

# DEVELOPMENTS IN MOISTURE SENSING AND DRYING

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## Lignomat Products

- Hand-held moisture meters
- In-line moisture meters
- Computerized kiln-control systems
- Dry-kiln parts

## Hand-Held Moisture Meters

Pin-type meters

Mini-Ligno Series

Lignometer K - G1000 with memory

Pinless meters

Scanner S, D, and SD

species selection

measuring depth selection



## Pinless Type Meters



*Scanner SD with  
Depth Adjustment*

*1/4" and 3/4"*

*Duo-Tec Meter*

## How Do They Work?

### Pin Meters

Pin meters measure the electrical resistance between two pins. The electrical resistance changes with the water content of wood. If moisture varies within the small measuring area, the highest value is indicated. Built-in corrections are available for different wood species and wood temperatures.

#### Pros

- precise readings and indicates highest moisture in area between pins
- can measure differences between core and surface moisture
- Not affected by surface texture or shape
- With the appropriate electrode one instrument can measure any wood thickness from veneer to thick logs

#### Cons

- leaves two pinholes
- more cumbersome to use

### Pinless Meters

Pinless Meters use electromagnetic wave technology, which measures density in a three dimensional field underneath the instrument. The density or specific gravity changes with the water content of wood. If moisture varies within the segment, the average moisture content is indicated. Built-in corrections are available for different wood species, wood temperatures do not affect moisture readings

#### Pros

- scans large areas quickly
- good indicator for water pockets and areas of higher moisture levels across a broad
- leaves no pinholes

#### Cons

- cannot show differences between surface and core moisture
- requires a smooth and flat measuring surface the size of the measuring pad
- measuring depth of the scanner is crucial

### In-line Moisture Meters

In-line moisture meters are used for

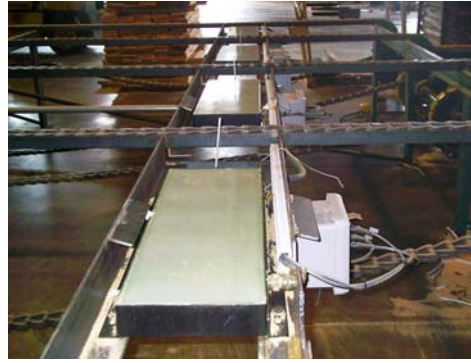
- Quality control for sold product
- Quality control for purchased product
- Performance control for kilns

## How They Look/Work

The Lignomat In-line Moisture Meter applies a new improved technology to the problem of accurately tracking and analyzing each piece of lumber processed at your facility.

Our meter operates using dual frequencies thus allowing for accurate moisture readings regardless of density changes within a species.

Lignomat's In-line Moisture Meter has been shown by independent testing to be one of the most accurate systems available. Lignomat guarantees when the system is operated per our operating instructions a repetition accuracy of  $\pm 0.5\%$  wood moisture or better.



## In-Line Meter for Flooring industry (small pieces)



## Kiln Control Systems

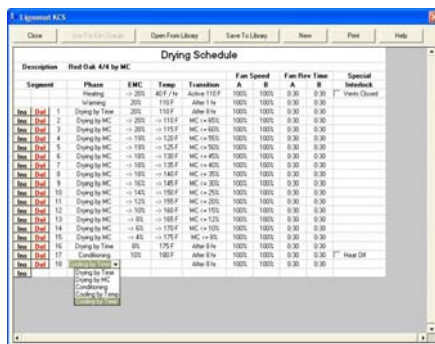
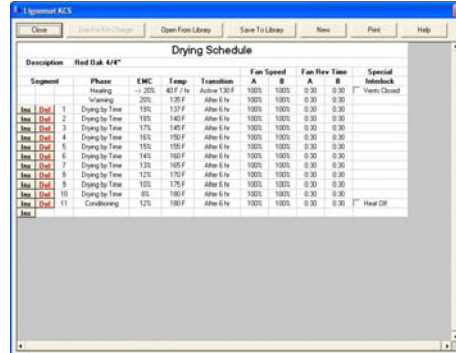
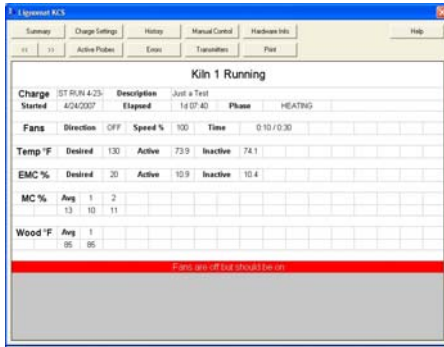
More than 3000 kilns are controlled with Lignomat Systems worldwide.

### Features

- Most flexible and easy to use operator interface
- All digital
- Several methods to determine MC
- Wireless
- Internet compatible
- Less expensive

## Flexible and Easy to Use Software

- Windows based (9x,2000,NT, XP)
- Creating schedules
- Determination of MC in kiln
  - Weighing samples, external scale
  - Wireless probes
  - Wireless in-kiln scale
- EMC or dry bulb – wet bulb
- Time- or MC-controlled schedule



The control box is a very small unit. It is all digital for secure and stable operation.

Wireless probes are available:

- Up to 16 MC and 2 EMC per kiln
- Temperature measurement
- Extremely low power consumption
- Expected lifetime up to 10 years
- Transmit at 900 MHz: no electrical interference
- FCC approval granted



Receiver and MC Transmitter



**Advantages**

- No cables
- Low maintenance
- More accurate readings
- Improved lumber quality
- Shorter drying times
- Less energy consumption

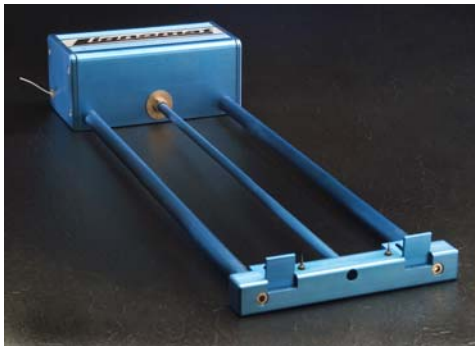
Receiver with T-Sensor



**Applications**

- Dry kiln
- Predrier
- Air drying yard
- Heat treatment
- Conditioning room control

Platform Type Wireless In-Kiln Scale



In-Kiln Scale with Sample Board



**How the scales work**

1. Initialize Scale
  - a. Determining "no load"
  - b. Determining "wet load"
2. Entering MC of sample board, determined by oven-dry test.

Kilns and Kiln Parts

Parts available from Europe, U.S. and Asia

Masonry kilns

Prefab kilns

