Barrier Logic Loop Detector

Model - BL100B

The BL100B combines the features of a loop detector and barrier logic into a single unit. The unit has been developed to control barriers using magnetic motors with ease of installation and without the need for a separate loop detector and external relay.

Applications

Typical applications are the control of barriers/booms in the parking and access control environments.

Features - Logic

Selectable Memory/Non Memory input. The Memory input feature will allow opening inputs to be memorized. This will then enable a number of vehicles to pass over the closing loop before the barrier lower output is enabled. The purpose of this feature is to enable vehicles to pass the barrier without opening and closing for each vehicle and hence allowing rapid entry or exit of vehicles.

Automatic/Manual mode. This mode allows the barrier to be manually operated for maintenance purposes using the toggle switch mounted on front of the unit.

Barrier raise/lower relay output. This output is used to control the motor which raises or lowers the barrier. The motor can be connected directly to this relay without the need for an external relay.

Ticket vend interlock output. This output is used to prevent tickets from being issued when the barrier is in the raised position.

Time out if vehicle reverses out. (Auto Close) On some occasions a vehicle may raise the barrier and then reverse out. In this situation the logic will time-out (switch selectable) and automatically lower the barrier.

Roll-back protection. After a vehicle has passed the closing loop and the barrier is closing, it is possible for the vehicle to roll backwards under the closing barrier. In this situation the logic will raise the barrier again until the vehicle moves forward off the closing loop.

Automatic closing from loop detector output. The loop detector is connected internally to the logic and is used to close the barrier when the vehicle has passed over the loop. The detector can be disabled using the switch settings if a loop is not required. In this case an external beam can be used as the safety device.

Facility for extra loop detector for opening input interlock. An arming loop detector may be used to prevent the barrier from being raised when there is no vehicle present at the ticket issuing machine. This is done by placing a loop in front of the barrier and a vehicle must be present on this loop to allow opening of the barrier.

Facility for Free Exit loop detector. Another loop detector may be placed after the barrier and used to raise the barrier as a free exit option. This feature is normally used in a bi-directional lane.

Beam Off Delay. This feature enables a beam delay of 2seconds. When enabled, the beam is extended by 2 seconds to prevent false closing of the barrier.

Features – Loop Detector

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

Sensitivity Boost. This feature sets the undetect level to maximum sensitivity and is used to prevent loss of detection of high-bed vehicles.

Switch selectable Frequency. Two frequency settings are available to prevent cross-talk between adjacent loops.

Detector On/Off. This feature enables or disables the units internal loop detector.

Indicators

Power Indicator. This LED Indicator illuminates when power is present.

Barrier Raise Indicator. This LED Indicator is illuminated when the barrier output relay is switched on to raise the barrier.

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.

Technical Specifications

Power supply	200 - 260VAC 50Hz 1.5VA
NMI/MI Input	This input may be activated by a potential free relay contact or open collector NPN transistor output. This input is isolated from the logic.
Beam Input	This input may be activated by a potential free relay contact or open collector NPN transistor output. This input is isolated from the logic and is used to keep the barrier open when a vehicle has broken the beam.
Raise/Lower Output Relay	These outputs are a relay contact rated at 5A/220VAC.
TVI Output Relay	This output is a normally closed relay output rated at 0.5A/35VDC.
Indicators	LED indicators show: Power, Barrier Raised and Loop Detector.
Detector tuning range	15 - 1500uH
Loop Frequency	Approx. 23 – 130KHz
Environmental tracking	Automatic Compensation
Protection	Loop isolation transformer with zener diodes and gas discharge tube.
Connector	11 Pin Connector on rear of unit.
Dimensions	80mm (height) X 40mm (width) X 79mm (Depth excl. connector).
Operating Temperature	-40°C to +80°C
Storage Temperature	-40°C to +85°C

Switch Settings

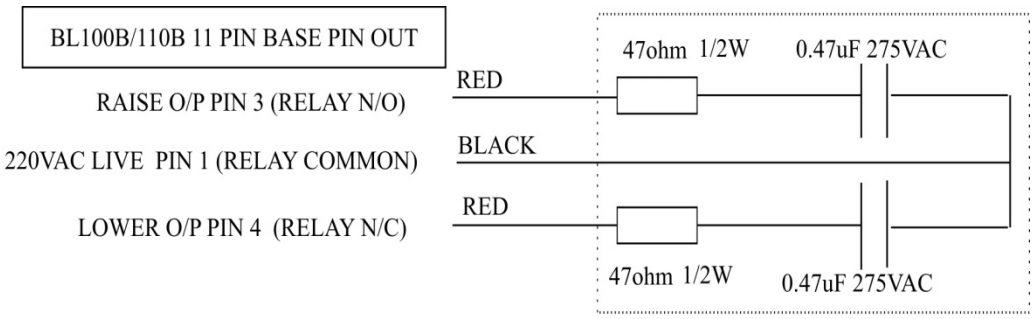
BL100B Switch Settings			
Switch No.	Function	ON	OFF
10	Reset (normally in Off position)	On	Off
9	Beam Delay	2 Sec	None
8	Loop Detector Disable/Enable	Off	On
6,7	Sensitivity 0.02%	-	S6/S7
6,7	Sensitivity 0.05%	S7	S6
6,7	Sensitivity 0.1%	S6	S7
6,7	Sensitivity 0.5%	S6/S7	-
5	ASB	On	Off
4	MI/NMI input select	MI	NMI
3	Roll back time	5 Sec	2 Sec
2	Auto Close time	None	20 Sec
1	Frequency	Low	High

Diagnostics

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The POWER LED is not on.	No power supply voltage on the input.	Check that the power supply is correctly wired to the detector. (PINS 1 and 2)
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 Detect LED is permanently illuminated with no vehicle present on the loop.	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 Ω). If the loop inductance is too large then try reducing the number of turns.

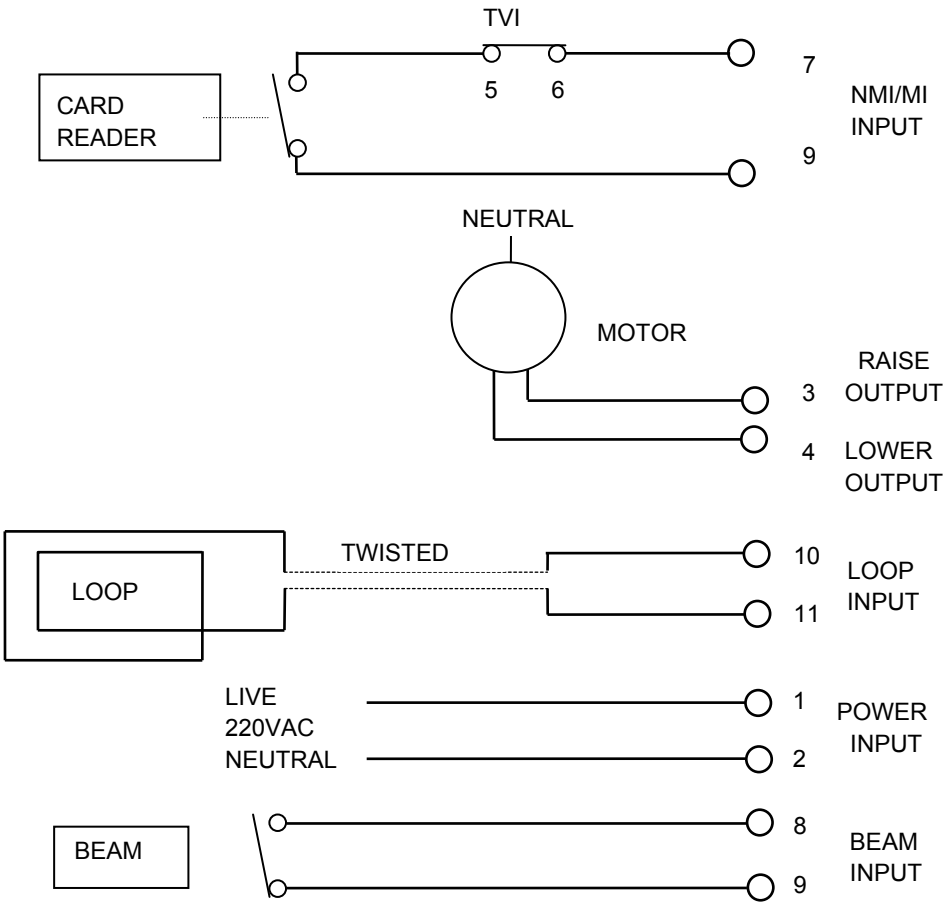
Installing Snubber Network

Due to the high inductance of the barrier motor, it is highly recommended to install an external snubber network to reduce electrical noise and interference generated when switching the motor. Recommended snubber network and connection details are shown below.

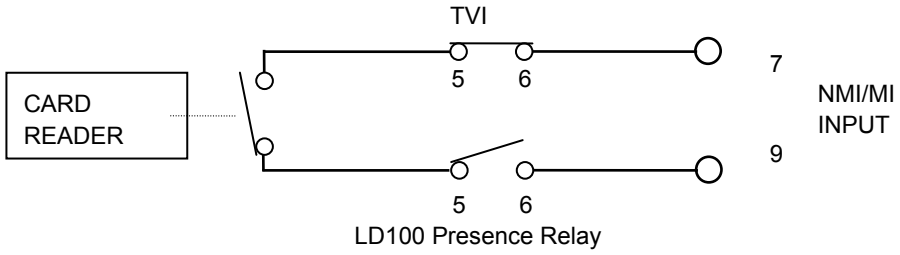


Wiring Diagram

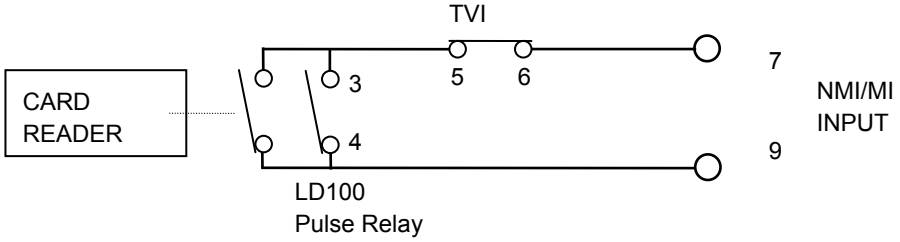
Standard Configuration



Configuration with Arming Loop Detector



Configuration with Free Exit Detector



Loop Installation Guide

1 The barrier logic 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.

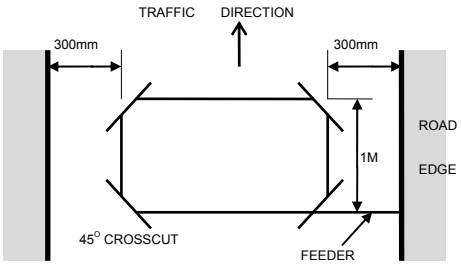
3 The loop should be either square or rectangular in shape with a minimum distance of 1 metre between opposite sides. Normally 3 turns of wire are used in the loop. Large loops with a circumference of greater than 10 metres should use 2 turns while small loops with a circumference of less than 6 metres 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.

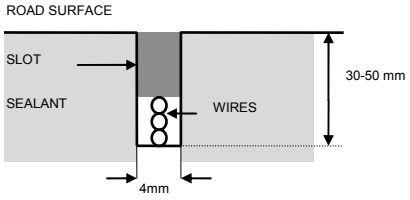
4 Cross-talk is a term used to describe the interference between two adjacent loops. To avoid incorrect operation of the detector, the loops should be at least 2 metres apart and on different frequency settings.

5 For loop installation, slots should be cut in the road using a masonry cutting tool. A 45^o 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

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