



January 27, 2016

Nippon Avionics Co., Ltd.

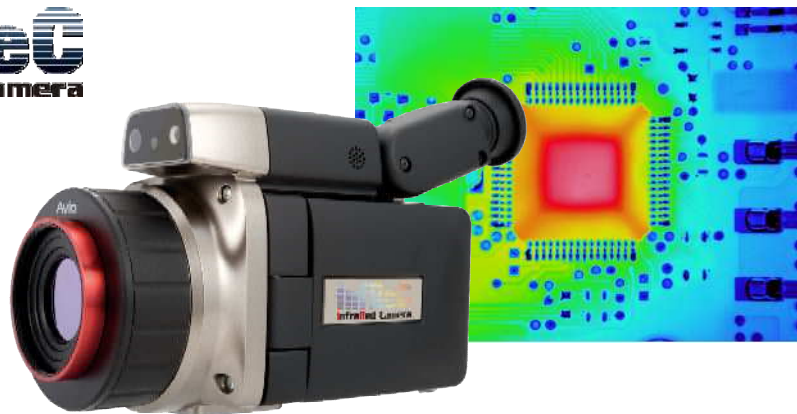
<http://www.avio.co.jp/english/>

*Improved high-resolution movie recording and
full selection of lens*

InfReC R500EX Series high-resolution, advanced function, Infrared Thermal Imaging Camera now available

Exerting the power further in thermal design, test and evaluation of electronic equipment

InfReC
InfraRed Camera



The InfReC R500EX series of infrared thermal imaging cameras improve on the InfReC R500 series cameras to achieve best-in-class thermographic recording at up to 1.2 million pixels (1280 × 960). These cameras were introduced to the market on January 27, 2016 by Nippon Avionics Co., Ltd. (Head office: Tokyo, Japan, President Katsuhiko Akitsu, and hereafter called Avio)

This new product doubles the speed of real-time data transfer to a personal computer (30Hz) for faster recording. A new “auto-record start” feature enables personal computer software to automatically start video recording by input of an external trigger signal to the camera, making it easy to record data reliably by interworking with test equipment or on-site facilities. New 21μm and 52μm close-up lens for temperature measurement of minute objects that cannot be measured with a thermocouple and a 3x wide-angle lens that provides 93° field of view to take advantage of the 1.20 million pixel resolution have been added to the lineup.

These new features for motion video and the expanded lens selection make this product a powerful tool for use in R&D of electronic components and other fields of research.

Avio continues to strive for a safe, secure and comfortable social environment by developing appealing products and services of even higher quality from the customer's point of view.

■ Model R500EX Series External Appearance



■ Model R500EX Series Lineup

Select a model to fit the application:

Note: See Specifications section for additional details.

- R500EX-Pro: Measuring range: -40 to +2000°C.
Full featured model for R&D.
Suitable for use in R&D, for making high temperature measurements, and for measuring sequential data.
- R500EX : Measuring range: -40 to +500°C.
Facility diagnosis model.
Excellent choice for inspection of electrical facilities and remotely located pipes.

Model	Frame rate	Features
R500EX-Pro	30Hz	Full featured for Research & Development
R500EX-Pro-D	7.5Hz	
R500EX	30Hz	For Facility diagnosis
R500EX-D	7.5Hz	

■ Lens Lineup

Lens system		Specifications
New	3x wide-angle lens	Field of View: 93° (H) × 73° (V)
New	21μm close-up lens	Field of View: 13 mm (H) × 10 mm (V)
New	52μm close-up lens	Field of View: 33 mm (H) × 25 mm(V)
	2x wide-angle lens	Field of View: 64° (H) × 48° (V)
	2x telephoto lens	Field of View: 16° (H) × 12° (V)

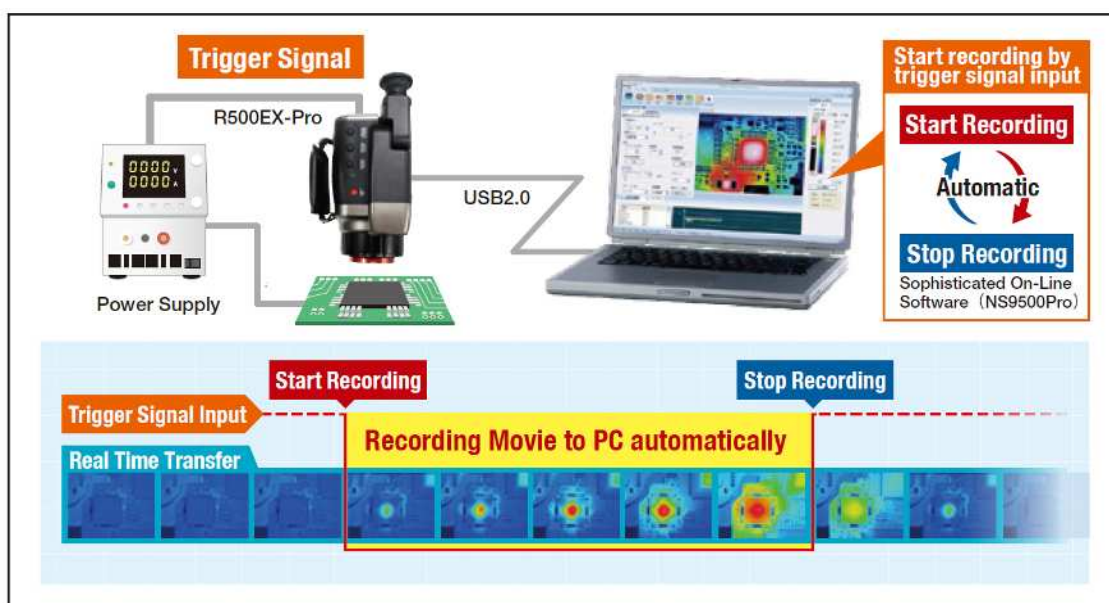
■ New functions and changes from previous models

1) Real-time high-resolution data transfer at 30Hz

- The previous 15Hz rate for real-time data transfer to a personal computer has been increased to 30Hz in this new series for 640 × 480 pixel resolution (only when thermal image data is transferred)
- The thermal image data for analysis is transferred together with the visible image data over a USB 2.0 connection. [*1]

2) Recording auto-start by analysis software[*2]

- Input of an external trigger signal to the camera unit enables analysis software that is running on a personal computer to automatically start video recording.
- Data can be recorded by interworking with testing equipment simply, without having to construct a system of I/O devices.

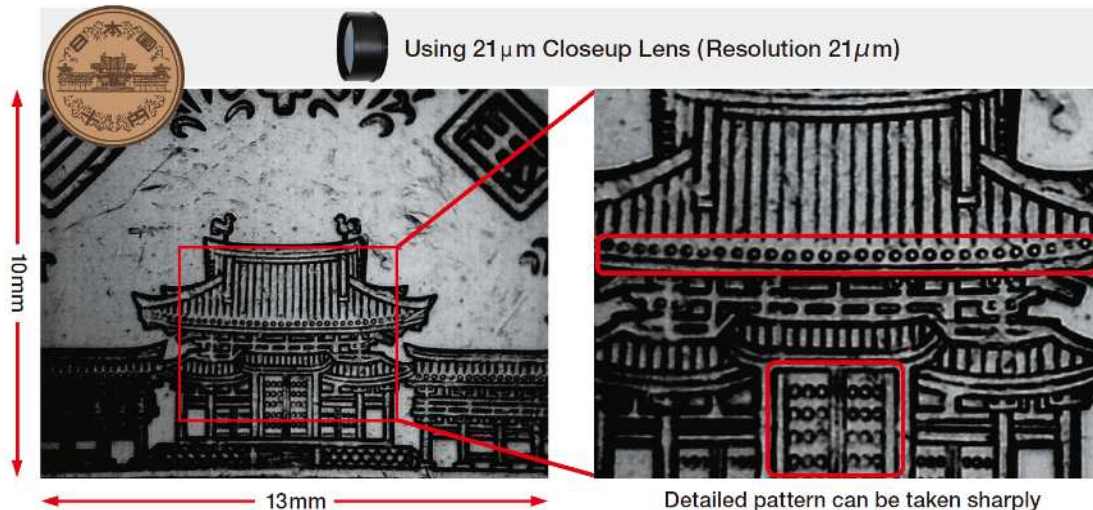


3) Improved temperature resolution with latest image filtering (denoising)

- This product uses the latest noise processing technology developed by the NEC Central Research Laboratories to reduce random noise by spatial filtering and preserve the outline details of the object being measured.
- The Sensivity (NETD) of 0.025°C (at 30°C) [*3] makes this product most suitable for discerning slight differences in temperature in non-destructive inspection.

4) Three types of lens provide optimum measurement of minute objects and a wide measurement range

- Two types of close-up lens for measuring temperature in minute objects such as electronic components have been added.
 - $21\mu\text{m}$ close-up lens (working distance of 22 mm, with a spatial resolution of $21\mu\text{m}$)
 - $52\text{-}\mu\text{m}$ close-up lens (working distance of 56 mm, with a spatial resolution of $52\mu\text{m}$)
- A wide-angle lens that can image a 93° field of view at a resolution of 1.20 million pixels has been added.
 - 3x wide-angle lens



[*1]: When thermal and visible image data are transferred together, the transfer rate is 15 Hz.

[*2]: Only R500EX-Pro, R500EX-Pro-D

[*3]: With improved S/N

Inquiries:

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<Specifications>

Features		R500EX-Pro	R500EX-Pro-D	R500EX	R500EX-D	
Basic Performance	Infrared Detector	Uncooled Focal Plane Array (Microbolometer)				
	Spectral Range	8 to 14 μ m				
	Measuring Range	-40 to 2000°C		-40 to 500°C		
	Sensitivity (NETD)	0.025°C at 30°C (with S/N improvement)				
	Accuracy	$\pm 1^\circ\text{C}$ *1				
	Frame Rate	30Hz	7.5Hz	30Hz	7.5Hz	
	Detector Pixels	640 (H) \times 480 (V) pixels				
	Recording Pixels	Standard mode : 640 (H) \times 480 (V) Super Resolution (SR) mode : 1280 (H) \times 960 (V) *2				
	Field of View	32° (H) \times 24° (V) (with standard lens)				
	Spatial Resolution	Standard mode : 0.87mrad Super Resolution (SR) mode : 0.58mrad equivalent *3				
	Focal Distance	10cm to infinity (with standard lens) *4				
	Focus	Auto / Manual				
Image Display	Auto Function	Auto Scale, Auto Focus, Full Auto				
	Color Palettes	7 palettes (Rainbow, Brightness, Hot-white, Hot-black, etc.)				
	Gradation	256 / 32 / 16 / 8 grade				
	Visible Camera	CMOS camera 5M pixels				
	Visible / Thermal Fusion	Side-by-Side, Fusion (transparency changeable), Picture-In-Picture (transparency changeable)				
	Display Functions	1 to 8 times continuous zoom (with display positioning scroll), Grid Overlay, 9 images multi-display (replay mode)				
	Image Quality Improvement	Denoising, Averaging (with ghost rejection), Edge enhancement				
Measuring Functions	Point Temperature	10 Movable Points, Temperature search: MAX/MIN x 1 each, Delta T				
	Line Profile	Horizontal, Vertical, Horizontal & Vertical				
	Temperature Display in Assigned Region	MAX, MIN and AVG in Box (for up to 5 Boxes)		N/A		
	Alarm Function	Alarm Display, Alarm Sound, Color Alarm, Alarm Recording,				
		Alarm Signal Output		N/A		
	Temperature Correction	Emissivity, Environmental / Background, Distance				
		Emissivity	Multi-point Correction, Emissivity Table			
			Emissivity Reverse Calculation		N/A	
Drift Stabilizer	Provided		N/A			
Storage & Output	Storage Device	SD card, Conforms to SDHC				
	Data Storage	Still Image : JPEG with temperature data (14 bit), Visible image				
		Movie (only for R500EX-Pro / R500EX-Pro-D) : SVX file (Avio original file)				
	Super Resolution (SR)	Provided				

	Quick Panorama	Horizontal equivalent to 100° / Vertical equivalent to 75°		
	SD Movie Recording	Max 3Hz	N/A	
	Interval Recording	3 sec to 60 min interval, with Visible image recorded		
	External Trigger Recording	Provided	N/A	
	Voice Recording	30 sec Recording, replay per a Thermal image		
	Text Annotation	Annotate up to 128 characters per a Thermal Image, Characters imported from SD Card		
	Interface			
	USB2.0	Mass-Storage, Image transfer (Thermal Image with visible image. Maximum transfer speed is 30Hz) *5		
		Automatic recording function by external trigger input	N/A	
	Video Output	NTSC / PAL Switchable		
	Alarm Output	Contact Signal. No Voltage	N/A	
	External Trigger Input	Pulse Signal	N/A	
	Other	Display	3.5" LCD Monitor (with tilt and brightness adjustment), Color View Finder (with tilt adjustment)	
		Auxiliary	Laser Pointer (Red, class 2, conform to PSC regulation), LED Light, Remote Controller	
Environment Resistance		Operating Temperature & Humidity	-15 to 50°C, 90%RH (non-condensing)	
		Storage Temperature & Humidity	-40 to 70°C, 90%RH (non-condensing)	
		Vibration & Shock	29.4m/sec ² (3G), 294m/sec ² (30G)	
		EMC	Conforms to CE regulations (Class A)	
		Dust & splash proof	Protection class IP54 equivalent	
Battery Operation		2.5hours (Typ), Rechargeable Li-Ion battery, (7.5 hours with optional "Portable Power (TVB-C501)") *6		
AC Power		100V - 220V AC, 50 / 60 Hz		
Dimensions		Approx. H121mm×W105mm×D195mm (excluding projection)		
Weight		Approx. 1.3kg (including Battery Pack)		
Standard Software		InfReC Analyzer NS9500 Professional	InfReC Analyzer NS9500 Standard *7	

- *1 Only the Range 1 at the environmental temperature from 20 to 30°C. (In other condition, it is ±2°C or ±2%).
- *2 Still image only
- *3 This increased resolution results from detecting characteristic within all frames acquired by the SR process and removing such effects as those caused by hand vibration.
- *4 For temperature accuracy: 30 cm to infinity
- *5 Thermal image only when image transfer speed at 30Hz.
- *6 2 extra batteries (optional parts) are required for 7.5 hours operation.
- *7 In order to transfer Thermal image movie data by R500EX / R500EX-D, you need to upgrade to "InfReC Analyzer NS9500 Professional" (optional software).

<Optional lens specifications>

21 μ m close-up lens: IRL-C021UB20

New



Measuring range	-40 to 500°C
Field of View (F.O.V.)	13mm (H) × 10mm (V)
Resolution	21 μ m
Focal Length	22mm
Dimension	ϕ 59 × 27.9mm
Weight	145g or less

52 μ m close-up lens: IRL-C052UB

New



Measuring range	-40 to 500°C
Field of View (F.O.V.)	33mm (H) × 25mm (V)
Resolution	52 μ m
Focal Length	56mm
Dimension	ϕ 44 × 30.0mm
Weight	105g or less

3x wide-angle lens: IRL-WX03D

New



Measuring range	-40 to 2000°C
Field of View (F.O.V.)	93.0° (H) × 73.0° (V)
Spatial Resolution	3.10mrad
Focal Length	0.1m to ∞
Dimension	ϕ 59 × 89.3mm
Weight	330g or less

2x wide-angle lens: IRL-WX02D



Measuring range	-40 to 2000°C
Field of View (F.O.V.)	64.0° (H) × 48.0° (V)
Spatial Resolution	1.74mrad
Focal Length	0.1m to ∞
Dimension	ϕ 80 × 63mm
Weight	230g or less

2x telephoto lens: IRL-TX02D



Measuring range	-40 to 2000°C
Field of View (F.O.V.)	16.0° (H) × 12.0° (V)
Spatial Resolution	0.44mrad
Focal Length	2m to ∞
Dimension	φ 64 × 22mm
Weight	125g or less