

CANOGA™ | Traffic Sensing System

Canoga™ C924X Vehicle Detector



DESCRIPTION

Canoga™ C924X Vehicle Detectors measure vehicle presence, count and roadway occupancy with industry-leading accuracy and reliability through superior inductive vehicle detection. The Canoga C924X is a four channel vehicle detector and is designed to meet U.S. control cabinet rack standards. It may be configured using Canoga™ C900 Configuration Software. Through the Canoga C900-CS software or via the front panel interface; users are able to easily change a detector's configuration, view binning data, monitor traffic real-time (including speed and length), and view detector status. The Canoga C924X allow remote access through serial ports on the front of the detector and on the back panel connector.

OPERATING CHARACTERISTICS

The Canoga C924X has built-in protection against lightning-induced and other transients. User-programmed settings and vehicle detector-gathered data are stored in non-volatile memory.

COMMUNICATIONS

Two independent serial ports are available for local and remote communications:

- Front panel RS232 port
- Back panel transmit/receive pin connectors for multi-drop RS485 communication

Canoga C900-CS uses the ports for local or remote configuration of the detector and for disturbance identification, to monitor and retrieve real-time activity, and to access data logging and binning information.

FEATURES

Tuning Range

20 to 2,500 microhenries.

Sensitivity Settings

Sixteen sensitivity settings are available per channel:

- Eight "pulse" mode sensitivities, or
- Seven "presence" mode sensitivities, or
- "Off" mode

Frequency Setting

Four frequency settings per channel.

Canoga™ C924X Vehicle Detector senses vehicle presence with industry leading accuracy.

About GTT

Global Traffic Technologies, LLC

(GTT), formed in 2007 from

3M's pioneering Intelligent

Transportation Systems business,

is the manufacturer of Opticom™

priority control systems and

Canoga™ traffic sensing systems.

SOLUTIONS FOR:



Traffic



FEATURES (CONTINUED)

Sensitivity, Threshold and 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

Remote Reset Input

Input allows an external reset of the detector. When input voltage on pin C is pulled below 6 VDC for > 17 milliseconds, the detector resets all active channels and establishes a new reference for each "On" loop within four seconds.

Power On/Off Switch (Reset Switch)

Allows the unit to be disabled or reset while still in the card rack.

Internal Loop Diagnostics

Records and stores type of loop fault and time of occurrence.

Channel by Channel Programmability

All vehicle detection parameters are programmable separately for each channel. This includes the sensitivity, background adapt rate, recovery method, wash delay time and wash adapt rate.

Status Output

Status output "on" when channel is okay.

Switch Output

Opto-isolated Darlington pair switch outputs.

Detect and Fault LED Indicators

Green Detect LED indicators display channel output status and output timing.

- "On" during detection indicates that a vehicle is being detected
- "Flash" indicates that timing is active during delay or extension (with timing option) or direction detection
- Continuous "on" indicates fault condition exists

Red Fault LED indicators display coded messages of current or historical fault status and failure type.

- One long and one short pulse indicates a current open loop
- One long and two short pulses indicate a current shorted loop
- One long and three short pulses indicate current excess inductance change ($\Delta L > 25\%$)
- A 5-second long pulse followed by the flash code for a fault indicates historical fault status

Power LED

- Indicates power is applied to the unit

Canoga™ C900 Configuration Software

Canoga™ C900 Configuration can be run on both PCs and laptop devices. It uses communication ports to access Canoga™ C924X Vehicle Detectors to read and change configuration settings, for disturbance or fault identification and verification, to monitor real-time activity, and to retrieve binned traffic data.

Configuration of Canoga C924X

Canoga C900-CS is used to completely configure Canoga C924X using the RS232 serial port. The following parameters can be programmed per channel:

- Sensitivity/mode and operating frequency.
- Delay or extend time
- Adapt parameters per channel: background adapt rate, recovery method, wash delay time, wash adapt rate
- Traffic sensor parameters
- Long loop counting parameters
- Directional vehicle detection parameters
- Detect LED, call output, fault LED and status output can be forced "on" or "off"

- Configure channel for traffic count and occupancy data selection
Canoga C900-CS is also used to set all other detector parameters:
- Field modem parameters
- Programmable address and password of detector
- Front and rear communication ports
- Synchronization mode
- Vehicle count period
- State of outputs for fault conditions
- Three types of noise filtering
- Pulse re-phase time
- Configure schedule for traffic count and occupancy data collection

Canoga 924X Front Panel Switch Configuration

The following operating parameters for each channel of the C924X loop detector may be set and monitored via the front panel display, and front panel switches.

- Loop Type (Micro-loop or standard inductive loop)
- Delay and Extension Timing
- Mode and Sensitivity Settings
- Frequency (Low Medium High)
- Recovery method (Normal or Fast)
- Pulse or presence mode

Applications — Real-time Activity Monitoring

The real-time activity monitoring application allows monitoring detector activity in real-time from a remote location. The following parameters can be monitored: loop measurements (loop status, loop inductance, loop frequency, reference frequency), last fault or disturbance (type, time and date of occurrence), last vehicle (inductance change, duration of detection, and time and date of detection) and count (vehicle count, directional count and period remaining).

Traffic Data Binning

Traffic data binning retrieves the binned data collected in the vehicle detector memory. Binned vehicle count and occupancy can be viewed by date and time for each channel. Since 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 detector. In this case, the first data collected will be replaced by new data. If longer binning duration is required, the Canoga™ 848 Memory Module is available as an option to increase the memory size.

The table below illustrates the binning duration depending on the indicated binning interval for four channels.

BINNING INTERVAL	ONBOARD MEMORY	MEMORY MODULE
1 minute	21 hours	90 hours
15 minute	13 days	56 days

Real-time Vehicle Logging

Canoga C900-CS receives data from the vehicle detector serial port and displays the information in real-time. Users may select which channel to log and can enter location-specific descriptions.

The following parameters are displayed in real-time calculated by Canoga C900-CS: vehicle speed, detection duration, loop duration and vehicle length. The real-time data may be stored in a file on a disk or printed for later analysis.

Canoga C900-CS can configure the Canoga

C924X for detection of vehicle travel direction. Two overlapping inductive loops are connected to either channels 1 and 2 or 3 and 4.

The travel direction of a vehicle is identified by the directional vehicle count and the directional call in either the first or second channel of the channel pair, depending on the channel chosen for direction detection.

Long Loop Counting

Canoga C900-CS can be used to remotely retrieve long loop counting information from the Canoga C924X.

ENVIRONMENTAL

- Temperature: -29° F (-34° C) to +165° F (+74° C)
- Humidity: 5% to 95% (non-condensing)
- Electrical: 10.8 VDC to 37.8 VDC
 - < 50 milliamperes/channel at 24 VDC
 - 110 milliamperes/unit typical at 24 VDC
 - 55 milliamperes/unit typical at 24 VDC

PHYSICAL DIMENSIONS

- Net Weight: 7.8 oz. (220 g)
- Width: 1.91 in. (4.86 cm)
- Height PC board: 4.5 in. (11.43 cm)
Face plate: 4.5 in. (11.43 cm)
- Depth: 7.1 in. plus .55 in. for handle
(18 cm plus 1.4 cm for handle)

Canoga™ C924X Vehicle Detector

CANOGA™ C924X VEHICLE DETECTOR OPTIONS

Canoga™ 848 Memory Module

The Canoga™ 848 Memory Module is an optional accessory for Canoga™ C924X Vehicle Detector and expands the memory used for traffic data binning. This module increases the standard available binning memory from 16KB to 64KB.

Canoga™ 832 Communication Module

The Canoga™ 832 Communication Module changes the rear TIA485 port to a RS232 port. The Canoga™ 832 module cannot be used when a Canoga™ 848 module is installed, and vice versa.

CANOGA™ C924X VEHICLE DETECTOR BOARD EDGE CONNECTOR TERMINATIONS

PIN	FUNCTION	C924X	PIN	FUNCTION
A	Common Of +24Vdc	•	1	Synchronize Conductor 1
B	+24Vdc (+10.8Vdc To 38Vdc)	•	2	Synchronize Conductor 2
C	Reset External	•	3	NC
D	Channel 1 Loop Input A	•	4	Channel 1 Redundant Loop Input A
E	Channel 1 Loop Input B	•	5	Channel 1 Redundant Loop Input B
F	Channel 1 Switch Output (C)	•	6	NC
H	Channel 1 Switch Output (E)	•	7	Channel 1 Disturbance Signal (OC)
J	Channel 2 Loop Input A	•	8	Channel 2 Redundant Loop Input A
K	Channel 2 Loop Input B	•	9	Channel 2 Redundant Loop Input B
L	Pe (Protective Earth)	•	10	NC
M	NC		11	NC
N	NC		12	NC
P	Channel 3 Loop Input A	•	13	Channel 3 Redundant Loop Input A
R	Channel 3 Loop Input B	•	14	Channel 3 Redundant Loop Input B
S	Channel 3 Switch Output (C)	•	15	NC
T	Channel 3 Switch Output (E)	•	16	Channel 3 Disturbance Signal (OC)
U	Channel 4 Loop Input A	•	17	Channel 4 Redundant Loop Input A
V	Channel 4 Loop Input B	•	18	Redundant Loop Input B
W	Channel 2 Switch Output (C)	•	19	EIA-485-A [RS-232 TX (M832 Option)]
X	Channel 2 Switch Output (E)	•	20	Channel 2 EIA Disturbance Signal (OC)
Y	Channel 4 Switch Output (C)	•	21	EIA-485-B [RS-232 RX (M832 Option)]
Z	Channel 1 Switch Output (E)	•	22	Channel 4 EIA Disturbance Signal (OC)

Shaded means this model has no connection to this pin.

(E) Emitter of Opto-coupler (C) Collector of Opto-coupler (OC) Open Collector/Open Drain NC No Connection

Pins 1 through 22 are on the top (component) side and pins A through Z are on the back (solder side).

Polarization keys are located at three positions: between B/2 and C/3, between M/11 and N/12, between E/5 and F/6.

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