

## CC & EX Contact Closure Cards

The Sensys Networks VDS 240 Wireless Vehicle Detection System uses pavement-mounted magnetic sensors to detect the presence and movement of vehicles. The magneto-resistive sensors are wireless, transmitting their detection data in real-time via low-power radio technology to a nearby Sensys Networks access point that then relays the data to one or more local or remote traffic management controllers and systems.

### The Sensys Networks CC and EX Contact Closure Cards.

The Sensys Networks VDS240 Wireless Vehicle Detection System can be used with Type 170, NEMA TS1, NEMA TS2, or Type 2070 ATC traffic controllers by installing one or more Sensys Networks contact closure cards into a detector shelf of the controller and connecting them to one or more Sensys Networks access points. The Sensys Networks Master (CC) and Expansion (EX) contact closure cards support this traffic controller interface, converting the real-time detection signals of the Sensys Networks wireless sensors supported by a access point into contact closure signals to the traffic controller.

Each CC and EX card provides one, two, three, or four channels, where each channel comprises an optically isolated contact closure relay and, if configured for TS2 operation, an additional contact closure relay to indicate the channel status. If the sensors supported by an access point require more than the four channels of a CC card, as many EX cards as required (up to 63) can be daisy-chained to the CC card, either via front-panel RJ45 jacks or via rewiring of the backplane connections. Multiple cards may also be needed if the traffic controller shelf has pre-defined functions or phases for each slot.

Each wireless sensor can be mapped to its own individual channel or up to 15 wireless sensors can be mapped to a single channel to effectively “OR” the sensor signals together so that if any of them detect a vehicle, the contact closure relay for that channel will close. In this way, a Sensys Networks VDS 240 Wireless Vehicle Detection System can be easily configured in the same way that inductive loops are configured to interface with a traffic controller.

**Types of Contact Closure Cards.** Sensys Networks offers two types of contact closure cards:

#### CC240, EX240

- Type 170 controllers
- Type 2070 controllers (without status relay)
- NEMA TS1 controllers
- Type 2070 controllers



### CC/EX Card Functions/Features

#### Sensys Networks contact closure interface to traffic controller

- Type 170 controllers
- NEMA TS1 controllers
- Type 2070 controllers
- NEMA TS2 controllers

#### Plugs directly into input file or detector rack without any additional adapter

#### Up to four detection channels per card

- Optically isolated contact closure signals
- TS2 configuration includes status channels

#### Pulse or presence and delay or extension modes

#### Easy installation

- Configured via access point using TrafficDOT
- Optionally configured via front panel switches
- Buzzer to assist in on-site verification

### Sensys Networks AccessBox

#### Junction box wired in-line between CC card and access point

- Routes power from CC card to access point
- Routes vehicle detections to controller via CC card
- Provides wired IP port for WAN connection and/or local management

## CC/EX Cards Functional Specifications

<b>interfaces</b>	<ul style="list-style-type: none"> <li>to/from traffic controller via 2x22 pin edge card connector</li> <li>to/from Access Point via Sensys Networks AccessBox</li> <li>to/from other Sensys contact closure cards                             <ul style="list-style-type: none"> <li>daisychain OUT port of CC or EX card to IN port of next EX card</li> </ul> </li> <li>optionally daisychain via backplane connections</li> </ul>
<b>TS2 status reporting</b>	<ul style="list-style-type: none"> <li>all sensors active on channel                             <ul style="list-style-type: none"> <li>status relay: closed (continuous Low or On state)</li> <li>TS2 state=1 (normal)</li> </ul> </li> <li>no sensors active on channel (no data rec'd in last 60s)                             <ul style="list-style-type: none"> <li>status relay: open (continuous High or Off state)</li> <li>TS2 state=2 (failure)</li> </ul> </li> <li>not all sensors active on channel                             <ul style="list-style-type: none"> <li>status relay: pulse modulation with 150 ms Off time</li> <li>TS2 state=5 (excessive inductance change)</li> </ul> </li> </ul>

## Power, Physical, & Environmental

<b>input voltage</b>	<ul style="list-style-type: none"> <li>via traffic controller backplane</li> <li>11-26 VDC</li> </ul>
<b>power consumption</b>	Up to 5 W (assuming connection to AP240-ESG)
<b>surge protection</b>	GR-1089
<b>AC power cross protection</b>	GR-1089
<b>card dimensions</b>	<ul style="list-style-type: none"> <li>single-slot width with extension to double-slot width</li> <li>single-slot: 7" x 4.5" x 1.1" (18 cm x 11.4 cm x 3 cm)</li> <li>double slot: 7" x 4.5" x 2.3" (18 cm x 11.4 cm x 6 cm)</li> </ul>
<b>accessbox dimensions</b>	2.4" x 1.5" x 0.9" (6 cm x 3.8 cm x 2.2 cm)
<b>weight</b>	<ul style="list-style-type: none"> <li>CC: 5.5 oz (0.16 kg)</li> <li>EX: 5 oz (0.14 kg)</li> </ul>
<b>operating temp</b>	-40°F to 176°F (-40°C to +80°C)
<b>humidity</b>	10 – 95% non-condensing
<b>vibration</b>	MIL-STD-810
<b>transportation vibration</b>	bounce & drop per ISTA Proc. 1A

## CC/EX Card Front Panel User Interface

<b>controls</b>	<ul style="list-style-type: none"> <li>ENTER: configure card with DIP switch/rotary dial settings</li> <li>RESET: ignore events and clear pending events (all channels)</li> <li>rotary switch: 16 settings for card configuration [0-15]</li> </ul>
<b>LEDs</b>	<ul style="list-style-type: none"> <li>CH1, CH2, CH3, CH4: on/vehicle present or no sensors detected; off/vehicle not present or channel disabled;</li> <li>blinking: vehicle detected</li> <li>LINK: on/operational; off/no link; blinking/active</li> <li>FAULT: on/an enabled channel has a fault</li> <li>MONITOR: on/state of selected channel or reconfiguration in process</li> </ul>

## AccessBox Functional Specifications

<b>interfaces</b>	<ul style="list-style-type: none"> <li>to/from Access Point via AP port</li> <li>to/from CC (Master) card via CC port</li> <li>to/from IP device/network via ACCESS port</li> </ul>
<b>circuits</b>	<ul style="list-style-type: none"> <li>Power, one-pair used for access point power (48V nominal)</li> <li>Vehicle detections, one-pair used for half-duplex control bus (RS-485)</li> <li>IP data, two-pair used for 10/100Base-T Ethernet</li> </ul>

## Compliance

<b>Cal Trans</b>	CalTrans TEES (Transportation Electrical Equipment Specifications) – Revision 11/19/1999
<b>NEMA</b>	TS 2-2003 v02.06
<b>FCC</b>	Part 15

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