CarSense 303-L ™

LOGIC INTERFACE

CS CarSense 303
LOGIC INTERFACE

TWO SENSOR OUTPUT	POSITION	PIN	FUNCTION
	0	1	POWER
		2	POWER
A/B LOGIC - SENSOR 1 → 2 RELAY 1	1	3	RELAY 2 N.O.
SENSOR 2 → 1 RELAY 2		4	RELAY 1 N.C.
		5	RELAY 1 COMMON
SENSOR 1 - RELAY 1 PRESENCE	2	6	RELAY 1 N.O.
RELAY 2 PULSE ON ENTRY		7	SENSOR 2
		8	SENSOR 1
SENSOR 1 - RELAY 1 PRESENCE	3	9	RELAY 2 COMMON
RELAY 2 PULSE ON EXIT		10	SENSOR PWR -
		11	SENSOR PWR +
SENSOR 1 - RELAY 1 PRESENCE	4		
RELAY 2 PRESENCE			
SENSOR 1 / SENSOR 2	5		
RELAY 1 PRESENCE			

EMX
MADE IN USA

MODEL CS303-L

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Cautions and Warnings

⚠️ **CE REQUIREMENT: Use CE rated power supply for CE compliance providing suppression as specified by EN61000-4-5.**

Not to be used in safety applications.

IMPORTANT:
This product is an accessory or part of a system. Always read and follow the manufacturer's instructions for the equipment before connecting this product. Comply with all applicable codes and safety regulations. Failure to do so may result in damage, injury, or death.

WARNING:
DO NOT INSTALL THE SENSOR DIRECTLY INTO HOT ASPHALT, see installation section

⚠️ **WARNING:**
Always use photoelectric protection when using the CS303 as a closing detector on a parking arm operator to prevent accidental closing on a car.

Product Overview

The CarSense 303 Logic Interface (CS303-L) works with CarSense 303 Direct Burial (CS303-DB) or CarSense 303 Flat Pack (CS303-FP) magnetoresistive sensors.   Once the sensors have been programmed using the CarSense 303 Controller (CS303-C-1), the sensors store the settings and can operate independent of the controller.

The Logic Interface allows one or two sensors to be connected and provides 6 different logic functions and two sets of relay outputs, one form A and one form C.

These functions include:

- AB Directional Logic
- Pulse on Entry
- Pulse on Exit
- Common Relay operation
- Discrete Relay operation
- Dual Relay operation

*For more information regarding these functions and how they work, see page *

Specifications

Specifications	
Power Indicator	Green LED
Detect Indicator	2x Red LEDs
Configuration Selector	10 position rotary switch
Outputs	Relay 1: SPDT (form C) Relay 2: SPST (form A)
Maximum Output Ratings	1A @ 24 VDC/120 VAC
Operating Environment	-40° C...82° C (-40° F...180° F) 0...95% relative humidity
Housing Material	ABS
Enclosure	IP30
Power (see Cautions and Warnings)	12-30 VDC or 24 VAC
Operating Current (Standby/Detect)	One sensor connected: 22/35mA Two sensors connected: 33/60mA
Supply Protection Circuitry	Reverse polarity and fuse protected
Dimensions	73mm (2.9") x 38mm (1.2") x 78mm (3.1")
Weight	0.25 lbs. (113 g)
Connector	11 pin male connector (JEDEC B11-88)

NOTE: Refer to CarSense 303 Operating Instructions for operation and installation of controller and sensor.

Operation

Power Up

Upon power up the detector initializes: all three LEDs will flash on, then off. The green LED indicates that the detector is powered and operational. Relay1 and Relay2 LEDs indicate when Relay1 or Relay2 is activated, respectively.

Note that the sensor must be installed and programmed using a CS303-C-1 prior to connection to the CS303-L. The CS303-L only monitors the sensors' NPN outputs and cannot be used to change operation settings in the sensor.

Set the Configuration Selector Switch

Presence detection is determined by the settings programmed to the CS303-DB / CS303-FP connected. Refer to the CS303 Operating Instructions when installing the sensor(s) (CS303-DB / CS303-FP) to determine sensor settings appropriate for your application.

Rotary Switch	Mode	Behavior
0	Discrete Relays	Relay1: Active while Sensor1 is active
		Relay2: Active while Sensor2 is active
1	AB Directional Logic	Relay1: Activates when Sensor1 and then Sensor2 activates
		Relay2: Activates when Sensor2 and then Sensor1 activates
2	Pulse on Entry	Relay1: Active while Sensor1 is active
		Relay2: 500ms pulse when Sensor1 activates
3	Pulse on Exit	Relay1: Active while Sensor1 is active
		Relay2: 500ms pulse when Sensor1 deactivates
4	Dual Relays	Relay1: Active while Sensor1 is active
		Relay2: Active while Sensor1 is active
5	Common Relay	Relay1: Active while Sensor1 or Sensor2 is active
		Relay2: 500ms pulse when Sensor1 or Sensor 2 activate
6 … 9	Invalid	Relay1: Inactive
		Relay2: Inactive

Discrete Relays

While operating in Discrete Relays mode, Relay1 will activate and remain active while a vehicle is detected by Sensor1. Relay2 will activate and remain active while a vehicle is detected by Sensor2.

AB Directional Logic

AB Directional Logic mode is capable of determining the direction of travel of a vehicle using two sensors. Two sensors are installed in the direction of travel to provide input.
If a vehicle is detected by Sensor1 and then Sensor2, Relay1 will activate and remain active while the vehicle is detected by Sensor2.
If a vehicle is detected by Sensor2 and then Sensor1, Relay2 will activate and remain active while the vehicle is detected by Sensor1.
When using the AB Directional Logic function, the sensors should be installed 1 meter (40") apart.

Pulse on Entry

Pulse on Entry provides mode presence (Relay1) and pulse (Relay2) outputs. When a vehicle is detected by Sensor1, Relay1 will activate and remain active while the vehicle is present, Relay2 will activate for 500ms and then remain inactive.

Pulse on Exit

Pulse on Exit mode provides presence (Relay1) and pulse (Relay2) outputs. When a vehicle is detected by Sensor1, Relay1 will activate and remain active while the vehicle is present, Relay2 will be inactivate until the vehicle is undetected, then Relay2 will activate for 500ms and then deactivate.

Dual Relays

Dual Relays mode allows for the operation of both Relay1 and Relay2 by Sensor1. While a vehicle is detected by Sensor1, both Relay1 and Relay2 will be active.

Common Relay

Common Relay mode allows for the operation of Relay1 and Relay2 by both Sensor1 and Sensor2. When a vehicle is detected by either Sensor1 or Sensor2, Relay1 will remain active while the vehicle is detected, Relay2 will activate for 500ms and then remain inactive.

Invalid

While the rotary switch is set to positions 6, 7, 8, or 9, the relays will remain inactive and all three LEDs on the unit will flash on and off once per second.

Controls and Indicators

CONFIGURATION SELECTOR

Function	Position 0...9
Discrete Relays	0
AB Directional Logic	1
Pulse on Entry	2
Pulse on Exit	3
Dual Relays	4
Common Relay	5
Invalid	6...9

POWER

Power	On/Off

RELAY 1

Relay 1	On/Off

RELAY 2

Relay 2	On/Off
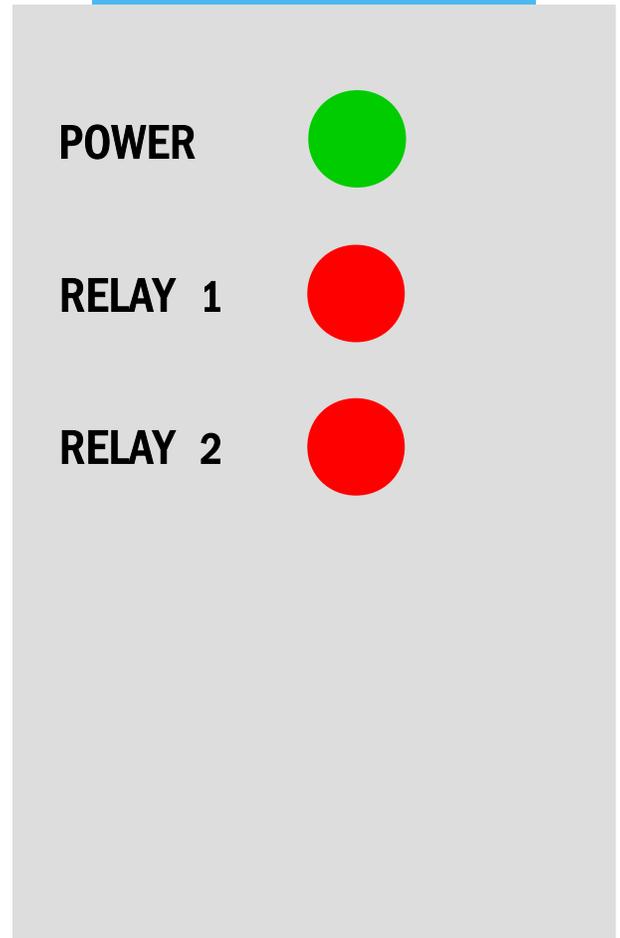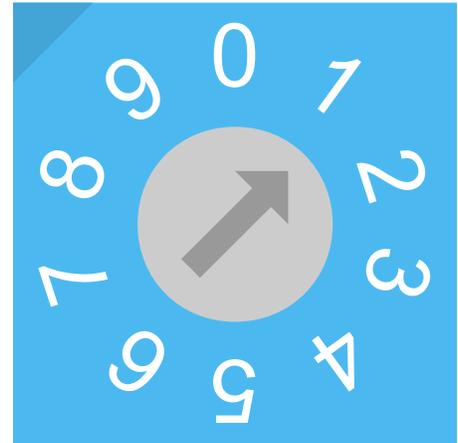
Connections

Pin	Description	Sensor #1 wire	Sensor #2 wire
1	Power (12 – 24 VDC/VAC)	-	-
2	Power (12 – 24 VDC/VAC)	-	-
3	Relay2 – NO	-	-
4	Relay1 – NC	-	-
5	Relay1 – COM	-	-
6	Relay1 – NO	-	-
7	Sensor2 Input	-	White
8	Sensor1 Input	White	-
9	Relay2 – COM	-	-
10	Sensors Power (–)	Blue	Blue
11	Sensors Power (+)	Brown	Brown

NOTES:
1) Refer to Operator Instruction for power and relay/control connections
2) Protect RED and GREEN wires from the sensor using electrical tape or other suitable electrical insulation

Troubleshooting

Symptom	Possible Cause	Solution
All LEDs flash, one second cycle	Invalid rotary switch selection	Set rotary switch to a valid setting (0-5)
Red LED flashes, relay clicks, unstable	Poor connection for Sensor1 or Sensor2	Check and fix connection If only one sensor is used, set rotary switch to a valid position for 1 sensor
Green and Red LEDs flash simultaneously	Insufficient supply voltage	Make sure the power supply is working correctly and properly rated according to connections table (see above)

Installation

1. Refer to CarSense 303 Operating instructions for installation and set-up of the sensors for proper operation. All settings are stored in the sensors for stand-alone operation.

2. CS303-L monitors the NPN outputs from the sensors and does not provide the ability to change sensor (CS303-DB / CS303-FP) settings.

3. When using the AB Directional Logic function, the sensors should be installed 1 meter (40") apart in the axis of travel.

4. When wiring the sensors to the CS303-L:
    a. The brown wire from both sensors goes to pin 11 on the CS303-L
    b. The blue wire from both sensors goes to pin 10 on the CS303-L
    c. The white wire from one sensor goes to pin 8 (Sensor1 Input) on the CS303-L
    d. The white wire from the other sensor goes to pin 7 (Sensor2 Input) on the CS303-L
    e. Protect RED and GREEN wires from the sensor using electrical tape or other suitable electrical insulation

Ordering Information

- **CS303-L   CarSense 303 Logic Interface**

Warranty

EMX Industries Incorporated warrants all products to be free of defects in materials and workmanship for a period of two years under normal use and service from the date of sale to our customer. This warranty does not cover normal wear and tear, abuse, misuse, overloading, altered products, damage caused by incorrect connections, lightning damage, or use other than intended design.

There is no warranty of merchantability. There are no warranties expressed or implied or any affirmation of fact or representation except as set forth herein.

EMX Industries Inc. sole responsibility and liability, and the purchaser's exclusive remedy shall be limited to the repair or replacement at EMX Industries option of a part or parts found not conforming to the warranty. In no event shall EMX Industries Inc. be liable for damages, including but not limited to damages resulting from non-conformity, defect in material or workmanship.

Effective date: January 1st, 2002

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