


LaCam[®] - M 4th generation

LaCam[®]

FAST, ACCURATE, RELIABLE
LASER SCANNER FOR HOT
SURFACE APPLICATIONS



3D Laser Profile Measurement in Hot Vessels and Transport Ladles.

- Increases Safety
- Reduces Cost
- Extends Refractory Life
- Optimizes Processes

LaCam[®] - M4 mobile version



3

LaCam[®] - M4 Laser Scanner Profile Measurement in Hot Vessels and Transport Ladles

FERROTRON

sold more than 260 laser measuring units world wide

(165 mobile versions and 99 fixed versions)



3D Laser Profile Measurement

- **Increases Safety**
- **Reduces Cost**
- **Extends Refractory Life**
- **Optimizes Processes**

Benefits



1)

Safety

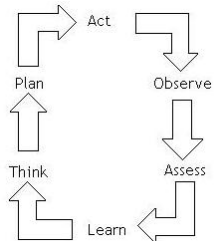
- Minimize dangerous and expensive break-outs



2)

Extension of vessel life by

- Accurate measurement of refractory lining
- Visualization and measurement of high wear areas
- Optimization of vessel brick lining
- Trend analysis and forecast of vessel lining life (accurate planning of downtimes)



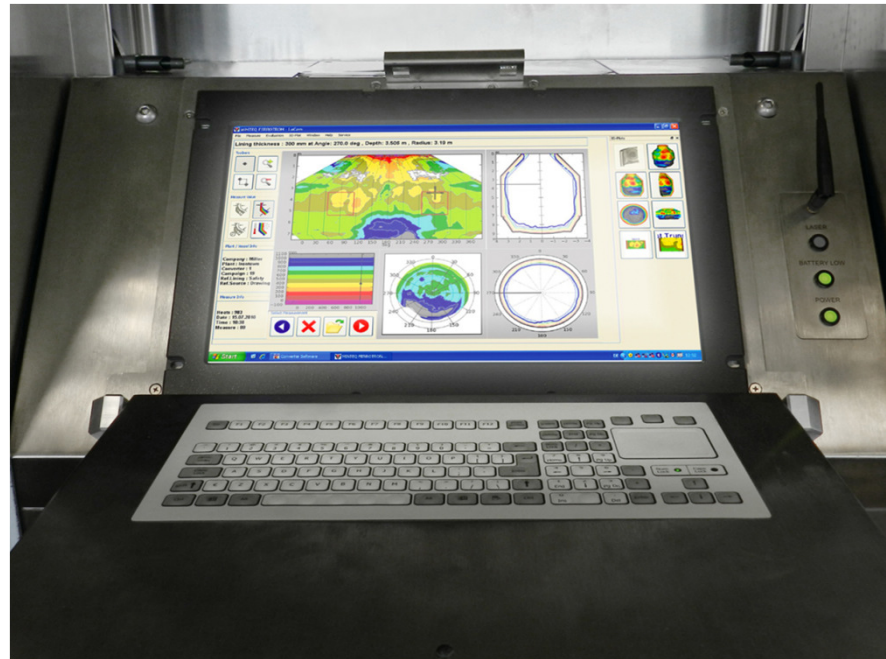
3)

Process Control, Maintenance

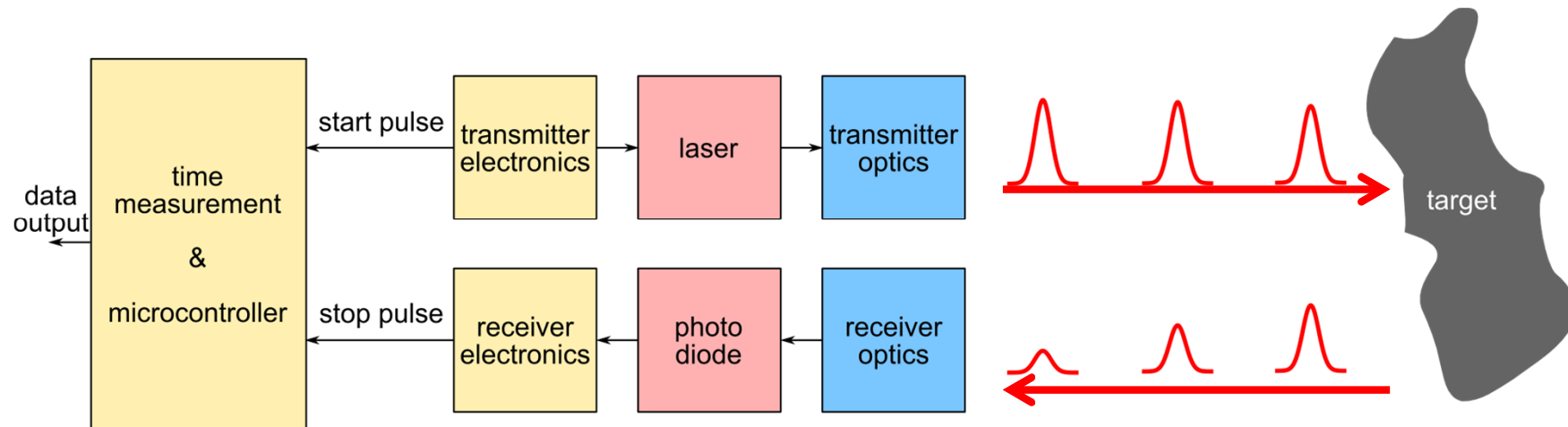
- Bath level measurement for optimal lance positioning
- Improved control of slag splashing and slag coating practices
- Control of gunning material selection and consumption
- Optimization of tapping angle

Technical details

Depending on application up to 4 million measuring points are achievable with a scan of 30 seconds due to a laser repetition rate of 300 KHz and an extended vertical viewing angle of 110°. The smallest laser beam size of 3 mm is offering the highest resolution and best accuracy. This allows improved joint and edge detection in ladles and other vessels.



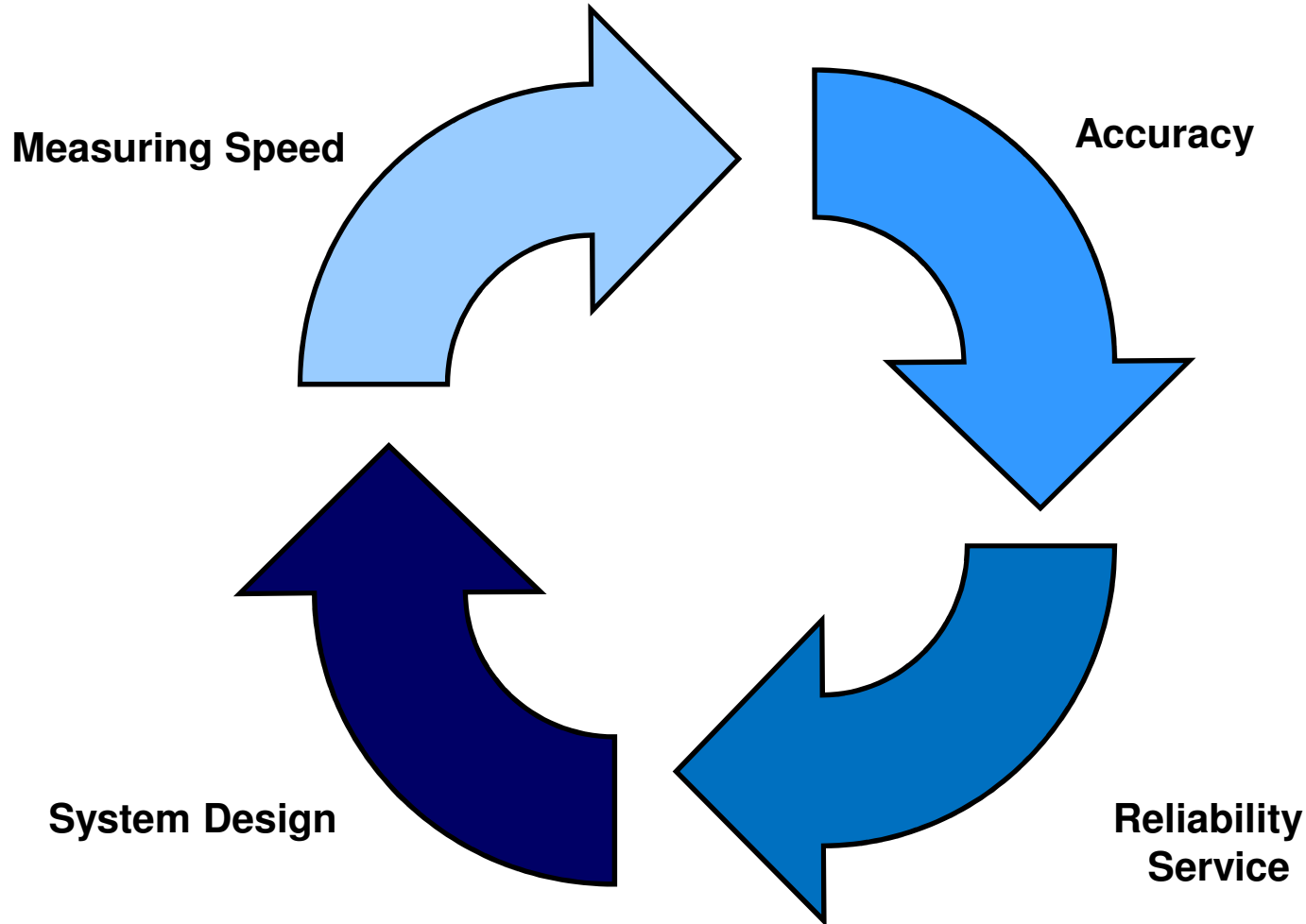
Principle Time-of-Flight Measurement



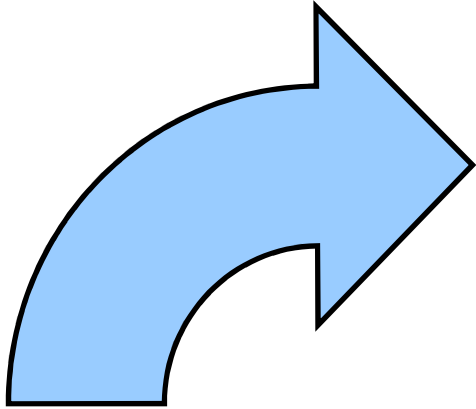
- short laser pulse in a highly-collimated beam is sent in well-defined direction
- pulse is partially and diffusely reflected by target(s)
- receiver gathers backscattered optical signal (echo signal) and converts it into electrical signal
- receiver electronics detects target(s)
- time between start pulse and stop pulses is measured and gives range

LaCam® 4th generation

introduces new upgrades offering the best performance for our customers:



Measuring Speed



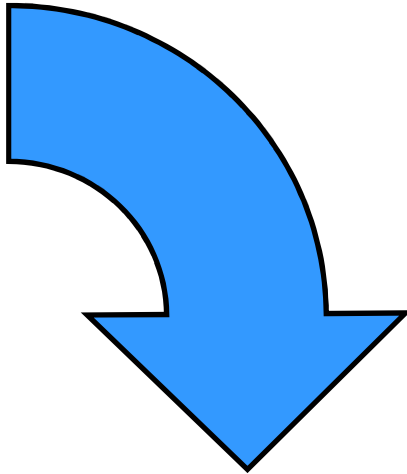
- Reduced over all measurement time due to intelligent positioning methods
Immediate Positioning System (IPS)
- Significant reduction of measurement time due to
Instant Result Scanning (IRS)

Benefits:

- Fastest lasercanner for hot surfaces on the market
 - Laser Pulse Repetition Rate of 300 Khz
 - Scan Rate: 135,000 Measuring Points/sec.
 - Total time for one scan: less than 10 sec. (Scanframe 110° X 80°, 880,000 MeasuringPoints/Scan)
 - 4 Million measuring points within a scan of 30 sec. → extreme high point density
- Results available and monitored after each single scan
- Ability to decide after each scan if areas of interest are already measured (no need to continue with additional scans)
- Echo digitization with full waveform analysis measurements are less sensitive to smoke and dust influence this leads to improved measuring results

Accuracy, Positioning

- Highest available accuracy, due to the use of latest laserscanner-technology and one scanner for positioning and measurement



- Precision: +/-2 mm
- Angular pointing accuracy: 0.0005°
- Min. Angle step width: 0.0024°
- Beam Diameter: 3 mm

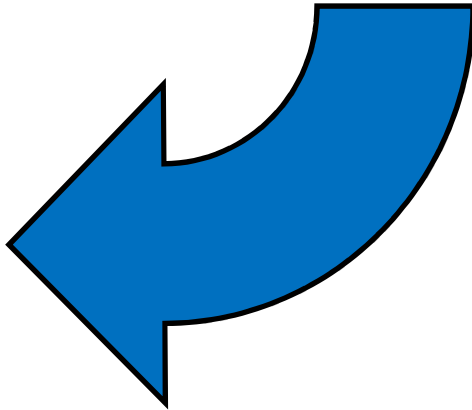
Advantages in Positioning compared to competitors:

no additional errors based on:

- second laser for positioning
- reflecting targets
- additional surveying measurement by a third party company

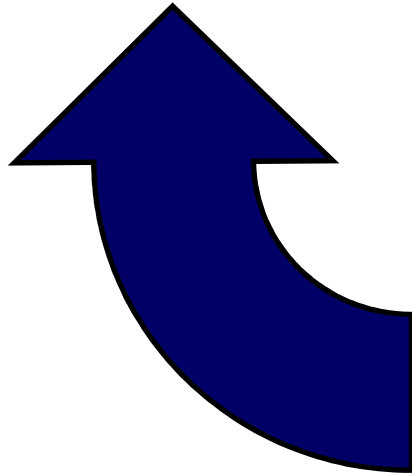
High flexibility in choosing structures for positioning due to multiple positioning methods (patented)

System Design



- **Active water cooling allows unlimited use**
no down times between measurements required
- Sturdy construction and the multi-wheel cart-design enables an easy movement of the LaCam[®] - M
- Extended vertical viewing angle of 110°
- Permanent network access and remote access (also wireless)
- Safety: Overhead protection for operator against skulls or debris
- Integrated Pyrometer (optional)
Benefit: allows temperature maps and tuyere status determination
- Operation mode: Battery or AC-power 85V – 265V
Benefit: enables operator to perform measurement (even if the battery is not fully charged)

Reliability, Service



- **Reduced temperature stress on mechanical and electrical components due to active water cooling**
- **No need for maintenance of positioning system (extra targets)***
- **User-friendly due to modular setup**
- **Active cooling system is monitored on-line**

- Service teams available world wide, Minteq provides infrastructure in more than 40 countries.
- Experienced manufacturer of laser-profile measuring equipment with more than 260 sold units world wide.

**Competitor uses additional reflecting targets (which have to be cleaned) and a second laser for positioning which increases the overall error rate*

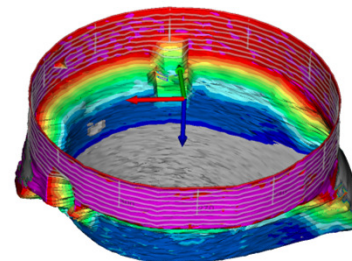
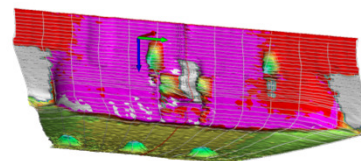
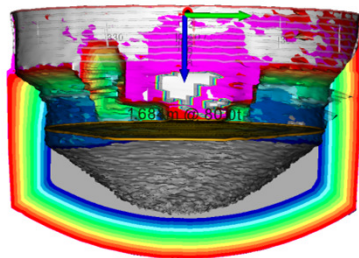
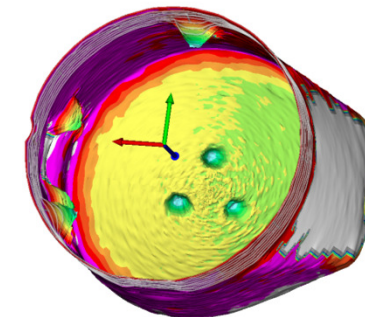
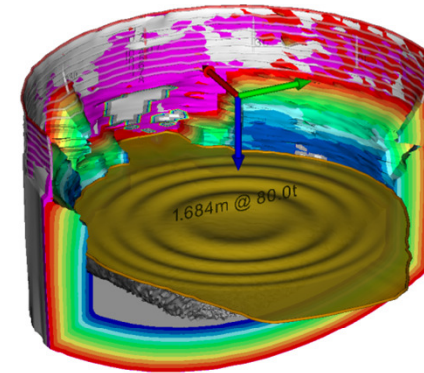
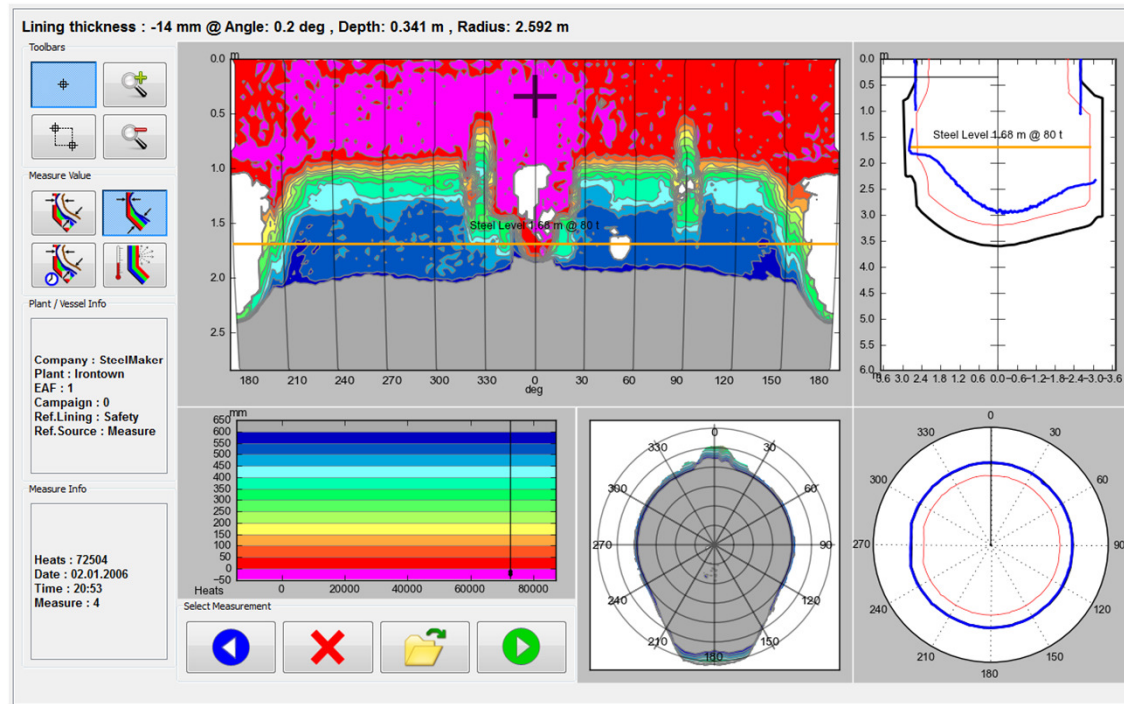
LaCam[®] EAF



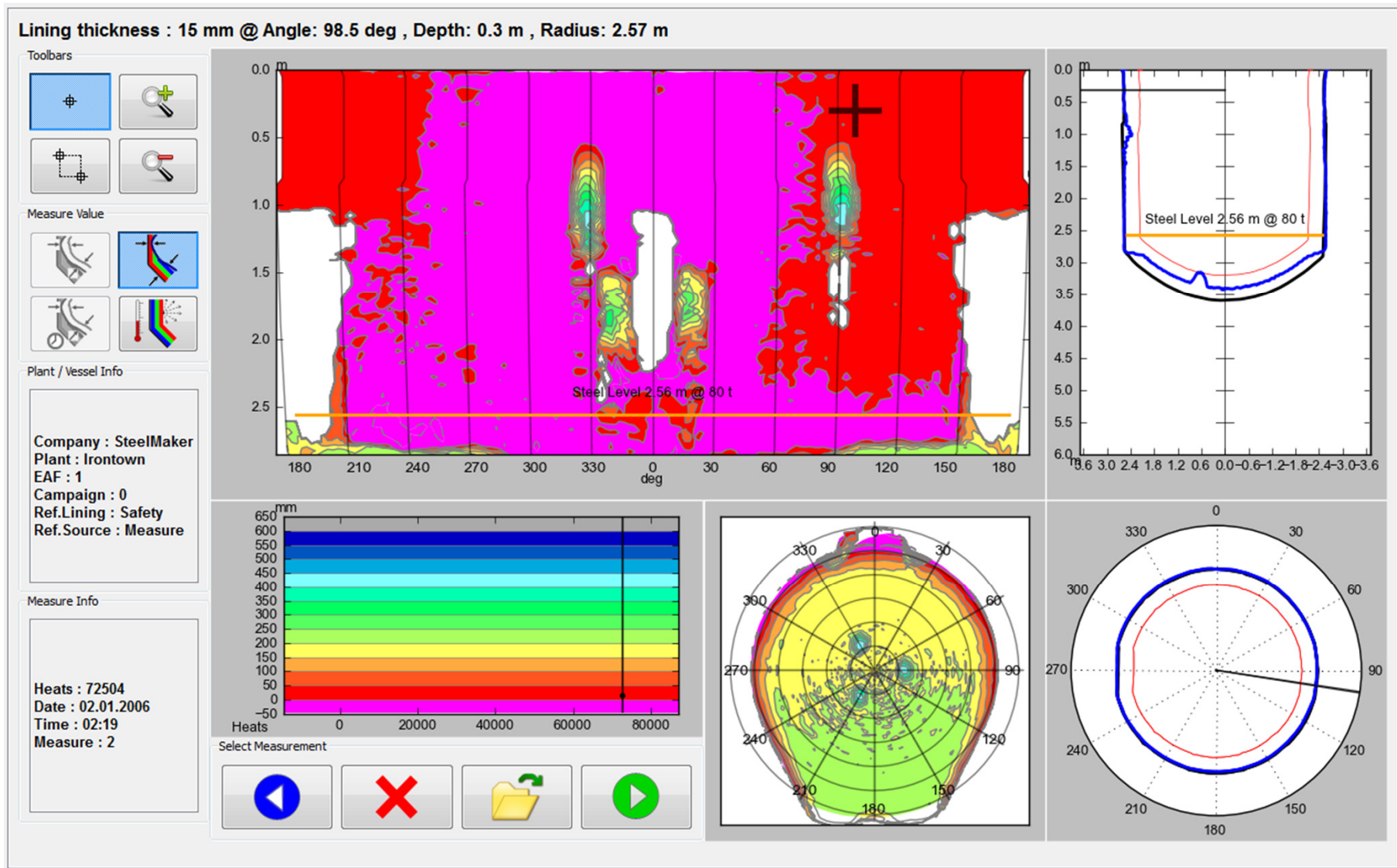
MINSCAN



Graphical User Interface and 3D for EAF Application



Graphical User Interface and 3D for EAF Application



SCANTROL® - Intelligent Control Module between Laser Wear Measurement System LaCam® and Automatic Spraying Manipulator



LaCam® M



LaCam® CI, converter



LaCam® - EAF



LaCam®, LI ladles

[Link to Scantrol PPT](#)



scantrol®



Tornado Shooter

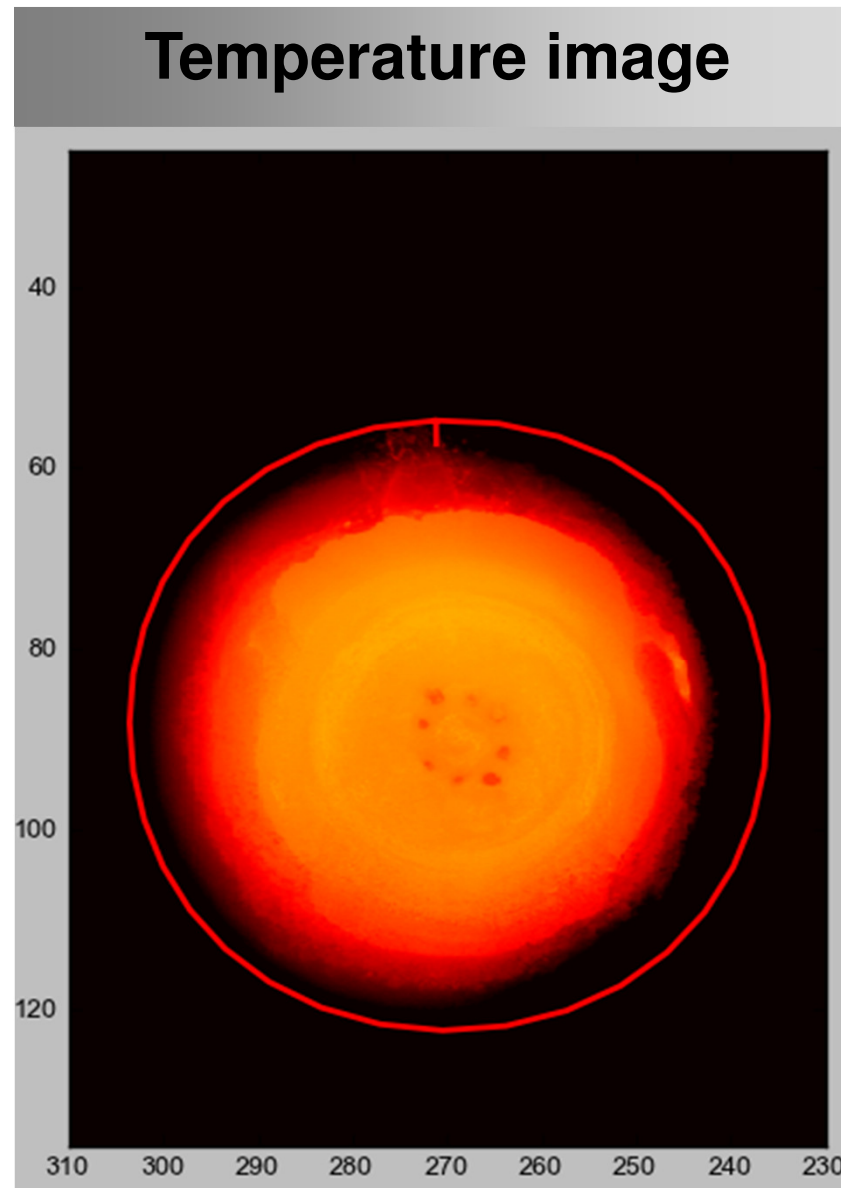


Minscan



Lego Manipulator

LaCam[®] Option: Pyrometer - Images



MINTEQ Internation GmbH FERROTRON DIVISION



THANK YOU!

