

# LFM Pilbara Moisture Analyser for Iron Ore

# LFM

## Moisture Analyser

**Intalysis' LFM Pilbara Moisture Analyser provides continuous, accurate measurement of moisture in the most demanding conveyor handling environments.**

### Application: iron ore operations

The LFM Pilbara is based on the CSIRO-developed Low Frequency Microwave (LFM) Moisture Analyser which has been used extensively by mine and port operators to achieve:

- Accurate rheology control through on-line measurement of ore moisture contents. This allows for precise addition of water from mine to port, helping operators to control dust extinction while keeping moisture below maximum shipping limits.
- Improved stock control and resource extension via enhanced knowledge of blend ratios.

### Description

The LFM technology is based on a microwave transmission measurement system, where microwaves are transmitted through the material from above and received below the belt. The system measures the microwave phase shift and attenuation to determine the moisture content of the material on the belt.

Measurements are not affected by vertical segregation of the material on the belt, are independent of material particle size and belt speed and are effective with both fabric and steel cord belts. The standard LFM system requires an output from a belt weigher to correct for variations in belt loading.

### Key Features

- Effective operation in conditions where microwave attenuation is high
- Large dynamic range for measurement of high moisture content, thick beds or highly attenuating materials
- True continuous moisture measurement



LFM Pilbara Moisture Analyser operating at Yandi Mine, Western Australia

- Rugged, light-weight, low-profile microwave antennae for easy installation
- High-performance, low-frequency microwave electronics which provide exceptional accuracy in demanding climatic conditions
- Inexpensive field maintenance due to easily replaceable electronic modules
- Flexible and user-friendly interface for calibration, operation and diagnosis
- Direct output to plant with industry standard 4-20mA, MODbus serial and Ethernet interfaces
- Diagnostics
- Radio modem communications for remote system diagnostics and operation
- Very low microwave power emitted (about 0.01 to 0.001 of that produced by a mobile phone)

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### Installation

The LFM Pilbara Moisture Analyser installs directly on the production conveyor belt. Installation requires little modification of the existing structures. The system comprises a lightweight antenna supported by customer supplied cross-beam. The LFM instrumentation is enclosed in a compact industrial IP65 enclosure.

The analyser does not contact the material monitored nor does it interfere with the routine operation of the conveyor. Once installed and calibrated the system operates continuously without the need for sampling. The LFM does require input from a belt weigher to provide the necessary weight compensation.

### Specifications

#### Operational

Conveyor width  
Conveyor speed  
Conveyor bed depth

Up to 1600mm from mounting point to belt center as standard  
No limit  
Generally 50-500mm but this is moisture range and mineralogy dependant.  
As a guide typical bed depths are:  
• Hematite fines < 320mm  
• Goethite fines < 400mm. These figures would increase by 10-15% for lump iron ore.  
300mm top size  
Typically 1-14% depending on bed depth  
Instantaneous, output as a rolling average updated at 1-10 second intervals

Material top size  
Moisture range  
Measurement time

#### Performance

Antennae  
Accuracy

Specially optimised for iron ore applications  
Application dependant,  $\pm 0.3\text{wt}\%$  (wet basis) at 1 standard deviation typical.  
This figure excludes the manual sampling precision  
 $\pm 0.1\text{wt}\%$  typical

Resolution

#### Outputs

Plant Interface  
Diagnostic Interface

4-20mA standard  
Error signal to plant, detailed hardware diagnostics

#### Inputs

Belt weigher

4-20mA from belt weigher

#### Electrical

Power

110-240V, single phase 2A supply

#### Environment

Operating temperature range  
Humidity

0-55°C, with protection from direct sun preferred  
0-95% relative humidity (non condensing)

#### Physical

Low profile antennas  
Microwave & control electronics

Transmitter: 340 x 320 x 10mm  
Receiver: 165 x 165 x 10mm (stainless steel/lexan)  
600 x 600 x 220mm Stainless Steel IP65 enclosure  
100kg

Shipping weight

#### Calibration

Customer-supplied, on-line, time-stamped sampling is remotely correlated by Intalysis specialists. Calibration curves are then remotely uploaded by Intalysis via a phone connection. Able to accommodate up to 30 different product calibrations.

#### Optional Accessories

Serial plant interface  
Modem

MODbus output to plant or serial Ethernet  
Landline, GSM or CDMA modems are available. VPN connections can also be made by arrangement

#### Software

Industry standard QNX operating system

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