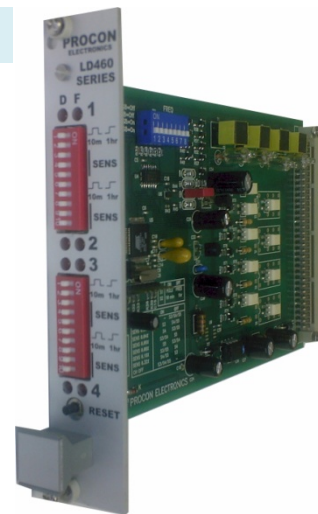# PROCON ELECTRONICS

Eurocard Loop Detector

Model – LD462 Series

The LD462 is a Eurocard four channel inductive loop detector designed for traffic control applications.

The detector uses loop multiplexing to prevent crosstalk between adjacent loops and is easy to set-up and install.

The LD462 uses the latest ARM7 32bit processor for peak performance.

Applications

Typical applications in the traffic environment are traffic control (traffic lights), toll systems and vehicle counting.

Features

Reset Switch. Pressing the reset switch enables the detector to be manually reset during commissioning and testing. This results in the detector re-tuning the sensing loop and becoming ready for vehicle detection.

Switch selectable Sensitivity. The detect sensitivity is the minimum change in inductance required to produce a detect output. ($\%\Delta L/L$). Seven sensitivity settings are available on the switches to allow flexibility in configuration.

Switch Selectable Frequency. The frequency of the loop is determined by the inductance of the loop and setting of the frequency. Four frequency settings are available to prevent cross-talk between adjacent loops on different detectors. The frequency switch changes the frequency on all loops at the same time.

Presence / Passage feature. Each channel can be individually setup to operate in presence or passage mode.

Selectable Presence Time. Each channel can be individually setup for a presence time of 10 minutes or 1 hour.

Channel Disable feature. This feature disables an unused channel so that the disconnected loop terminals do not result in a fault output.

Fault output for each channel. Each channel has a opto-coupler fault output. Also included is a master fault out for the whole detector.

Indicators

Detect Indicator. This LED Indicator is illuminated when there is a vehicle over the loop or the loop is faulty. This LED can also be used to determine the loop frequency. On reset, count the number of times the LED flashes. Multiply this number by 10KHz.For example: if the LED flashes 6 times, then the loop frequency is between 60KHz and 70KHz.

Loop Fault Indicator. This LED Indicator is illuminated when the loop is either open circuit or short circuit and is used to give a visual indication of a faulty loop.

Technical Specifications

Power supply	19.6 - 28.8 VDC
Processor	32 bit ARM7 @ 50Mhz
Presence Output (LD462) Relays	0.5A/220VAC . (Fail Safe - The channel output will go into detect if a loop fault is detected or the power fails.)
Presence Output (LD462O) Optocouplers	These outputs are a normally open solid state transistor output rated at 50mA/24VDC.
Fault Outputs (x5) Optocouplers	These outputs are a normally open solid state transistor output rated at 50mA/24VDC.
Indicators	LED indicators show: Detect state and Loop Fault.
Detector tuning range	15 - 1500uH
Loop Frequency	Approx. 23 – 130KHz (Multiplexing)
Environmental tracking	Automatic Compensation
Protection	Loop isolation transformer with zener diodes and gas discharge tube.
Connector	DIN 41612 Form B.
Dimensions	160mm X 100 X 25mm
Operating Temperature	-40°C to +80°C
Storage Temperature	-40°C to +85°C

Switch Settings (Front Panel x 4)

LD462 Switch Settings			
Switch No.	**Function**	**ON**	**OFF**
1	Relay Mode	Pulse	Presence
2	Presence Time	10 min.	1 hr.
3,4,5	Sensitivity 0.02%	-	S3/S4/S5
3,4,5	Sensitivity 0.03%	S3	S4/S5
3,4,5	Sensitivity 0.04%	S4	S3/S5
3,4,5	Sensitivity 0.06%	S3/S4	S5
3,4,5	Sensitivity 0.08%	S5	S3/S4
3,4,5	Sensitivity 0.16%	S3/S5	S4
3,4,5	Sensitivity 0.32%	S4/S5	S3
3,4,5	Channel Disable	S3/S4/S5	-

S1
S2
S3
S4
S5
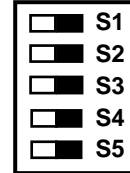
Switch Settings (SW4)

LD462 Switch Settings			
Switch No.	**Function**	**ON**	**OFF**
1	Test Mode	On	Off
2	Anti-Lock	On	Off
3	Auto Retune	On	Off
4	Power Save	On	Off
5	-	-	-
6	-	-	-
7,8	Frequency Hi	-	S7/S8
7,8	Frequency Med. Hi	S7	S8
7,8	Frequency Med. Lo	S8	S7
7,8	Frequency Lo	S7/S8	-

S1
S2
S3
S4
S5
S6
S7
S8
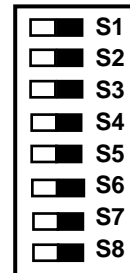
Output Functionality

OUTPUTS		VEHICLE PRESENT	NO VEHICLE	LOOP FAULTY	NO POWER
PRESENCE RELAY (LD462)	N/O	CLOSED	OPEN	CLOSED	CLOSED
	N/C	OPEN	CLOSED	OPEN	OPEN
PRESENCE OUTPUT (LD462O)	N/C	OPEN	CLOSED	OPEN	OPEN
FAULT OUTPUTS	N/C	CLOSED	CLOSED	OPEN	OPEN

Diagnostics

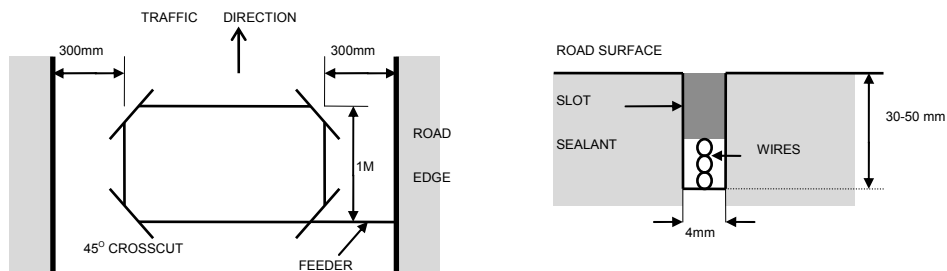| SYMPTOM	POSSIBLE CAUSE	SOLUTION
The DETECT LED flashes erratically.	There may be a poor connection in the loop or loop feeder. The detector may be experiencing crosstalk with the loop of an adjacent detector.	Check all wiring. Tighten screw terminals. Check for broken wires. Try changing frequencies using the frequency switch. Put the detector with the larger loop onto low frequency and the detector with the smaller loop onto high frequency.
The DETECT LED randomly stays on.	Faulty loop or loop feeder wiring. Movement of the loop in the ground.	Check the wiring. Tighten screw terminals. Check for pinched or bent wires. Is the feeder wire twisted? Check for cracks in the road surface near the loop.
The LOOP FAULT LED is permanently illuminated.	The loop inductance is too small or the loop is short circuit. The loop inductance is too large or the loop is open circuit.	Check that there is no short circuit on the loop feeder wiring or the loop. If there is no short circuit then the inductance is to small and more turns of wire should be added to the loop. Check that there is electrical continuity on the loop. This can be done using a multimeter on the ohms range ($< 5\ \Omega$). If the loop inductance is too large then try reducing the number of turns.

Terminal Wiring (LD462)

TERMINAL	FUNCTION	TERMINAL	FUNCTION
1a	CH1 Output Relay N/C	1b	CH1 Fault +ve
2a	-	2b	CH1 Output Relay Common
3a	CH1 Output Relay N/O	3b	CH1 Fault –ve
4a	-	4b	Master Fault +ve
5a	CH1 Loop Input	5b	-
6a	-	6b	CH1 Loop Input
7a	Master Fault +ve	7b	-
8a	CH2 Fault +ve	8b	CH2 Output Relay N/C
9a	CH2 Output Relay Common	9b	-
10a	CH2 Fault -ve	10b	CH2 Output Relay N/O
11a	Master Fault -ve	11b	-
12a	-	12b	CH2 Loop Input
13a	CH2 Loop input	13b	-
14a	-	14b	-
15a	CH3 Output Relay N/C	15b	CH3 Fault +ve
16a	-	16b	CH3 Output Relay Common
17a	CH3 Output Relay N/O	17b	CH3 Fault –ve
18a	-	18b	-
19a	CH3 Loop Input	19b	-
20a	-	20b	CH3 Loop Input
21a	-	21b	-
22a	CH4 Fault +ve	22b	CH4 Output Relay N/C
23a	CH4 Output Relay Common	23b	-
24a	CH4 Fault -ve	24b	CH4 Output Relay N/O
25a	-	25b	-
26a	-	26b	CH4 Loop Input
27a	Ch4 Loop Input	27b	-
28a	-	28b	-
29a	External Reset (active low)	29b	-
30a	-	30b	+24V DC
31a	-	31b	-
32a	-	32b	0V DC

Terminal Wiring (LD462O)

TERMINAL	FUNCTION	TERMINAL	FUNCTION
1a	CH1 Output +ve	1b	CH1 Fault +ve
2a	-	2b	CH1 Output –ve
3a	CH1 Output +ve	3b	CH1 Fault –ve
4a	-	4b	Master Fault +ve
5a	CH1 Loop Input	5b	-
6a	-	6b	CH1 Loop Input
7a	Master Fault +ve	7b	-
8a	CH2 Fault +ve	8b	CH2 Output +ve
9a	CH2 Output -ve	9b	-
10a	CH2 Fault -ve	10b	CH2 Output +ve
11a	Master Fault -ve	11b	-
12a	-	12b	CH2 Loop Input
13a	CH2 Loop input	13b	-
14a	-	14b	-
15a	CH3 Output +ve	15b	CH3 Fault +ve
16a	-	16b	CH3 Output –ve
17a	CH3 Output +ve	17b	CH3 Fault –ve
18a	-	18b	-
19a	CH3 Loop Input	19b	-
20a	-	20b	CH3 Loop Input
21a	-	21b	-
22a	CH4 Fault +ve	22b	CH4 Output +ve
23a	CH4 Output -ve	23b	-
24a	CH4 Fault -ve	24b	CH4 Output +ve
25a	-	25b	-
26a	-	26b	CH4 Loop Input
27a	Ch4 Loop Input	27b	-
28a	-	28b	-
29a	External Reset (active low)	29b	-
30a	-	30b	+24V DC
31a	-	31b	-
32a	-	32b	0V DC

Loop Installation Guide

1. The detector should be installed in a waterproof housing as close to the loop as possible.
2. The loop and feeder should be made from insulated copper wire with a minimum cross-sectional area of 1.5mm^2. The feeder should be twisted with at least 20 turns per metre. Joints in the wire are not recommended and must be soldered and made waterproof. Faulty joints could lead to incorrect operation of the detector. Feeders which may pick up electrical noise should use screened cable, with the screen earthed at the detector.
3. The loop should be either square or rectangular in shape with a minimum distance of 1 metre between opposite sides. Normally 3 turns of wire are used in the loop. Large loops with a circumference of greater than 10 metres should use 2 turns while small loops with a circumference of less than 6 metres should use 4 turns. When two loops are used in close proximity to each other it is recommended that 3 turns are used in one and 4 turns in the other to prevent cross-talk.
4. Cross-talk is a term used to describe the interference between two adjacent loops. To avoid incorrect operation of the detector, the loops should be at least 2 metres apart and on different frequency settings.
5. For loop installation, slots should be cut in the road using a masonry cutting tool. A 45° cut should be made across the corners to prevent damage to the wire on the corners. The slot should be about 4mm wide and 30mm to 50mm deep. Remember to extend the slot from one of the corners to the road-side to accommodate the feeder.
6. Best results are obtained when a single length of wire is used with no joints. This may be achieved by running the wire from the detector to the loop, around the loop for 3 turns and then back to the detector. The feeder portion of the wire is then twisted. Remember that twisting the feeder will shorten its length, so ensure a long enough feeder wire is used.
7. After the loop and feeder wires have been placed in the slot, the slot is filled with epoxy compound or bitumen filler.

Contact Details