AT SENSORS

www.at-sensors.com

RELIABILITY
INTELLIGENCE SMART
STAND-ALONE



IR Smart Camera



IRSX-2

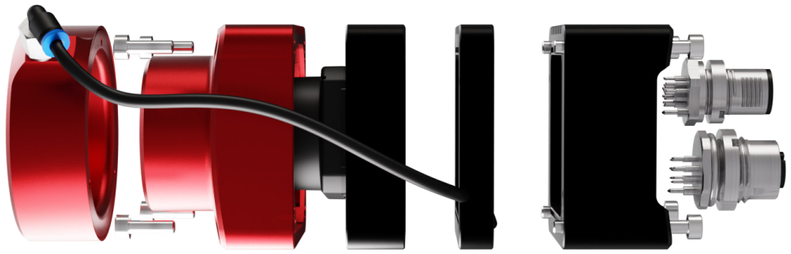
The World's First Truly Smart Infrared Camera







- ✔ Smart **stand-alone solution** with integrated image processing
- ✔ New **compact design** optimized for demanding industrial environments
- ✔ **Easy integration** via Modbus, REST API and Ethernet
- ✔ Flexible **App & Job concept** with multiple AOIs
- ✔ **Smart Processing and GigE Vision Apps** for flexible system integration
- ✔ Available in **three optical variants**: 4.9 mm, 9.2 mm and 13.6 mm
- ✔ Robust **IP67 housing** with industrial M12 connections



Modbus · GigE Vision · OPC UA · MQTT · REST API · Lua

KEY FACTS

By Professionals for Professionals

User-Friendliness

- ✔ Web front-end for configuration and visualisation
- ✔ Camera simulator for easy 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 lightweight 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 tightest of spaces

Precise Measurement

- ✔ Measurement accuracy of +/- 5°C or +/- 5%
- ✔ Thermal measurement range -10°C to +500°C
- ✔ Different models with different resolutions, FoV and frame rates available

... and it‘s really smart!



MODELS

Overview



IRSX-2-640-13.6-32D

- ✔ 640 x 512 Pixels
- ✔ NETD <40 mK
- ✔ (Measurement) accuracy: +/- 5°C or +/- 5%
- ✔ Frame rate 9Hz or 30Hz/60Hz
- ✔ Focal Length: 13.6 mm
- ✔ Field of View: 32° x 25°



IRSX-2-640-9.2-50D

- ✔ 640 x 512 Pixels
- ✔ NETD <40 mK
- ✔ (Measurement) accuracy: +/- 5°C or +/- 5%
- ✔ Frame rate 9Hz or 30Hz/60Hz
- ✔ Focal Length: 9.2 mm
- ✔ Field of View: 49.9° x 39.3°



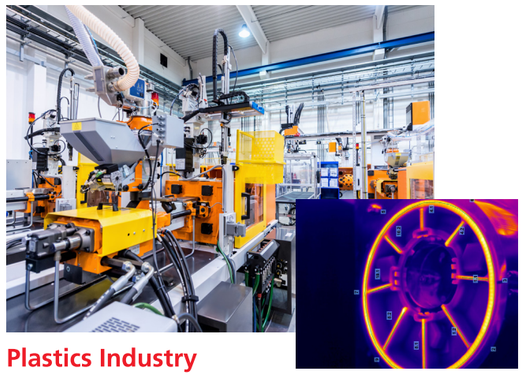
IRSX-2-640-4.9-95D

- ✔ 640 x 512 Pixels
- ✔ NETD <40 mK
- ✔ (Measurement) accuracy: +/- 5°C or +/- 5%
- ✔ Frame rate 9Hz or 30Hz/60Hz
- ✔ Focal Length: 4.9 mm
- ✔ Field of View: 95° x 77°

More models available soon...

APPLICATION VARIETY

Suitable for All Industries



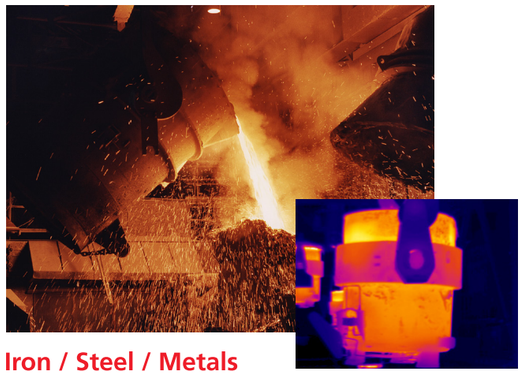
Plastics Industry

- ✔ **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



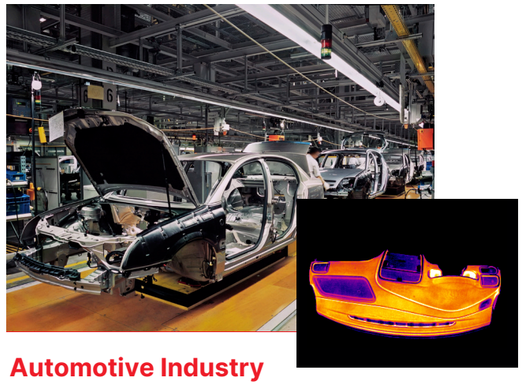
Iron / Steel / Metals

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



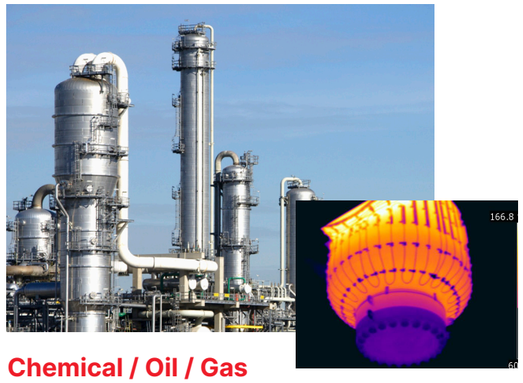
Food Industry

- ✔ **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: In-line 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!

SOFTWARE SUPPORT

Integrate Easily



AT SolutionPackage

- ✔ Fast setup and configuration of thermal imaging applications
- ✔ Create and test measurement jobs offline with the IRSX Simulator
- ✔ Visualize temperature data and measurement results with dedicated software tools
- ✔ Integrate thermal imaging systems using C, C++ and Python APIs
- ✔ Test industrial communication interfaces before deployment
- ✔ Reduce commissioning time and integration effort

Smart Processing App

- ✔ Complete functionality to create application 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
- ✔ Integrated IoT Protocols like **Modbus Server** and **Client, OPC-UA, MQTT** and **Profinet** for communication with external devices
- ✔ The integrated **LUA Scripting** engine allows the definition of sophisticated evaluations

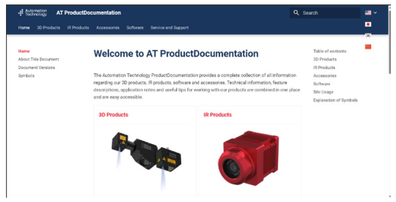
Rest API

- ✔ 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

GigE Vision App

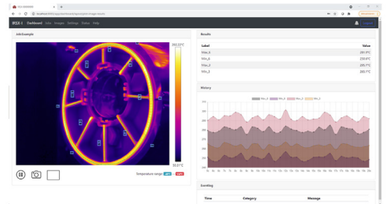
- ✔ Allows high-speed thermal image streaming based on GigE Vision standard
- ✔ Complies to the newest GenICam standard

The AT SolutionPackage consists of a variety of tools that can be used to acquire Infrared images, configure the IRSX cameras and analyze thermal data and more. This package is a software add-on to our Infrared products.



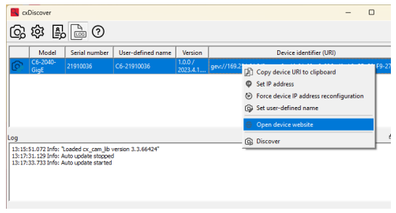
AT ProductDocumentation

- ✔ Complete documentation for all AT products including full support
- ✔ Easily accessible HTML documentation
- ✔ Offline version included



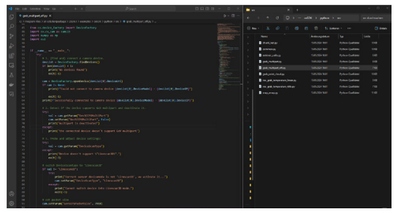
IRSX Simulator

- ✔ Digital twin for offline configuration and testing
- ✔ Create and validate jobs without interrupting production



cxDiscover

- ✔ GigE Vision device discovery tool
- ✔ Network settings configuration



cxSDK

- ✔ SDK for image acquisition and camera configuration
- ✔ SDK provides everything you need to integrate your infrared camera into industrial environments
- ✔ Capture and process thermal images and data

UNIQUE FEATURES

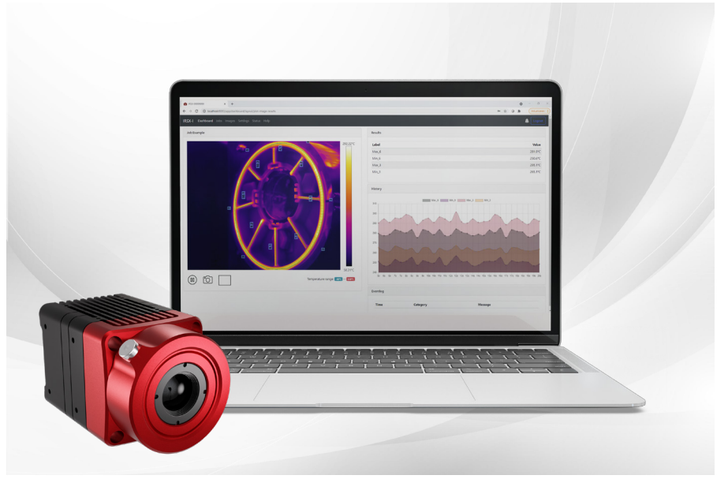
Smart Add-Ons

App Concept



- ✔ Smartphone-like app concept for maximum flexibility
- ✔ Toolbox apps for rapid creation of custom solutions
- ✔ Ready-to-use apps for complete application workflows
- ✔ Adapt functionality to new tasks without hardware changes
- ✔ Faster implementation of thermal imaging applications

IRSX Simulator



- ✔ Digital twin of the IRSX-2 with full configuration, evaluation and communication functionality
- ✔ Create and test new jobs or modify existing ones offline
- ✔ Keep production running while developing and validating applications
- ✔ Transfer validated jobs directly to the camera with a single click

Job Concept



- ✔ Store multiple measurement configurations directly on the camera.
- ✔ Switch between jobs automatically for different products or processes.
- ✔ Easy job selection via Modbus, REST API/OpenAPI or LUA scripting.
- ✔ Ideal for multi-product production lines and changing inspection tasks.

Air Purge System



- ✔ Continuous lens protection against dust and contamination
- ✔ Consistently high image quality and measurement accuracy
- ✔ Reduced maintenance and cleaning effort
- ✔ Reliable operation in harsh industrial environments
- ✔ Increased system uptime and long-term reliability
- ✔ Compact integrated solution for 24/7 operation

ACCESSORIES

Enhance Flexibly

With more than 25 years of practice, we have developed the following accessory components specifically tailored with the goal of providing the best tools for precise and fail-safe temperature measurement in various industrial applications.



Smart Blackbody IRS Calilux

- ✔ Lets you increase the measurement accuracy of an IRSX-2 camera up to ±0.3 °C
- ✔ Camera automatically detects if it's still measuring accurately by transferring the actual blackbody temperature which allows for continuous fail-safe thermal imaging systems
- ✔ In-field verification of calibration of infrared cameras allows for easy maintenance without uninstalling.
- ✔ 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 re-certification after installation is not necessary.



I/O Panel

- ✔ 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



I/O Panel & Cables

- ✔ Cables available in different lengths
- ✔ GigE Ethernet cable for communication and data transfer
- ✔ Power & I/O cable for power supply and control signals
- ✔ Optional 90° adapter for space-constrained installations

READY FOR EVERY ENVIRONMENT

- ✔ Harsh Industrial Areas
- ✔ High-Temperature Applications
- ✔ ATEX Zones
- ✔ Outdoor Installations
- ✔ Automated Production Line

„From calibration and connectivity to protection and integration, the IRSX accessory portfolio ensures maximum performance in every application.“

- Cristian Ferber, Senior Sales Manager



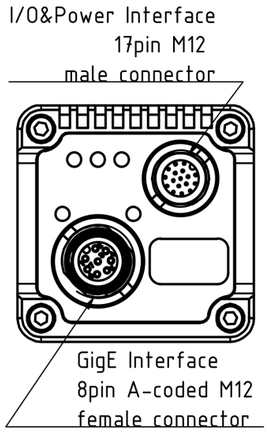
SPECIFICATIONS

Find the Perfect Fit

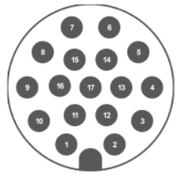
Thermal Imaging Performance	
Detector Type	Focal Plane Array (FPA), non-cooled microbolometer
Detector Resolution	640×512
Spectral Range	8 µm – 14 µm
IR Filter	no ND Filter
NETD	40 mK
Pixel Pitch	12 µm x 12 µm
Full Frame Rate	9 Hz
Radiometric Temperature Range	-10°C - +140°C (High Gain), -10°C - +500°C (Low Gain)
Temperature Accuracy	+/- 5°C
Interface Specifications	
Physical Interface	1000Base-T | up to 1000 Mbit/s
Encoder	A, B | RS-422 | -
Digital inputs	2x isolated digital inputs | 5V - 24V DC
Digital outputs	2x isolated digital outputs | 5V - 24V DC
Analog output	1x analog output | 0V-5V DC
Analog input	1x analog input | 0V-5V DC
Ethernet Protocols	GigE Vision | GenICam | Modbus TCP* | RestAPI* | FTP* *only available in combination with the SmartProcessing App
Electrical and Mechanical specifications	
Power Supply	10V-24V DC
Power Consumption	Max. 5 W
Connectors	Power&I/O: M12-Connector | 17-pin | A-coded Ethernet: M12-Connector | 8-pin | A-coded
Housing Material	Anodized aluminum
Dimensions (L x W x H)	91.3 mm x 50 mm x 50 mm
Weight	-
Environmental conditions	
Operating Temperature	-20-60°C
Storage Temperature	-50-80°C
Humidity	0 -95%
Vibration Resistance	4.3 g (IEC 60068-2-6)
Shock Resistance	200 g (IEC 60068-2-29)
Protection Class	IP67
Image Processing (only SmartProcessing App)	
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 with LUA

Optical specifications			
Model Name	IRSX-2-S7-BC-640S/F-4.9-95D-B	IRSX-2-S7-BC-640S/F-9.2-50D-B	IRSX-2-S7-BC-640S/F-13.6-32D-B
Focal Length	4,9 mm	9,2 mm	13,6 mm
Field of View	95° x 77°	49.9° x 39.3°	32° x 25.6°
F-Number	f/1.1	f/1.01	f/1
Lens Transmission	90 %	90 %	90 %
Hyperfocal Distance (HFD)	1.8238 m	6.9927 m	16.3473m
Minimum Object Distance (MOD)	0.1 m	0.3 m	0,5 m

Technical Drawings

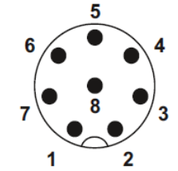


Power & I/O Connector: M12 17-Pin A-Coded Male



1	Z-	Encoder input Z- (RS-422, D-HTL)
2	L-VCC	Laser supply voltage (5-24V DC)
3	Z+	Encoder input Z+ (RS-422, TTL, D/SE-HTL)
4	B+	Encoder input B+ (RS-422, TTL, D/SE-HTL)
5	GND	Camera and Laser supply ground
6	B-	Encoder input B- (RS-422, D.HTL)
7	A-	Encoder input A- (RS-422, D.HTL)
8	VCC	Camera supply voltage
9	GND	Camera and Laser supply ground
10	A+	Encoder input A+ (RS-422, TTL, D/SE-HTL)
11	IN-GND	Reference ground for Encoder/Digital inputs
12	OUT2	Digital output 2, level defined by OUT.VCC
13	IN1	Digital input 1 (5-24V DC)
14	IN2	Digital input 2 (5-24V DC)
15	OUT-VCC	Output supply voltage (5-24V DC), refers to OUT-GND
16	OUT1	Digital output 1, level defined by OUT-VCC
17	OUT-GND	Reference ground for digital outputs
Shield	SHIELD	Connected to device housing

GigE cable, straight M12 male connector (IP67) on camera plug to RJ45



GigE Signal Name	Pin No. M12	Pin No. RJ45
1	BI_DC-	5
2	BI_DD+	7
3	BI_DD-	8
4	BI_DA-	2
5	BI_DB+	3
6	BI_DA+	1
7	BI_DC+	4
8	BI_DB-	6
Shield	Shield	Shield

AT SENSORS

Learn more about our Infrared Cameras:
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