

# ***Drenth***

***motorsport gearboxes***

## ***Drenth Display Unit User Manual***



***Pole Position***  
*In gearboxes*

## Function description

The Display unit, which Drenth can supply, has the following options:

### **Gearindication:**

The gear indicator displays the selected gear by measuring the position of the selector barrel with a potentiometer. This function can be calibrated via the supplied software.

### **Shiftlight**

The gear indicator can be used as a shiftlight when a preset level of RPM is reached. This preset level and the manner of indicating can be set with the supplied software.

### **Flatshift**

The gear indicator can act as a flatshift system (powershift) This means that you can accelerate (full throttle) and shift up without using the clutch or lifting of the throttle. This can also be calibrated with the supplied software.

Please note that Drenth Gearboxes always recommends using the clutch when shifting down!

This manual describes the different options on how to use them.

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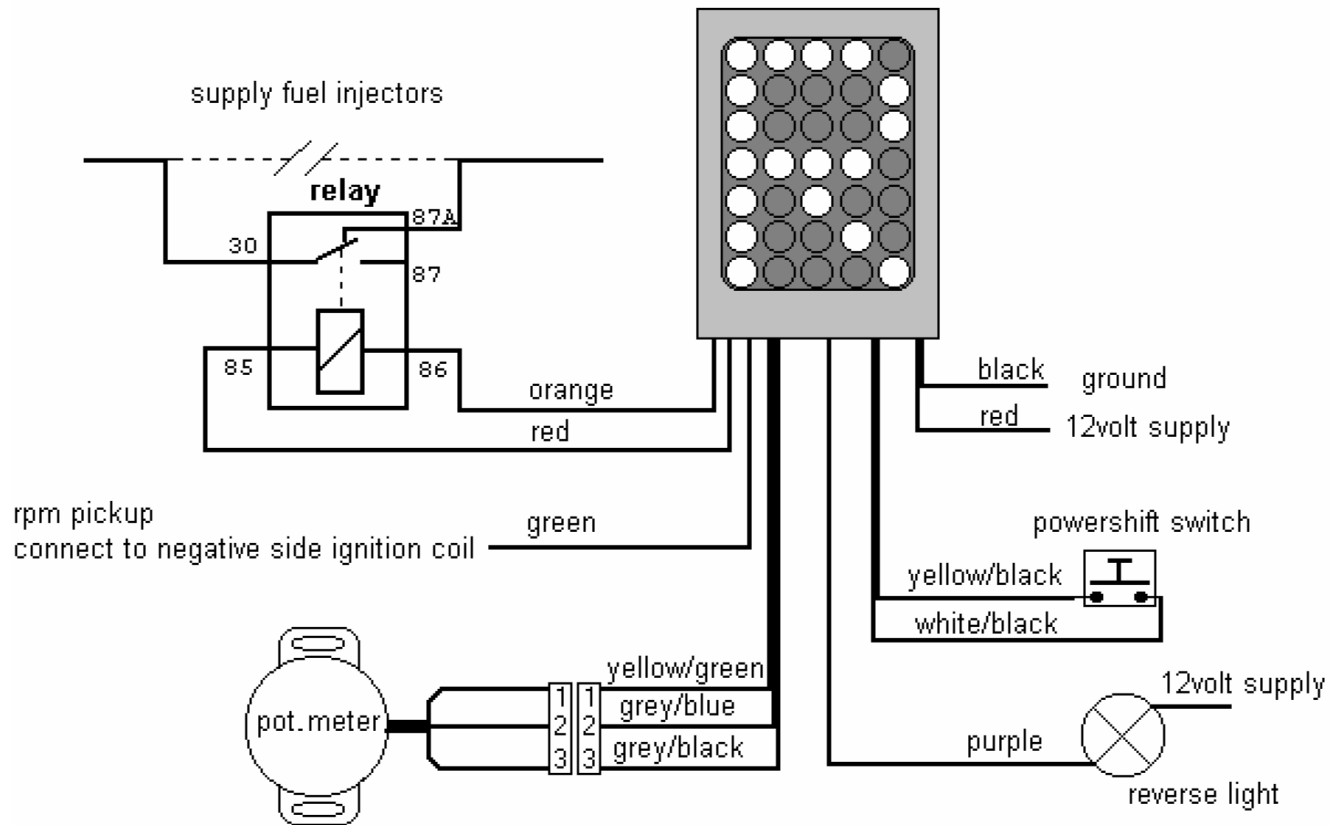
## Connections

1. Power is supplied to the red (12 volt) and black wire (ground). The maximum voltage of the supply is 17-volt, the minimum is 9 volt. Make sure that the supply is free of interference (do not connect to ignition coil or starter). The ground must be directly connected to engine ground, do not place a switch in this wire. Disconnecting ground when the display is on can lead to permanent damage!
2. For the RPM pickup the gear indicator comes with 2 wires. You can use either one (not both) depending on car electrics and wire loom. We advise to start with the green wire as this can handle 1700 volts maximum. Connect the green wire to the negative side of the ignition coil. Otherwise use the pink wire to connect to the coil driver's (of the ignition system). Note that it can only handle 15 volts maximum. If this wire is overloaded the gear indicator is damaged.
3. Power shift wires are the yellow/black (signal) and white/black (ground). They must be connected to the switch that is mounted in the gearbox. It is actuated when the gearbox shifts up, the type of switch NO (Normally Open) or NC (Normally Closed) can be set in the software. Make sure that the switch is isolated from the gearbox.
4. Gear position wires are black/grey (ground), yellow/green (5 volts) and grey/blue for the signal. These go to the potentiometer as follows:

<b><i>Cable display</i></b>	<b><i>Function</i></b>	<b><i>Cable potentiometer</i></b>
Black / grey	Ground	Black
Yellow / green	5 Volts	Red
Grey / blue	Signal	White

5. Relay wires are the orange (switched ground) and red (12 volt). Connect these to the coil of the relay. The switch of the relay is placed in the supply line to the ignition coil.
6. If the reverse is engaged the purple wire is connected to ground. Please note that the maximum load for the wire is 12 watt. This signal can be used for a reverse light.

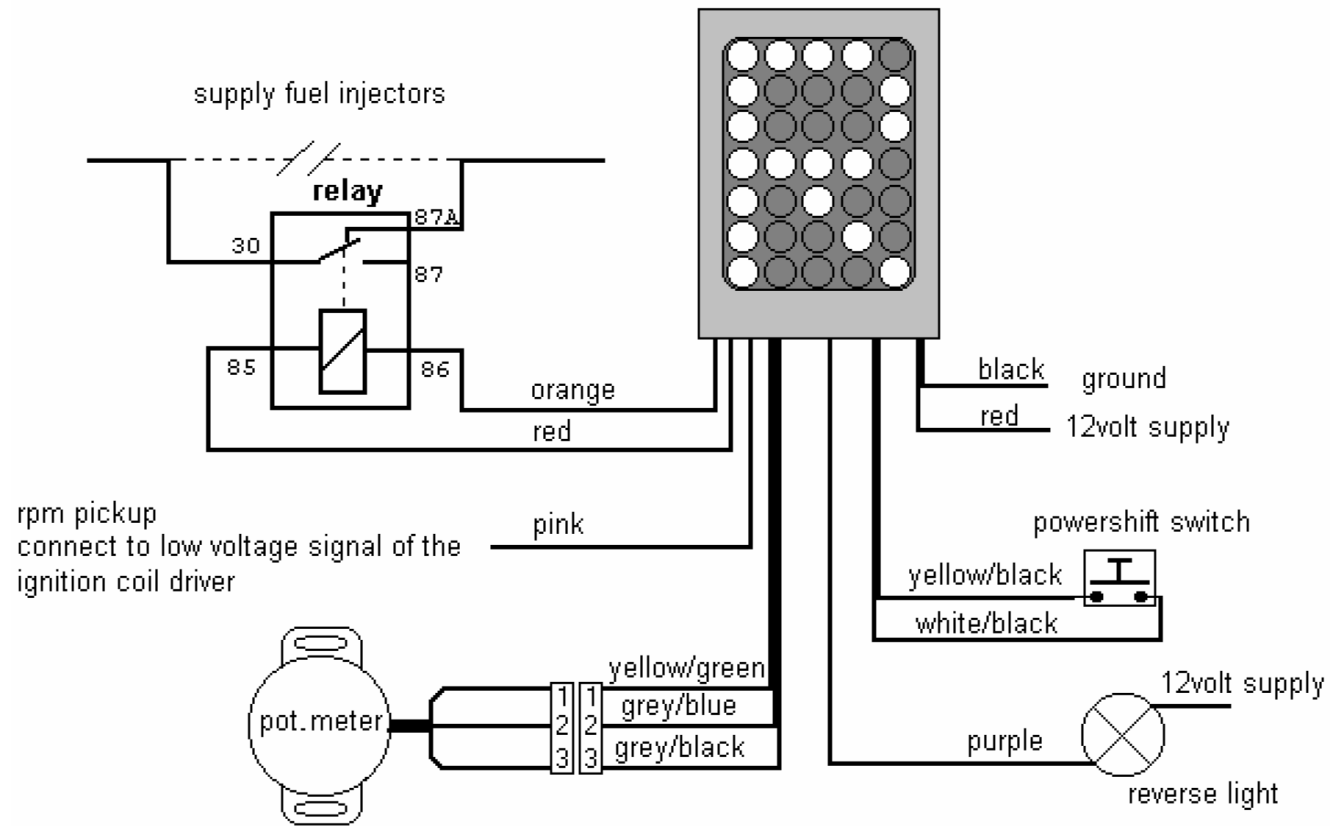
## Wiring diagram for engines with a standard coil



**Tip** to test the rpm pickup is correct set the shift light to 2000 rpm mode 0. If the shift light starts at a different rpm level than the setting [Rpm **Pickup**] in the software may be incorrect. If it doesn't work then check the connections.

**Figure 1:**  
Wiring diagram engines standard coil

## Wiring diagram for engines with a built-in coil driver



**Figure 2:**  
Wiring diagram built-in coil driver

## Software functions

### 1. Load settings from file

Opens a dialog box where you can open a saved settings file.

### 2. Save settings to file

Opens a dialog box to save the settings that are currently on your screen.

### 3. Transmit settings to display

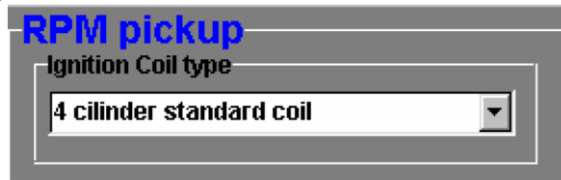
Sends the settings that are currently on your screen to the display unit.

### 4. Receive settings from display

Reads the settings that are in the display unit. It's important to do this first. The software will always start with the default setting, for example if you only change the shift light and then select [**transmit settings to display**] the setting of the default file with the changed shift light values will be sent to your display.

### 5. RPM Pickup – ignition coil type

In this box you can set what type of coil is used. It is important to fill it in correctly; it is not only used for the shift light but also for the power shift. The power shift only works above 3000 rpm, this will allow engagement of first gear without stopping the engine.



### 6. Switch type

With the box [**switch type**] you can select the type of switch that is used. With the box [**Cut time**] you can set the time that the relay is active. The time that is needed depends on the weight of the flywheel and crankshaft, for a 4-cylinder engine with a light flywheel a time of 60 ms will be correct.



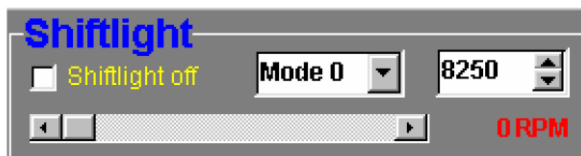
## 7. Shiftlight

In this box the shift light rpm and mode can be set. Mode 0: On the set level the gear display will change to a completely filled flashing display.

-Mode 1: On the set level the gear display will change to a completely filled display without flashing.

-Mode 2: 900 rpm before the set level the display is emptied and will then be filled bottom row first, then upwards until the display is completely filled.

-Mode 3: 900 rpm before the set level the display is emptied and will then be filled bottom row first, then upwards until the display is completely filled. The display is flashing when it's being filled upwards.

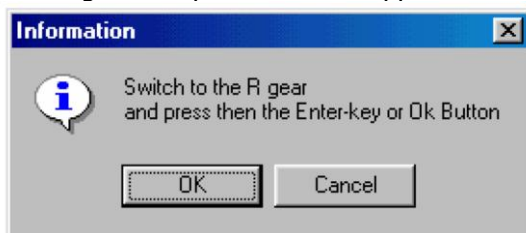


## 8. Default

If this button is used the software will load the file {default.drg} and delete the settings that are on your screen.

## 9. Automatic Cal.

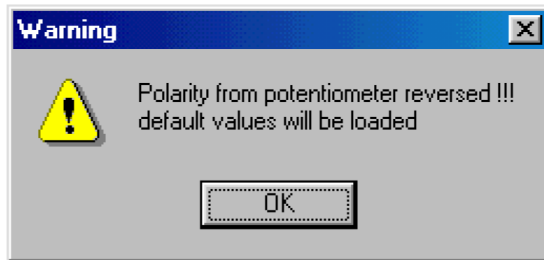
With this button the potentiometer that is mounted in the gearbox can be calibrated. After pressing this button a dialog box will open and you will be asked to put the gear box position in the uppermost box of the [display text], at the same time the display will show a [p].



When the gear is selected click on the [ok] button. Repeat until the last gear is done.

## 10. Potentiometer

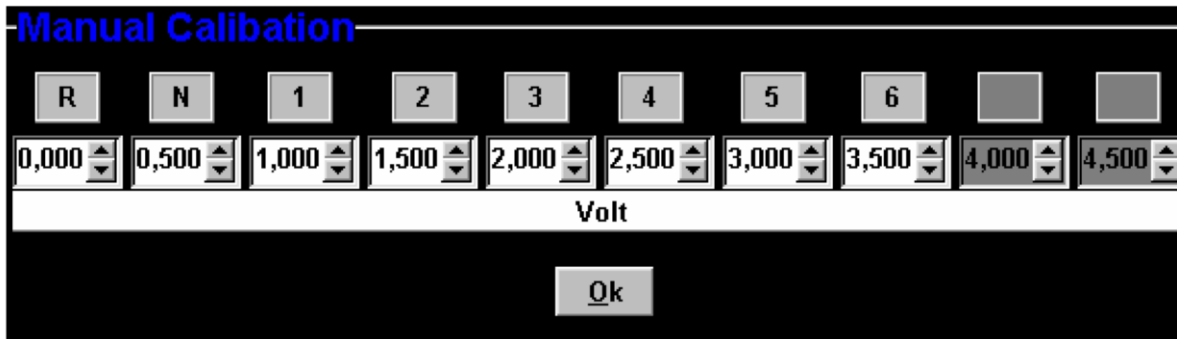
Please note: if the potentiometer is not working properly, then this message will appear. It can be that the potentiometer does not change or the polarity is reversed.



Check if the potentiometer is connected properly. On pin 2 of the connector there must be a higher voltage when a higher gear is selected.

## 11. Manual Calibration

With this function you can do the manual calibration.



The values must increase otherwise the display will show an incorrect value. If the potentiometer gives a voltage that is between two gear positions the display will show [x] to show you the gearbox is not properly engaged.

## 12. Display brightness

With this function you can set the brightness of the display. The [automatic] selection only works on displays with a day light sensor, which is located on the front of the display.



### 13. Number of gear positions

With the [on/off] setting you can set how many gear positions are used, it is important to set this correctly. The function [Automatic Cal.] uses these values to see how many gear positions there are, and if not set correctly [Automatic Cal.] it will not function. With [display text] you can set in which order and how many gears there are.

on/off	Display text
<input checked="" type="checkbox"/>	R
<input checked="" type="checkbox"/>	N

### 14. Advanced setting – cut times

To use the advanced settings, first select [Use advanced settings] (tick box) and then select [Advanced settings].

**RPM cut on gear change**

Switch type  
 Normally open  
 Normally closed

Cut time  
100 ms  
Only > 3000RPM !!!

Use advanced settings

Advanced settings

The delay time is the time to wait for the cut time. Please leave the delay time set to nil as this is only used on direction of Drenth. The cut time is the time that the ignition is paused.

**Advanced settings RPM cut on gear change**

	R	N	1	2	3	4	5	6		
Cut time :	0	0	0	0	0	0	0	0	0	0
	ms									
Delay time :	0	0	0	0	0	0	0	0	0	0
	ms									

Only > 3000RPM !!!

Ok

## Setting up for powershifting

This is a brief description about adjusting the power shift system. You need to adjust the switch first, and then the cut time via the supplied software. Depending on the type of gearbox delivered from Drenth, there is an external switch mounted on the gearbox or Drenth can supply a strain gauge gearlever. This switch or gearlever detects an up shift. When an upshift is detected the controller cuts of the ignition by the programmed amount of time. First calibrate the potentiometer via the [**automatic cal.**] function of the display.

### External Switch

The external switch comes preset from the factory. For the switch please check if it is set correctly. Use a multimeter to determine if the switch is closed. When you are up shifting the switch should close when all the play in the selection system is pushed out. You will feel an increase of force needed to pull the lever. This is when the switch should be closed. You can adjust it via the shims supplied with the power shift switch. Please note that if the switch is set with very close to little movement of the lever. It will also react to vibrations of the car, or an drivers hand rested on the gear lever. This is not preferable as the engine will be cut randomly.

### Strain Gauge Gearlever

The strain gauge gearlever comes preset from the factory. For more detailed information on the strain gauge gearlever please see the manual for the strain gauge gearlever.

### Test the RPM pickup

Set the shift light to 2000 rpm mode 0. If it starts at a different rpm, the software may be set up incorrectly. If it does not work, there might not be a rpm-signal pickup. Please check all the connections.

### Cut times

To correctly adjust the cut-time, you need to be familiar with the "feel" of the gearbox. We recommend that you drive it first with no power shift and use the clutch with up- and downshifting. Then try to shift up without use of the clutch and lift your foot off the throttle. Focus on the feeling in the gear lever it should go just as easily as it would when using the clutch. When you are confident enough with the "feeling" of shifting up, you can try to adjust the power shift system.

First try to flat shift using the default values (cut time for each gear 100 ms). You will feel a difference when selecting gears. Some will feel like shifting with a clutch, but the most will feel "stiffer" or more harsh. Try to find an optimum setting for the gear's 2 till 5. If you have achieved this, then we recommend to use advanced settings.

### Delay times

The delay time is the time to wait for the cut time. Please leave the delay time set to nil as this is only used on direction of Drenth. The cut time is the time that the ignition is paused. Set the cut time for each gear independently at the recent found settings. Then lengthen the time for the lower gears, and shorten the time for the higher gears. The cut time will vary between 120 –45 ms. If it's to long or to short it won't shift with the same feeling as when using the clutch. Note that a properly setup power shift system, can reduce wear on the gearbox. Also a not very accurate setting can cause damage!

## Communication problem between computer and display unit

Some customers use a USB – serial adapter to connect the display to the laptop. However every time the adapter is connected with the laptop, the serial port gets a new COM number. When the error message as shown below is displayed please proceed with the following.

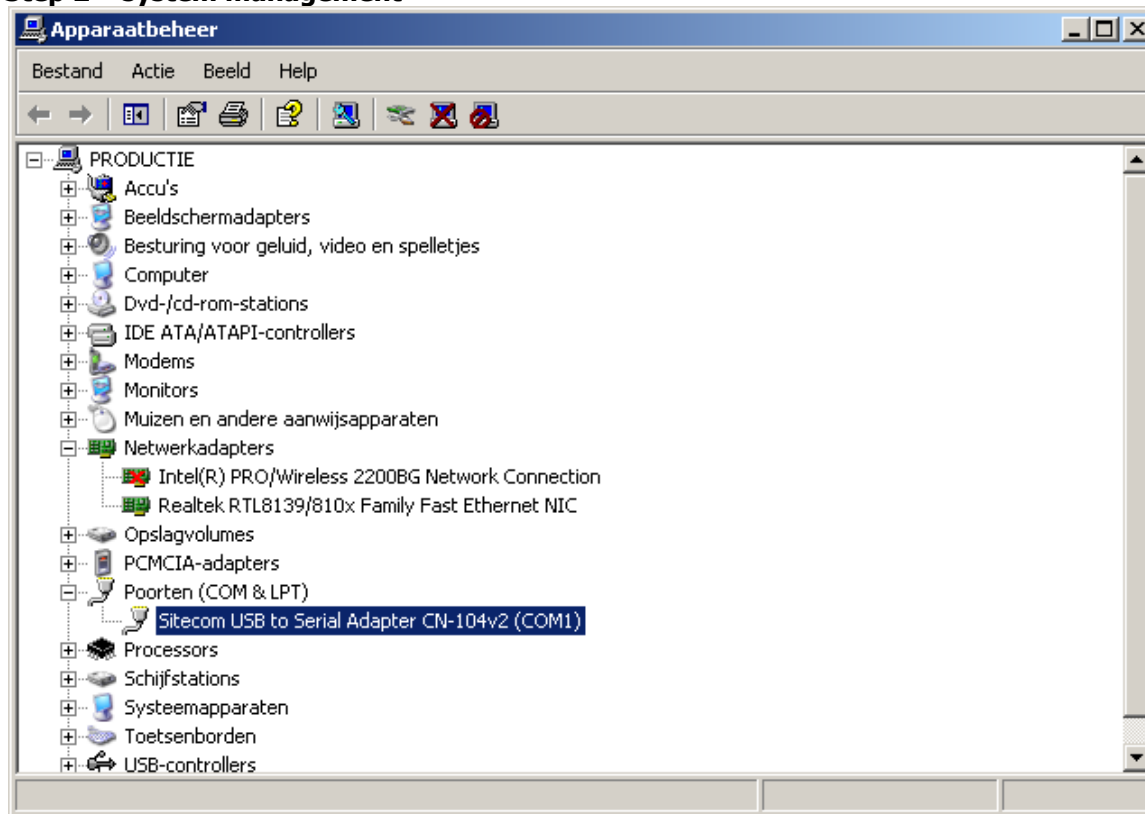


Please check the COM-port number of the USB-adapter. The solution for this can be found when you search via the hardware wizard on which COM port the serial adapter is working. Suppose that in this example it's COM5, you can refer to that port as shown on the images below.

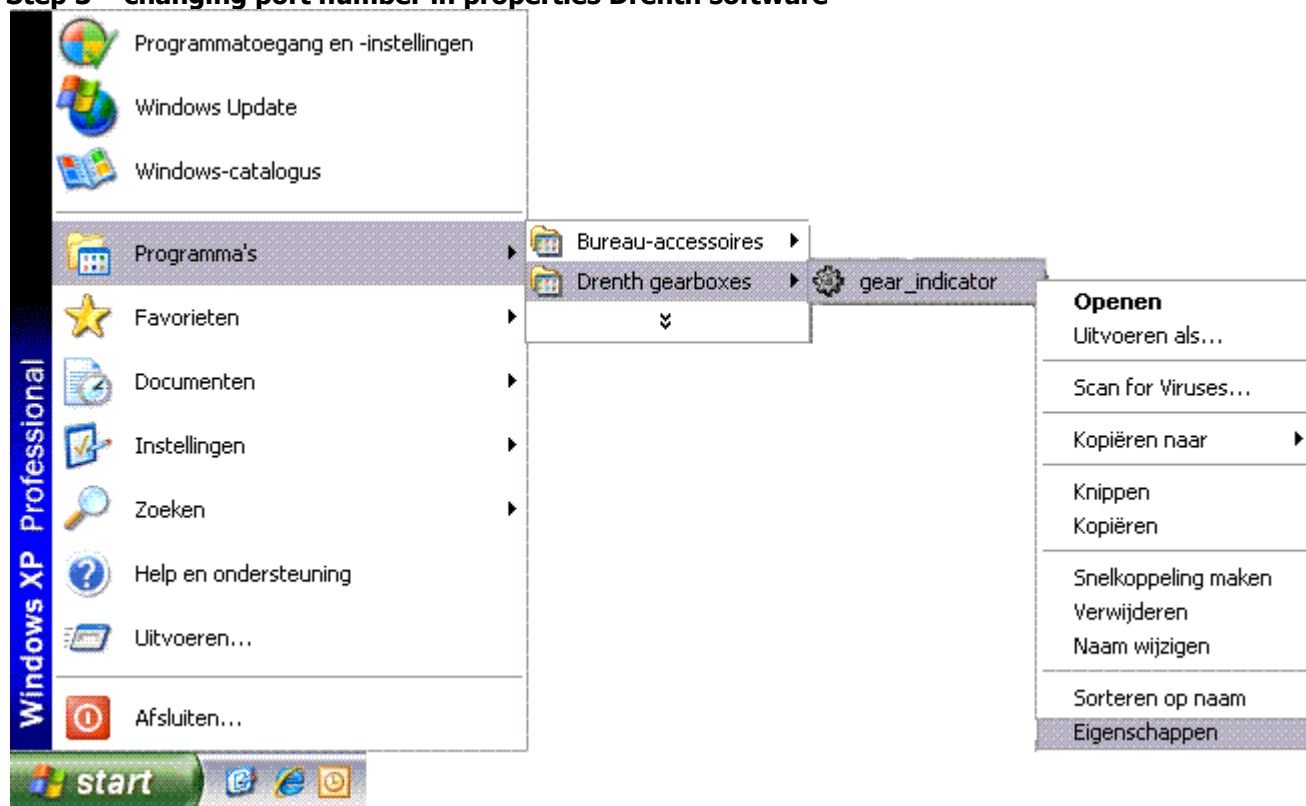
### Step 1 – system properties



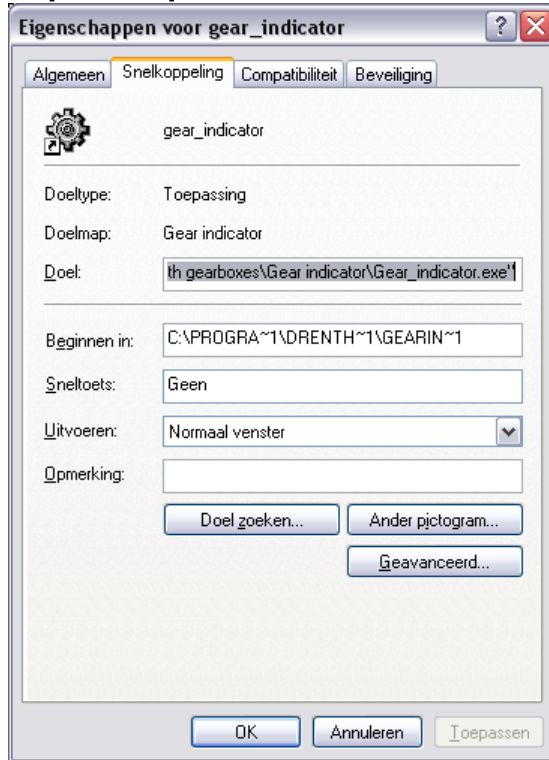
## Step 2 – system management



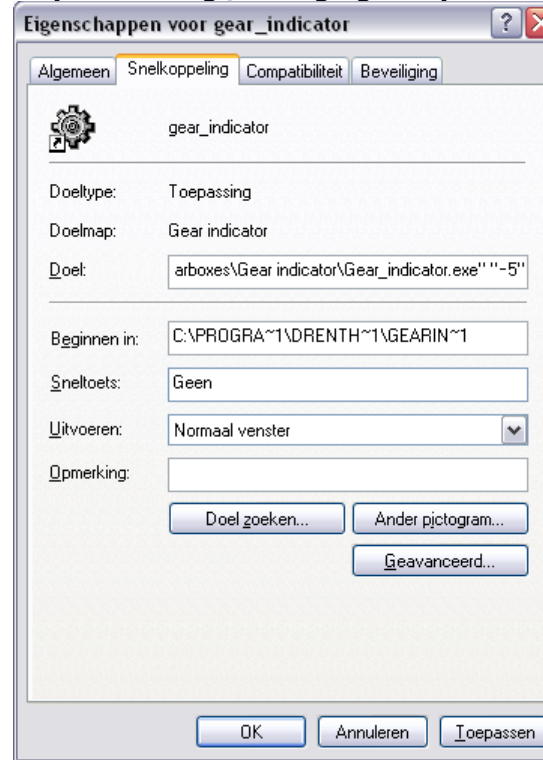
### Step 3 – changing port number in properties Drenth software



#### Step 4 – Properties link Drenth software



#### Step 5 – adding / changing Comport-number



## Contact Information

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