

# AI1831 Location Interrogator (High Voltage)

## Features

- ▶ Compatible with AT5831 Location Transponder and AP4431 Programmer/Tester
- ▶ Manufactured to high quality ISO 9001-compliant specifications
- ▶ Adjustable data rate
- ▶ Power up self-test
- ▶ Integral test transponder



The high-voltage version of the AI1831 Interrogator is compatible with the AT5831 Location Transponder and the AP4431 Programmer/Tester.

The AI1831 interrogator uses a 125-kHz inductive loop to energize transponder circuits. Transponders couple to the interrogator-generated 125-kHz field, eliminating the need for batteries.

The inductive loop carries an encoded signal. This signal verifies that only the intended transponder is being read. Each interrogator's unique identification code (encoded signal) differentiates between a possible random data reception and a uniquely encoded data reception. All received data is qualified by the interrogator before being transmitted to the trainborne host computer.

Each AI1831 interrogator is designed to prevent interference from nearby AI1831 interrogators. Interrogators placed within 4 meters (13.12 ft) of each other have no degradation in performance.

Systems using the AI1831 interrogator and AT5831 transponder operate through various levels of debris, including snow, water, ice, ballast, grease, oil, mud, and brake/iron dust.

Interrogator output signals include data and the TLS. Both outputs use differential line drivers. The test transponder enable signal uses a differential line receiver.

The test transponder is located within the interrogator and simulates the AT5831 transponder.

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## COMMUNICATIONS

### Frequency Range

2450 MHz  
125 MHz

### OPTIONS

Customer specific part numbers, date of manufacture, and other customer-specified information can be laser etched onto the radome of the interrogator.

## POWER REQUIREMENTS

### Power Source

+110V DC, nonpolarized, 95 W maximum

### Inputs

Test transponder enable, RS-422

### Outputs

Data, RS-485  
TLS, RS-422

## PHYSICAL ATTRIBUTES

### Dimensions

**Size:** 42 x 43.8 x 10.2 cm (16.5 x 17.2 x 4 in.)

**Weight:** 12.1 kg (26.9 lb)

### Case Material

Weatherproof ULTEM

Meets LUL flammability requirements

The AI1831 Interrogator circuitry is enclosed in a weatherproof ULTEM radome and aluminum sandcasting. The case is designed to operate in harsh and fire-sensitive environments. The interrogator ULTEM radome meets London Underground Limited (LUL) flammability and nontoxic smoke emissions requirements and is approved for appropriate use in underground environments.

### Mounting Surface

Train Body

The AI1831 Interrogator can be mounted to any flat smooth metal surface on the underside of a train.

When the mounting surface is nonmetallic or irregular, the AI1831 Interrogator must be mounted to a flat metal backplate.

### Mounting Bolts

M8 x 35 mm (0.315 in. x 1.38 in.)

## ENVIRONMENTAL PARAMETERS

### Operating Air Temperature

-20°C to +55°C (-4°F to +131°F)

### Humidity

95% condensing

### Vibration Tolerance

Designed for rail environment

### Shock

15 g peak, 11 ms, all axes

### Train Velocity

Up to 500 km/hr (310.7 mph)

## STANDARDS

The AI1831 Interrogator is fully compliant with accepted European standards such as the EMC directive (CE Mark) and UK type approval. The AI1831 Interrogator meets the criteria for performance by the appropriate sections of British Railways Board/Railway Industry association specifications RIA12, RIA13, and RIA20.

## LICENSING

### Equipment License

This equipment uses 2450-MHz frequency and thus does NOT comply with FCC frequency allocation requirements for the U.S.

Users in all countries should check with the appropriate local authorities for licensing requirements.

## DOCUMENTATION

*Global Absolute Positioning System (High Voltage) Reference Guide*

## APPLICATIONS

The AI1831 Interrogator can be used as a component of subsystems such as:

- ▶ Automatic train control
- ▶ Positive train control
- ▶ Moving block train control

For more information:

Call **800.923.4824** (Sales Support) | **505.856.8007** (Technical Support)

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