



# Canoga™

## Vehicle Detection System

**C800 Interface and Data Acquisition Software (C800 IS)  
C800 Vehicle Detectors**

3M™ Canoga™ Vehicle Detection System

### Description

The 3M™ Canoga™ Vehicle Detection System provides data acquisition for advanced traffic management systems. It consists of C800 Interface and Data Acquisition Software (C800 IS), C800 Vehicle Detectors and inductive vehicle sensors. Its superior detection technology measures vehicle presence and movement with industry-leading accuracy and reliability. Binning features support the collection of traffic data needed for superior system-wide transportation management. A communication link provides remote access to the detector for reading and changing its configuration, for fault identification and verification, and for real-time system monitoring and data acquisition.



— *C800 Vehicle Detector*

## Features

- Provides superior value . . . compared to other inductive traffic data acquisition systems
  - Reduces the need for on-site data collection by using real-time remote traffic data monitoring and data logging.
  - Improves data accuracy and reliability and reduces unnecessary maintenance calls by using real-time remote monitoring of key system parameters and easy identification of loop failures or intermittent loop operation.
  - Reduces investment in communication infrastructure by permitting remote retrieval of data from several C800 detectors using the same communication or “party” line.
  - Reduces maintenance by providing remote configuration of the vehicle detector, eliminating crosstalk and noise induced by power lines.
  - Eliminates investments in additional cabinets, power and communication infrastructure by providing one vehicle detector that supports up to four traffic monitoring stations per mile.
- Promotes ease of use . . . for more efficient operations
  - Helps generate timing for traffic operations with downloaded real-time traffic data.
  - Facilitates efficient, effective detector reconfiguration.
  - Delivers simple and rapid loop diagnostics and calibration by measuring and displaying inductance and inductance changes.
- Flexibility . . . to achieve the goals of advanced traffic management
  - Communicates accurate traffic data to the C800 IS software even when different loop configurations are used.
  - Makes available multiple applications to the user through the same software.
  - Measures vehicle speeds and lengths in English or metric units.
- Information reliability . . . with proven consistency
  - Assures that loop problems are identified immediately and the reliability of the data is known via remote access to diagnostic information and binning of count and occupancy.
- Information accuracy . . . required for advanced traffic management systems
  - Provides accurate traffic information for real time traffic control or traveler information systems.
  - Detects motorcycles or bicycles in the lanes they are traveling without detecting other vehicles in adjacent lanes.

### Real-Time Vehicle Logging

The Real-Time Vehicle Logging application receives the detection data from the serial port of the vehicle detector and displays the information in real time.

Users may select which channels to log and can store a description (9 characters), loop type and the field length for each loop connected to the channel into the non-volatile memory of the vehicle detector. For later analysis, the real-time data can be stored in a file on a disk, or printed.

The following information can be viewed in real-time:

- Log Entry Number
- Channel Number
- Date (Month, Day, Year)
- Time (Hours, Minutes, Seconds)
- Vehicle Speed (miles/hour or kilometers/hour)
- Vehicle Length (feet or meters)
- Detection Duration (msec)
- Loop-Loop Duration (msec)

### Traffic Data Binning

Traffic Data Binning retrieves the binned data collected in the memory of the vehicle detector. The binned vehicle count and occupancy can be viewed by date and time for each channel.

During the initial set-up, the user determines the bin interval and the binning duration (start and end time and date). These parameters determine the number of bins that the software will set up in the vehicle detector in order to bin the data.

Since the overall memory is limited in size, setting the end time to indefinite or too far into the future will eventually fill the memory of the vehicle detector. In this case, the first data collected will be replaced by the new data (the memory data buffer will wrap-around). If a longer binning duration is required, the Model 814 Memory Module is available as an accessory to increase the size of the memory.

## Software Configurable Parameters

The C800 IS software completely configures a C800 or C400 detector from a remote location through its serial port. The following parameters may be set:

### General

Configuration source (switches or EEPROM), oscillator frequency and vehicle count period can be selected for the entire unit.

### Sensitivity/Mode

Seven sensitivity settings (2:1 increments) in pulse or presence mode and an additional sensitivity in pulse mode are available on each channel.

### Communications

- Field modem command string and transmit delay
- Baud rate (1200, 2400, 4800, 9600 and 19200 bps)

One of 127 different programmable addresses and/or 16 different hardwired backpanel addresses may be selected to allow for communication on a party line.

### Password

When the password is enabled, the vehicle detector's configuration is protected from unauthorized access. Real-time activity can be viewed without a password. The software allows selecting and changing the password.

### Timing-Delay/Extend

Green Gating and the Delay or Extend Time can be set for each channel if the detector has been purchased with the timing option.

### Long Loop Counting

The presence of all vehicles can be tracked readily over a long loop if the Long Loop Counting has been enabled and the Threshold Multiplier, Slope Timer and Slope Divisor set to the values suggested by the C800 IS software. Long Loop Counting is available on all channels.

### Directional Vehicle Detection

The Directional Mode must be enabled and a Directional Time Out selected for the Canoga C800 vehicle detector to detect the direction of vehicles traveling over overlapping loops. The Directional Time Out determines the minimum vehicle speed at which the travel direction of the vehicle is detected. For each channel, the duration of the call can be selected to range from 1 to 255 seconds or else the call can be a pulse.

### Microloop

If the vehicle detector is connected to a 701 Microloop or a 702 Non-invasive Microloop, then the Microloop Mode can be enabled and the Reference Setback and Bridge Time set, for optimal performance.

### Outputs

The Status Output can be enabled for TS2 operation and the Call Output Fail-Safe parameters can be set for open loop, shorted loop or >25% inductance change. The pulse duration can be selected from 10-255 milliseconds.

### Noise Immunity

Noise in the loop signal can be reduced by enabling the power line filter (60Hz or 50Hz), selecting different oversampling rates or by disabling or setting the overscan parameter.

### Programmable Adapt Parameters

Background Adapt Rate: The background adapt rate can be disabled or set between 0 and 2.0 thresholds/second in increments of 1/16th thresholds/second.

Recovery Method can be set to normal or fast recovery.

Wash Delay Time can be selected from 6-600 seconds.

Wash Adapt Rate can be disabled, set instantaneous or 1.0 or 2.0 nH/second.

Pulse Rephase Time can be disabled or range from 0.1-25.5 seconds.

The following utilities are available:

### Force All Outputs and LEDs

For each channel, the Detect LED, Call Output, Fault LED and Status Output can be forced to On or Off.

### Reset

The entire vehicle detector or only the detection reference and counts for selected channels can be reset.

## Operating Characteristics

All C800 vehicle detectors are resistant to the effects of lightning strikes and have power loss protection for the programmed parameters.

### Communication

Two serial ports are available for local and remote communication:

- front panel RS232 port
- transmit/receive pins on the card edge connector for multi-drop mode communication

The serial ports may be used with the C800 Interface and Data Acquisition Software (C800 IS) to configure the detector, to identify faults, and to monitor and retrieve real time activity, data logging and binning information from a remote location.

### Tuning Range

20 to 2500 microhenries

### Sensitivity Setting

Sixteen-position push-wheel switch to select either:

- eight Pulse mode sensitivities or
- seven Presence mode sensitivities, or
- Off mode per channel

Any sensitivity or mode change will cause an automatic reset per channel.

### Sensitivity, Threshold, Typical Response Time Values

| Sensitivity Level | Threshold in NanoHenries | Typical Loop System Response Time |
|-------------------|--------------------------|-----------------------------------|
| C                 | 1024                     | <5 milliseconds                   |
| 1                 | 512                      | <6 milliseconds                   |
| 2                 | 256                      | <6 milliseconds                   |
| 3                 | 128                      | <8 milliseconds                   |
| 4                 | 64                       | <12 milliseconds                  |
| 5                 | 32                       | <20 milliseconds                  |
| 6                 | 16                       | <34 milliseconds                  |
| 7                 | 8                        | <64 milliseconds                  |

### Frequency Setting

Three frequency selections per unit.

### Fail-Safe Detect Output

Optically isolated, solid state design provides continuous output in the event of unit failure or power loss to the unit (F-option only).

## C800 Vehicle Detectors

### Edge Connector Terminal Assignments

| Edge Connector Terminal Assignment       |    |                    |                             | Model Number  |    |       |    |               |    |       |    |
|--|----|--------------------|-----------------------------|---------------|----|-------|----|---------------|----|-------|----|
| Non-Component Side (NC)                  |    | Component Side (C) |                             | C822T-        |    | C822- |    | C824T-        |    | C824- |    |
|  |    |                    |                             | C             | NC | C     | NC | C             | NC | C     | NC |
| CH 1 GREEN DC+                           | 1  | A                  | DC GND                      | ■             | ■  |       | ■  | ■             | ■  |       | ■  |
| CH 2 GREEN DC+                           | 2  | B                  | POWER<br>(+10.8 to +37 VDC) | ■             | ■  |       | ■  | ■             | ■  |       | ■  |
| A = CHANNEL 3 GREEN<br>B = DET ADDRESS 3 | 3  | C                  | REMOTE EXT RESET            | A or B<br>(1) | ■  | B     | ■  | A or B<br>(1) | ■  | B     | ■  |
| LOOP IN CH 1                             | 4  | D                  | LOOP IN CH 1                | ■             | ■  | ■     | ■  | ■             | ■  | ■     | ■  |
| LOOP IN CH 1                             | 5  | E                  | LOOP IN CH 1                | ■             | ■  | ■     | ■  | ■             | ■  | ■     | ■  |
| DET ADDRESS 0                            | 6  | F                  | CH 1 OUT +                  | ■             | ■  | ■     | ■  | ■             | ■  | ■     | ■  |
| STATUS OUTPUT CH 1                       | 7  | H                  | CH 1 OUT -                  | (3)           | ■  | (3)   | ■  | (3)           | ■  | (3)   | ■  |
| LOOP IN CH 2                             | 8  | J                  | LOOP IN CH 2                | ■             | ■  | ■     | ■  | ■             | ■  | ■     | ■  |
| LOOP IN CH 2                             | 9  | K                  | LOOP IN CH 2                | ■             | ■  | ■     | ■  | ■             | ■  | ■     | ■  |
| A = CHANNEL 4 GREEN<br>B = DET ADDRESS 1 | 10 | L                  | CHASSIS GND                 | A or B<br>(1) | ■  | B     | ■  | A or B<br>(1) | ■  | B     | ■  |
| NO CONNECTION                            | 11 | M                  | NO CONNECTION               |               | ■  |       | ■  |               | ■  |       | ■  |
| NO CONNECTION                            | 12 | N                  | NO CONNECTION               |               | ■  |       | ■  |               | ■  |       | ■  |
| LOOP IN CH 3                             | 13 | P                  | LOOP IN CH 3                |               |    |       |    | ■             | ■  | ■     | ■  |
| LOOP IN CH 3                             | 14 | R                  | LOOP IN CH 3                |               |    |       |    | ■             | ■  | ■     | ■  |
| DET ADDRESS 2                            | 15 | S                  | CH 3 OUT +                  | ■             |    | ■     |    | ■             | ■  | ■     | ■  |
| STATUS OUTPUT CH 3                       | 16 | T                  | CH 3 OUT -                  |               |    |       |    | (3)           | ■  | (3)   | ■  |
| LOOP IN CH 4                             | 17 | U                  | LOOP IN CH 4                |               |    |       |    | ■             | ■  | ■     | ■  |
| LOOP IN CH 4                             | 18 | V                  | LOOP IN CH 4                |               |    |       |    | ■             | ■  | ■     | ■  |
| DATA TRANSMIT                            | 19 | W                  | CH 2 OUT +                  | (2)           | ■  | (2)   | ■  | (2)           | ■  | (2)   | ■  |
| STATUS OUTPUT CH 2                       | 20 | X                  | CH 2 OUT -                  | (3)           | ■  | (3)   | ■  | (3)           | ■  | (3)   | ■  |
| DATA RECEIVE                             | 21 | Y                  | CH 4 OUT +                  | (2)           |    | (2)   | ■  | (2)           | ■  | (2)   | ■  |
| STATUS OUTPUT CH 4                       | 22 | Z                  | CH 4 OUT -                  |               |    |       |    | (3)           | ■  | (3)   | ■  |

(1) A is the selected function when Green Gating is Enabled and Backpanel Addressing is Disabled using C800 IS.

B is the selected function when Backpanel Addressing is Enabled using C800 IS. Factory default is A.

(2) Refer to Installation Instructions for information on activating these terminals.

(3) Status outputs can be enabled using C800 IS.

Important Notice to the Purchaser

THE FOLLOWING IS MADE IN LIEU OF ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE:

3M will, at its option, either repair or replace any 3M™ Canoga™ Vehicle Detection System component or components found to be defective in materials or manufacture within five (5) years from date of purchase provided the component has been installed, maintained, and used as instructed. This warranty does not apply to components that have been subjected to misuse, neglect or accident or that have been damaged by extreme atmospheric or weather related conditions, including chemical corrosion, hail, windstorm, lightning or flooding.

In no event shall 3M be liable for any injury, loss, or damage, whether direct, indirect, incidental or consequential, arising out of the use or inability to use the Canoga system or any component thereof. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.



**Intelligent Transportation Systems  
3M Safety and Security Systems Division**

3M Center, Building 225-4N-14  
St. Paul, MN 55144-1000

1-800-328-7098  
1-800-224-2085 fax

612-575-5794

**3M Canada Inc.**

P.O. Box 5757  
London, Ontario, Canada  
N6A4T1

1-800-3MHELPS  
519-451-2500