

## Car Hit Detection

Car Hit Detection will only be activated after calibration is done. This is indicated by "C" on the last character of the LCD second line during normal display.

### A. Calibration Process

- 1) Press SW1
- 2) LCD display "CALIBRATION" on the first line. And the number of calibration cycle and the current measured continuously on second line.

2x16 LCD

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| C | A | L | I | B | R | A | T | I | O | N |   |   |   |  |  |
| C | Y | C | L | E | = | x |   |   |   | x | . | x | A |  |  |

- 3) Barrier will move up if it is at down position
- 4) Barrier move down 5 times. Of course the barrier has to move up every time after it moves down. But if the barrier is originally at down position, barrier will remain down for the last movement.
- 5) Take the average of the peak current continuously when it moves down.
- 6) Average the 5 current data and stored in the EEPROM. This will be the reference current for car hit detection.
- 7) LCD display "COMPLETE" on the first line and the final average current on the second line.

2x16 LCD

|   |   |   |   |   |   |   |   |   |  |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|--|---|---|---|---|--|--|
| C | O | M | P | L | E | T | E |   |  |   |   |   |   |  |  |
| R | E | F | E | R | E | N | C | E |  | x | . | x | A |  |  |

LCD returns to the standard display when normal operation starts.

### Error handling

- 1) During the calibration process, if there is a "obstruction" like SEN1, time out and etc, the process will stop. LCD display "ERROR"
- 2) If any of the 5 readings differences are more than 0.6A., calibration process will stop. LCD display "ERROR": follow by the 5 measured currents.

2x16 LCD

|   |   |   |   |   |   |  |   |   |   |   |  |   |   |   |   |
|---|---|---|---|---|---|--|---|---|---|---|--|---|---|---|---|
| E | R | R | O | R |   |  | x | . | x | A |  | x | . | x | A |
|   |   | x | . | x | A |  | x | . | x | A |  | x | . | x | A |

### Reset Calibration

- 1) Press SW1 and hold for more than 5s
- 2) Erase the stored reference current in the EEPROM
- 3) Deactivate the Car Hit Detection
- 4) Clear the "C" on the last character of the LCD second line.

## B. Car Hit Algorithm

- 1) Barrier move down
- 2) "Measured current" increases more than 0.6A with respect to "calibrated current" stored in the EEPROM
- 3) Barrier moves up immediately

### Case I: DIP SW5 off

- 4) DW is detected and SEN1 is not detected; or SEN2 is detected when DW is not low and SEN1 is not detected.
- 5) Barrier moves down

### Case II: DIP SW5 on

- 4) DW is detected 2 times and SEN1 is not detected; or SEN2 is detected when DW is not low and SEN1 is not detected.
- 5) Barrier moves down

Note that the 6th and 7th digit of the first line on LCD should display CR when DIP SW5 is on.

2x16 LCD

|   |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|
| U | P |   | S | R | C | R |  | x | x | x | x | x | x | x | x | x |
| x | . | x | A |   | 3 | S |  | N | - |   | s | N | O |   |   | C |

## C. Purpose of VR7

Normally VR7 is set to maximum resistance. In the field, if end customer found that the car hit is too sensitive, the VR7 resistance will be reduce. Thus the software measured current will be lower than the actual current (Note that at this point the LCD display is no more accurate). But the reference current is not changed in the EEPROM as no calibration is done. So it will take a higher actual current before the car hit is detected. Thus we achieved lower sensitivity in car hit.