Main Features
- Simple, secure menu-driven operation, with automatic restart upon restoration of power.
- Real-time numerical displays of current ash content, the shift ash content, the current tonnes per hour flow rate and the total shift tonnes.
- Up to four calibrations to handle different coal types.
- Up to eight different coal types can be accommodated.
- User-definable shift pattern with comprehensive end-of-shift reporting.
- Archival and retrieval of shift reports.
- Two 4 to 20mA Analogue outputs which can be set to the current ash content, the shift ash content or the current tonnes per hour flow rate.
- Two Relay outputs (c/o contacts) which can be set to operate on a critical system fault, a non-critical system fault, the current ash content below a target band, within a target band or above a target band.
- User-definable quality parameters (target ash content and desired ash band).
- Downloading of information to Multi-Media-Card (MMC) or RS232 Serial port to allow more comprehensive user analysis (usually in conjunction with other user-supplied data).
- Serial output (RS232/RS485) of percentage ash, tonnage and various other house-keeping data for onward transmission to the customer’s computer control system or the optional Bretby Gammatech Remote Display Unit.

Principle of operation
The dirt associated with mined coal contains higher concentrations of radioactive material than the coal itself. The Ash Eye uses a sensitive detector placed under the conveyor belt. This detector senses the natural gamma variations from the conveyed load. There is also another small detector that senses the natural variations in the background gamma but is shielded from the load. The signals from these two detectors along with tonnes per hour and belt speed signals from a belt weigher are combined using special algorithms to obtain the ash measurement.
Accuracy
The accuracy of the Ash Eye will depend upon the site and the belt weigher. Accuracies of (1 sigma) better than 0.5% ash on final product and between 1 and 3% ash with run of mine (ROM) have been achieved with production systems.

Precision
Precisions in the order of 0.5% are regularly being achieved with final product monitors (Measured to ISO 15239).

Applications
- Run of mine (ROM) or raw coal monitoring.
- Control of diverting system for high ash material.
- Washed coal - for input to washing plant control system.
- In blending control system.
- Final Product Monitoring.
- Monitoring of coal deliveries at Power Stations, Coking Plants and Cement works.

Benefits
- In run of mine (ROM) applications the Ash Eye is being used to identify the sources of dirty coal enabling managers to tackle the problem.
- In a large mining complex a network of Ash Eyes were successfully used to apportion the proceeds on the basis of ash content and tonnage.
- In blending control systems the good use of the Ash Eye information leads to a more consistent blend leading to higher financial proceeds for the coal producer.
- In final product applications the Ash Eye has, in many cases, eliminated the requirement for hourly control samples – significant Heat Error improvements have been achieved – thereby reducing costs and increasing revenue to the user.
- In many in-plant applications the Ash Eye information can be used to give advance warning of problems e.g. changes in gravity levels, blocked chutes etc.
- In power station applications the Ash Eye is often used to identify dirty coal prior to it entering the boilers thus saving costly downtime and boiler cleaning.

Accuracy
The accuracy of the Ash Eye will depend upon the site and the belt weigher. Accuracies of (1 sigma) better than 0.5% ash on final product and between 1 and 3% ash with run of mine (ROM) have been achieved with production systems.

Precision
Precisions in the order of 0.5% are regularly being achieved with final product monitors (Measured to ISO 15239).

Applications
- Run of mine (ROM) or raw coal monitoring.
- Control of diverting system for high ash material.
- Washed coal - for input to washing plant control system.
- In blending control system.
- Final Product Monitoring.
- Monitoring of coal deliveries at Power Stations, Coking Plants and Cement works.
For further information contact:
Bretby Gammatech Ltd, Unit 4 Station Yard, Station Road
Melbourne, Derbyshire, DE73 8HJ. United Kingdom.
Tel: +44 (0) 1332 694594  Fax: +44 (0) 1332 865860
Email: info@bretbygammatech.com
Website: www.bretbygammatech.com

Site Specifications
Conveyor Speed: No limit (usually 1 – 8 m/sec)
Conveyor Width: No limit (usually 800 – 2400 m)
Tonnage rate: No upper limit*
Bed Depth: No upper limit*
*Mass loadings of <25kg/m should be avoided

Electrical Requirements
85 – 264 VAC, 47-440Hz single phase 5A at both the Conveyor site and the Optional Remote Display Unit site

Environmental Requirements
Operating Temperature: -10 to 40°C
Moisture: 5 to 95% relative humidity (non-condensing)

System Inputs
Tonnage Rate: 4-20mA or 0.4-2.0V
Belt Speed: 4-20mA or 0.4-2.0V or <24V pulse per unit of travel
or contact closure if constant speed

System Outputs
2 User configurable analogue outputs of any measured or calculated parameter (4 - 20mA)
2 User configurable alarms, for example High/Low ash (voltage free contacts)
Standard Serial output (RS232)

Shipping Details
Gross weight: 1500 kg (approximate, depends upon conveyor dimensions)
Gross Volume: 4.5m³ (approximate, depends upon conveyor dimensions)

Specifications are subject to change without notice