

# LFM Bowen Moisture Analyser for Coal



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

## Application: coal operations

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

- Accurate moisture control through on-line measurement. This allows for precise addition of water from mine to port, assisting operators to control dust extinction while keeping moisture below maximum shipping limits
- Improved stock control through accurate moisture measurement and tighter blending ratios.

## Description

The LFM Bowen is available in two models:

- LFM Bowen Standard – suitable for medium attenuation situations (typically bed depths of less than 250mm) such as coal processing plants where value pricing is critical. It accommodates one product calibration.
- LFM Bowen Outloader - designed to accommodate high bed depths of coal (500mm at typical moisture contents) such as those occurring at train or ship load outs.

The 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.



Tarek Kazzaz commissioning the LFM Bowen Moisture Analyser at Dalrymple Bay, Queensland

## Key Features

- Effective operation in conditions where microwave attenuation ranges from medium to high
- Large dynamic range for measurement of high moisture content, thick beds or highly attenuating materials
- True continuous moisture measurement
- 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
- 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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# LFM

## Moisture Analyser

## Installation

The LFM Bowen Moisture Analyser installs directly on the production conveyor belt. Installation requires little or no modification of the existing structures. The system comprises a lightweight antenna supported by customer supplied cross-beam and 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

Material top size  
Moisture range  
Measurement time

### Performance

Dynamic Range  
Accuracy  
Resolution

### Outputs

Plant Interface  
Diagnostic Interface panel

### Inputs

Belt weigher

### Electrical

Power

### Environment

Operating temperature range  
Humidity

### Physical

Low profile antennas  
Microwave & control electronics

Shipping weight

### Calibration

### Optional Accessories

Plant interface  
Modem  
Antennae

### Software

Up to 1600mm from mounting point to belt center as standard  
No limit

Bowen Standard model typically 50-250mm in coal  
Bowen Outloader model typically 100-500mm in coal  
300mm top size

5-25% application dependant, substantially higher in lignite  
Instantaneous, output as a rolling average updated at 1-10 second intervals

Bowen Standard model >55dB / Bowen Outloader model >70dB  
Application dependant,  $\pm 0.3\text{wt}\%$  (wet basis) at 1 standard deviation typical  
 $\pm 0.1\text{wt}\%$  typical

4-20mA standard  
Error signal to plant, detailed hardware diagnostics. Outloader has LCD on door of cabinet.

4-20mA from belt weigher

110-240V, single phase 2A supply

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

Transmitter: 340 x 320 x 10mm  
Receiver: 165 x 165 x 10mm (stainless steel/lexan)  
600 x 600 x 220mm Stainless Steel IP66 enclosure  
100kg with packaging

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. The Outloader is able to accommodate up to 50 different product calibrations.

MODbus output to plant (Ethernet or RS232)  
Either PSTN or GSM telephone link  
Outloader has the option of an enhanced antennae for wide belt applications  
Industry standard QNX operating system

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