

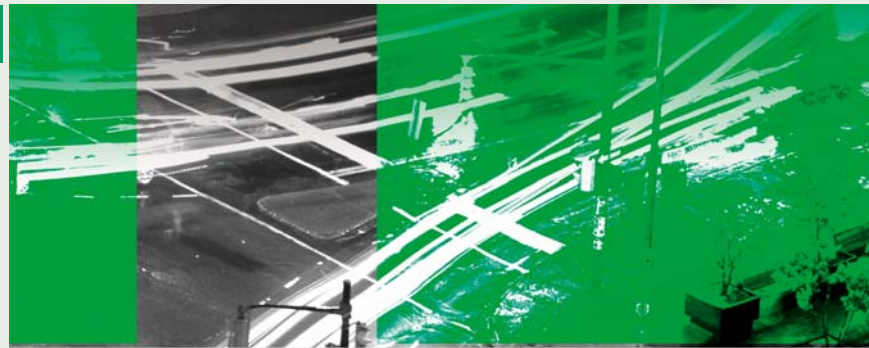
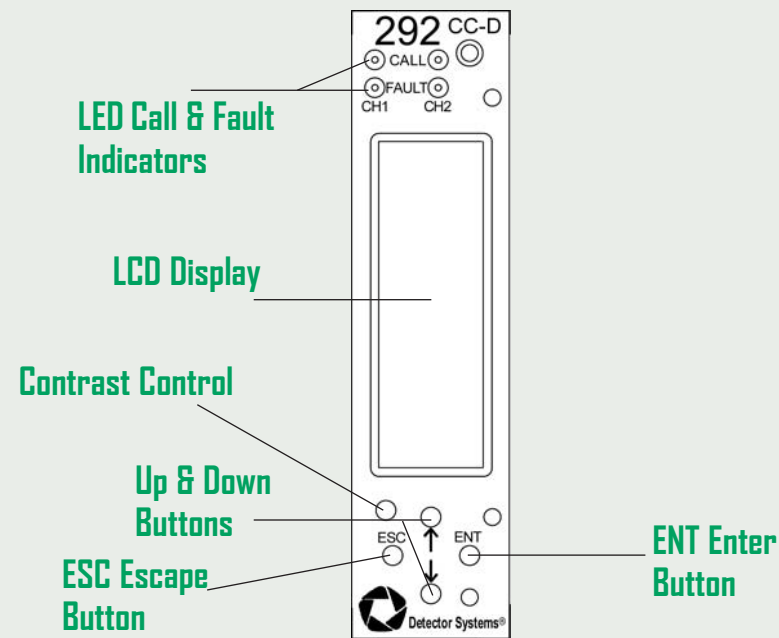
## SPECIFICATIONS

Detector address capability	Four external address pins (pins 3, 6, 10, and 15) provide the capability of activating the detector address feature and provide up to fifteen hard-wired addresses.
Data receive/transmit provisions	External input and output lines provide a means of communicating with the detector to set and read detector parameters. Protocol presently being defined by NEMA Standards Committee.
Operating power	10.8 VDC to 26.5 VDC, 80 milliamps maximum.
Operating temperature	-40°F to +180°F (-40°C to +82°C).
Size	4.5" H x 6.875" L x 1.12" W (114 x 175 x 28 mm). Edge card connector is centered on the 4.5" (114 mm) edge.
Weight	5 oz (170 g)
Connector	2 x 22-pin edge card connector with 0.156 inch (4mm) contact centers. Key slots are located between B and C, E and F, M and N.

### Pin Assignments (P1)

PIN	FUNCTION
A	D.C. Common
1	Ch. #1 Delay/Extension Input
B	D.C. (+) Power
2	Ch. #2 Delay/Extension Input
C	Reset
3	Detector Address Bit #3
4 & D	Loop #1
5 & E	Loop #1
F	Output #1 (Collector)
6	Detector Address Bit #0
H	Output #1 (Emitter)
7	Ch. #1 Status Output
8 & J	Loop #2
9 & K	Loop #2
L	Chassis Ground
10	Detector Address Bit #1
11 & M	(Reserved)
12 & N	(Reserved)
15	Detector Address Bit #2
W	Output #2 (Collector)
19	Data Transmit Output
X	Output #2 Emitter
20	Ch. #2 Status Output
21	Data Received Input

Key slots located between B & C, E & F, M & N.



# MODEL 292CC-D

## FEATURE ENHANCED TWO CHANNEL DIGITAL INDUCTIVE LOOP VEHICLE DETECTOR WITH LCD DISPLAY

### FEATURES & BENEFITS

- ▶ RX/TX communication port.
- ▶ Delay and extension timing.
- ▶ Self-tuning and complete environmental tracking.
- ▶ Two selectable output modes per channel:
  - Presence, normal hold time
  - Pulse
- ▶ Front panel pushbuttons and a front panel graphic LCD display permits menu driven programming of the following functions for each channel:
  - Channel enable/disable
  - Loop frequency
  - Sensitivity
  - Output modes
  - Delay timing
  - Extend timing
  - Maximum presence timing
- ▶ Advanced diagnostic features:
  - Place call using front panel buttons.
  - Loop inductance measurement.
  - %<sup>3</sup> inductance & max %<sup>3</sup>L display.
  - Event log records 9 previous loop faults.
- ▶ Custom channel names (to 5 characters).
- ▶ LCD display & external status outputs indicates individual channel status states as defined by NEMA TS 2.
- ▶ LCD display of vehicle count per channel.
- ▶ Failsafe output for each detector channel.
- ▶ Eight levels of sensitivity per channel.
- ▶ Four loop frequencies per channel.
- ▶ Four address pins allow for detector addressing.

- ▶ Provision for communicating digitally with the detector.
- ▶ Loops are sequentially scanned to minimize crosstalk.
- ▶ High intensity red LED indicators to display detection (call) and fault status for each channel.
- ▶ Complete low power CMOS digital design.
- ▶ Contrast control accessible from the front panel.
- ▶ Transformer isolation for loops.



Exceeds NEMA TS2 Specification



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Specifications are subject to change without notice to reflect improvements and upgrades.



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# MODEL 292CC-D

FEATURE ENHANCED TWO CHANNEL  
DIGITAL INDUCTIVE LOOP VEHICLE  
DETECTOR WITH LCD DISPLAY

## SPECIFICATIONS

**Self-tuning** Operational within one second after application of power or after a reset command. 30 seconds of operation is required before full presence is possible.

**Environmental and drift tracking** Fully self-compensating for environmental changes and component drift over full temperature range and loop inductance range.

**Loop inductance range** 20 - 2000 microhenries with Q factor of 5 or greater.

**Loop feeder length** Up to 5000 feet (1524 m) maximum with proper feeder cable and appropriate loops.

**Loop input** Transformer isolated.

**Loop frequency** Four selectable frequencies (normally in the range of 20 - 80 kilohertz) are provided for each channel.

**Lightning protection** The detector can tolerate, without damage, a 10 microfarad capacitor charged to 2,000 volts to be discharged into the loop terminals or a 10 microfarad capacitor charged to 2,000 volts discharged between either loop terminal and earth ground.

**External reset** Switch closure between D.C. Common (pin A) and the reset line (pin C) for 15 microseconds or longer will reset both detector channels.

**Manual reset**

- ▶ Both channels of the detector may be manually reset by removing power momentarily or by pushing the front panel ESC and ↓ buttons together.
- ▶ An individual channel may be manually reset by changing the sensitivity or frequency for that channel.

**Sequential scanning** The two detector channels are alternately turned ON and OFF to minimize crosstalk.

**Response time** Measured with same sensitivity level settings for both channels.

	MAX		MAX	
	SENSITIVITY	RESPONSE TIME	SENSITIVITY	RESPONSE TIME
Levels 0-4	23	milliseconds	Level 6	45
Level 5	31	milliseconds	Level 7	83

**Output conditions table**

MODE	POWER OK				POWER OUT*
	Normal		Loop Failed		
	Car	No Car	Car	No Car	
PRES (Presence)	Saturated	Off	Saturated	Saturated	Saturated
PUL (Pulse)	Mom.Saturated	Off	Saturated	Saturated	Saturated
STATUS	Displays the last fault recorded in memory since last reset or power up.				

*\* When terminated to a NEMA-defined input.*

**Sensitivity** Vehicle detection results from negative change in loop inductance ( $^{-3}L/L$ ). Note that the detector channel is reset automatically whenever the sensitivity level is changed.

SENSITIVITY	$^{-3}L/L$	SENSITIVITY	$^{-3}L/L$
Level 7	0.01%	Level 3	0.16%
Level 6	0.02%	Level 2	0.32%
Level 5	0.04%	Level 1	0.64%
Level 4	0.08%	Level 0	1.28%

**Detect indicators operation** High intensity red light emitting diodes (LED) indicate a call output for each channel.

**Fault indicators operation** High intensity red light emitting diodes (LED) indicate a past or present fault condition.

## SPECIFICATIONS

**Modes**

- ▶ **PRES:** Presence mode with a hold time of 4 minutes minimum (regardless of vehicle size) and typically 20 to 30 minutes for a car. May be conditioned with delay and extend timing.
- ▶ **PUL:** In the pulse mode, each vehicle generates a pulse output of  $125 \pm 25$  milliseconds. Should a vehicle remain over the loop for 2 seconds or longer, the detector will tune out the vehicle such that the remainder of the loop zone detects subsequent vehicles after 2 seconds. When the vehicle leaves the loop, the detector resumes full sensitivity within 0.75 seconds.

**Call delay time** Programmable from 0-64 seconds in one second increments.

**Call delay inhibit mode** Switch closure (1 volt maximum) between delay inhibit line (ch. 1 - pin 1, ch. 2 - pin 2) and D.C. Common (Pin A) inhibits delay time function for that channel.

**Call extension time** Programmable from 0-25 seconds in 0.5 second increments.

**Call output circuit rating** Darlington transistor optically isolated from each channel output; 36 VDC maximum collector to emitter; 50 milliamps maximum collector current. The transistor saturation level is 1.2 VDC maximum. The output transistor is protected by a 36 volt transorb connected across the emitter and collector.

**Status output circuit rating** An open-drain FET solid state output, with source connected to D.C. common, provides an output for each channel. A 36 volt transorb is connected across the source and drain for transient protection.

**Status output format** Status output conforms to NEMA TS 2. Refer to operator's manual.

**Programming capability** The following functions may be programmed from the front panel for each channel:

- ▶ Channel enable or disable
- ▶ Sensitivity level
- ▶ Output mode (pulse/presence)
- ▶ Frequency
- ▶ Delay timing
- ▶ Extension timing
- ▶ Maximum presence timing

**Graphic display** A front panel 122 x 32 pixel LCD display provides dual functions:

- ▶ During programming mode, displays the various steps in the programming menu.
- ▶ When not in programming mode, displays the operating status of both channels.

**Programming pushbuttons** Pressing the ENT button during norm operation will open the program menu.

- ▶ ↑ or ↓ : Allows scrolling through subheadings and attributes.
- ▶ ENT: Enters selected menu subheading or attribute.
- ▶ ESC: Terminates the program and returns to default operating screen.

**Channel name capability** Channel names displayed on LCD screen can be customized up to 5 characters selected from an alpha/numeric menu.

**Diagnostic capability** The following diagnostic functions may be selected from the front panel:

- ▶ Place call using front panel buttons
- ▶ Loop inductance measurement
- ▶ Percentage  $^{-3}L$  inductance and maximum percentage  $^{-3}L$  display
- ▶ Event log records 9 previous loop faults



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