AT5831 Location Transponder

**Features**
- Compatible with AI1831 Location Interrogator and AP4431 Programmer/Tester
- Approved for use in underground environments
- Manufactured to established quality control and transponder sensitivity criteria and ISO 9001-compliant specifications
- Weatherproof, safety-yellow case for harsh and fire-sensitive environments
- Battery-free operation

The AT5831 Location Transponder is a trackbed-mounted location device. The customer-specified fixed data stored in the transponder is provided to the trainborne absolute position reference (APR) system when the transponder is externally interrogated.

An AT5831 transponder receives frequencies of 2450 MHz, 15 MHz, and 125 kHz. Battery-free operation of the AT5831 transponder circuits is provided by inductive coupling to the 125 kHz field generated by the A11831 Location Interrogator. Transponders are inactive until sufficient energy is coupled to provide operating voltages. The 2450 MHz signal is encoded and then reflected back (backscattered) to the interrogator for data decoding.

The AT5831 transponder circuitry is enclosed in a weatherproof Xenoy UV-stabilized case. The Xenoy case is designed to operate in harsh and fire-sensitive environments. The transponder case meets London Underground Limited (LUL) flammability and nontoxic smoke emissions requirements and is approved for appropriate use in underground environments.

Each AT5831 is manufactured to high quality ISO 9001-compliant specifications and must pass a uniformity test according to established quality control and transponder sensitivity criteria. The AT5831 transponder meets the appropriate design requirements sections of British Railways Board/Railway Industry Association specifications RIA13 and RIA20. The transponder also meets International Protections of Enclosures Specification IP67.
**AT5831 Location Transponder**

**COMMUNICATIONS**

**Frequency Range**
- 2445 to 2455 MHz
- 15 MHz, 125 kHz

**POWER REQUIREMENTS**

**Power Source**
- Battery-free
- Inductive (125 kHz)

**PHYSICAL ATTRIBUTES**

**Size**
- 32 x 15 x 6 cm
- (12.6 x 5.9 x 2.4 in.)

**Weight**
- 1.5 kg (3.4 lbs)

**Case Material**
- Weatherproof Xenoy
- UV stabilized
- Meets LUL flammability requirements

**Mounting Bolts**
- M12 x 30 mm
- (0.47 x 1.18 in.)

**Mounting Surface**
- Nonmetallic or metallic

The AT5831 transponder is mounted directly to any flat trackbed surface using M12 x 30 mm or equivalent bolts. Specify if the transponder is to be mounted on a metallic or nonmetallic surface.

**ENVIRONMENTAL**

**Operating Temperature**
- -30°C to +70°C (-22°F to +158°F)

**Shock and Vibration**
- Designed for trackbed environment

**Humidity**
- 95% condensing

**Polarization**
- Length parallel to sleeper (perpendicular to rail)

**OPTIONS**

Factory or Field Programmable. The AT5831 transponder stores up to 768 bits that can be programmed to customer specifications at the factory or in the field with the AP4431 Programmer/Tester (using a 15 MHz signal).

**Laser Etch**
- Customer part number, date of manufacture, and other customer specified data can be laser etched into the case of the transponder.

**ACCESSORIES**

**AP4431 Programmer/Tester**
- The AT5831 transponder can be programmed in the field using the AP4431 programmer. The AP4431 programmer contains serial interface logic for connection to a host PC. The AP4431 programs, tests, and verifies transponder operation.

**AP4431 Programmer Package**
- The AP4431 programmer package is a turnkey field programming package that combines a laptop PC with the AP4431 programmer and TransCore’s APR transponder programming software.

**DOCUMENTATION**

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

**TRANSPONDER APPLICATIONS**

The AT5831 transponder can be used as a component of subsystems such as:

> Automatic train control
> Emergency braking systems
> Positive train control
> Moving block train control