



MEASURING SYSTEMS  
FOR CONTINUOUS CASTING MACHINES





# EMTM66

## MOULD TAPER CHECKER

Leader in mould taper measuring. Light, versatile and accurate instrument, needful to keep under control the mould dimension, product quality, optimize maintenance costs and steel quality. High accuracy and reliability. Use easiness in CCM casting floor and in maintenance work shop.



### FEATURES

- Light, versatile and easy to use
- Wide measure range by the same measure head
- Square, Round, Rectangular and Beam Blank mould shapes
- Mould measuring from 1 to 6 axis (3 each side)
- Auto calibration
- Battery powered



EMTM66 Mould Taper Measurer is available in different versions:

- EMTM66+: Plus Version (Standard)
- EMTM66-2L: Laser Version
- EMTM66-BB: Beam-Blank Version

## TECHNICAL DATA

|                    |   |
|--------------------|---|
| Operator interface | Rugged Tablet PC  |
| Accuracy           | +/- 0.02 mm (2L Version)<br>+/- 0.1 mm (PLUS Version)         |
| Technology         | Contact probe (Plus Version)<br>Triangular Laser (2L Version) |
| Repeatability      | +/- 0.02 mm   |
| Data Trasferring   | Bluetooth   |
| Battery life       | 8 hours   |
| Environmental IP   | IP62  |
| Weight             | ~ 7Kg   |

## BENEFITS

- Removal of the defects due the Mould
- Break-out reduction
- Mould life optimization
- Planning of the CCM stop for mould replacing
- Reduction of the mould overhauling
- New mould check
- Product quality



# EMTM66-2L

## MOULD TAPER MEASURER

EMTM66-2L tool is designed for mould taper measuring on X, Y and diagonals axes using laser technology.

It's suitable for square, rectangular and round moulds providing measure for taper profile, ovalization (round moulds) and squareness (square moulds).

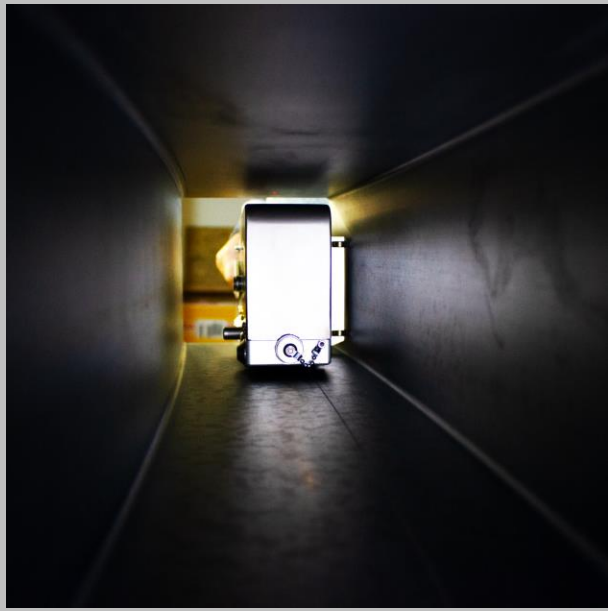
Contactless laser measuring provides several advantages like:

- avoid fingerprints on internal surface
- enhanced measuring range without mechanical adapters
- greater reliability and no maintenance due to absence of moving parts

Use easiness in CCM casting floor and in maintenance workshop.

### FEATURES

- Light, versatile and easy to use
- Wide measurement range by the same measurement head
- Square, Round and Rectangular mould shapes
- High accuracy  $\pm 0.01\text{mm}$
- Mould profile, ovalization and squareness checks
- Real-time measure reading on rugged tablet PC
- 2D/3D graphs and data archive
- Wireless communication
- Auto calibration
- Battery powered
- Transportable compact bag



## TECHNICAL DATA

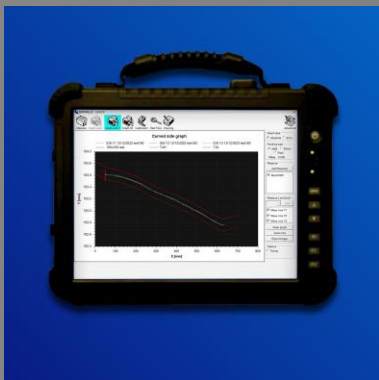
|                    |  |
|--------------------|--|
| Operator Interface | Rugged Tablet PC                       |
| Communication      | Bluetooth                              |
| Accuracy           | +/- 0.01 mm                            |
| Resolution         | +/- 0.005 mm                           |
| Repeatability      | +/- 0.02 mm                            |
| Technology         | Triangular Laser (2x)                  |
| Range              | 140mm up to 340mm<br>(square or round) |
| Battery life       | 8 hours                                |
| Environmental IP   | IP62                                   |
| Weight             | < 4Kg                                  |

Measurement data are available through Tablet PC software, SW features includes:

- Instrument diagnostic (battery, electronic and sensors status)
- Auto calibration procedure
- Mould drawing definitions including tolerances
- Acquisition and post-processing of measure data (2D/3D graphs)
- Measure database with comparison functions

## BENEFITS

- Prevent quality defects
- Prevent breakouts
- Optimize mould life
- Reduce mould costs
- Reduce maintenance cost
- Optimize plant productivity







# EMTM67

## MOULD TUBE LASER SCANNER

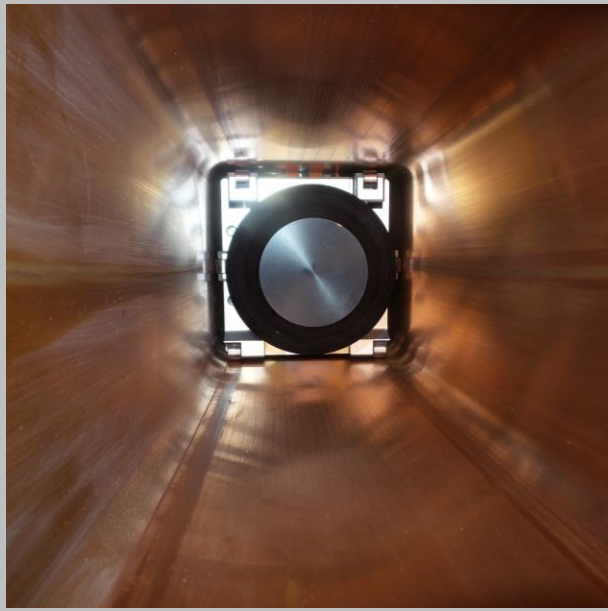
EMTM67 instrument is designed to satisfy operators needs to perform everywhere mould dimensional measurement in an easy, fast and accurate way.

The most important feature, beyond the accuracy and its advanced software, is the lightness and manageability. The whole system is contained in a transportable trolley (<30Kg).

The 360° laser scansion is possible at different settable steps. The data elaboration allows to get longitudinal profiles, transversal sections, 2D/3D surface representation and many other data.

### FEATURES

- Light, versatile and easy to use in CCM and Workshop
- Complete laser scansion (360°) of mould internal surface
- Square, round and octagonal mould shapes
- High accuracy  $\pm 0.02\text{mm}$
- Complete set of 2D/3D graphs and data tables
- OK/NOK measure summary according with set tolerance
- Measure report generation
- Measure database and measures comparison functions
- Auto calibration
- Wireless and battery powered
- Transportable compact bag



## TECHNICAL DATA

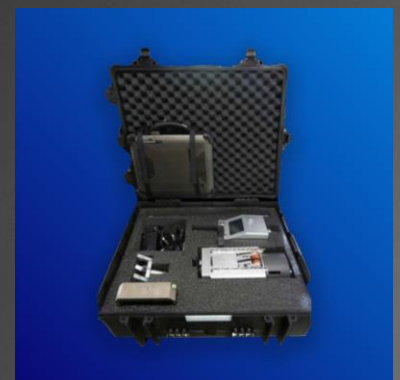
|                    |   |
|--------------------|---|
| Operator Interface | Rugged Tablet PC                                  |
| Communication      | Wi-Fi   |
| Accuracy           | +/- 0.02 mm                                       |
| Resolution         | +/- 0.005 mm                                      |
| Repeatability      | +/- 0.03 mm                                       |
| Technology         | Triangulation Laser                               |
| Range              | 130mm up to 220mm<br>(different sizes on request) |
| Battery life       | 8 hours   |
| Environmental IP   | IP62  |
| Weight             | < 20Kg  |

EMTM67 can be used indifferently in workshop or on casting floor by one operator without crane or lifting means. It can operate in horizontal or vertical position (using optional winch).

After the preliminary setting operations, the instrument performs the measurements in automatic way without any operator assistance.

## BENEFITS

- Prevent quality defects
- Break-out reduction
- Mould life optimization
- Planning CCM stop for mould replacing
- Reduction of the mould overhauling
- New mould check
- Reduce maintenance cost





## EMTM69

DETECTING INTERNAL GEOMETRY OF  
BILLET, BLOOM, OCTAGONAL AND  
ROUND MOULDS

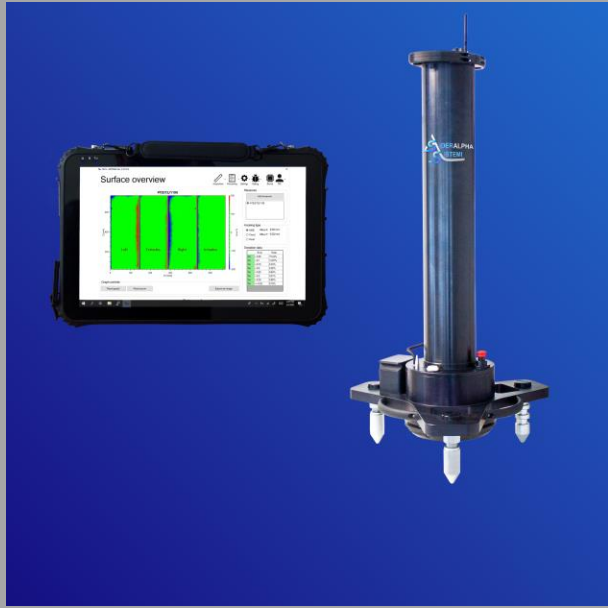
EMTM69 is a instrument designed to satisfy the operators needs to perform the mould measurment in way easily, fast, accurate and everywhere. The most important feature, beyond the accuracy and a rich software, is the lightness and his manageability. The whole system is contained in a transportable trolley (<30kg). By the laser sensor a 360° scanning is possible at different settable steps.



### FEATURES

- Removal of the defects due to the Mould
- Break-out reduction
- Mould life optimization
- Planning of the CCM stop for mould replacing
- Reduction of the mould overhauling
- New mould check
- Product quality





By the Laser sensor a 360° scanning is possible at different settable steps. The data elaboration allows to get Longitudinal Graphics, Slides and 3D representation. It can be used indifferently in Workshop or on Casting floor by one operator without crane or lifting means. It can operate in Horizontal or Vertical position. After the preliminary setting operation the instrument performs the measurements in automatic way without the operator assistance.

## TECHNICAL DATA

|                              |  |
|------------------------------|--|
| Taperform supported          | Round (Diameter from 130 to 220 mm)<br>Square (Diagonal from 140 to 200 mm)<br>Octagonal (Diagonal from 140 to 200 mm) |
| Technology                   | Triangulation laser sensor   |
| Resolution                   | +/- 0.005 mm   |
| Accuracy                     | +/- 0.02   |
| Repeatability                | +/- 0.03   |
| Longitudinal measurment step | From 5 to mm   |
| Data trasmission             | WiFi   |
| Battery life                 | 8 hours  |

## BENEFITS

- Versatile and easy to use
- Mould measuring by 360° laser. Slice and longitudinal measure lines
- Able for straight, curve, multi taper parabolic moulds
- High accuracy +/-0.02
- Measuring until 10 mould and sending the data to the PC by bluetooth
- Auto calibration
- Print data and graphic



# MCS

## MOULD CHECKER STATION

MCS is a fixed installed and fully automatic station for mould internal geometry scanning (Using laser technology). It can be used in CCM Workshop for mould inspection (Used mould check or new mould acceptance) or by copper mould producers for product quality check and certification. MCS support up to 6 mould loading for automatic sequential scanning.



### FEATURES

- Scanning of the whole internal mould's surface
- Fully automatic station for CCM Work-shop or Copper Mould producers
- Wide measurement range by interchangeable measure heads
- Able for Billet, Bloom, Round and Octogonal
- Measure database with measures comparison functions



MCS supports up to 6 mould loading for automatic sequential scanning. It performs a complete mould checking due to the 360 degrees scanning. It can check mould's shape, squareness, ovalization, bending radius, corner radius, and more.

MCS station is available in two versions: horizontal mould loading (MCS-H) or vertical mould loading (MCS-V). Both versions support interchangeable measure heads for a wide range of measures.

## TECHNICAL DATA

|   |   |
|---|---|
| Taperform supported                     | Round Square, Rectangular and Octogonal. Diagonal range from 130 mm to 500 mm (Using different measure heads) |
| Accuracy                                | +/- 0.02 degrees  |
| Technology                              | Triangulation laser sensor  |
| Repeatability                           | +/- 0.03 mm   |
| Longitudinal measurement step           | From 5 to 50 mm   |
| Measurement time (1000 mm taper lenght) | 10' (25 mm step) / 50' (5 mm step)  |
| Operator Interface                      | Stand-alone totem with touch display PC   |
| Mould loading capacity                  | Up to 6   |

## BENEFITS

- Removal of the defects due to the Mould
- Break-out reduction
- Mould life optimization
- Planning of the CMM stop for mould overhauling
- New mould check
- Product quality
- Mould life
- Maintenance cost reduction



## RGCBL

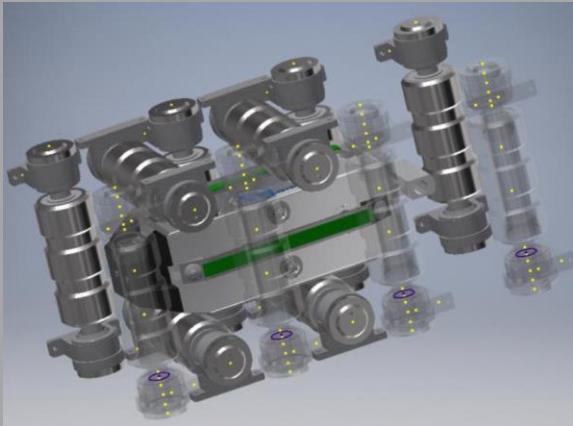
### STRAND MONITORING FOR BILLET/BLOOM CCM

RGBL is a CCM strand monitor system. It's installed on dummy bar head and can be configured to measure mould profile, roll gap, roll alignment, roll rotation and efficiency of water spray along the CCM strand. It can operate both on top and bottom feeding CCM.



#### FEATURES

- Mould profile measurement
- Segment's roll gap measurement
- Segment's roll alignment measurement
- Segment's roll rotation status check
- Secondary cooling system (Water spray) efficiency check
- Lightweight module installed on dummy bar



The module is installed on dummy bar using a custom designed adapted and execute the measurement cycle during the bottom-to-top or top-to-bottom dummy bar movimentation.

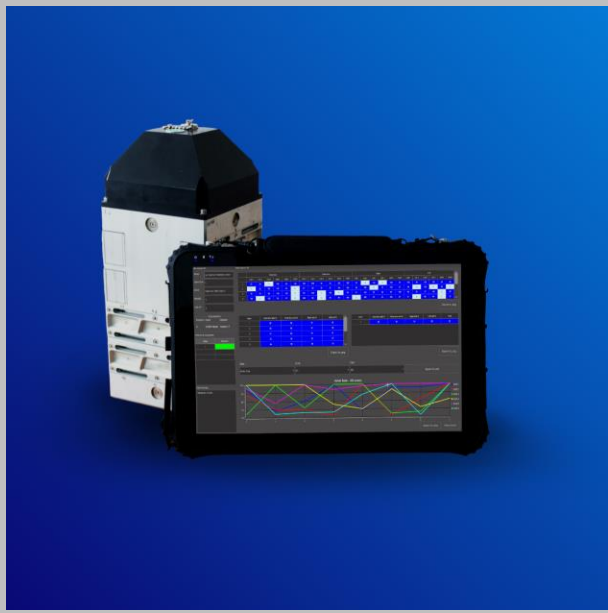
## TECHNICAL DATA

|                        |   |
|------------------------|---|
| Supported CCM Types    | Top/Bottom Feeding CCM for Billet or Bloom                        |
| Measurment Range       | Square/Rectangular Billet/Bloom from 200 to 400 mm                |
| Roll Gap               | Accuracy +/- 0.05 mm<br>Resolution +/- 0.02 mm                    |
| Roll Alignment         | Accuracy +/- 0.05°<br>Resolution +/- 0.005°                       |
| Roll Rotation          | Qualitive indication from 0% (Blocked roll) to 100% (Free roll)   |
| Water Spray Efficiency | Qualitive indication from 0% (Occluded) to 95% (Fully functional) |
| Operator Interface     | Rugged tablet PC  |
| Data Trasmission       | WiFi  |
| Battery operative time | 6 hours   |

## BENEFITS

- Removal of the quality defects
- Break-out reduction
- Mould life optimization
- Planning of the CCM Stop for mould and segments replacing
- Reduction of the mould overhauling
- Product quality
- Mould life
- Maintenance cost reduction
- CCM Stop reduction
- CCM productivity





# SCSB

## WATER SPRAY CHECKER

SCSB is a driving measuring instrument composed by digital electronic sensors to detect the presence and intensity of secondary cooling water jets in the Billet/Bloom continuous casting machines.

It's composed by cell bars, a set of pressure membrane sensors, adapted according to the billet/bloom size. An advanced data processing and visualization, provides measurement results at different levels:

- Global result (GO/NOGO)
- Cooling zone or side
- Spray line
- Single sensor cell

The module is installed on dummy bar using a custom designed adapter and execute the measurement cycle during the bottom-to-top or top-to-bottom dummy bar movimentation.

### FEATURES

- Light, versatile and easy to use
- Designed to check the secondary cooling system efficiency
- Results at different levels: side, zone and spray line
- PDF/CSV measurement report
- Wireless communication
- Battery powered
- Transportable compact bag



## TECHNICAL DATA

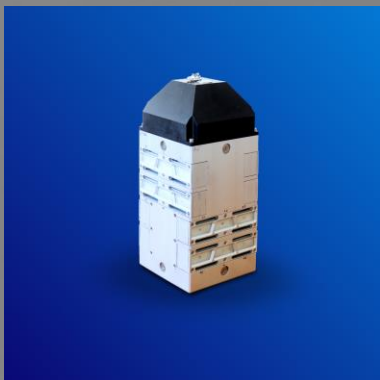
|                        |  |
|------------------------|--|
| Operator Interface     | Rugged Tablet PC   |
| Communication          | Wifi   |
| Form supported         | Billet, Bloom, Round<br>(size as requested)                                |
| Technology             | Electronic pressure sensor   |
| Water Spray Efficiency | Qualitative indication:<br>From 0% (occluded) to<br>100%(fully functional) |
| Battery life           | 8 hours  |
| Environmental IP       | IP67   |
| Weight                 | < 10Kg   |

Measurement data are available through Tablet PC software, SW features includes:

- Graphical results at different levels: side, zone and spray line
- CCM cooling system editor (zone, spray line, spray position, etc)
- PDF/CSV measurement report
- Measure database
- Instrument diagnostic

## BENEFITS

- Prevent quality defects
- Prevent breakouts
- Optimize water spray life
- Reduce maintenance cost
- Optimize plant productivity





# MRGC

## ROLL GAP CHECKER

MRGC is an hand held electronic meter designed to measure the gap between a pair of rolls in continuous casting segment. It's battery powered equipment with an LCD display for indication of actual gap measure, minimum gap value and gap difference vs reference.

The instrument can be customized to the required gap measure range.



### FEATURES

- Light, versatile and easy to use in CCM and Work-shop
- Wide measurement range
- Proper for Billet, Bloom and Slab CCM
- Indication of actual, difference and minimum gap
- LCD display with touchscreen
- Battery powered

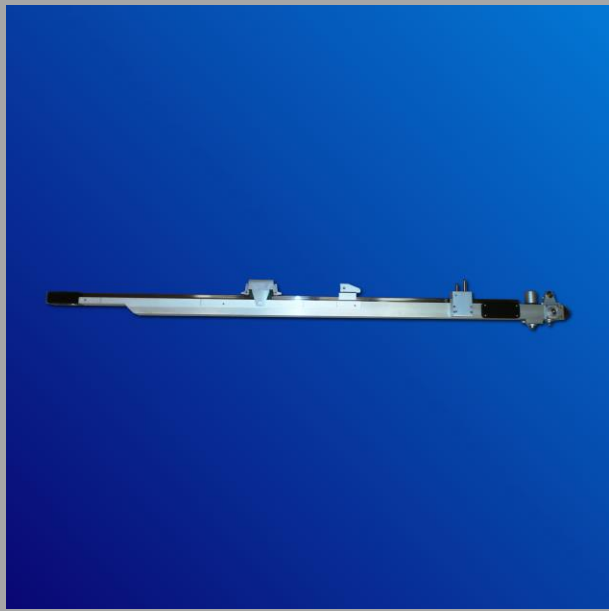


### TECHNICAL DATA

|                        |                        |
|------------------------|------------------------|
| Portable equipment     | Easy to use and read   |
| Gap measure range      | As required            |
| Accuracy               | +/- 0.02 mm            |
| Resolution             | +/- 0.005 mm           |
| Battery operative time | 8 hours                |
| Operator interface     | LCD display with touch |

### BENEFITS

- Accurate and fast detection of roll's gap
- Speed up segments inspection operations on CCM or Workshop
- Maintenance cost reduction
- CCM Stop reduction



# FRC

## FOOT ROLLS ALIGNMENT TOOL

FRC is a foot roll alignment tool. It can be used to check the alignment of foot rolls with respect to the mould taper position, tangent point and bending radius.

It's equipped by a rugged tablet PC where the operator can check on real-time the roll's position error. using the measure error indication, foot roll position can be adjusted for a perfect alignment with the mould.



### FEATURES

- Show the foot rolls position error during the mould assembling
- Lightweight, versatile and easy to use
- Foot roll alignment procedure with operator instructions on a tablet PC
- High accuracy
- Easy calibration procedure
- Battery powered
- Usefull bag for transportation





## TECHNICAL DATA

|                    |                                     |
|--------------------|-------------------------------------|
| Operator Interface | Touch LCD Display                   |
| Accuracy           | +/- 0.01 degrees<br>(+/- 0.1 mm/mt) |
| Technology         | MEMS sensor                         |
| Angle Range        | +/- 5 degrees                       |
| Mould length       | As required                         |
| Battery life       | 6 hours                             |
| Environmental IP   | IP62                                |
| Weight             | ~ 7Kg                               |

## BENEFITS

- Speedup mould and foot rolls assembly operations
- Reduction of break-out or product defects due to the wrong mould vs foot rolls alignment
- Standard procedure for foot rolls positioning and check
- Product quality
- Maintenance cost reduction
- CCM Stop reduction
- CCM Productivity



# RDLS

## ROLL & WATER SPRAY CHECKER

RDLS is an innovative modular system for CCM strand's segments check.

Its lightweight modules are installed on dummy bar for data acquisition during DB movement operations.

The modular system's versatility allows that up to 6 modules can be placed in the DB Head during the normal introduction without waste of production time, allowing the CCM control when desired.

RDLS modules can acquire roll's gap, alignment and rotation status. Using an additional module, it can also check the water spray efficiency.

### FEATURES

- Segment roll's gap, alignment and rotation check
- Secondary cooling system(water spray) efficiency check
- Lightweight module installed on dummy bar
- Top-Bottom or Bottom-Top measure during dummy bar movement
- Quick install/uninstall operation without lifting means
- From 2 to 6 modules installed for up to six lines of measure
- Measure database and measures comparison functions
- Auto calibration
- Wireless and battery powered



## TECHNICAL DATA

|                    |   |
|--------------------|---|
| Operator Interface | Rugged Tablet PC  |
| Communication      | Wi-Fi   |
| Roll Gap           | +/- 0.02 mm (resolution)<br>+/- 0.1 mm (accuracy)                           |
| Roll Alignment     | +/- 0.005° (resolution)<br>+/- 0.05° (accuracy)                             |
| Roll Rotation      | Qualitative indication:<br>From 0% (blocked roll)<br>To 100% (free roll)    |
| Water Spray        | Qualitative indication:<br>From 0% (occluded)<br>To 100% (fully functional) |
| Slab thickness     | From 50mm to 300mm  |
| Battery life       | 6 hours   |
| Environmental IP   | IP62  |
| Weight             | < 20Kg (single module)  |

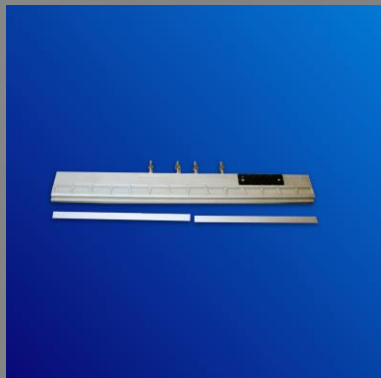
The system can be composed by:

–From 2 to 6 modules for rolls data measurement (every module provides a line of measure for roll gap and alignment)

–An optional water spray check bar

Optionally, modules can be installed on a dedicated shell for permanent installation on dummy bar (In-Chain version).

## RDLS OPTIONS & VARIANTS



SPRAY MODULE



THIN SLAB



IN-CHAIN



# EMTM46

## SLAB MOULD TAPER CHECKER

Steel production on CCM needs accurate, frequent and easy check up of mould status. EMTM46 equipment answers to such needs. It's an accurate, lightweight and easy to use hand held tool for shape and inclination detection of mould plates in slab or blooms CCM. It's designed to be used directly in the casting floor or in the workshop, without any cable connection.



### FEATURES

- Light, versatile and easy to use
- Fast inclination detection of the mould's plates
- Slab, Thin Slab and Blooms CCM
- High accuracy  $\pm 0.01$  degrees
- Real-time measure reading on LCD display
- Auto calibration
- Battery powered



## TECHNICAL DATA

|                    |                                     |
|--------------------|-------------------------------------|
| Operator Interface | Touch LCD Display                   |
| Accuracy           | +/- 0.01 degrees<br>(+/- 0.1 mm/mt) |
| Technology         | MEMS sensor                         |
| Angle Range        | +/- 5 degrees                       |
| Mould length       | As required                         |
| Battery life       | 6 hours                             |
| Environmental IP   | IP62                                |
| Weight             | ~ 7Kg                               |

A systematic control of the geometry of the molds, allows to reach up to 95% of the optimal life, avoids harmful use when unexpected deformations or wear occur.

The advantages deriving from this method are reflected in the reduction in the purchase costs of the molds, on their maintenance and the stops for replacement.

## BENEFITS

- Prevent quality defects
- Prevent breakouts
- Optimize mould life
- Reduce mould costs
- Reduce maintenance cost
- Optimize plant productivity





# EMTM48

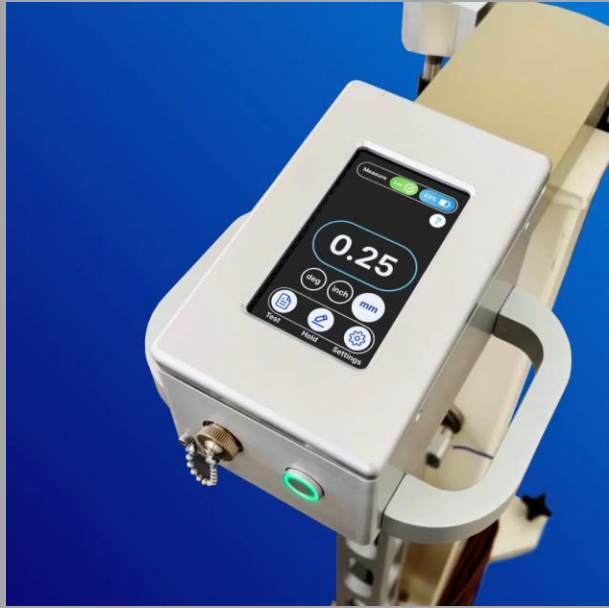
## FOOT ROLLS ALIGNMENT MEASURER

EMTM48 instrument is designed to measure the foot rolls alignment. It measures the angle between the following rolls surface and the gravity axis. The measure is expressed in degrees, and it is indicated on digital display, located on the upper side of the instrument.



### FEATURES

- Accurate foot rolls alignment indication
- Light, versatile and easy to use in CCM and Work-shop
- Proper for Slab and Bloom CCM
- Measure reading in line on the electronic box display
- Auto-calibration
- Battery powered



## TECHNICAL DATA

|                        |                                 |
|------------------------|---------------------------------|
| Portable equipment     | Lightweight and easy to use     |
| Mould length range     | As required                     |
| Angle range            | +/- 15 degrees                  |
| Resolution             | +/- 0.01 degrees<br>(+/- mm/mt) |
| Weight                 | < 10 Kg                         |
| Battery operative time | 6 hours                         |
| Operator interface     | LCD Display with touch          |

## BENEFITS

- Speedup mould and footrolls assembly operations
- Reduction of break-out or product defects due to the wrong mould vs footrolls alignment
- Standard operator procedure for footrolls positioning and check
- Product quality
- Maintenance cost reduction
- CCM Stop reduction
- CCM Productivity



# EMTM33

## FOOT ROLLS ALIGNMENT MEASURER

Proper for maintenance yard use. Computerized assistance for segment assembly. Wide Sizes range. Segment measuring on 4 more axis. Able for straight, curve, multi taper, parabolic,. High accuracy  $\pm 0.01$  mm. Electronic bar flecion compensation, measure reading on line on the electronic display. Acoustic signal during the roll positioning. Elaboration of the measure data by P.C. and showing on graphic and table.

### FEATURES

- Accuracy:  $\pm 0.01$
- Equipment size as client request
- Acoustic and displaying signaling of the roll position during the assembling.
- Data visualization on monitor and print out of tables and graphics

## TECHNICAL DATA

|                        |                                 |
|------------------------|---------------------------------|
| Portable equipment     | Lightweight and easy to use     |
| Mould length range     | As required                     |
| Angle range            | +/- 15 degrees                  |
| Resolution             | +/- 0.01 degrees<br>(+/- mm/mt) |
| Weight                 | < 10 Kg                         |
| Battery operative time | 6 hours                         |
| Operator interface     | LCD Display with touch          |

## BENEFITS

- Accurate footrolls alignment indication
- Light, versatile and easy to use in CCM and Work-Shop
- Proper for Slab and Bloom CCM
- Measure reading in line on the electronic box display
- Auto-calibration
- Battery Powered



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