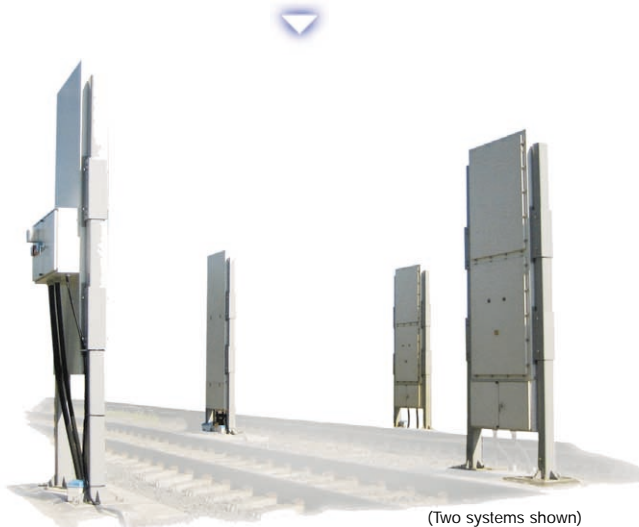


Train/Large Vehicle Portal Monitors

TM-850

Gamma-Neutron train/large vehicle portal monitor



Description

TSA's train/large vehicle monitor TM-850 consists of two self-contained weather resistant pillars placed on either side of the railroad track or roadway to be protected. Each pillar contains two large organic plastic scintillator detectors, four neutron detector blocks with either two or four neutron detectors each, multiple occupancy detectors, and an SCA-775 amplifier/single channel analyzer. The master pillar also has a battery, power supply/battery charger and an SC-770 system controller.

TSA's TM-850 system requires a minimum of two conduits, one to provide ac power to the battery charger, and one for the pillar to pillar connections. A third conduit may be required to route signals to TSA's AM-270 alarm monitor. A relay output is available for connection to the AM-270 alarm monitor or other site security system. TSA's RAVEN (Radiation Alarm and Video Event Notification) monitoring system connects through wired or wireless Ethernet.

The pillars are usually bolted to a concrete footing, with the interconnecting conduits installed under the railroad tracks or roadway. The pillar spacing varies depending on local requirements for sensitivity and traffic.

OPERATION: When the system is powered up, it takes twenty seconds to acquire an initial background. The background is continually updated until the system is occupied.

When the detector senses occupancy, the system starts comparing the current count to the most recent background data. Alarm comparisons are made every 200ms. If the count exceeds the alarm level, both audible and visual alarms will be triggered. The system monitors itself and indicates low and high background conditions. System status is continuously updated on TSA's SC-770 system controller, located in the master pillar.

Specifications

- **SENSITIVITY:**
 - Gamma: Will detect 200g of ²³⁵U (HEU) or 3g of ²³⁹Pu, 50% probability of detection, 95% confidence in a 20 µR/hr background at a passage speed of 5 mph (8km/h).
 - Neutron*: Will detect less than 200g of ²³⁹Pu in a shielded container that reduces the gamma flux to 1% of the unshielded gamma flux.
- **DETECTORS:**
 - Gamma: Two, 48" h x 12" w x 1.5" d (122 x 30 x 4cm) organic plastic scintillator detectors per pillar; provides approximately 3,456 in³ (56.6 liters) of detector volume per system. The scintillator detectors are shielded on four sides with 0.375" (10mm) of lead.
 - Neutron*: 2" diameter x 36" (5 x 91cm) ³He tubes.
- **ALARM INDICATION:** Gamma alarms are indicated by a red strobe light mounted on the master pillar. High and low faults along with other fault conditions are indicated by an amber light. Neutron alarms are indicated by a blue strobe light. Audio alarms are triggered in gamma or neutron alarm conditions.
- **DISPLAY:** Alphanumeric LCD, 4 lines x 16 characters
- **COMMUNICATIONS:** Equipped with RS-232 and Ethernet communications capability
- **POWER REQUIREMENTS:** 90 - 250 Vac, 47 - 63 Hz, less than 100 VA
- **BATTERY LIFE:** Greater than 12 hours of normal operation
- **DIMENSIONS:** 120" h x 48" w x 10" d (305 x 122 x 25cm) per pillar
- **WEIGHT:** ≈1100 lb (499kg) per pillar
- **ENVIRONMENTAL:** -30° to 122°F (-34° to 50°C) Designed for outdoor use in most climates. For extreme conditions, optional heating/cooling is available.
- **OPTIONAL COMPONENTS:** Heaters and Insulation, AM-270, RAVEN monitoring system, ³He tubes

* For neutron detection, contact TSA Systems to determine availability and quantity of ³He tubes.

Applications

TSA's train/large vehicle portal monitor is designed to automatically scan railroad or vehicular traffic without the need for frequent calibration. It is intended for applications where the relatively low energy emissions from ²³⁵U and ²³⁹Pu are the main concern.

The monitor is currently in use where protection of SNM is essential. The unit can be insulated, heated and/or cooled for use in severe environmental conditions.