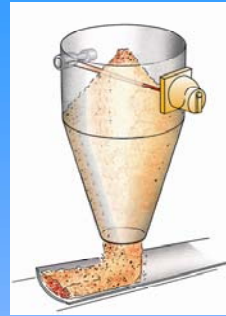


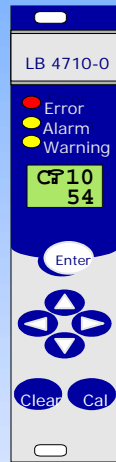
Point Level

Radiometric point level measurements are easy to do under the most abrasive and harsh process conditions. If the process level rises in the range of the radiation field, the product being measured attenuates the beam. A relay contact is opened or closed depending upon the presence of process material in front of the beam. This measurement is highly repeatable and provides excellent reliability in either high or low level applications



LB 471 Mini Switch

- Non -contacting, non- intrusive technology
- Uses either GM tube (single or dual) or Scintillation
 - Easy to use evaluation unit
- Detector count display for easy predictive maintenance
- Works where other technologies fail
- Cost efficient as redundant switch for other technologies
- Works in the most rugged and harshest of environments
- Superior reliability as a primary or redundant technology



LB 471 Mini Switch

Point Level Applications in Mining

Coal	Cement
Ore	Gypsum
Nickel	Limestone
Gold	Bauxite

LB 421 AshAlyzer Ash Monitor

The LB 421 AshAlyzer measures Ash content in coal and other materials using non contacting and non-intrusive technology. The measurement can be made consistently and reliably as well as providing dramatic reductions in operating and maintenance costs.

In addition to Ash content, the LB 421 provides determination of calorific value (BTU) right on the conveyor. As an option, the LB 421 has a package that can provide compensation for moisture changes in the material.



LB 421 showing color touch screen and CPU/electronics

The LB 421 uses an easy to read color touch screen interfaces which make it easy to operate and interpret measurement results. Below are a sample of the views that the color touch screen can provide:

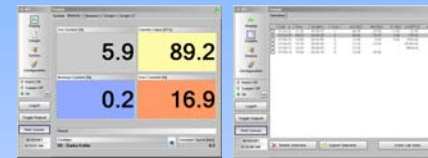


Figure One

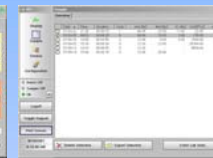


Figure Two

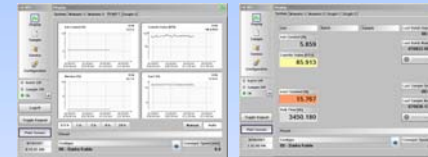


Figure Three



Figure Four

Figure One—Shows ash, BTU, moisture and Iron content

Figure Two—Shows log for laboratory data

Figure Three—Shows graphic displays for the values in Figure One

Figure Four—Shows sample measurement with values and related data

Berthold Technologies-Wildbad Germany

Founded in 1949, Berthold Technologies has been a world leader in radiometric measurement technologies as well as being on the forefront of microwave moisture detection. Corporate headquarters are located in the beautiful Black Forrest area of Southwestern Germany.

Berthold Technologies-USA

Berthold Technologies, USA is located in Oak Ridge Tennessee. It is responsible for Sales, Operations and Service in both North and South America. The office includes Sales, Technical Support, Engineering and Administrative support personnel.



Measurement Solutions for Mining Applications



Bulk Weight Moisture Density Point Level Ash Monitor

Retrofitting older nuclear gauges

99 Midway Lane

Oak Ridge, Tennessee 37830

PH 865 483-1488; Fax 865 425-4309

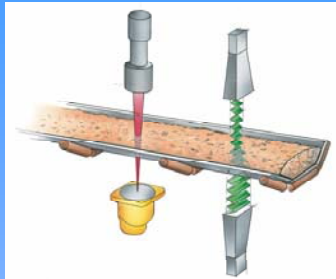
www.berthold-us.com



www.berthold-us.com

Microwave Moisture

Microwave moisture technology has proven to be cost effective for a variety of mining applications. Using FMCW signal transmission, a sweep frequency of 2.7-3.4 GHz is transmitted through the process. A sophisticated frequency regression program insures the most accurate signal processing and produces a highly accurate and repeatable % moisture measurement.



Transmit and receive antenna transmits beam through the process—not just on the surface!

LB 456 Micro Moist

- Berthold Technologies Microwave moisture technology measures through the process—not just on the surface
- Uses FMCW for superior detection and results
- Optional radiometric compensation for varying belt profiles
- 22 frequency regression assures repeatable and accurate output
- Accuracy to .5% -depending upon application



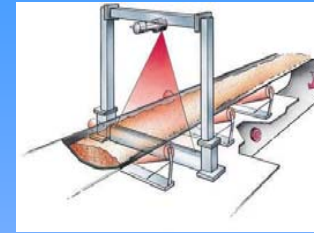
Full function evaluation unit

Selected Moisture Applications

- Nickel Ore
- Coal—Coking
- Gold Ore
- Copper Ore
- Bauxite
- Coal-Coal Preparation
- Lignite Coal

Bulk Weight

Radiometric Bulk Scales are non-contacting and non-intrusive instruments. They use the attenuation method of measurement where a radiometric source shines a beam across a belt (or similar conveyance) to a detector on the opposite side. The detector receives a signal dependent upon the attenuation of the process material. Radiometric Bulk Scales are highly repeatable and do not have the problems of belt tension, counterweight and recalibration as do mechanical bulk weight instruments. They are an excellent measurement product in an industry with harsh and abrasive conditions.



Bulk Scale Sensor showing the rod source and point detector configuration

LB 442 Bulk Scale

- Accurate and repeatable measurement-less than 1%
- Little or no maintenance
- Ability to do belt, chute, screw and bucket conveyor configurations
- Optional tachometer for varying belt speeds
- Variety of configurations to fit any process



LB 442 with frame over belt and point detector

Selected Bulk Weight Applications

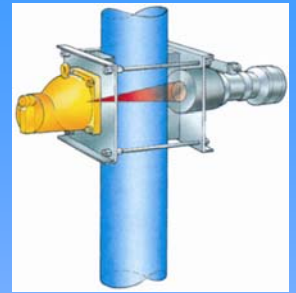
- Soda Ash
- Mineral Ore
- Bauxite
- Coal
- Copper Ore
- Gold Ore
- Potassium



www.berthold-us.com

Density

Berthold Technologies LB 444 provides superior non contacting-non intrusive measurement system for a wide variety of density measurements. The system employs time-tested and proven radiometric technology. Berthold Technologies Density gauges are used throughout the world in a number of mining applications. Their rugged construction assures long life in a variety of harsh process conditions.



Typical Radiometric Density configuration showing source, shielding and detector.

LB 444/LB 491

- Ideal for any type of slurry, (i.e. copper, moly, kaolin, soda ash, lime, coal, gold, magnetite and others)
- Highly sensitive detectors assure low source sizes.
- Available in integrated unit (HART protocol) or remote evaluation unit
- Stainless steel detector housings for long life
- No maintenance required —no replacing intrusive probes or other elements



LB 444 Radiometric Density gauge with 90 degree clamp and mounting configuration.

Retrofitting Older Nuclear Gauges

Benefits of Retrofitting Older Gauges

Saves thousands of dollars in disposal costs

- Adds years of life to existing nuclear sources
- Upgrades electronics to modern state of the art technology detection systems
- No additional licensing involved
- Reduces downtime caused by older or obsolete electronics



Older bulk scales with ion chambers are just one example of great retrofit candidates. Call us and we'll tell you how!