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Proforma Invoice

Date: 31.03.21
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Please reference above no. in all inquiries!

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Terms of delivery DAP	Person in charge: Renata Safina
(Incoterms 2020)	Our V.A.T. number: DE140297864
Your reference:	Your V.A.T. number:

We thank you for your inquiry and would like to submit the following offer in accordance with our general terms of trade:

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
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		High-End Thermographic System	1	Pc(s)	114,500.00	114,500.00
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equipped with:

- Native (high spatial resolution) and Binning (high speed) modes
- high-speed detector in Binning mode with frame rate up to 622 Hz in full frame mode
- generation of up to 3,343 Hz in sub-window modes
- spatial resolution in Native mode with (1,280 x 1,024) IR-pixels
- Opto-mechanical upgrade - MicroScan - for improved spatial resolution up to (2,560 x 2,048) IR-pixels
- high quality 50 mm lens incl. the respective lens calibration
- high quality microscopic lens M=1.0x WD40 incl. the respective lens calibration
- HighSense-calibration and ScaledNUC for flexible integration times and subwindow modes
- trigger interface with 2 In and 2 Out channels
- complete professional software package
- high-performance notebook

ImagelR® 9450 hp BB / 50 mm 1 Pc(s)

Completely equipped real-time high end thermographic system for universal use, consisting of the following components:

1 R10248 High end camera unit ImagelR® 9400 hp BB 1 x
with the following technical data and specifications:

- Detector format (1,280 x 1,024) IR pixel
- Detector type cooled Indium Antimonide (InSb) Focal Plane Arr
- Readout mode Snapshot
- Spectral range MWIR, (1.5 ... 5.5) µm
- Pitch 10 µm, 20 µm with Binning
- Detector cooling integrated, robust Stirling rotation cooler, MTTF > 10,000 h
- Temperature resolution NETD @ 30 °C < 30 mK, 20 mK with Binning
- Integration time (1 ... 20,000) µs, with step no longer than 20 µs
- Dynamic range 14 bit

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		<ul style="list-style-type: none"> Window mode yes Random-subwindow-mode with random positioning and Binning Frame rate Full frame: up to 180 Hz Half frame: up to 342 Hz Quarter frame: up to 622 Hz Line: up to 2,601 Hz <p>The implementation is made application-specific within the technical possibility.</p> <ul style="list-style-type: none"> High speed mode (Binning) <ul style="list-style-type: none"> Increase of the frame rate Same FOV as in full frame mode Significant improvement of the temperature resolution Binning modes <ul style="list-style-type: none"> up to 622 Hz @(640 x 512) IR pixel up to 1,000 Hz @(640 x 260) IR pixel up to 1,053 Hz @(640 x 256) IR pixel up to 1,615 Hz @(640 x 128) IR pixel up to 3,343 Hz @(640 x 4) IR pixel Measurement accuracy +/- 1 K or +/- 1 % Focus manual, sensitively adjustable Storage temperature (-40 ... 70) °C Operation temperature (-20 ... 40) °C, optional (-20 ... 50) °C Humidity storage/operation relative humidity (10 ... 95) %, non-condensing Power supply (100 ... 240) VAC 50/60 Hz Housing <ul style="list-style-type: none"> robust light metal dust- and splash-proof (IP54) tripod mount 1/4 " photo thread Weight (without lens) 4.3 kg Dimensions approx. (241 x 123 x 160) mm³ (LxWxH) Shock/vibration load 2 G, IEC 68-2-29/26 Universal wide range adapter <ul style="list-style-type: none"> Power supply (100 ... 240) VAC 50/60 Hz Connecting length 2.5 m, LEMO® connector Handy, hermetical Peli transportation case with safety lock Installation and documentation data carrier 				
2	M94599	10 GigE interface for ImageIR®	1	pc(s)		
		<ul style="list-style-type: none"> Remarkable performance, economical and reliable Very high transmission rates (10 times higher than GigE) Easy connection with a control unit (notebook oder stationary PC) Lightweight and flexible transmission cable (fibre-optic-fibre, multi-mode-fibre), long transmission distances up to 10 km, compact connector-style Low dissipation power and non-sensitive against electromagnetic radiation Compatible with GigE vision - field-tested standard for industrial applications Including 10 m cable 				

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Lens and calibrations package ImageIR®

Includes the following lenses and additional components

3	M95647	Precision lens 50 mm for thermographic system ImageIR® 9400				1 pc(s)
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Thermally decoupled broadband telephoto lens for thermographic measurements with following specifications:

- Focal length 50 mm
- F-number 2.0
- Field of view (14.6 x 11.7)°
- Object size (256 x 205) mm
@d=1 m
- Instantaneous field of view 0.2 mrad
- Focusing range approx. 0.5 m ... infinity
- Spectral range (2.0 ... 5.5) µm

4	R10237	Standard calibration ImageIR® 9400 f/2.2 <ul style="list-style-type: none"> • Calibration of a thermographic system ImageIR® for a measuring range of (-10 ... 200) °C • Contains the calibration for 50 mm lens in full frame mode 				1 pc(s)
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Software Package

5	M86702	Software IRBIS® view 32-Bit-Windows software for viewing, converting and managing of infrared images and -sequences, providing the following functions: <ul style="list-style-type: none"> • Fast thumbnail-overview presentation of *.irb, *.sid and *.iri thermal images • Easy navigation in directories, functionality like Windows Explorer • Full screen view with different colour palettes, including temperature indication at the cursor • Selectable display mode of the temperature representation range in image content/shot • Turning and mirroring, enlarging as well as shortening of single images • Presentation of the corresponding visual image or play back the spoken comments - depending upon camera solution being used • Single image presentation of digital IR-Sequences • Export of thermal images to different picture formats *.bmp, *.jpg, *.pcx, *.png, *.tif, *.gif • Direct start of the thermographical analysis software IRBIS® 3 on selection of thermograms • Print function of single images • Software operational with Windows® 7, 8 & 10 				1 pc(s)
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6	M93864	Software IRBIS® 3.1 professional Comfortable Professional Thermography Software Package				1 pc(s)
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IRBIS® 3.1 professional is the high-end analysis software for the ambitious analysis of complexe tasks.

The configuration contains complex correction models for R&D applications, sequence- as well as freely programmable macro editor and the tool IRBIS® 3.1 mosaic. Through various soft- and hardware interfaces analysis results can be displayed partly or fully automated.

- General/User interface

- Intuitive, user-friendly interface offering an overview of the operating functions
- Multi-lingual layout
- Configurable quick start bar for customized usage
- Compatible with thermograms of all thermographic cameras of the InfraTec product range
- Multiple-window operation, simultaneous handling of multiple thermograms
- Automated handling and measurement of series of thermograms

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
		<ul style="list-style-type: none"> Favourite files and gallery view of thermograms Possibility of an additional VIS-camera-connection (H.264/MJPEG)* Operational with e.g. Windows® 8 and 10 				
		- Display functions <ul style="list-style-type: none"> Free selection of 17 different colour palettes (optimised for screen and print) incl. combined false colour and greyscale display as well as inverted display Ex post selection of displayed temperature range and automatic adjustment to complete thermogram or a part of it Display of thermogram in °C, °F, K, radiation values in W/m2 or digits Display and calculation within the thermograms Add, display and edit of visual images Display of difference image with free choice of the reference image Add, replay and edit of voice annotations Merging of visual image and thermogram Display of configurable table of measurement values with statistics and emissivity values Optional automatic display of points of maximum and/or minimum temperature of the complete thermogram or measurement areas Stepless zoom subwindow for improved orientation Display of the thermogram in 3D (3D-standard and OpenGL) 				
		- Editing of thermograms <ul style="list-style-type: none"> Accumulation of thermograms with definable parameters Creation of pictures with Dynamic Resolution-Enhancement (DRE) to increase the geometrical resolution to the up to quadruple number of pixels of the native detector format* Setting and moving of an unlimited number of measurement points (shapes: line, rectangle, circle, ellipse, polygone) Ex post correction of global emissivity value and transmission of measurement path Comfortable determination of emissivity value Definition of correction areas (shapes: rectangle, ellipse, polygone, free-hand areas) by using deposited symbolised correction models Deposited models are: object (emissivity value and ambient temperature), object with transmission path, object with window, transparent object with transmission path/window, relative humidity, offset-adjustment, pixelwise automatic correction of the emissivity value, temperature-dependent correction of the emissivity value $\epsilon_{ps} = f(T)$, and blackend image and unblackend image Pixelwise subtraction of the temperature values of thermograms Geometrical distance measurements of lines and shapes within thermogram Editing of thermogram (interpolation, mirroring, deformation, rotating, etc.) Image enhancement by 5 digital filters 				
		- Analysis of thermograms <ul style="list-style-type: none"> Setting and moving of an unlimited number of measurement areas (shapes: point, line, rectangle, circle, ellipse, polygone) Display and storage of temperature-time diagrams, freely definable temperature profiles, profile-time diagrams (alternatively as 3D diagram) of series of thermograms, histograms Display of column value diagram (coloured or three lines) Replay, thinning out and saving of series of thermograms Display of up to 20 eligible and configurable coloured isotherms Labeling with coloured eligible and configurable arrows and text boxes Continuous zoom for image display as well as scroll function with a guideline Display of all measurement and recording parameters Creation of special measurement areas by using definable formula 				
		- Export and reporting <ul style="list-style-type: none"> Export of image and measurement values to WORD, PDF, TIFF, PNG, BMP, JPEG and ASCII for further processing Recording of 3D-live-AVI-sequences* Saving of difference image-sequences* Possibility of the export of VIS-image-sequences 				

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
		<ul style="list-style-type: none"> • Converting of single thermograms and complete series into common graphic formats and ASCII and 3D-AVI-sequences • Integrated WORD-based report generator incl. templates for convenient analysis allows automated integration of thermograms, visual images, diagrams, profiles, measurement values and parameters • Integration of GPS data and display of position with browser in Google® Maps • AVI generator for generation and saving of videos of single thermograms and series of thermograms • Direct printing by using the in the system software installed printers <p>- Professional tools</p> <ul style="list-style-type: none"> • Creation of a self-extracting file (IRBIS.exe) for a self-sufficient replay of thermograms and sequences (license free) • Sequence editor allows after customized criteria the automated selection of thermographic data out of complex series of thermograms and compilation of filtered series of thermograms • Creating pictures with the EverSharp-function for the exact display of all objects within the frame, irrespective of the depth of field of the used optics or the distance of the measuring object to the camera, allows using a special algorithm the automatic combination of several thermograms with different focus adjustments (multifocus pictures)* • Setting an recording list that includes up to 20 differently set recordings, recording lists can be executed up to 100,000 times in a row • IRBIS® mosaic - automated assembling of single thermograms to a complete image with all measurement data • Palette editor - developing of freely definable colour palettes • Macro editor for creation, editing and activating of handling processes <p>* only in conjunction with IRBIS® 3.1 online</p> <p>- Optional Extensions</p> <ul style="list-style-type: none"> • IRBIS® 3.1 online for camera control and data acquisition with the highest data rates • IRBIS® 3.1 process for easy set-up of process controls • IRBIS® 3.1 active for analysing different operations of active thermography 				
7	M93866	Software IRBIS® 3.1 online Thermography software				1 pc(s)

High performance software for control of thermographic camera and acquisition of digital infrared images, integrated in software packages IRBIS® 3.1 plus or IRBIS® 3.1 professional, providing the following functions:

- Time and/or temperature based acquisition of 16bit thermographic data at PC or notebook
- Acquisition at harddisk or RAM
- Fast replay of acquired data with selectable replay speed
- Convenient remote control of the thermographic camera with graphical interface
- Real-time visualization and analysis of digitally transferred thermogram
- Automatic display of maximum and/or minimum temperature of thermogram and selected measurement areas
- Various online temperature measurement functions; setting of meas. points and areas
- Comprehensive statistical analysis
- Online temperature profile and difference image mode
- Online display with selection of colour palettes and individual selection of temperature scale and automatic adaption to temperatures of the thermogram
- Selectable scale for screen display
- Correction of emissivity value (global, area or point) of online thermogram
- External trigger facilities, retrigger, repeated signal, pretrigger
- Freely definable temperature trigger
- Setting of parameters for measurement areas, thresholds, alarm functions
- Operational with Windows® 7, 8 & 10 specific to camera

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
8	M95171	High-performance notebook High performance laptop for camera control, acquisition and saving of thermal images Technical data: <ul style="list-style-type: none"> • CPU Intel® Core i7 • Display 39.6 cm (15.6"), Full HD (1,920 x 1,080 pixel), low-reflection surface • RAM 16 GB • Hard disk 512 GB SSD • HDMI, USB, Bluetooth, Thunderbolt 3, WLAN, LAN 10/100/1000 • Keyboard with backlight, QWERTY keyboard • Windows 10 pro, 64 Bit • Including 1 year DELL basic-support Scope of delivery: <ul style="list-style-type: none"> • 4-Cell-Battery, 68 Wh • Power supply • Nylon bag • Wireless mouse • USB to GigE converter InfraTec may change parameters due to technical progress guaranteeing the relevant performance parameters for the thermographic data and camera handling.				1 pc(s)
9	M96399	Interface accessories Notebook 10 GigE				1 pc(s)
Subtotal: 114,500.00€						
10	R10160	HighSense-calibration with scaled NUC for ImageIR® <ul style="list-style-type: none"> • In addition to the factory calibration individual temperature measurement ranges can be realised for any subframe • Enables the retention of the calibration also when the user changes the integration time • Calibration curves and NUC-table are calculated for individual integration times • In addition to the factory calibration, individual sub-frames can be defined while maintaining the temperature calibration • When entering a custom temperature range, the optimal integration time is calculated automatically • Suitable temperature range limits can be determined from a user defined integration time • Enables accurate temperature measurement with the optimal signal-to-noise ratio 	1	x	5,300.00 less 100%	0.00

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
11	R88954	Triggerinterface ImageIR® with the following technical data: <ul style="list-style-type: none"> Channels: 2 x IN / 2 x OUT Functions: Trigger IN/OUT, Digital IN, Analog IN, function generator Trigger modes IN: Detector Sync, Frame Mark, Gate Trigger modes OUT: Detector Sync, Integration, Frame, Line, Camera IN 1, Camera IN 2, Detector Sync Divider Peak, Detector Sync Divider Toggle Signal: TTL (5 V) Trigger delay; Jitter: $\leq 1 \mu\text{s}$; $\leq 20 \text{ ns}$ Integration delay: detector-specific Analog IN: 0 ... 5 V Digitization: 10 bit Cable: flexible connection cable with 4 x BNC-connector, length (1.5 m) Analog function generator <ul style="list-style-type: none"> Number of channels: 2 Basic frequency: (0,1 ... 100) Hz Signal shapes: Sine, ramp, sawtooth, square, constant 	1	pc(s)	1,650.00 less 100%	0.00
12	M95655	Special microscope lens M=1x Special infrared microscopic lens with following specifications: <ul style="list-style-type: none"> Magnification: M=1.0x F-number: 2.0 Object size: (13 x 10) mm Pixel size: 10 μm Working distance: 40 mm Calibration can be realised customized from (20 ... 200) °C within the scope of technical feasibilities, preferably for an operating temperature range from (10 ... 40) °C.	1	pc(s)	13,850.00	13,850,00
13	R10240	Calibration for microscopic lenses ImageIR® <ul style="list-style-type: none"> Calibration of a microscopic lens for the thermographic system ImageIR® for a measuring range of (20 ... 200) °C For lenses with a magnification of M=1.0x (WD40) Measurement accuracy $\pm 2 \text{ K}$ (20 ... 100) °C, resp. $\pm 2 \%$ Calibration is performed in full frame mode and will be realized customized within the scope of technical feasibilities 	1	pc(s)	3,250.00	3,250.00

Item	Part no.	Description	Qty.	Unit	Unit price	Total price
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14	R10233	MicroScan for ImageIR® 9450	1	pc(s)	9,450.00 less 60.00%	3,780.00
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Thermographic camera with integrated opto-mechanical real time precision scanner

with the following technical data and specifications:

- Includes a fast rotating 4-position filter wheel
- Increase of the image resolution to (2,560 x 2,048) IR pixels (5,24 Megapixels) by integrated fast rotating opto-mechanical precision component
- High-resolution thermographic images will be realised by optical MicroScanning where quadrupling of the amount of IR pixels can be achieved by the movement of the pixel allocation of half of the pixel width each
- Distinct improvement of image quality
- In contrast to the interpolation, real temperature measured values will be recorded with the MicroScan technology
- This function works maintenance-free and was designed for long-term operations in rough environments
- Suitable for creating high-resolution high speed thermography images with frame rates of up to 177 Hz

The MicroScanning function requires a detector with a resolution of (1,280 x 1,024) IR pixels and cannot be upgraded afterwards.

15	R10115	Optional System introduction ImageIR®	1	X	1,650.00	
		Online system introduction by an experienced service engineer of InfraTec GmbH				
		<ul style="list-style-type: none"> • Design and commissioning of thermographic systems • Instruction of the hardware • Security advices • Practical measurements • Evaluation of thermographic images 				

Subtotal		135,380.00
less discount	5.00 %	6,769.00
Net amount		128,611.00
Total price	EUR	128,611.00

Payment terms: Prepayment 50%; 50% after delivery; 30 days net
30 days without deduction 128,611.00 EUR

Please note that we grant you with **100% discount** on **HighSense-calibration** and **ScaledNUC** (5,300.00€) and **100% discount** on extended trigger interface with 2 In and 2 Out channels (1,650.00€).

Also, as discussed earlier via email, we grant you with **60% discount** on the opto-mechanical upgrade feature **MicroScan** (3,780.00€) to provide you a completely equipped high-performance system perfectly suitable for multiple measurement tasks.

Please note that we offer you a discount of 5% for becoming a reference customer.

We are interested in providing you with a complete professional thermographic system and these upgrades will help you to conduct your measurement tasks much easier.

For technical advice our service and application team will be available which can be reached via the InfraTec hotline.

You are eligible for free software updates within 36 months after purchasing.

Also please note that optional items of this offer are not reflected in the final price and not included in shipment.

Delivery: approx. 8 weeks, after receipt of order

Warranty: 24 months or 3,000 operating hours of the cooler - whichever occurs first

Validity of offer: 31st of July 2021

Please notify your valid VAT-Id-No. within your Purchase Order, this is a requirement for tax-free intra-community supply.

Thermographic cameras contain dual-use technology resulting in export control requirements. In the thermographic cameras we offer specially classified key components made in the EU. This assures an export licence and hassle free, short-term delivery within the EU and the countries listed in the EU001 register (currently containing: Australia, Japan, Canada, New Zealand, Norway, Switzerland, USA). No additional US-American export licences are required. Sales and usage of the thermographic cameras outside of these countries requires an export licence of the German export control authority.

We hope that our offer is of interest for you. We would be pleased to receive your purchase order.

Best regards

InfraTec GmbH
Infrarotsensorik und Messtechnik

Dr. Matthias Krauß

This document was generated electronically and is valid without signature.

