

Ladle Monitoring - Technical Data

Thermal Cameras

Maintenance-free thermal cameras with un-cooled detector (5 pcs. for capturing the complete outer surface of the ladle). The cameras are consistently designed for industrial applications, featuring intelligent processing functions and a Standard-GigE-Interface for data exchange. They are calibrated with an extended measurement range of up to 600°C for measuring absolute temperatures with high accuracy.

Type	IRSX-I Industrial Infrared Camera	
Temperature Measurement Range	-40°C to +600°C	
Temperature Measurement Accuracy	± 2°C or ± 2% of reading	
Thermal Resolution	0.1°C	
Image Pixels	336 x 256	640 x 512
Field of View	25° x 19°	45° x 35°
	other lenses available on request	
Frame Rate	9 Hz or 60 Hz	
Detector	Uncooled Microbolometer	
Interface	Gigabit Ethernet	
Ambient Temperature Range	-40°C to +60°C	
Weight	310 g	
Dimensions	55mm x 55mm x 87mm	
Protection Class	IP67	

Camera Enclosures

Double-chamber protective enclosure, manufactured from stainless steel. An air barrier installed at the front side effectively prevents dust formations at the durable Germanium window. All connection cables are guided through one cable gland with a high-temperature-resistant hose at the rear of the enclosure. Equipped with a wall mount with manually adjustable joint, the enclosures can be easily installed in any required position.

Type	IRCamSafe AIW 168
Enclosure Material	Stainless Steel
Coolant	Air or water
Germanium Window	Ø70mm x 3mm, DLC coated
Air Barrier	Adjustable air flow, supply pressure 1 - 3 bar
Cable Protection	Heat resistant hose, configurable length. Resistance to thermal load: up to +1640°C
Ambient Temperature Range	-40°C to +350°C
Weight	10.5 kg
Dimensions	Ø168mm x 505mm
Protection Class	IP67
Mounting Bracket	Heavy duty bracket with joint, made from stainless steel. Load rating 45 kg.

Other Components

Server Computer	Industry standard server computer, 19"metal case for rack installation. The server computer hosts the LadleCheck measurement software, the database and the web-server
IRCamSafe Controller	<p>Integrated inside the camera enclosure. The board gives a significantly reduced installation effort, allowing a direct connection to mains power and Ethernet without any additional connection cabinet. It features various sensors to continuously monitor the ambient conditions in the enclosure, thus ensuring a safe operation of the camera.</p> <ul style="list-style-type: none"> ■ 4 Port Switch with 2x LWL-LC 100Base-FX or 2x RJ45(10/100) Up-Links ■ 2 internal sensors for temperature; sensors for pressure and humidity ■ Supports a ring structure of the network for lower cabling complexity ■ Switchable camera power and heater via Modbus-TCP/IP (controlled by the monitoring software)

Interfaces

Web-Server	Ethernet Link
ODBC	OPC
Modbus-TCP	SQL Database
Digital I/O, 24V Input/Output, Potential-Free (Fieldbus Module)	

Data Link of Cameras and Computer

Gigabit Ethernet
Up to 90m with Industrial Ethernet Cable
Up to 500m with Multi-Mode Glass Fiber Cable
Up to several km with Single Mode Glass Fiber Cable



Temperature Monitoring for Continuous Casting



EAF Transformer Monitoring



Slag Detection



Torpedocar Monitoring



Automation Technology
Vision Sensors and Systems