AVI SYSTEM

AUTOMATIC VEHICLE IDENTIFICATION (AVI)

LOW FREQUENCY INDUCTIVE COUPLED COMMUNICATION SYSTEM

Overview

The Model AVI-X-n* transmitter is designed to work in conjunction with either the Model AVI-A-n* receiver or the Model AVI-C receiver. The system provides Automatic Vehicle Identification (AVI) and/or priority access. The Model AVI-X-n* transmitter communicates with either receiver through standard roadway loops. When power is applied the transmitter sends out a continuous low frequency coded signal. This coded signal is permanently programmed into the transmitter at the time of manufacture. The transmitter is ruggedly built and is designed to be securely mounted to the underside of the vehicle and connected to the vehicle’s electrical system.

The Model AVI-A-n* receiver is programmed to identify any one of 19,683 possible codes. When the transmitter code matches the receiver code, the receiver provides a signal (relay contact closure) for external use. The receiver requires no adjustment or setup. The Model AVI-A receiver is a two channel, card-rack type receiver that identifies all codes. Each channel is capable of independently identifying all 19,683 individual transmitter codes and can be programmed to accept or reject each code. The Model AVI-C provides an output signal (relay contact closure or solid state output) for any of the 19,863 possible codes that have been programmed as a valid code. The AVI-C uses two loops (one per channel) installed in the roadway surface to receive transmitter codes. The AVI-C continually monitors the integrity of the loop circuits. The AVI-C receiver includes a DB-9 RS-232 connector that facilitates communication with external equipment.
AVI SYSTEM SPECIFICATIONS

This is a Performance Specification. It is not intended to be used as Operating Instructions.

Model AVI-X-n* Transmitter

General Description: The Model AVI-X-n* Automatic Vehicle Identification (AVI) Transmitter is a small, self-contained device that is easily installed on the underside of a vehicle. When power is applied the transmitter outputs a uniquely coded signal. This signal is picked up by a loop coil mounted in the roadway surface that is connected to a Model AVI-A-n* or a Model AVI-C Automatic Vehicle Identification (AVI) Receiver capable of decoding the transmitted signal.

Transmitter Codes: 19,683 possible transmitter codes.

Setup: The transmitter is operational immediately upon application of power and does not require any adjustment or setup.


Fuse: A one ampere (1 A) fast blow fuse should be installed in the power lead.

Power: 12 VDC version (AVI-X): 11.5 to 15.0 VDC, 135 milliamps maximum. 24 VDC version (AVI-XP): 23 to 30.0 VDC, 73.5 milliamps maximum. 36 VDC version (AVI-XRF): 34.5 to 45 VDC, 54 milliamps maximum.

Ruggedized Construction: To ensure reliable, long term operation, all electronic components are encapsulated in an epoxy-based resin.

Operating Temperature: -40º F to +180º F.

Humidity: Up to 100% relative humidity.

Power Cable: 15 foot unterminated, two conductor shielded twisted pair cable.

Size: Transmitter base - 4.50 inches diameter x 1.00 inch thick. Mounting stud - 0.38 inch diameter (3/8-16 UNC thread) x 3.25 inches long.

Weight: 1.00 lb.

Model AVI-A-n* Receiver

General Description: The Model AVI-A-n* Automatic Vehicle Identification (AVI) Receiver identifies vehicles equipped with a uniquely coded signal transponder and provides a control signal for external use. The receiver uses a loop coil installed in the roadway surface to receive the transmitter's code. The receiver is factory programmed to identify one specific transmitter code and does not require any adjustments or setup. The receiver is operational immediately upon application of power. LEDs on the front of the receiver indicate the presence of power and the presence of a valid coded transmitter within the loop area.

Receiver Codes: 19,683 possible receiver codes.

Setup: The receiver does not require any adjustment or setup.

Receiving Range: The transmitter must be directly above the loop coil embedded in the roadway surface.

Response Time: The receiver will reliably recognize a valid coded transmitter remaining within the area of the loop coil for a minimum of 75 milliseconds.

Presence Time: Once a valid coded transmitter has been recognized, the receiver will output a signal as long as the transmitter is over the loop coil and for a period of two (2) seconds after the transmitter leaves the loop coil.

Loop Coil Area: The maximum area recommended for the loop coil is 150 square feet.

Loop Coil Turns: The loop coil should have a minimum of two (2) turns of wire for loops up to 75 square feet and a minimum of three (3) turns of wire for loops between 75 square feet and 150 square feet.

Loop Feeder Length: The maximum length of loop feeder cable (lead-in cable) is 300 feet.

Power Indicator: A high-intensity, green light-emitting diode (LED) indicates power is present.

Detect Indicator: A high-intensity, red light-emitting diode (LED) indicates the presence of a valid coded transmitter within the area of the loop coil.

Relay Output Ratings: The output relay contacts are rated for maximum continuous current of 6 amps, 300 VAC maximum, 150 VDC maximum, and 180 Watts maximum power.

Power: 120 VAC version (AVI-A-1-n*): 89 to 135 VAC, 50/60 Hz, 6 Watts maximum.

Low voltage version (AVI-A-4-n*): 12.0 to 24.0 VDC / 12.0 to 24.0 VAC, 2 Watts maximum.

Ruggedized Construction: The receiver enclosure is 0.062 inch thick aluminum with a durable powder coated finish. The printed circuit board is 0.062 inch thick FR4 material with 2 oz. copper on both sides and plated through holes. Circuit boards and components are conformal coated with polyurethane.

Lighting Protection: The receiver can tolerate, without damage, a 10 microfarad capacitor charged to 2,000 volts being discharged directly into the loop input terminals, or a 10 microfarad capacitor charged to 2,000 volts being discharged between either loop terminal and earth (chassis) ground.

Operating Temperature: -40º F to +180º F.

Connector: 2 x 22 contact edge connector card (1 per channel) with gold plated female contacts. (See AVI-C Receiver Pin Assignments (2 x 22 Card Edge Connector table.)

Communication Interface Connector: Front panel mounted, nine pin, metal shell, D subminiature receptacle with gold plated female contacts. (See AVI-C Receiver Pin Assignments (DB-9 RS-232 Communication Interface Connector table.)

Size: 4.50 inches high x 1.12 inches wide x 6.875 inches deep (including connector, excluding handle). Handle adds 1.00 inch to depth measurement.

Weight: 6.0 oz.

AVI-A-n* Receiver / Wiring Harness Pin Assignments (Wire Colors refer to Reno A&E Wiring Harness 801-4)

AVI-C Receiver Pin Assignments (2 x 22 Card Edge Connector)

AVI-C Receiver Pin Assignments (DB-9 RS-232 Communication Interface Connector)