



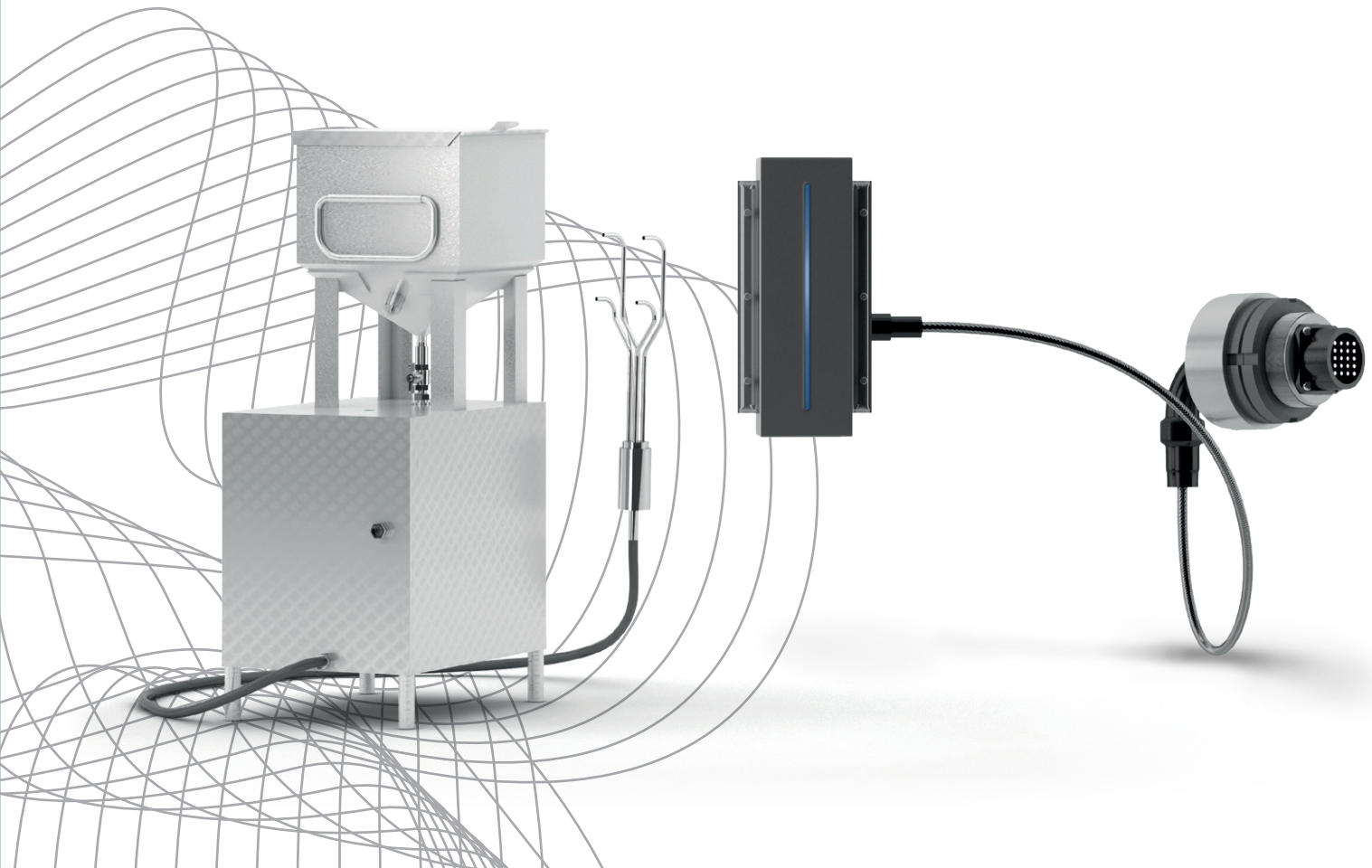
**ergolines**  
INNOVATION PARTNER

## ULD – ULTRASONIC LEVEL DETECTOR.

The key impact of mould powders on the quality of cast steel is widely recognized. Specifically, the ability to maintain constant powder thickness and stable meniscus position is essential to cast quality steel. Mould powder thickness can be controlled through closed-loop automated powder feeding. Ergolines' Ultrasonic Level Detector (ULD) is a new sensor dedicated to the real-time measurement of mould

powder thickness. Closed-loop powder thickness control is implemented by using the ULD feedback to drive an automated powder feeding machine, leading to improved steel quality and process stability.

The ULD can be used either in combination with a pre-installed radiometric sensor or with Ergolines' OPD.



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## MAIN FEATURES

The ULD is designed to work with several sections of long products and allows for fine tuning of the mould powder flow rate.

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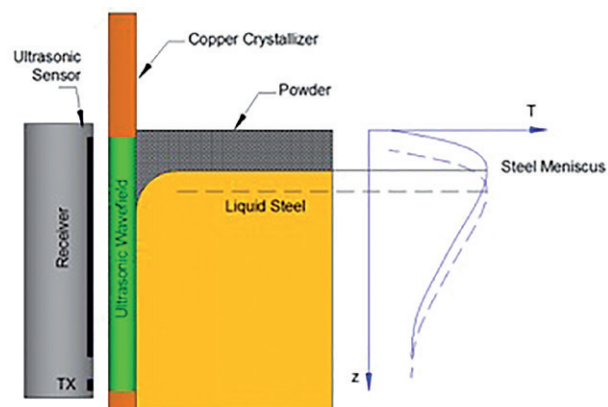
- › keeping powder thickness constant;
  - › reducing level fluctuations;
  - › optimizing mould lubrication;
  - › reducing inclusion entrapment;
  - › improving homogeneity of the powder thickness and consequently favouring even heat transfer;
  - › keeping product quality constant;
  - › reducing need to visually check the powder and manually feed it into the mould.
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## HOW IT WORKS

Powder thickness is measured by processing the signals measured by two sensors:

- › Ergolines' ULD sensor, which detects the meniscus thermal profile and the meniscus position accordingly;
- › A radiometric sensor, which measures a mass-weighted average of steel and powder or the Ergolines' OPD, which detects the profile of the powder top.



The ULD measures the mould thermal profile in the meniscus region through a fully contactless approach, based on ultrasound propagation. The steel level is then calculated from the thermal profile by means of a dedicated algorithm.

Ergolines' logic module exploits further signal processing algorithms to determine the instantaneous powder thickness. This value is used as feedback signal to drive the powder feeding machine. By automatically regulating the powder flow rate, the powder thickness is kept constant at the set point.

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## INSTALLATION

The ULD sensor is installed directly on the water jacket, requiring minimal machining.



ULTRASONIC SENSOR  
INSTALLATION IN  
WATER JACKET

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## SYSTEM COMPONENTS

The system is made up of the following components:

- › ULD – Ultrasonic Level Detector;
- › Flexible cable (Max LH 10 m);
- › Signal processing unit - SPUe;
- › Main Switchboard, including electronic components for measurement and closed loop control;
- › HMI for data recording, visualisation and management;
- › Operator Panel (on request).

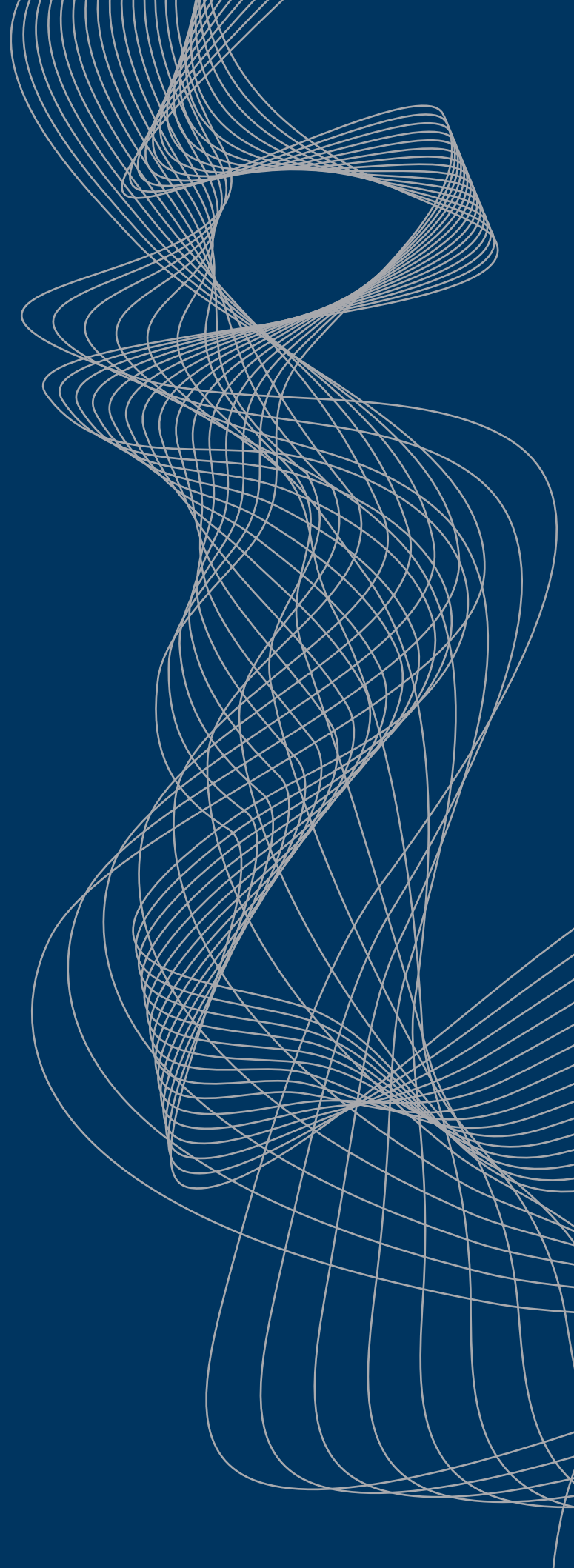
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## TECHNICAL DATA

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|--------------------|------------------------|
| Sampling frequency | max. 10 Hz             |
| Measurement range  | 80 mm on vertical axis |
| Precision          | $\pm 2$ mm             |

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**ergolines lab s.r.l.**

in Area Science Park, Bldg. R3  
Padriciano 99, 34149  
Trieste, Italy  
C.F./P.IVA 00955410329

P +39 040 375 5422  
F +39 040 375 5421  
infosteel@ergolines.it  
**www.ergolines.it**