Shift Proto - Zx

Gear counter for Sequential gearbox equipped with resistive sensor

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Shift Proto – Zx

Shift counter for cars with sequential gearbox or H gearbox non-water proof, with LED display:

- Shift Proto – Gauge Z - 1" (24x34 [mm])
- Shift Proto – ZK - 1" (24x34 [mm])
- Shift Proto – ZS - 1.5 "(44x30 [mm])
- Shift Proto - ZB - 2.3" (70x47 [mm])
- Shift Proto – ZBB (bi-color) - 2.3" (70x47 [mm])
- Shift Proto - ZXL - 3" (85x65[mm])

In the SHIFT PROTO ZB, SHIFT PROTO ZBB Shift Proto - ZXL models, the brightness is adjustable.

Warning!!! Unauthorized removal of the label with our logo leads to the forfeiture of any form of warranty on the product.

Very simple to install as it evaluates the ratio using a resistive sensor (linear, discrete, rotary, etc ...) pre-installed on the gearbox, it is well suited for installation for those prototype cars in which there is no wheel speed signal.

The display indicates the ratio value as a function of the value read by the sensor (sensor NOT supplied in the KIT), recognizes the various gears (settable up to 6 gears + Neutral and reverse) simply by carrying out an initial programming (see programming chapter).

if you need a sensor for your gearbox, you can find it here:
https://www.demarco-prototipi.com/categoria-prodotto/sensori/

1. Installation

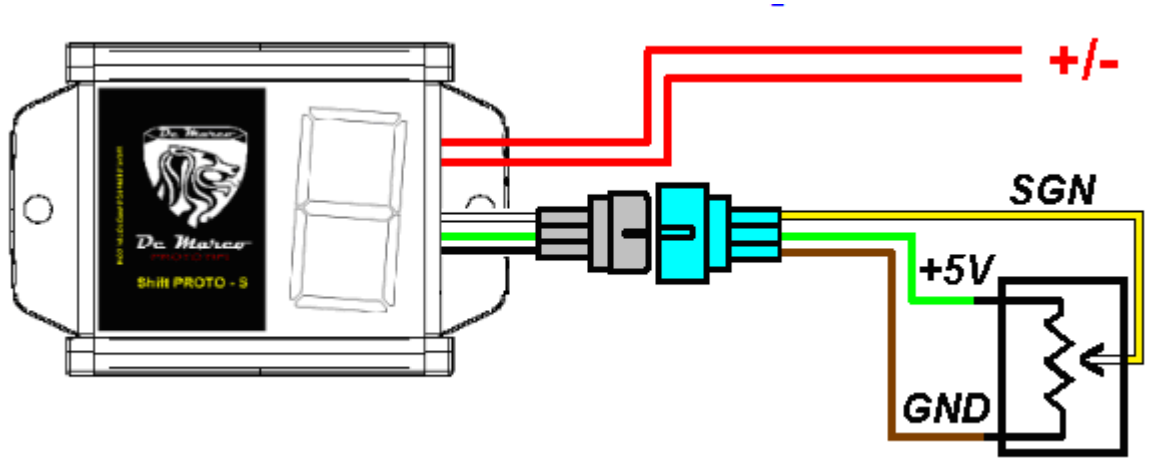


Fig.1 Shift PROTO - Zx connection diagram

To install Shift PROTO - ZX simply connect the cables as shown in the image above.

The power cables (marked with the +/- 12V label) can be connected indistinctly one to the positive (+ 12V) and the other to the negative, while the other cables must be connected to the sensor according to the colors dictated by the diagram above (See Fig .1).

It is advisable to connect the positive to an under-key contact, and to place a fuse with capacity <1A in series with the positive.

2. Shift LIGHT Function

The Shift PROTO HBB version with integrated Shift light changes color when the engine reaches the stored rpm. Shift PROTO HBB Accepts motor signals with different types of waveforms (see Fig. 3) without changing any internal setting (self-adaptive system)
It can read up to 48,000 RPM with 1 Hz accuracy (1 pulse per second)

The input signal can be:

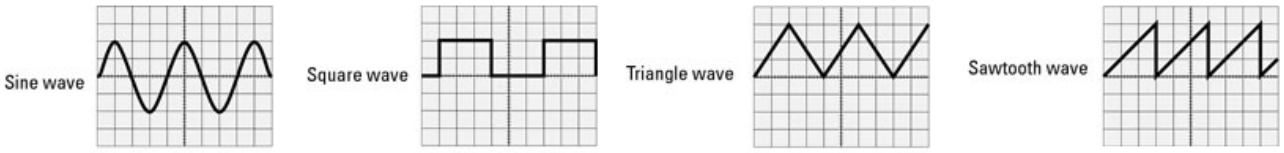


Fig.2 waveforms accepted by the device

The installation of the device is very simple, regardless of the number of engine stroke, the number of cylinders, and so on, the engine signal must be connected to the **SGN** cable.
The signal to be connected to the **SGN** cable coming from the motor can be connected:

- To the NEGATIVE of the INJECTORS
- To the NEGATIVE of the COIL
- To one of the NEGATIVES of the bi- COILS
- To the variable reluctance rpm sensor (sine wave)
- To the Hall Effect sensor
- At the tachometer signal
- At any pulsating signal in phase with the motor with values from 5V up to 20V (maximum)

WARNING!!! SGN CANNOT be connected directly to the common rail injectors, an adapter is required due to the high voltage level, it is preferable to connect the signal, for example, to the phase sensor (cam sensor)

3. SHIFT LIGHT Programming

Following installation, the flashing regime must be memorized.
To activate the flashing at a given number of revolutions, follow the instructions below:

1. Unscrew the top cover of the display
2. Locate the button in the center.
3. Bring the engine to the speed where you want the Flash to be active (eg 8000 RPM).
4. Press (single) the internal button.
5. Screw the previously removed cover back on.

From now on the Flash will light up at the memorized RPM with 1Hz precision !!!

4. Programming

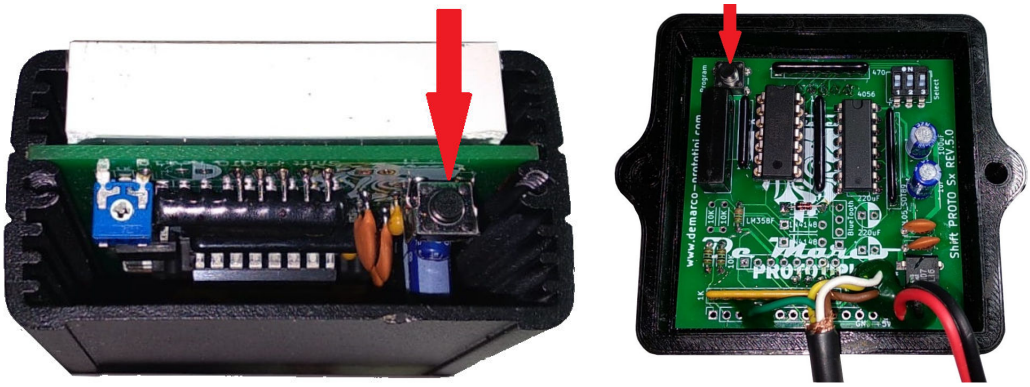


Fig.4 Position of the programming button

At the first start up the some device (2.3" and 3") may flash the letters "E"... "P" in sequence This indicates that the device is not programmed, so just follow the steps below.

a) Make sure the shift sensor is connected to the device.

b) Power up the device.

c) Remove the display side cover (See Fig. 4) or rear cover for models with ABS case

d) Keeping the display facing upwards, you will find a button at the top right, press it for the first time. the letter "P" will appear

e) Release the button, the "-" symbol will appear on the display

f) Place the gear lever in the central position (neutral).

g) Press the button again, the letter "P" will appear

h) Release the button, the symbol "1" will appear on the display

i) Place the gear lever in a position to activate 1st gear (First).

j) Press the button again, the letter "P" will appear

k) Release the button, the symbol "2" will appear on the display

l) Place the gear lever in a position to activate the 2nd (second) gear.

m) Press the button again, the letter "P" will appear

n) Release the button, the symbol "3" will appear on the display

o) Place the gear lever in a position to activate the 3rd (third) gear.

p) Press the button again, the letter "P" will appear

q) Release the button, the symbol "4" will appear on the display

r) Place the gear lever in a position to activate the 4th gear (4th).

s) Press the button again, the letter "P" will appear

t) Release the button, the symbol "5" will appear on the display

u) Place the gear lever in a position to activate the 5th (fifth) gear.

v) Press the button again, the letter "P" will appear

w) Release the button, the symbol "6" will appear on the display

x) Place the gear lever in a position to activate the 6th gear (sixth). If the 6th gear is not present, position the lever in the same position as the last gear (e.g. 5 °)

y) Press the button again, the letter "P" will appear

z) Release the button, the "r" symbol will appear on the display

aa) Place the gear lever in a position to activate the inverting gear (reverse).

bb) Press the button again, the letter "P" will appear (If the prototype does not have reverse gear, perform point "z" in sixth)

cc) Close the cover and Restart the system.

dd) The reprogramming is completed.

NOTE: if during programming the sequence is not exactly as described, there is a possibility that the programming was not successful.
Turn the device off and on again and perform a new one reprogramming.
ERRORS AND SOLUTIONS:

- **after the programming sequence, the device flashes quickly, displaying "E" or is static in one gear**

  Possible solution the sensor is not connected well or is disconnected. Connect the sensor and check the sequence of reports, if necessary reprogram the device.

- **After programming, the gear counter flashes with the letters "E"… "P" or is static in one gear.**

  The sequence of letters "E"… "P" indicates programming error. Check that the sensor is connected correctly and in particular that the SGN or + 5V cable is not connected to the negative.

- **The gear counter flashes quickly displaying "E" and I cannot enter programming.**

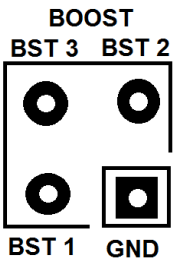
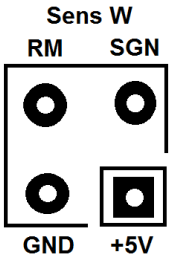
  1. **1. In this case you have to connect a trimmer with a value as close as possible to the sensor value (eg 5K sensor → 4.7k trimmer) to the gear counter.**
  2. **After connection, slowly rotate the trimmer until you find any gear.**
  3. **Once you have found a gear, enter programming by pressing the button, keeping the trimmer always in the same position.**
  4. **Keep pressing the button until the letter "r" appears.**

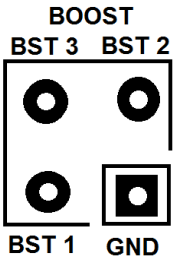
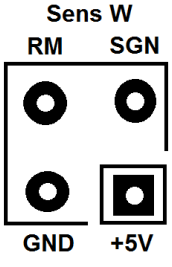
     When you reach the letter "r", the gear counter has cleared the memory (it is blank), now you can reprogram it.

5. PIN OUT

Shift PROTO ZS	
PIN N°	**Function / Description**
1	Input to GND 1st Ratio (enable with Jumper) change H.
2	Input to GND 2nd Ratio (enable with Jumper) change H.
3	Input to GND 3rd Ratio (enable with Jumper) change H.
4	Input to GND 4th Ratio (enable with Jumper) change H.
5	Input to GND 5th Ratio (enable with Jumper) change H.
6	Input towards GND 6th Ratio (enable with Jumper) change H.
7	RM input (+ 12V)
8	Special functions (0)
9	Special functions (2)
10	Special functions (3)
11	Special functions (4 sequence jumpers)
12	+ 5V - 3-wire resistive sensor 5V output (enable with Jumper)
13	SGN - 2-wire resistive sensor 5V output (Motorcycle engine)
14	GND (Ground) - 2/3 wire resistive sensor
15	+ 12V input
16	+ 12V input

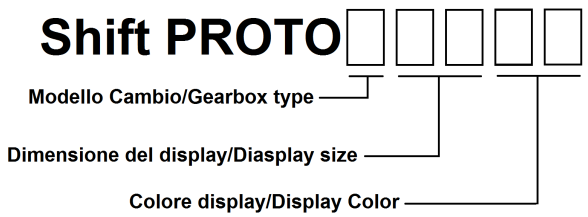
Shift PROTO ZB	
PIN N°	**Function / Description**
1	Input to GND 1st Ratio (enable with Jumper) change H.
2	Input to GND 2nd Ratio (enable with Jumper) change H.
3	Input to GND 3rd Ratio (enable with Jumper) change H.
4	Input to GND 4th Ratio (enable with Jumper) change H.
5	Input to GND 5th Ratio (enable with Jumper) change H.
6	Input towards GND 6th Ratio (enable with Jumper) change H.
7	RM input (+ 12V)
8	Neutral + 12V or GND input (See Fig.XXX) / Bicolor GND only

9	Special functions (0)		
10	Special functions (4)		
11	Paddle Shift Up (electronic gear decrease)		
12	Paddle Shift Down (electronic gear decrease)		
13	Overboost (0) / Special Functions (4)		
14	Overboost (1) / Special Functions (3)		
15	Overboost (2) / Special Functions (2)		
16	GND (Ground) - 2/3 wire resistive sensor		
17	+ 12V or GND (Ground) power supply		
18	+ 12V or GND (Ground) power supply		

Shift PROTO XL			
PIN N°	**Funzione / Descrizione**		
1	Input to GND 1st Ratio (enable with Jumper) change H.		
2	Input to GND 2nd Ratio (enable with Jumper) change H.		
3	Input to GND 3rd Ratio (enable with Jumper) change H.		
4	Input to GND 4th Ratio (enable with Jumper) change H.		
5	Input to GND 5th Ratio (enable with Jumper) change H.		
6	Input towards GND 6th Ratio (enable with Jumper) change H.		
7	RM input (+ 12V)		
8	Neutral + 12V or GND input (See Fig.XXX) / Bicolor GND only		
9	Special functions (6)		
10	Special functions (7)		
11	Paddle Shift Up (electronic gear decrease)		
12	Paddle Shift Down (electronic gear decrease)		
13	Overboost (0)/ Special Functions (4)		
14	Overboost (1)/ Special Functions (3)		
15	Overboost (2)/ Special Functions (2)		
16	GND (Ground) - 2/3 wire resistive sensor		
17	Wheel speed sensor signal		
18	+ 12V or GND (Ground) power supply		
19	Wheel speed sensor signal		
20	+ 12V or GND (Ground) power supply		

Shift PROTO GAUGE (in this model ALL the signal are activated towards GND)	
PIN N°	**Function / Description**
1	Input to GND 1st Ratio (enable with Jumper) change H.
2	Input to GND 2nd Ratio (enable with Jumper) change H.
3	Input to GND 3rd Ratio (enable with Jumper) change H.
4	Input to GND 4th Ratio (enable with Jumper) change H.
5	Input to GND 5th Ratio (enable with Jumper) change H.
6	Input towards GND 6th Ratio (enable with Jumper) change H.
7	Neutral GND input
8	RM input (+ 12V)

6. Model Decoding



1) Gear box model cambio

a) H- H
b) K- Suzuki/Kawasaki engine Gear box
c) M- Motorcycle gearbox without sensor
d) S- Sequential gearbox without sensor
e) Z- Sequential gearbox with resistive sensor

2) Display dimensione

a) B-Display 2.3" (70x47)]
b) S - Display 1.5" (44x30)
c) XL - Display 3" (85x65)]
d) K- Display 1" (34x24)]

3) Display Color

a) B – Display Bi-color
b) BL - Display Blu

7. Package Contents

1) N°1 Shift PROTO Zx gear counter device complete with wiring

2) Accessories / small parts for assembly