

### Electromagnetic slag detection for ladles

The Agellis EMLI-LadleSlag system continuously monitors steel tapping ladles to rapidly detect the presence of slag in the stream, control slag carryover and improve quality in the casting process.



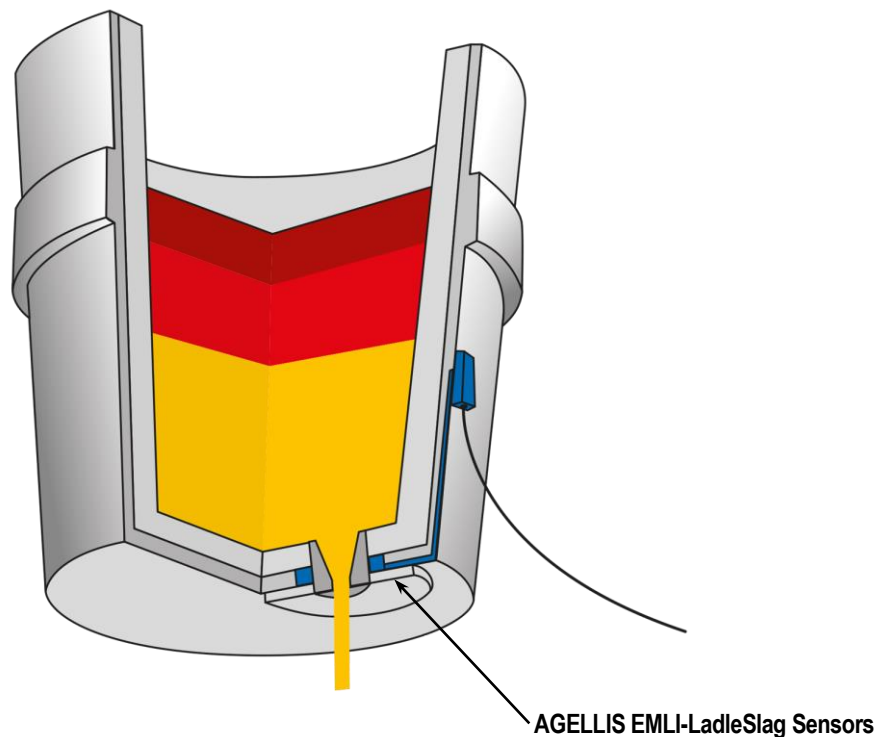
The Agellis EMLI-LadleSlag system continuously monitors steel flow during ladle teeming when casting and provides alarm outputs when slag is detected in the stream. These outputs can be used to immediately end teeming by gate closure, while also giving visual and audible alarms. The use of a well-functioning slag detection system increases yield significantly due to consistent and objective gate closure, ensuring that a maximum amount of steel is transferred.

The sensors are designed to be used in high temperatures which makes the system particularly well-adapted for vacuum degassing process routes. EMLI sensors and cabling are customised to fit any ladle and sliding-gate arrangement with only minimal modification to existing equipment. The sensors can be accessed from the outside of the ladle.

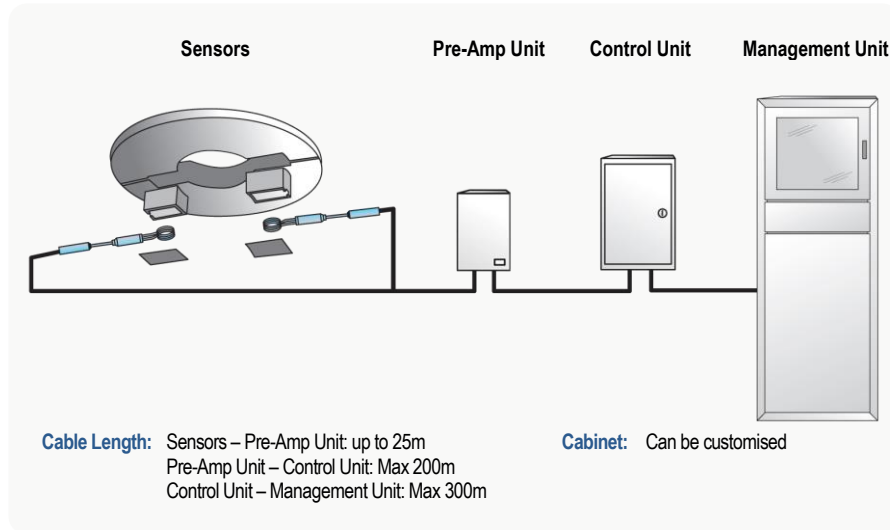
The double sensor solution ensures that the measurements are precise and remain

unaffected by high temperatures around the tap-hole.

The Management Unit is capable of running multiple systems. This enables the user to expand the system to add mould level and tundish level measurement systems. All EMLI systems have compatible electronics which means stocking spares is cost effective and reduced to a minimum.



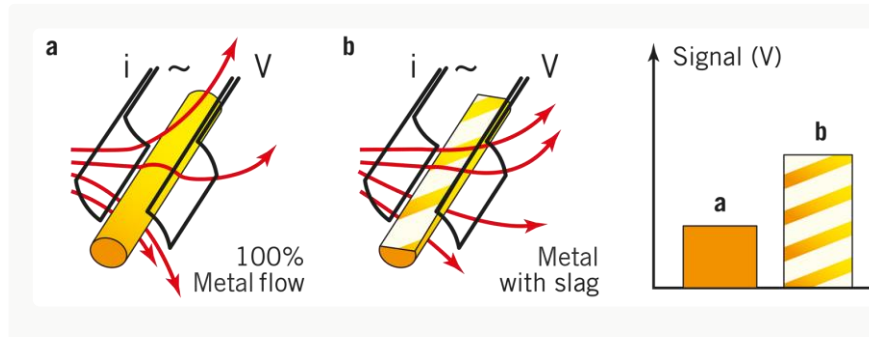
## System Overview



## Technical Information

<b>Power Supply:</b>	90 - 230 VAC 50/60 Hz max 500 W
<b>Frequency:</b>	Normally 280Hz
<b>Sensitivity:</b>	0,2%
<b>Alarm level:</b>	Adjustable
<b>Mounting Specification:</b>	Designed to endure the industrial environment mounted on a ladle
<b>Cooling:</b>	Sensor – no cooling required Main Electronics Unit – ambient temp. range up to +55°C
<b>Safety Standard:</b>	Complies with known safety standards
<b>Note:</b>	Above data can vary depending on ladle gate nozzle size shape and local conditions

## Principles of Operation



A transmitter sensor is supplied with a signal of a selected frequency which creates an electromagnetic field that in turn induces a corresponding signal of the same frequency in the receiver sensor.

When a 100% metal flow exists between the transmitter and receiver there is an induced signal (a) at the receiver. As soon as the flow becomes a metal/slag mix, the induced signal immediately increases (b).

## User Benefits & Advantages

<b>Process control</b>	<ul style="list-style-type: none"> <li>– Control consistent slag carryover.</li> <li>– Minimise the slag in tundish.</li> <li>– Maximise steel transfer to tundish.</li> </ul>
<b>Process improvements</b>	<ul style="list-style-type: none"> <li>– More than 98 % system availability.</li> <li>– Increase the casting sequence length.</li> <li>– 99,9 % accuracy.</li> </ul>
<b>Cost effective</b>	<ul style="list-style-type: none"> <li>– Long life high temperature sensors, engineered for hot degassing routes.</li> <li>– Optimise yield by leaving minimum amount of steel in ladle.</li> </ul>
<b>Easy to use</b>	<ul style="list-style-type: none"> <li>– Easy to use and maintain.</li> <li>– The system handles all steel grades.</li> </ul>



Agellis follows a policy of continual improvement of design and we must therefore reserve the right to supply equipment differing in detail from that described herein.