Global Traffic Technologies

Canoga™ Traffic Sensing System

Canoga™ 702 Non-invasive Microloop™ Sensors

A Matched Component of the Canoga™ Traffic Sensing System **October 2007**

Description

Canoga™ 702 Non-invasive Microloop™ Sensors are a matched component of the Canoga™ Traffic Sensing System. These traffic sensors provide a unique alternative to other vehicle detection systems when connected to a suitably configured Canoga™ Traffic Monitoring Card or a Canoga™ C900 Series Vehicle Detector.

The Canoga 702 Microloop is a transducer that converts changes in the vertical component of the earth's magnetic field to changes in inductance. Vehicles containing vertical components of ferromagnetic material "focus" the earth's field, increasing the magnetic field at the sensor when vehicles move over the sensor. Changes in inductance can be sensed by a Canoga traffic monitoring card or Canoga C900 series vehicle detector suitably configured for the Canoga 702 Microloop.

The Canoga 702 Microloop sensor's small size permits its easy insertion into a 3-inch (7.6 cm) plastic conduit installed 18–24 inches (46–61 cm) below the road surface. Installing the sensors in a conduit leaves the road surface intact, bypasses the effects of poor pavement conditions and inclement weather, and virtually eliminates maintenance and service requirements.

Features

Canoga 702 Microloop offers superior value compared with other vehicle detection technology. It effectively replaces inductive loops for freeway, counting and intersection applications. When connected to Canoga traffic monitoring cards, Canoga 702 Microloop provides accurate, real-time mean speed, count and occupancy data, and vehicle speed and length classification. When performance and life cycle cost are important, Canoga 702 Microloop provides an industry leading advantage.

Canoga™ 702 Non-invasive Microloop™ Sensor

Superior Value

- Lower life cycle costs.
- No maintenance. Underground, protected from weather and traffic, highly durable Canoga 702 Microloop requires no maintenance.
- Lower service costs. Repair is virtually eliminated. Buried sensors and cables are not affected by environmental factors, pavement deterioration or other mechanical stresses. Sensors can be replaced from the roadside without affecting traffic.
- Lower pavement repair and maintenance costs; the road surface is not damaged.
- Better installation and efficiency; traffic lanes are not closed for long periods of time.
- Better road repair efficiency; resurfacing and surface repairs can occur without affecting detection performance.

Flexibility

The Canoga™ 702 Non-invasive Microloop™ Sensors can be easily repositioned or readjusted to improve vehicle sensing accuracy or to reflect changing traffic characteristics in permanent installations or work zones.

Easy to Install

Conventional, horizontal directional drilling techniques or open trenching are used for installation of the conduit.

Small Size

Canoga 702 Microloop sensors fit into specially designed carriers. Carriers can be inserted in less than an hour into a 3-inch (7.6 cm) Schedule 80 conduit installed 18–24 inches (46–61 cm) below the road surface.

Accurate

Canoga 702 Microloop sensors connected to a suitably configured Canoga™ Traffic Monitoring Card or Canoga™ C900 Series Vehicle Detector provide accurate and highly reliable measurements.

- Closely spaced vehicles can be resolved and adjacent lane vehicles rejected.
- Accurate detection is achieved in every lane and under all environmental conditions, unfazed by rain, snow, wind or fog.

Operating Parameters

- **Earth's Vertical Magnetic Field:** 0.2–0.8 oersted.
- **Inductance (Red to Green Wires):** 50–63 microhenries per sensor plus a nominal 16.5 microhenries per 100 feet (30 m) of lead-in cable.
- **DC Resistance (Red to Green Wires):** 1.2–1.8 ohm per sensor plus a nominal 3.04 ohm per 100 feet (30 m) of lead-in cable.
- **Transducer Gain (Sensitivity):** Typically 5.0 nH per millioersted per sensor at 0.4 oersted ambient vertical field intensity.
- **Canoga 702 Microloop Assemblies:** Available in single, double or triple sensor assemblies with standard sensor separations and connected in series to a lead-in cable which may be up to 1,000 feet (305 m) in length.
- **Home-run Cable:** Canoga™ 30003 Home-run Cable is used to connect lead-in cable to the cabinet. The combined length of home-run cable and lead-in cable may be as long as 2,500 feet (762 m).
- **Maximum Number of Sensors per Channel:** Up to three sensors are recommended per channel.
- **Microloop Peak-to-Peak Drive Current with Canoga Traffic Monitoring Cards or Canoga C900 Series Cards:** The cards must provide between 14 and 80 milliAmp$_{p\text{-}p}$.

Installation

Canoga 702 Microloop sensors are designed to be inserted into a 3-inch (7.6 cm) non-ferrous Schedule 80 conduit.

Conduit is installed 21 ± 3 inches (53.3 ± 7.6 cm) below the road surface using horizontal directional drilling or open trenching techniques.

See Canoga 702 Microloop installation instructions for more information.

Wiring

Multiple Canoga 702 Microloop sets can be wired in series to accommodate different applications. Two independent sensor sets can be connected to a single Canoga 30003. For reliable operation, all splices must be soldered, insulated and waterproofed. See Canoga 702 Microloop installation instructions for detailed wiring instructions.

Environmental

- **Temperature:** -30° F to +165° F (-34° C to +74° C).
- **Relative Humidity:** 100% (including submersion in solutions of chemicals typical of roadway runoff).

Physical Characteristics

- **Sensor:** Cylindrical, 2.25 inches (5.7 cm) high, fitting a .8125 inch (2 cm) hole in the carrier.
- **Lead-in Cable:** Polyurethane-jacketed cable with two PVC insulated AWG #22 conductors. Overall diameter 0.19 inches (0.48 cm).
- **Color:** Black sensor body and black jacketed lead-in cable with red and green insulated wires.

Related Products or Accessories

Canoga™ 702 Non-invasive Microloop™ Sensor Carriers hold Canoga 702 Microloop sensors in a fixed, vertical position as they are inserted into the previously installed, 3-inch (7.6 cm) conduit. The carriers' interlocking mechanism maintains the alignment of the sensors within ± 20° from vertical.

— Physical characteristics of the carrier: 12 inches (30.5 cm) long PVC sensor carrier with an outer diameter of 2.6 inches (6.6 cm).

Canoga™ 702 Non-invasive Microloop™ Sensor Installation Kit is required for each conduit

\(one kit per conduit). The kit contains all of the parts necessary to insert and remove the sensors, to label sensor cables and to close off the conduit ends.

— Physical characteristics of the end cap carrier: PVC tubing 13 inches (33 cm) long and 2.6 inches (6.6 cm) in diameter. The end cap carrier is the first piece to be inserted into the conduit. It has an attached rope that permits removal of the installed Canoga 702 Microloop assembly.

Consult the installation instructions to install the conduit and Canoga 702 Microloop sensors using Canoga 702 Microloop carriers.

3M™ Scotchcast™ 3832 Buried Service Wire Splice Installation Kit is recommended for splicing the lead-in cable with the home-run cable. This wire splice installation kit ensures a reliable connection in the environments encountered by the Canoga 702 Microloop.

Canoga™ 942 or 944 Traffic Monitoring Card for monitoring vehicle speeds, count and occupancy, and for classification of vehicle speeds and lengths.

Canoga™ C922 or C924 Vehicle Detectors for detection of vehicle presence and for traffic count applications.

Canoga™ 30003 Home-run Cable is recommended for all home-runs, especially those exceeding 500 feet.

Canoga™ 702 Non-invasive Microloop™ Sensor Carriers

Canoga™ 702 Non-invasive Microloop™ Sensor Installation Kit

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