software for MiTIE

Graphical User Interface (GUI)



GUI Software Features:

- Integration time change
- Non-uniformity correction
- Sub-windowing
- External trigger
- For Microsoft Windows

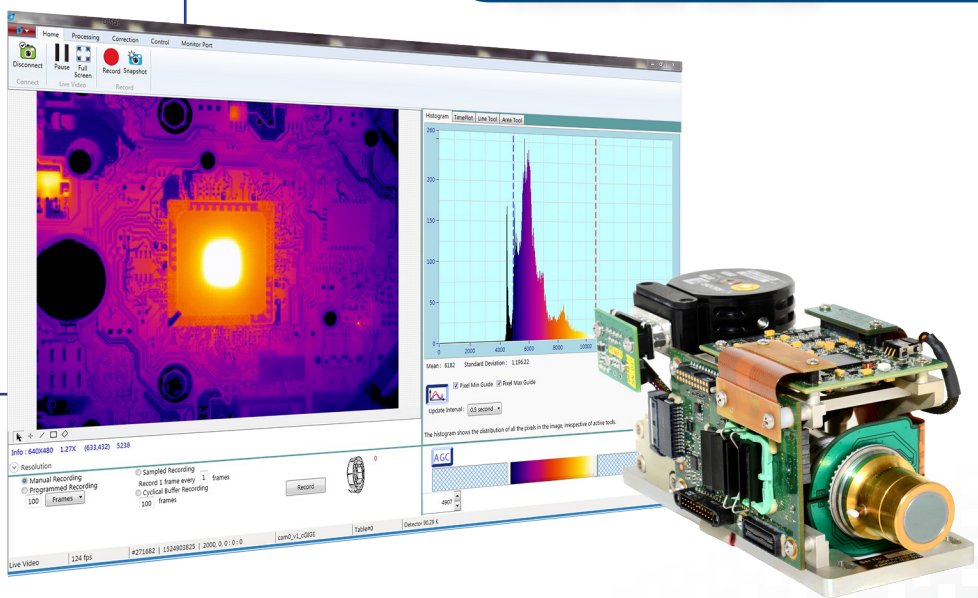
D*STAR for MiTIE

Digital Storage and Retrieval and Image Processing Software Suite

D*STAR for MiTIE Software Features:

- Real-time recording and playback
- Single image capture and playback
- 14-bit image conversion to .AVI
- Export of data to standard files
- Multiple color palette selection
- Image averaging
- Span and level control
- AGC
- Spot meter
- Line profile
- Region of interest – user-defined rectangle
- Histogram analysis (ROI)
- Time plot

- **Comprehensive camera control**
- **Real-time digital recording**
- **Power analysis tools**
- **Intuitive user interface**



Also available: C++ Software Developer's Kit for MiTIE

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