# Drenth

## motorsport gearboxes

## Strain Gauge Gearlever User Manual With Interface

*Pole Position*

*In gearboxes*

# Introduction

The Strain Gauge Gearlever is specially designed to be used for flat shifting. A strain gauge is an accurate instrument to cut down the engine at the right moment, for a smooth gear change. Due to its design it can be used in all types of cars with a sequential gearbox. The gearlever has an analogue output. If the mounted ECU is able to use the analog input for flat shifting, then the gearlever can be connected directly to the ECU. A digital output can be added with the interface option. This digital output can be connected to the Drenth display unit. With this display unit you can only flat shift by up shifting. For more information about the optional Drenth display unit see chapter 'Options' or visit our website. When the mounted ECU is able to use the digital signal for flat shifting, the gearlever can be connected directly to the interface. Depended on manufacturer of mounted ECU you can either use the digital (with interface) or the analogue signal. It's possible to use flat shifting for up shifting and throttle-blip for downshifting, this can be realized when the car has 'drive by wire throttle system' and an ECU that supports this system.

This document contains information about the Strain Gauge Gearlever. It includes technical specifications and possible options. For more detailed information please contact Drenth Gearboxes.

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*Last modified: November 2010*
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# Technical Specifications

## Wiring Specifications

| Cable | Function | Remarks |
|---|---|---|
| Yellow | 5 Volts | Can be shared with 5V from the ECU |
| Black | Ground | Can be shared with ground from the ECU |
| Grey | Analogue Readout | When lever is in neutral position (no forces applied) the Grey cable will carry 2.5V. This voltage will increase as the up shifting force increases. The voltage will decrease as the downshifting force increases. |

## Connection Diagram

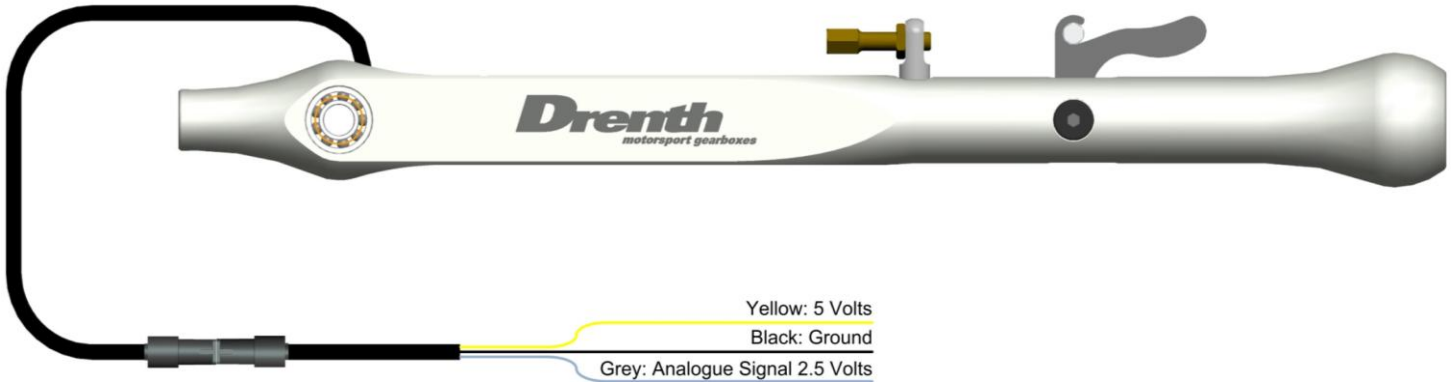


*Figure 1:*
*Connection diagram*

## Driving direction


*Figure 2:*
*Driving direction*

# Options

## Interface

The interface converts the analogue signal of the gearlever to a digital signal for the Drenth display unit or a mounted ECU that is able to use a digital signal input for flat shifting. The upper and lower threshold can be adjusted with the use of two potentiometers. The interface is powered by 12V and converts it to 5v for the gearlever. Wiring specifications, connection diagram and threshold adjustment are described on the following pages.

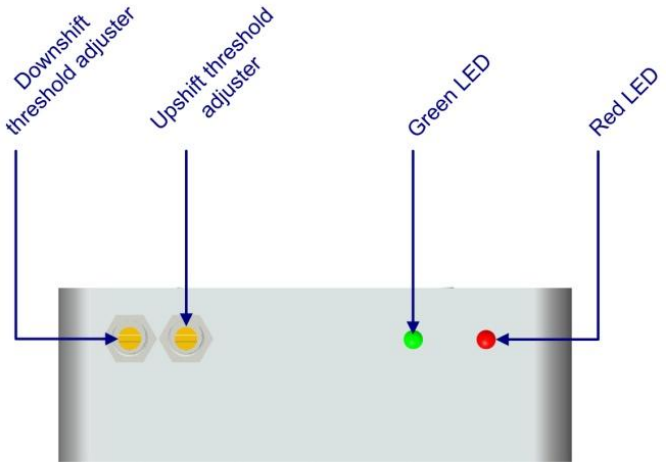


*Figure 4:*
*Adjustment & Led interface*

*Figure 3:*
*Interface*

## Wiring specifications

| Cable | Function | Remarks |
|---|---|---|
| Braun | 12 Volts | Can be shared with 12V from Drenth Display (Red wire) |
| Blue | Ground | Can be shared with ground from Drenth Display (Black wire) |
| Green | Analogue Readout | When lever is in neutral position (no forces applied) the Green cable will carry 2.5V. This voltage will increase as the up shifting force increases. The voltage will decrease as the downshifting force increases. |
| Yellow | Upshift Cut | Can be connected directly to the Yellow/Black wire from the Drenth Display. When enough force is applied and threshold is reached, the Red indicator LED will light up and the Yellow wire will be connected to ground. |
| White | Downshift Cut | When enough force is applied and the threshold is reached, the Green indicator LED will light up and the White wire will be connected to ground. |

## Connection Diagram

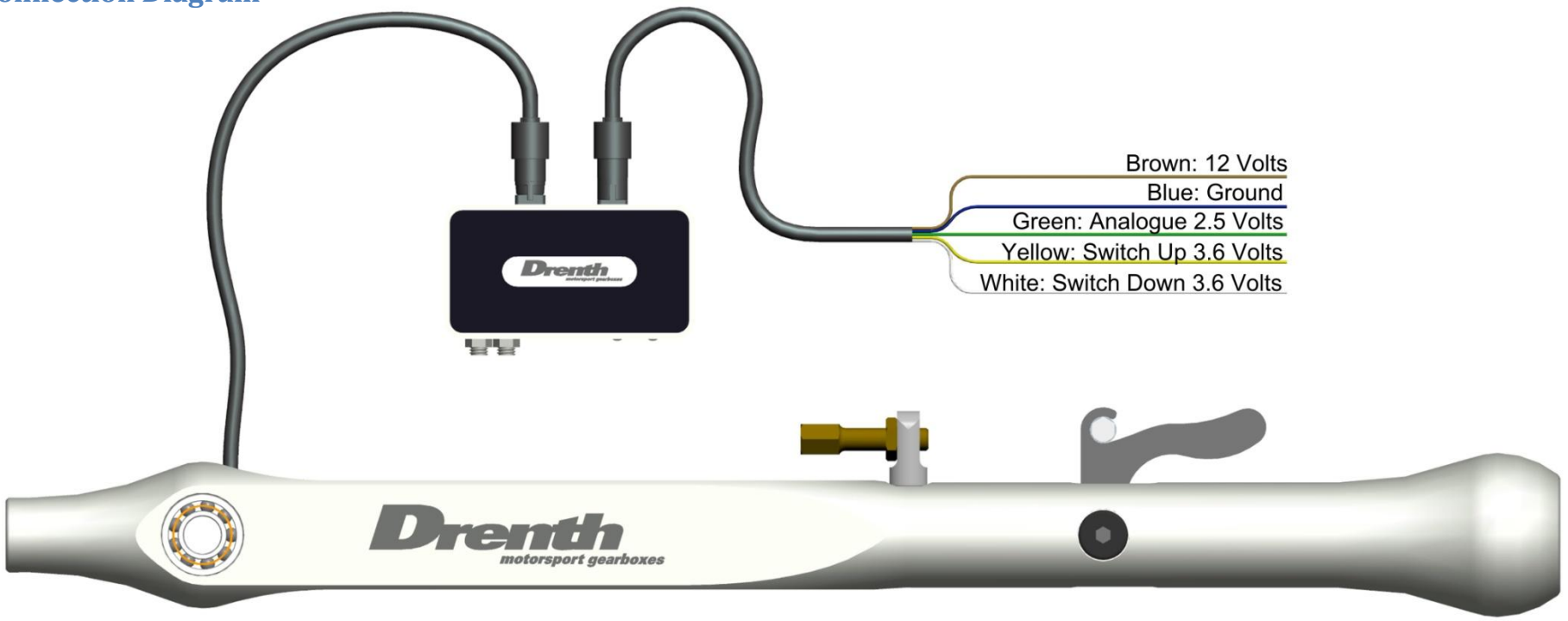


*Figure 5:*
*Connection diagram*

## Threshold Value Adjustment

Please note that the interface comes preset from our factory, it's set to a threshold to match our sequential mechanism. But still you can adjust it to your own specification. To adjust upshift threshold follow procedure described below:

- Disconnect the cable from the interface to the ECU or Drenth display unit or turn the ignition off.
- Push gearlever completely forward and hold in position (Step 1).
- Ask a colleague to reconnect the cable to the ECU or Drenth display unit, while pushing gearlever in forward position, or turn the ignition on. (Step 1).
- After the cable is reconnected the Green LED lights up and the Red LED starts blinking (when enough force is applied). When the Red LED stops blinking you have entered programming mode.
- Put gearlever in neutral position and adjust the right threshold potentiometer, please adjust in small increments. Drenth recommends a quarter turn per time. For the adjustment of the potentiometer a screwdriver for slotted screws is included.
- Turning potentiometer clockwise will result in a higher threshold and higher shift force before engine cut is made. Turn the potentiometer counter-clockwise to decrease the threshold (Step 3). When the Red LED lights up you have passed the minimum threshold.
- Now pull gearlever completely reverse and hold in position for 5 sec to exit programming mode (Step 4).

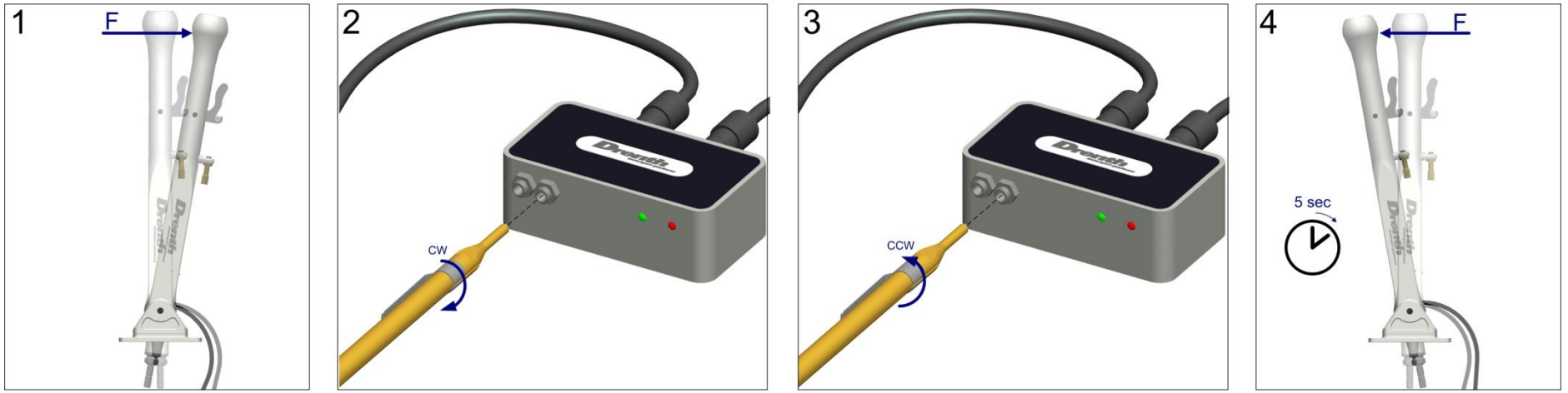


***Figure 6:***
***Upshift adjustment***

To adjust downshift threshold follow procedure described below:

- Disconnect the cable from the interface to the ECU or Drenth display unit or turn the ignition off.
- Pull gearlever completely reverse and hold in position (Step 1).
- Ask a colleague to reconnect the cable to the ECU or Drenth display unit, while pushing gearlever in reverse position or turn the ignition on (Step 1).
- After the cable is reconnected the Red LED lights up and the Green LED starts blinking (when enough force is applied). When the Green LED stops blinking you have entered programming mode.
- Put gearlever in neutral position and adjust the left threshold potentiometer, please adjust in small increments. Drenth recommends a quarter turn per time. For the adjustment of the potentiometer a screwdriver for slotted screws is included. (Step 2).
- Turning potentiometer counter-clockwise will result in a higher threshold and higher shift force before engine cut is made. Turn the potentiometer clockwise to decrease the threshold (Step 3). When the Green LED lights up you have passed the minimum threshold.
- Now pull gearlever completely forward and hold in position for 5 sec to exit programming mode (Step 4).

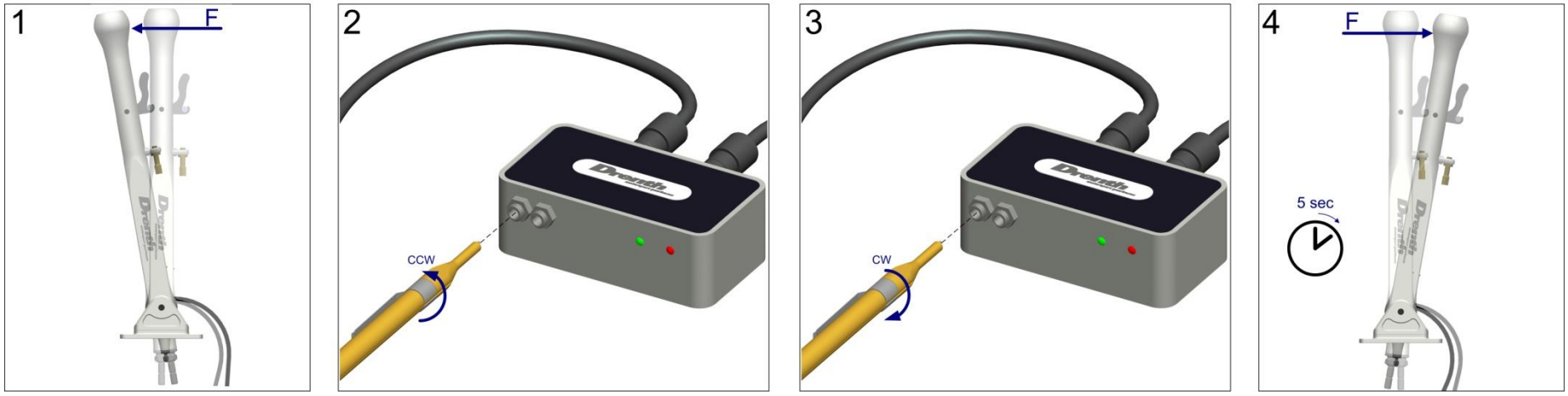


***Figure 7:***
***Downshift adjustment***

## Gearlever

- There are 2 types gearlevers of with different lengths available to suit the drivers need. For the dimensions see figure 5 in the right top corner.
    - Short gearlever
    - Long gearlever
- There are 3 different studs available for shift length adjustment.
    - Short stud
    - Intermediate stud
    - Long stud
- A custom shifting rod can be made on request.

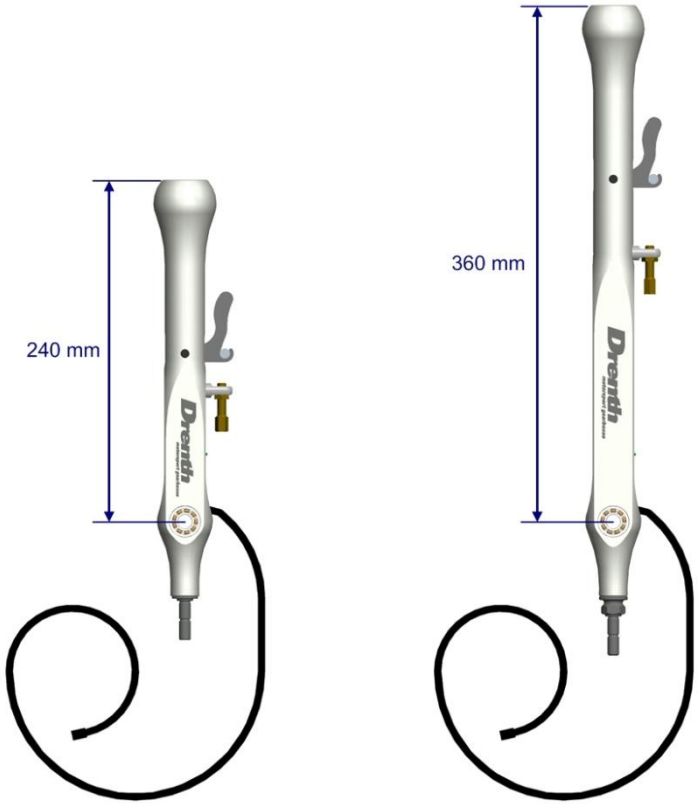


*Figure 8:*
*Available gearlevers*

## Drenth Display Unit

The display unit houses several functions to adjust the drivers need and to fine-tune the gearbox.

The system comes with a software application and a separate user manual. With the software application information shown on the display can be adjusted. There are different modes to adjust: the shape of the RPM indication and the duration of the ignition cut can be controlled (power-shift). Beside this the gear indicator also gives information about which gear is selected. For more information contact our sales department or visit our website.


*Figure 9:*
*Display unit*

## Drenth Gear Indicator

The Drenth Gear indicator is a display unit that can be used with any Drenth gearbox with a potentiometer sensor. Any gear order can be accommodated with up to 7 forward speeds besides neutral and reverse.

Programming the unit is achieved by the use of a single button and a user-friendly programming routine. Additionally, the unit features a counter to log the total number of gearshifts made – useful for tracking the life of critical gearbox components. The display also adapts its brightness by a light sensor.

The set comes with a separate user manual. For more information contact our sales department or visit  our website.


*Figure 10:*
*Gear indicator*

# Contact Information

## Address

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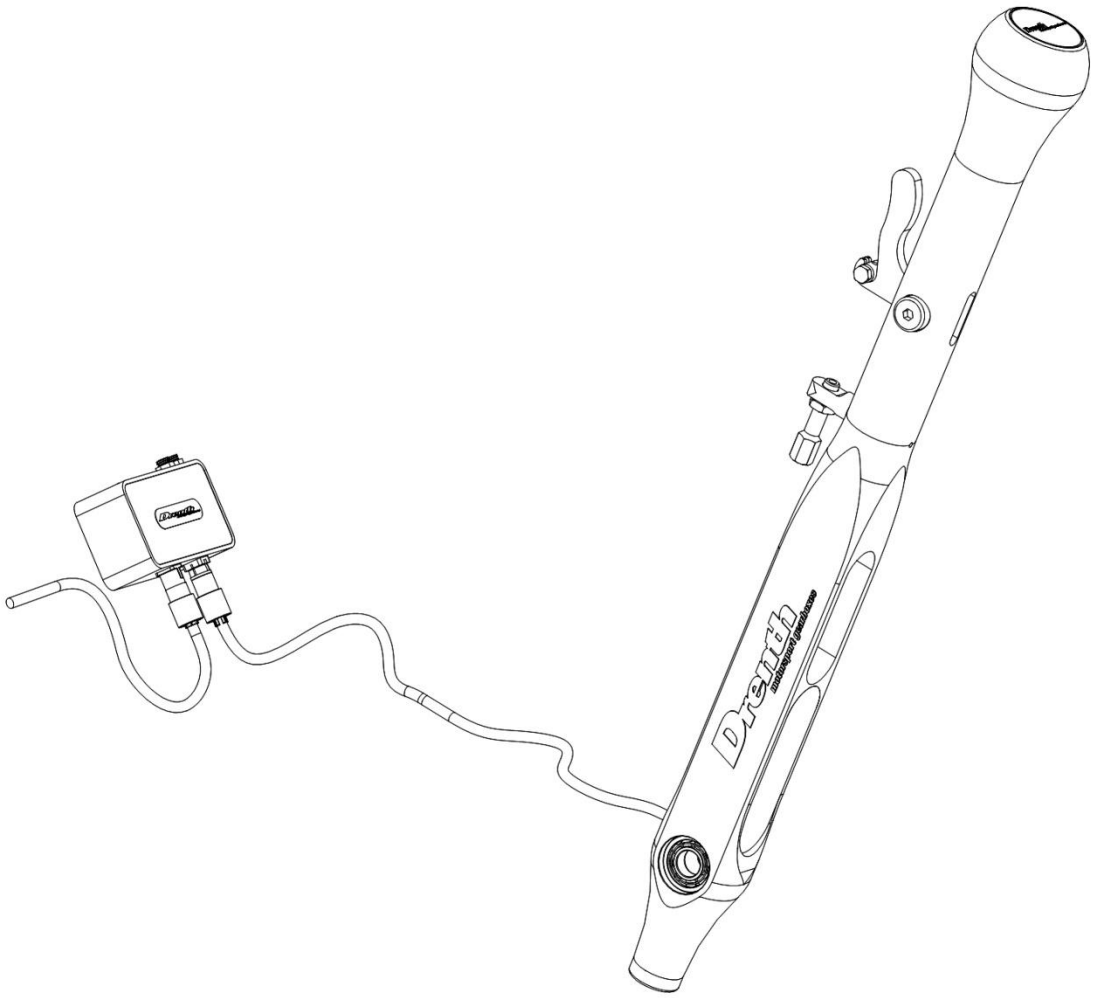

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