Information Technology Solutions

Physical Ladle Tracking System

Physical ladle tracking is an important constraint in many steel making facilities. AustralTek has developed a smart, simple, cost effective and very flexible PLT™ system that permanently senses the position and status of a ladle or other heavy equipment throughout the whole plant.

The PLT™ system benefits include:

- Accurate refractory contact time with hot steel
- Automatic ladle number recognition without operator input
- Improved safety - detect early deterioration of ladle refractory
- Maximize the life of the ladles
- Reduce the heat losses and waiting time of full ladles
- Determine the best refractory for a particular steel grade
- Determine the optimum ladle practice
- Improve maintenance time and ladle turnaround
- Define the best ladle selection to use in the cycle
- Compare different refractory suppliers and optimize selection
- Use the system to monitor the ladles in real time
- Optimize ladle re-line schedule
- Better coordinate when to place the ladles on tapping car
- More closely monitor ladles in service
- Accurately track the number of heats for each ladle
- Monitor the amount of time on each porous plug

Hardware:

The hardware of the system utilizes Passive Radio Frequency Identification (RFID) technology:

- An RFID tag is attached to the ladle and is read by the antennas
- The sensors and antennas are strategically located throughout the melt shop
- The RFID tag is protected by a computer designed shield called armor that is engineered and manufactured to withstand the high temperatures, steel splashes, and accidental collisions with other equipment and structures
- The hardware can be used with existing plant tracking software

Characteristics of the RFID:

- Utilizes a frequency that is safe and do not interfere with other on-site devices
- Handles higher amount of information than other typical identification processes
- Handles greater distances than other tracking systems
- Utilizes passive RFID technology – it does not require a battery or electrical power on the tag

Maintenance:

- Minimal time required for armor maintenance
- Quick armor installation on a ladle
- Fixed or interchangeable armor options for ladles
- Heavy duty design for industrial processes
- Simple sensor exchange
- Low cost maintenance materials

TECHNICAL SUPPORT

After every system installation, our team is permanently available for helping with any technical questions on the system, or new requirements. Spare parts are always in stock and can be in your plant on next day.

ZERO DOWNTIME

Hardware installation on ladles can be done in less than 25 minutes, allowing maintenance personnel to easily install sensors during normal ladle maintenance practices.

Readers and computers for software system can be hooked to existing Ethernet networks without affecting production. Wireless Stations are available if needed. Any added sensors are automatically detected, allowing a fast replacement and simple ladle addition.

TURNKEY SOLUTIONS

Our personnel will supervise the hardware installation and install the software in site.

The system will be functional and ladles will be detected on the same day of installation.

AustralTek

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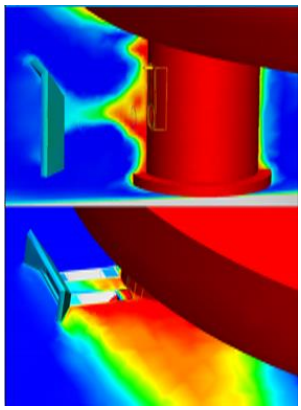
Computer designed armor

- Parts designed and simulated with Thermal Analysis Software
- Protection designed for convective cooling
- High temperature radiation insulation up to 1200F°
- High temperature conduction insulation up to 2300F°
- Very strong steel construction and special insulation material
- Tested in plant with ladle surface temperatures of 780°F
- Frontal and lateral shock resistant up to 400 Pounds
- Fast and simple sensor replacement in less than one minute



STANDARD MODULE

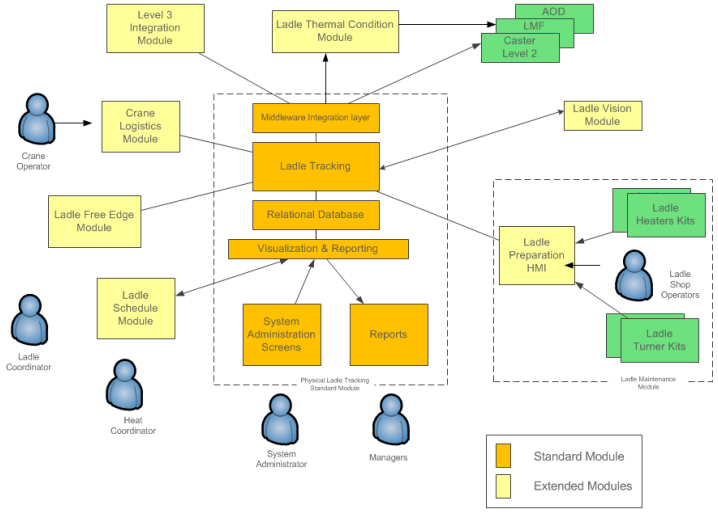
Functions implemented:

- Production Programming and ladles synchronization
- Tracking of relationship between Ladle/Heat/Processes
- Meltshop layout mimic
- Status of all supervised objects
- Record of alternate operations such as reladling, slide gate clogging, plug clogging
- Provides information for Reports such as “Campaigns Report”, “Heat Details”, “Average Process Times”

EXTENDED MODULES

- Ladle Schedule Module
- Ladle Maintenance Module
- Ladle Thermal Condition Module (Mathematical Model)
- Crane Logistics Module (additional hardware is required)
- Corporate Level 3 and Level 2 Integration Module
- Thermal Ladle Vision Module (additional hardware is required)

Software Overview



The PLT Framework takes care of configuration, rules and restrictions for the Meltshop operation, interacting as well with the supervised objects such as ladles and cranes, and their properties.

The PLT framework features are:

- Local Database with objects information
- Built-in workflow classes
- User Authentication and rules
- Web portal with intuitive Navigation

The Ladle Tracking Module collects and stores the information related to the operational cycle of all available ladles, either during maintenance or process operations.

System Design

The system is distributed in different areas of the plant, and antennas are installed in specific spots where the ladles are to be detected. Each antenna will detect the RFID sensor installed on the ladles, and will communicate their location and unique information to the system Server via Ethernet.

The sensors installed in the ladles can be detected up to a distance of 100 feet if there is a clear view between sensor and reader, or up to 60 feet in blocked areas.

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