![Nortech Detection logo]

Nortech Detection Pty Ltd
Tel: 02 8977 4047   Fax: 02 9475 4742
email: support@nortechdetection.com.au
web: www.nortechdetection.com.au

Application Note

PD230 Detector Direction Logic Operation

A-B LOGIC Mode is a direction logic mode, and is capable of determining direction of travel of a vehicle. The PD230 Enhanced Detector may be configured in either one of the two possible AB logic modes:

A-B Logic Presence output Mode
A-B Logic Pulse output Mode

A-B Logic Mode (Loop layout)

NB: In ALL cases, for the direction logic to work correctly, the distance between loops must be less than the length of the shortest vehicle. i.e. the shortest vehicle must "bridge" the two loops.

Due to the short distance between loops in this case and the fact that the dual detector switches between loops, the A-B logic is suitable only for vehicle speeds < 50km/H
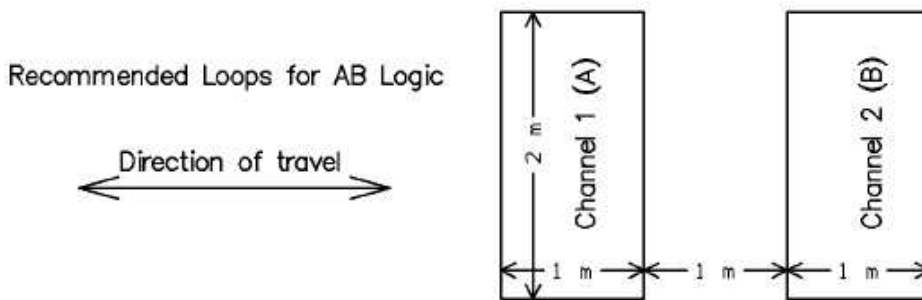
A. A-B Logic Presence Output Mode

Internal link LK1 (see page 3) must be fitted from Pin 1 to Pin 2. In this mode switches 9 & 10 are ignored.

If a vehicle first enters Channel 1 Loop and then proceeds to Channel 2 Loop, Channel 1 relay contacts will close for the duration of that the vehicle is over Channel 2 Loop.
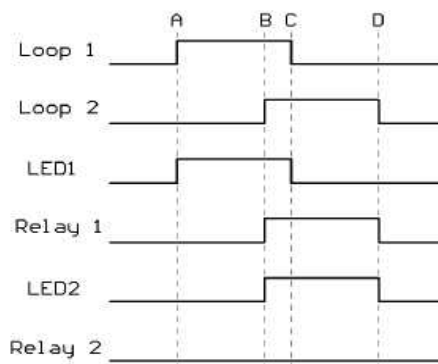
If a vehicle first enters Channel 2 Loop and then proceeds to Channel 1 Loop, Channel 2 relay contacts will close for the duration of that the vehicle is over Channel 1 Loop.

For vehicles travelling in a reverse direction, the operation is similar, but in this case Relay 2 will operate instead of Relay 1.

B. A-B Logic Pulse Output Mode

Internal link LK1 (see page 3) must be fitted from Pin 2 to Pin 3. In this mode switches 9 & 10 are ignored.

If a vehicle first enters Channel 1 Loop and then proceeds to Channel 2 Loop, a 150 ms pulse will be issued on Channel 1 relay output as the vehicle leaves Channel 1 Loop.
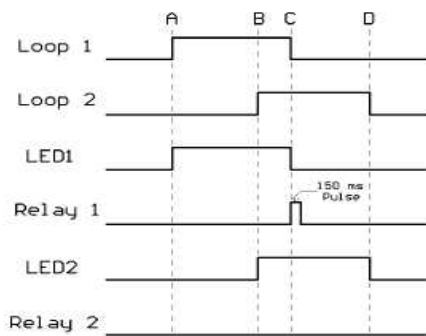
If a vehicle first enters Channel 2 Loop and then proceeds to Channel 1 Loop, a 150 ms pulse will be issued on Channel 2 relay output as the vehicle leaves Channel 2 Loop.

(AB LOGIC Pulse Mode)

Forward direction

A - Vehicle Enters Loop1
B - Vehicle Enters Loop2
C - Vehicle Exits Loop 1
D - Vehicle Exits Loop 2

This is the correct forward operation for Pulse AB Logic

For vehicles travelling in a reverse direction, the operation is similar, but in this case Relay 2 will operate instead of Relay 1.

As the pulse mode operation is often used in a vehicle counting situation, the case where a vehicle changes direction after crossing the first loop is important.
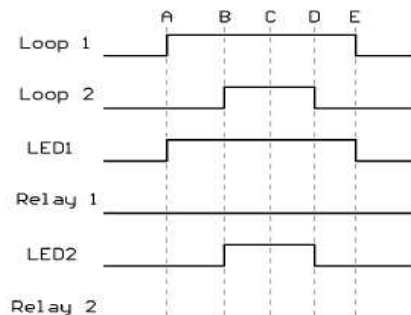
In the case where the vehicle reverses before the directional pulse is generated, there is no output on either relay.

(AB LOGIC Pulse Mode)

Forward then reverse out

A - Vehicle Enters Loop1
B - Vehicle Enters Loop2
C - Vehicle Starts to reverse
D - Vehicle Exits Loop 2
E - Vehicle Exits Loop 1

No outputs as vehicle does not enter

There is a final condition applicable to the pulse output mode that occurs if the vehicle reverses out AFTER the directional pulse is output for the original direction. In this case a second pulse is generated on the other relay so that the vehicle count condition is maintained correctly.

(AB LOGIC Pulse Mode)

Forward direction then reverse out

A - Vehicle Enters Loop 1
B - Vehicle Enters Loop 2
C - Vehicle Exits Loop 1
D - Vehicle reverses back on Loop 1
E - Vehicle Exits Loop 2 in reverse
F - Vehicle Exits Loop 1 in reverse

Both entry and exit pulses occur
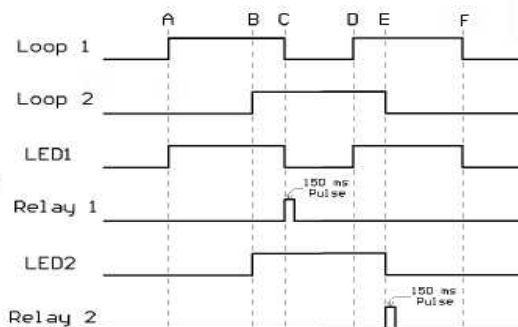
Important notes to A-B logic applications

In ALL cases, for the direction logic to work correctly, the distance between loops must be less than the length of the shortest vehicle. i.e. the shortest vehicle must "bridge" the two loops.

Due to the short distance between loops in this case and the fact that the dual detector switches between loops, the A-B logic is suitable only for vehicle speeds < 50km/H

The use of A-B logic in situations where vehicle tailgating is prevalent (in conditions of slow moving vehicle queues) has the added complication that the status of both loops determines the detector output. There is additional risk in this case that counting errors may occur in conditions of tailgating.
Also, when A-B logic "pulse mode" is used with tailgating prevalent, the "reverse out" feature described above may result in incorrect direction count outputs.
Note that in all cases, once the event direction has been determined, a vehicle travelling in the opposite direction may only be counted if both loops have been vacated prior to the event.

To Configure A-B Logic Operation - Internal Link Selection

WARNING - ONLY SERVICE PERSONNEL MAY OPEN THE UNIT TO CHANGE INTERNAL SETTINGS!

There is one 3 way link located inside the PD230 Enhanced detector housing, which is used to alter the mode of operation of the detector. The link has been placed inside the unit to avoid incorrect operation due to selection by an unauthorised operator.

On earlier models (Circuit Board 302AW0004 07) There are 3 link positions located inside the PD230 which are used to alter the output relay configuration of the detector. In all cases the A-B logic configuration is similar.
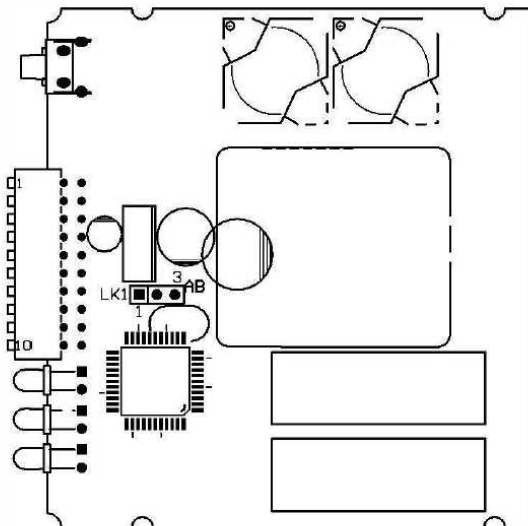
LK1	AB Logic Selection	
LK1 [■●●]	Link from Pin 1 to Pin 2	Presence AB Logic
LK1 [■●●]	Link from Pin 2 to Pin 3	Pulse AB Logic
LK1 [■●●]	Link open Leave link on Pin 2 only	No AB Logic

For the PD230 Enhanced parking detector, the default setting for both channel output relays is presence mode (Front panel switches 9 & 10 OFF) with **no AB logic** (i.e. no jumper on LK1).