The ground-breaking Gemini parcel X-ray inspection system from AS&E combines dual-energy transmission with patented Z Backscatter technology for the most comprehensive threat detection available for parcel, baggage, and mail screening. Gemini's unique capability to detect both metallic and non-metallic threats — even in cluttered environments — makes it an invaluable inspection tool for security officials.

POWERFUL COMBINATION OF TECHNOLOGIES

The power of the Gemini system lies in its ability to simultaneously detect both organic and inorganic materials with its combination of dual-energy transmission and Z Backscatter X-rays — two complementary, advanced, and commercially-proven technologies. Together they provide the most information available about the contents of a parcel.

MULTI-TECHNOLOGY

Gemini’s Dual-Energy Transmission X-rays generate a high resolution image in which metallic threats such as guns and knives are easily detected and fine details such as tiny wires that could indicate an improvised explosive device are discerned. Dual-energy transmission technology uses two X-ray energy levels to determine the “effective” atomic number of objects in the parcel and then colorizes the image based on material type.

Gemini’s Z Backscatter X-rays generate an image that highlights organic materials — such as sheet, bulk, and liquid explosives; narcotics; and plastic weapons — frequently missed in transmission-only detection systems. Z Backscatter’s photo-like images facilitate image interpretation and reduce operator fatigue.

SUPERIOR THREAT DETECTION

Simultaneous display of images The electronic clutter in the dual-energy transmission image (top) obstructs views of the threats in the briefcase. The Z Backscatter image (bottom) of the same briefcase exposes the Glock handgun and plastic and liquid explosives.
**OPERATING FEATURES**

**X-Ray Sources**
- Dual-Energy source: 140 keV rated, operating at 140 keV
- Z Backscatter source: 160 keV rated, operating at 140 keV

**Tunnel Opening**
- Width: 25.50” (64.8 cm)
- Height: 17.25” (43.8 cm)
- Length: Unlimited

**Conveyor**
- Continuous operation in normal mode. Auto-return allows one person operation.
- Width: 25.50” (64.8 cm)
- Height: 27” (68.6 cm)
- Capacity: 300 lbs (136 kg)

**System Dimensions**
- Length: 78” (198 cm)
- Width: 33.5” (85 cm)
- Height: 53.25” (135 cm)
- Weight: 1750 lbs (794 kg)

**Throughput**:
- Up to 1,500 parcels per hour
- Transmission beam orientation: Diagonally upwards
- Z Backscatter beam orientation: Vertically upwards

**Temperature**
- Operating: 32°F – 104°F (0°C – 40°C)
- Storage: -4°F – 140°F (-20°C – 60°C)
- Humidity: 5 – 95% relative humidity (non-condensing)

**Power**
- 120 VAC +/- 10%
- 20 AMP single phase
- 220/240 V AC +/- 10%

**IMAGE DISPLAY**

**System Performance**
- Resolution: 40 AWG
- Penetration: Equivalent to 30 mm steel
- Contrast: 16,000 gray levels visible

**Detection Capability**
- Simultaneous transmission and Z Backscatter imaging.
- High resolution dual-energy transmission X-ray provides the ability to detect organic “High Z” objects such as guns, knives, and wires for IEDs and provides metallic and organic discrimination in uncluttered environments.
- Z Backscatter detects organic “Low Z” objects such as explosives, plastic weapons, and drugs.

**Image Analysis Tools**

**Operator’s Console**
- Two high-resolution displays present separate and simultaneous transmission and Z Backscatter images
- ASEInspection Software
- ASEInspection is the Windows-based application software used to convert X-ray data into images. ASEInspection contains a suite of tools for manipulating and enhancing images, and is used for image storage and retrieval.

**ASEInspection Features**
- Mark and Annotate: Attaches pointers and comment fields to images
- Image Save and Restore: Saves images to the hard-drive
- Density Expand: Adjusts the contrast of the displayed image, thus enhancing the differences in objects
- Edge Enhancement: Accents the edges of objects in the image, enabling the operator to recognize objects faster and more readily
- Continuous Zoom: 2x, 3x, 4x, 8x, 16x magnification
- Negative: Displays the normal, “positive” image or the reverse black-and-white “negative” image, thereby enhancing subtle density differences
- Color palette: Adds the ability to evaluate images and regions of interest in greater depth using color

**Dual-Energy Specific Image Analysis Tools**
- View Z: Toggles the image between black-and-white and colors associated with Zeff allowing the operator to better discriminate different materials in the image
- Metallic Stripping: Strips out non-organic material leaving only those colored orange or green, enabling the operator to better identify organic materials
- Organic Stripping: Strips out organic material leaving only those colored blue or green, enabling the operator to better identify inorganic materials
- ASE Frame: Frames high absorption objects automatically, aiding the operator in finding threats
- Auto Enhance: Improves resolution of the image by optimizing contrast throughout, thereby enhancing subtle differences in the image

**SYSTEM FEATURES**

**Operating System:** Windows XPe

**System Options:**
- Inkjet color printer
- Global power conditioning (Sola Regulator) 50 or 60 Hz
- Steel roller tables (3 ft and 6 ft)
- Stainless steel exit trays (18” and 3 ft)
- Remote console capability
- Threat Image Protection (TIP)
- Also available in transmission-only model

**HEALTH AND SAFETY**

**Operator**
- Receives less than 0.1 mR/hr (1.0 μSv/hr) at 2” (5 cm) from cabinet.
- Complies fully with all applicable federal health and safety regulations:
  - Center for Devices and Radiological Health Standards for Cabinet X-ray Systems (21 CFR subchapter J Section 1020.40).

**Film safe**

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