



innovative and green tech'

TCAM128-65



IR camera technology

MONITORING TECHNOLOGY FOR
ADDITIVE MANUFACTURING AND WELDING

www.tpsch.fr



ABOUT US

3D CONTACTLESS MEASUREMENT, NDT, INDUSTRIAL PROCESS AUTOMATION
AND REAL-TIME ADAPTIVE PROCESSES.

For the past 25 years, we have been providing 3D contactless scanning services to industrial companies. We offer services related to part control and measurement : reverse engineering, comparison to CAD file and control reports.

We develop nondestructive control means and green technologies, to meet OEM expectations, and to observe new industrial policies regarding green and nonpolluting solutions.

We automate production and control processes and are able to combine several technologies in order to integrate our solutions to the production line, providing immediate results.

From the study to the solution implementation including maintenance, we offer a full and high quality service. Off-the-shelf products, customized solutions, prototypes, feasibility studies: we manage all our resources to meet your needs.

Our company is divided into 3 business units : **Service delivery**, **Industrial engineering** and **R&D**. We entirely carry out a project from the feasibility study to the industrial launching.





SWIR technology



SWIR

0.9 TO 1.7μm

128 X 128 PIXELS

InAsGa SENSOR

COOLED SENSOR

SWAP

LOW CONSUMPTION

EASY TO INTEGRATE

EMBEDDED APPLICATION

LOW WEIGHT

REDUCED SIZE

SMART

DATA FUSION

AUTOMATIC MONITORING

SMART CAMERA

EMBEDDED IMAGE PROCESSING



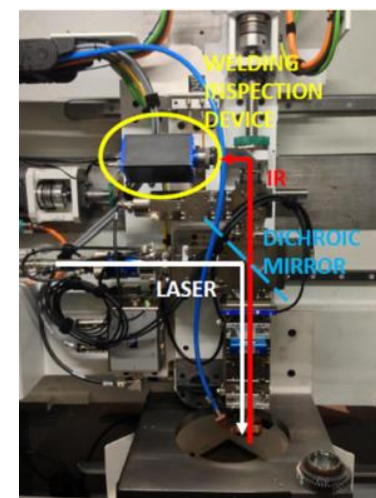
TPSH WILL HELP
YOU WITH :
PERSONALIZED
SOLUTIONS

SWAP & SMART

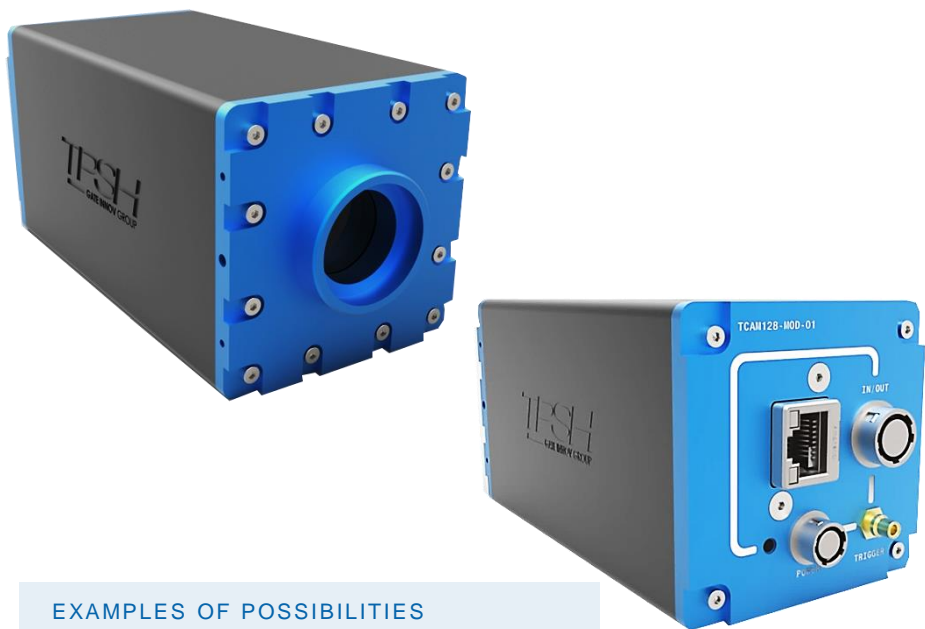
Size, weight and power of TPSH cameras are optimized to facilitate the device integration into an industrial machine. Moreover, these smart cameras are equipped with a built-in processor able to analyze "in live" the infrared images, to manage external devices or to synchronize the image processing data with machine parameters (X, Y, Z, laser power...). The sensor can also be cooled to allow the monitoring of a process with a low power/velocity ratio or a low power deposition (for accurate welding process).

EASY TO USE

With their embedded image processing capabilities and their standard fixings (C-mount, metric thread), TPSH cameras offer a real standalone control solution, quick to install and easy to use. The image processing data is transferred through an Ethernet connection to monitor the manufacturing process directly through the machine or from any computer connected to the company network. Our cameras coupled to the TPSH analysis software is a turnkey system improving the traceability of the manufacturing and certifying good quality of complex parts where traditional NDT techniques are unable to control.

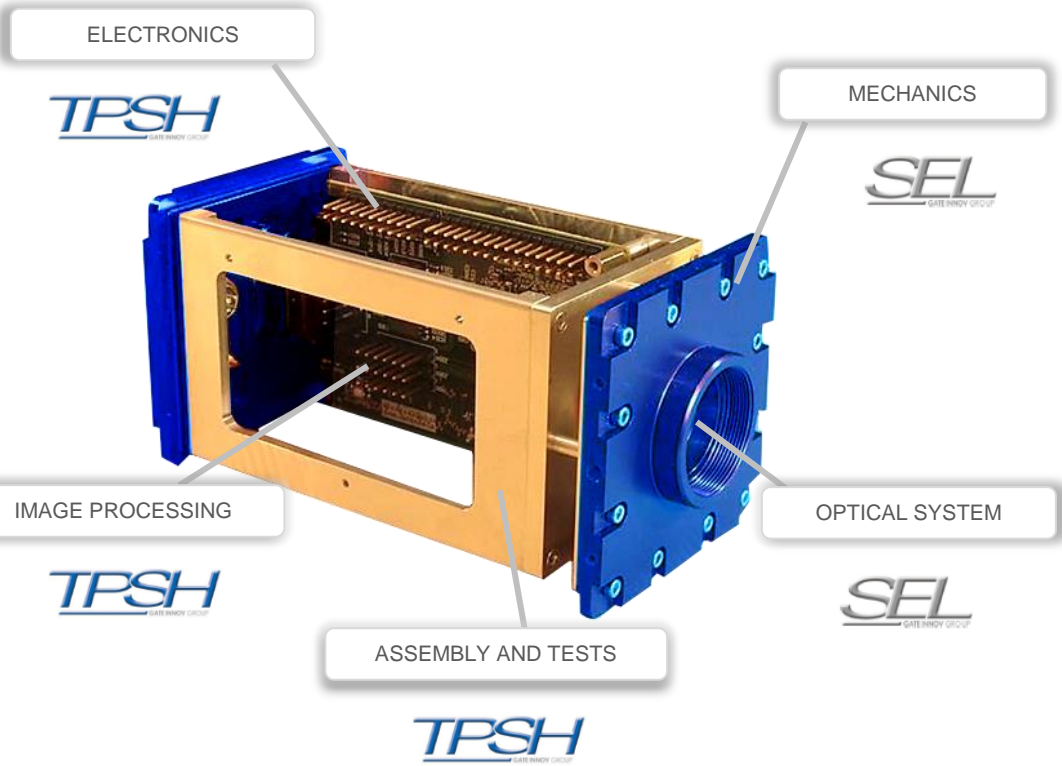


SWIR camera solutions



EXAMPLES OF POSSIBILITIES

- Embedded image processing
- Selective data storage
- Ethernet video output
- 1 trigger output
- Machine coordinate or other parameters record (12-pins connector)



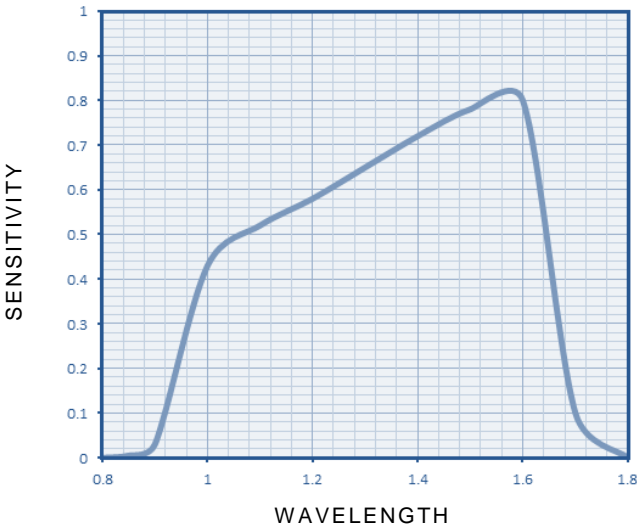
All conception steps are made by Gate Innov Group subsidiaries along the production.

PRODUCT SPECIFICATIONS

SENSOR	Resolution	128 x 128 pixels
	Pixel pitch	20 µm
	Image size	2,56 mm x 2,56 mm
	Pixel operability	99 %
CAMERA	Size ¹	60 mm x 60 mm x 121 mm
	Weight	< 470 g
	Frame rate	65 Hz
	Exposure control	0,05 – 500 ms
OPERATING CONDITIONS	Power requirements (external)	DC 7 V to 28 V via 4-pin connector
	Power consumption	Up to 2 W when cooling is ON
	Operating temperature	-10 to 60 °C
	Storage temperature	-20 to 70 °C
MECHANICAL CHARACTERISTICS	Lens mount	C
	Lens mount	6 x M2 thread 3 x M3 thread
BATTERY	The operating time will be established at the purchase order	

¹ without lens

SPECTRAL RESPONSE



MAIN FEATURES | STRENGTH AND LIGHTNESS

- Robust frame designed to protect the smart core against harsh environments
- Embedded advanced image processing
- Powered by battery to improve autonomy
- 10-bit digital processing
- Selective data storage

TPSH WILL HELP
YOU WITH :
A REACTIVE
ACCOMPANIMENT
ALONG YOUR
PROJECTS

Acquisition software

SIMPLY THE ESSENTIEL

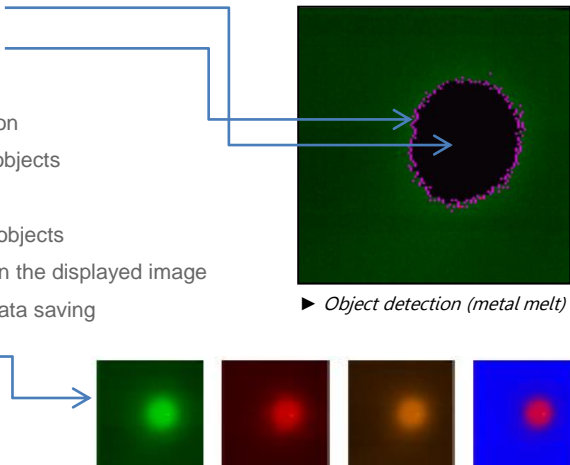
The software HMI works like a real time programming interface. HMI proposes to the user basic functions (save, review, snap, configuration), image processing functions and image analysis tools.



EQUIPMENT – CAPACITY AND PERFORMANCES

TPESH cameras include several functions of conventional image processing:

- Double threshold
- Edge detection
- Heat point detection
- Number of object detection
- Dimensions of detected objects
- Area of detected objects
- Coordinates of detected objects
- Live processing results on the displayed image
- Only image processing data saving
- 4 color mapping
- Gamma cursor
- ...

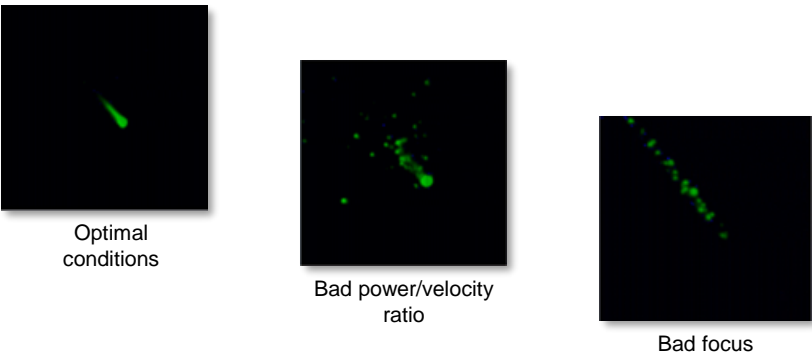


► Object detection (metal melt)

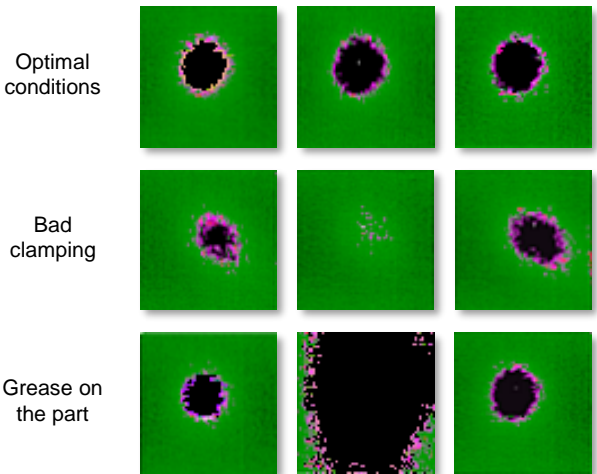
Examples of application

A LARGE SCOPE FROM THE R&D TO THE PRODUCTION PULSE LINE

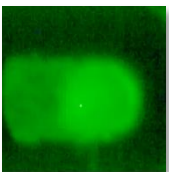
► Optimization of manufacturing parameters in SLM



► Real-time monitoring in welding (parameters : surface and shape of the melting bath)



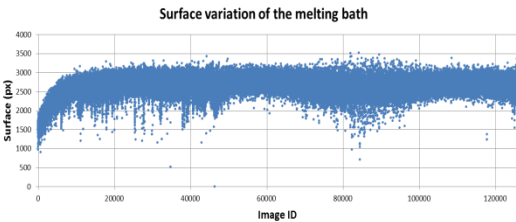
► Inspection post-manufacturing in DMD (parameter : surface of the weld pool)



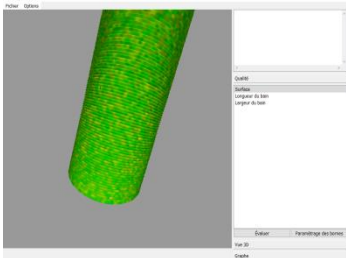
Raw image

```
Image 0 nb objets 1
objet 000 -> 047 053x046 1470 059-076 012/011
Image 1 nb objets 1
objet 000 -> 042 052x040 1305 057-075 012/011
Image 2 nb objets 1
objet 000 -> 048 055x046 1422 059-076 000/000
Image 3 nb objets 1
objet 000 -> 048 053x044 1428 058-078 000/000
```

Embedded image processing data



Post-manufacturing analysis in 2D



Post-manufacturing analysis in 3D

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