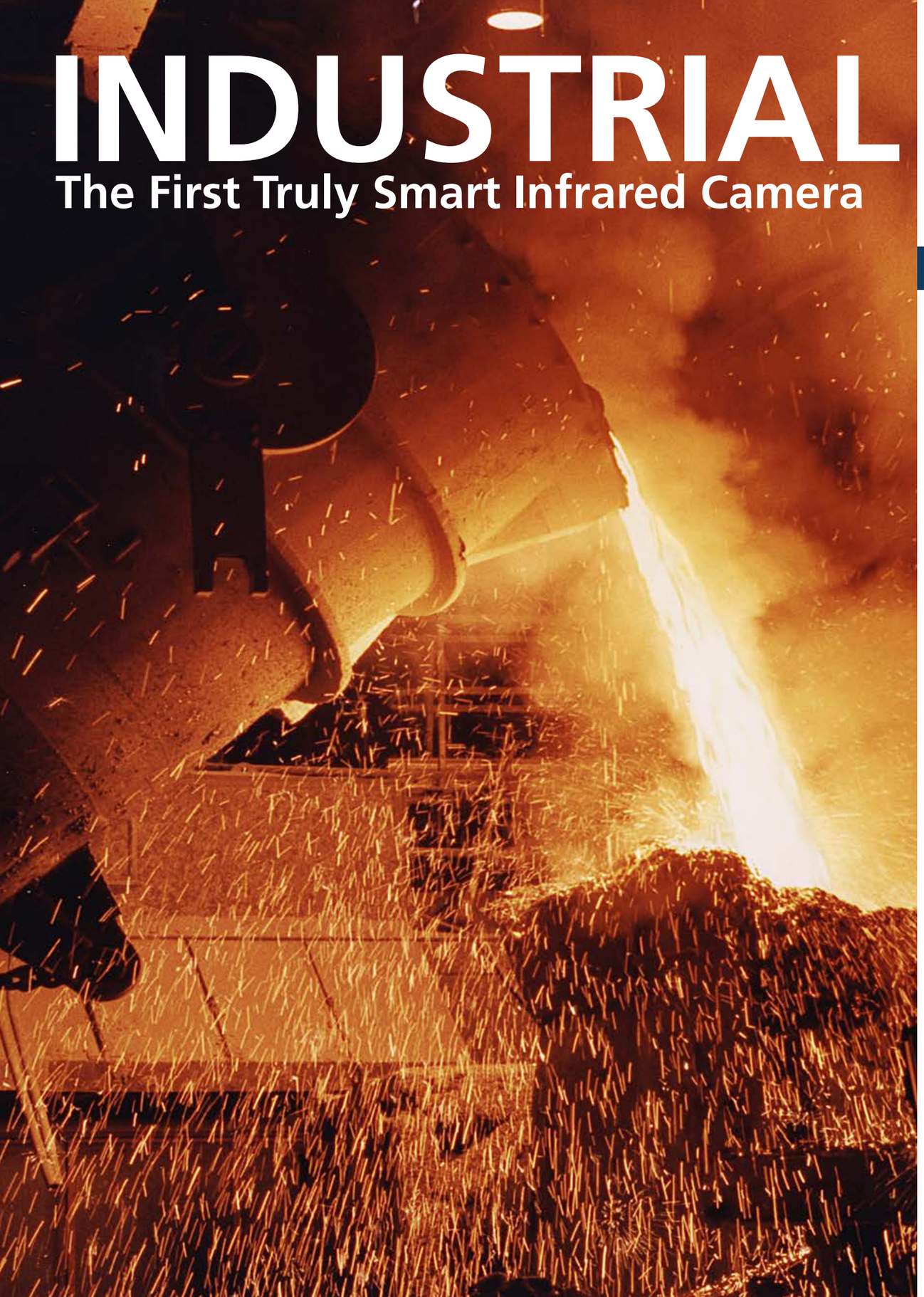
Automation Technology

INDUSTRY 4.0
SMART SOLUTIONS

IRSX Series

IR Smart Camera



INDUSTRIAL USE

The First Truly Smart Infrared Camera

Doing it the Smart Way – Intelligent Temperature Monitoring

- ✔ **Easiest access to the world of temperature imaging**
  Create your individual application solution within minutes on the graphical web-frontend of the camera. No programming is required.
- ✔ **Industrial protocols for direct communication with your process control**
  Outstanding functionality for the practical implementation of Industry 4.0.
- ✔ **App concept**
  Change the functionality of your camera just by loading the appropriate App
- ✔ **Job concept**
  Perform different measurement tasks by automatically switching between multiple jobs (measurement configurations)

INDUSTRY 4.0
SMART SOLUTIONS

GiGE VISION · OPC UA · MQTT · REST API

IRSX KEY FACTS

By Professionals for Professionals

Exceptional User-friendliness

- ✔ Web-frontend for configuration and visualisation
- ✔ Camera simulator for easiest job creation and testing

IoT Communication

- ✔ Multitude of communication protocols (HTTPS, Modbus TCP, REST API, etc.)
- ✔ Digital I/Os for control and alarming
- ✔ Encoder interface, e.g, for part tracking on variable speed lines

Software Support

- ✔ Consistently growing set of software tools including apps, sensor communication libraries, standard APIs

Tailored Accessories

- ✔ For precise and failsafe temperature measurements in any kind of industrial applications

Easy Integration

- ✔ Stand-alone operation without a computer or external interfaces
- ✔ No special software required for visualization and parameterization
- ✔ Individual design/implementation of your measurement task with the extensive tool palette of the SmartProcessingApp
- ✔ Reduced system complexity, installation effort and costs

Robust Industry Design

- ✔ Easy installation thanks to compact and light weight design
- ✔ Use in harsh environments without any protective housing thanks to IP67 protection
- ✔ Rugged housing with air purge for the lens, small enough to fit in the thightest of spaces

Precise Measurement

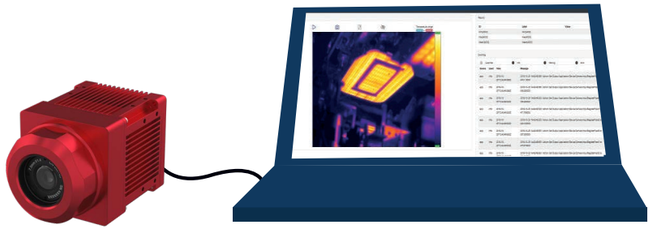
- ✔ Measurement accuracy of +/- 2°C or +/- 2%
- ✔ Thermal measurement range -10°C to +550°C
- ✔ Different models with different resolutions, FoV and frame rates available

... and it‘s really smart!

Doing it the Easy Way - Web-based Configuration

Thanks to a powerful, user-friendly web frontend, configuring the IRSX cameras as a whole as well as the image and result display is child's play. In fact, creating solutions for thermal imaging applications has never been easier and more efficient.

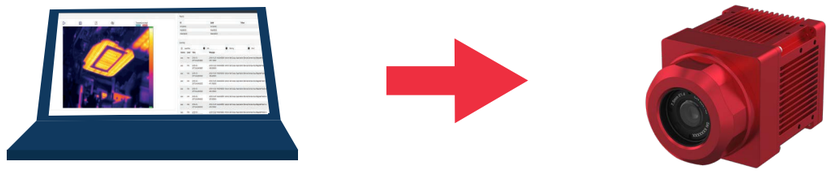
- ✔ Easily configure the interfaces and display parameters as well as measurement plans including the processing of measurement results
- ✔ Configurations are stored on the camera and can also be exported for the use on other cameras
- ✔ LUA Script engine for implementing special functions not included in the smart toolset of the camera
- ✔ Platform independent
- ✔ Multi-client capable



Configure it on the camera

Doing it the Comfortable Way - IRSX Camera Simulator

- ✔ The Camera Simulator is a software that comes together with your IRSX-I camera. Install it on a computer and it will simulate an IRSX-I camera with all functions including configuration, evaluation and communication protocols
- ✔ Now just lean back in your office, start modifying existing jobs or create new ones and do the com plete functional testing.
- ✔ Your camera can meanwhile remain on the shop floor where it continues to monitor your installation or your production.
- ✔ Transfer the job to the camera when you are absolutely satisfied with the functions and the results of the tests on the simulator



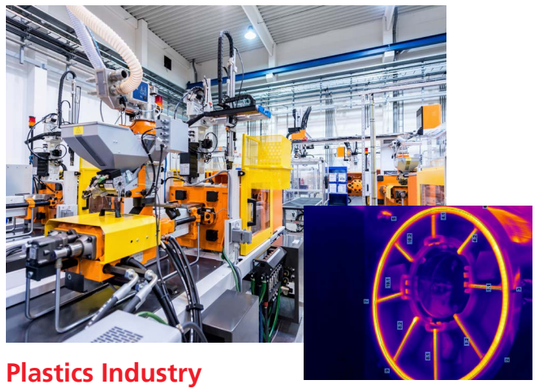
Create and test
it on digital twin

Deploy it

Configure and test it on the simulator –
... and all while sitting at your desk!

APPLICATION VARIETY

Suitable for All Industries



Plastics Industry

- ✔ **Plastics welding, injection molding, thermoforming:** Inline thermal process monitoring for quality assurance

Industrial Infrastructure

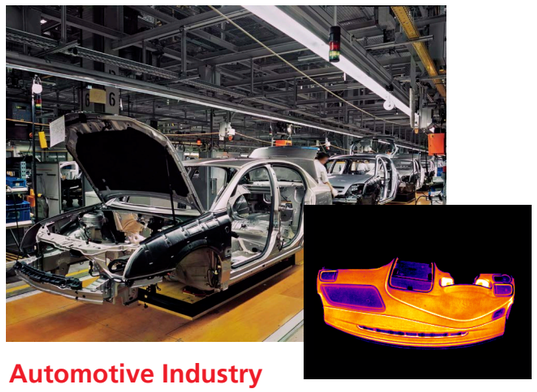
- ✔ **Warehouses** for combustible goods
- ✔ **Industrial installations** where there is a risk of fire
- ✔ Detection of critical conditions before a fire outbreak

Iron and Steel Industry

- ✔ **Steel ladles:** Condition monitoring of the refractory lining. Avoiding breakouts of liquid steel
- ✔ **Slag detection:** Quantification and reduction of slag transfer during tapping

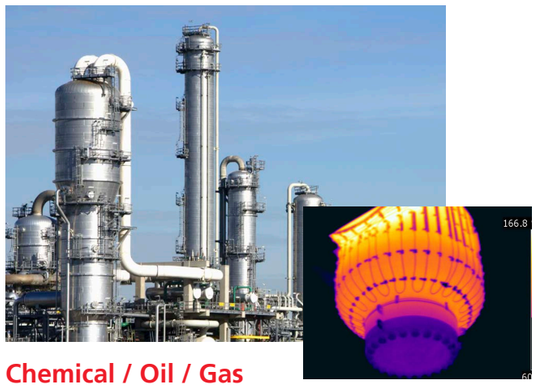
Food Industry

- ✔ **Ready meals:** Checking the sealing of cover foils for defects
- ✔ **Baked goods, fish, meat, chocolate,...:** Thermal process monitoring during manufacturing



Automotive Industry

- ✔ **Foamed parts**, e.g. dashboards: Inline inspection for voids in the foam layer
- ✔ **Hot stamping:** Monitoring the temperature distribution before and after forming to ensure an optimum product quality



Chemical / Oil / Gas

- ✔ **Flares:** Monitoring of the pilot flames to comply with environmental regulations
- ✔ **Reactor vessels, gasifiers:** Condition monitoring to avoid major accidents

Electricity Utilities

- ✔ **Substations / transformers:** Remote condition monitoring at large distances
- ✔ Critical conditions can be detected in an early stage, before a damage occurs
- ✔ Safe and traceable operation of the installations even at maximum power

... and many more!

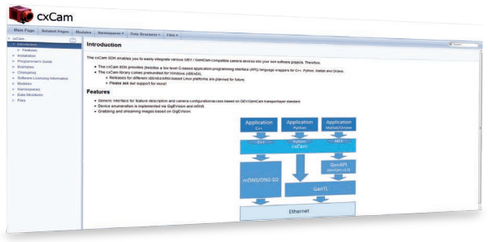
Doing it the Adaptive Way - Software Support

GigE Vision App

- ✔ Allows high-speed thermal image streaming based on GigE Vision standard
- ✔ Complies to the newest GenICam standard

Smart Processing App

- ✔ Complete functionality to create applications solutions for a stand-alone operation of camera
- ✔ Web-based configuration of your measurement task and display of results
- ✔ Supports temperature evaluation based on an unlimited number of ROIs
- ✔ Supports automatic temperature profile detection and evaluation
- ✔ Modbus server and client for IoT communication with external devices
- ✔ The integrated LUA Scripting engine allows the definition of sophisticated evaluations



irsxSupportPackage

- ✔ Enables an easy integration of the IRSX cameras into software projects
- ✔ Provides a C-based application-programming interface (API) and language wrappers for C++, Python, MATLAB and Octave as well as .NET (C#)
- ✔ Comes with a generic interface for feature description and camera configuration/access based on the GEV/ GenICam transport layer standard

Rest API

- ✔ The IRSX Series camera provides a RESTful web service described according to OpenAPI 3.0 specification
- ✔ Allows an easy integration of services and functions of IRSX Smart Apps into your application

MAXIMUM
Guaranteed Fail-Safe Operation

PRECISION

Doing it the Flexible Way - Optimally Tailored Accessories

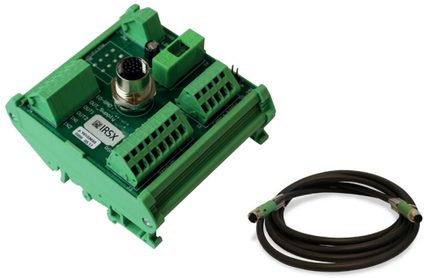
Based on our more than 25 years of practice as an integrator of temperature imaging systems, we have developed accessory components optimally tailored to our cameras that all aim to one target: To give you the best tools for precise and fail-safe temperature measurement in industrial applications.

Smart Blackbody IRS Calilux

- ✔ Lets you increase the measurement accuracy of an IRSX-I camera up to ±0.3 °C
- ✔ Allows the setup of real fail-safe thermal imaging systems. By transferring the actual blackbody temperature, the camera can detect, if it still measures accurately.
- ✔ Allows the in-field verification of the calibration of infrared cameras. Uninstalling the camera and sending it to the manufacturer can often be avoided.
- ✔ Communication between camera and blackbody via Ethernet / WiFi
- ✔ Comes with a traceable high-precision radiometric calibration

Protective Enclosures

- ✔ Stainless steel enclosures for installations in harsh industrial environments. Also available as water- or air-cooled versions for environments with high surrounding temperatures.
- ✔ Explosion proof (EX) enclosures. Certified according to the latest ATEX standards for explosion protection zones 1, 2, 21, 22. The certification comprises the camera so that a recertification after installation is not necessary.



I/O Panel & Cables

- ✔ For easily connecting IRSX-I cameras to electrical power and to external components
- ✔ Provides all signal and power connections on plug terminals.
- ✔ Includes a reverse polarity protection and a 2 A micro fuse.
- ✔ Cables avaible in different lengths

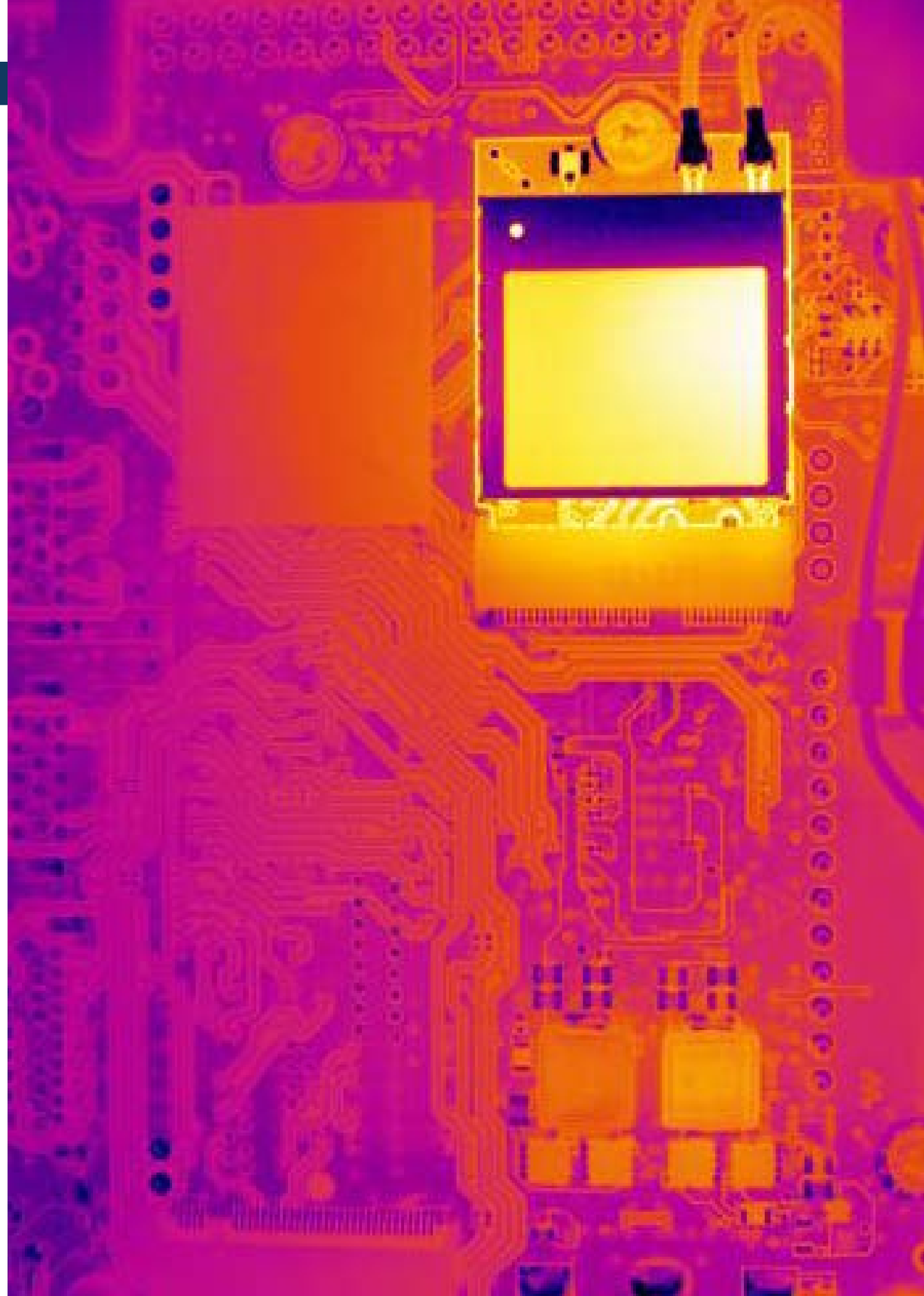
Doing it the Safe Way - Specifications

Camera Model	IRSX-I336		IRSX-I640	
Detector Resolution	336 x 256 px		640 x 512 px	
Detector Type	Focal Plane Array (FPA), uncooled microbolometer			
Spectral Range	7.5–13 µm			
Pixel Size	17 x 17 µm			
Frame Rate	9 Hz	60 Hz*	9 Hz	30 Hz*
Measurement				
Imaging Range	Range 1: –25 to +140 °C, range 2: –40 to +550 °C, optional high-temperature range: +200 to +1,200 °C (w/ ND filter)			
Radiometric Calibrated Range	Range 1: –10 to +140 °C, range 2: –10 to +550 °C, optional high-temperature range: +200 to +1,200 °C (w/ ND filter)			
Accuracy of Radiometric Calibration	±2 °C (±3.6 °F) or ±2 % of reading (@ +10 to +35 °C ambient T)			
NETD	< 30 mK (f/1.0, range 1)			
Lenses				
Fixed Lenses	7.5 mm, 9 mm, 13 mm, 19 mm, 25 mm, 35 mm			
Image Processing				
Configuration	Web interface			
Areas of Interest	Spot, line, polyline, elliptical line, rectangular area, elliptical area, polygon area			
Smart Realignment	Intelligent search and compensation algorithm to guarantee accurate temperature readings independent of e.g. machine or part tolerances			
Temperature Evaluation	Min, max, mean, range, variance, standard deviation			
Comparison Functions	Equal, less, greater, in range, out of range			
Script Interface	Scripting w/ LUA			
Interfaces				
Ethernet Protocols	DHCP, DNS, GigE Vision, HTTP(S), mDNS, NTP, FTP, SSH, Modbus TCP, (MQTT (TLS), OPC-UA, PTP IEEE1588, Profinet (CC-A, RT-1), ONVIF)**			
Ethernet Type	10/100/1,000 MBit/s	Ethernet connector	8-pin A-coded M12 connector	
Image Streaming Protocol	GigE Vision w/ GeniCam, (RTSP)**	Ethernet image streaming	16-Bit, 14-Bit, 8-Bit	
Video out	Available on request			
Input/Output				
Digital Input	2x electrically isolated; 5–24 VDC (max. 27 VDC)	Encoder/resolver input	A+, A–, B+, B–; high-speed, dual RS-422/RS-485 receiver	
Digital Output	2x electrically isolated; 5–24 VDC	Analog output	0–5 VDC	
Digital I/O, Supply Voltage	4.5–30 VDC, max. 100 mA	Analog input	0–5 VDC	
Environmental				
Protection Class	IP67 (IEC 60529)	Bump	200 g (IEC 60068-2-29)	
Operating Temperature Range	–20 to 60 °C (non condensing)	Vibration	4.3 g (IEC 60068-2-6)	
Storage Temperature Range	–50 to 80 °C (IEC 68-2-1 and IEC 68-2-2)	RoHS	Compliant	
Humidity	0–95 % relative humidity (IEC 60068-2-30)			
Mechanical				
Dimensions	I55 x 55 x 77 mm (w/o lens, w/ connectors)	Lens mount	M34x0.5, M34x0.75, M46x0.75	
Weight	270 g (w/o lens)	Base mounting	4x M3 threaded holes (at all 4 sides)	
Accessories				
Adjustable mounting bracket, mounting adaptors, lens protection cap w/ Ge window, air barrier, terminal panel, protective enclosures (IRCamSafe series), focus tool				

* Subject to dual use export regulations (for frame rates > 9 Hz).
()** Coming soon.

Lenses

Focal Length [mm]	Field of View [°]		F/#	Hyperfocal Distance [m]	MOD [mm]
	IRSX-I336	IRSX-I640			
7.5	45 x 35	90 x 69	1.4	1.2	25
9	35 x 27	69 x 56	1.25 / 1.4	1.7	32
13	25 x 19	45 x 37	1.25	4.4	76
19	17 x 13	32 x 26	1.25	9.5	153
25	13 x 10	24 x 19	1.4	21	300
35	9.3 x 7.1	18 x 14	1.5	35	600



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1ST VISION
A Division of Next Imaging

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