S1 Sequential

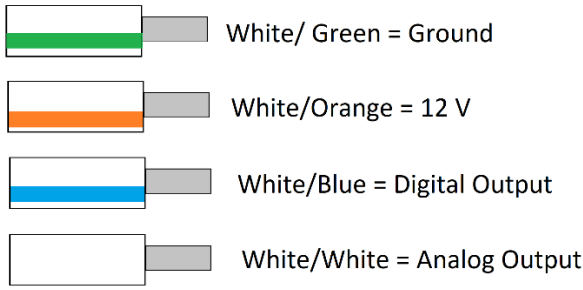
Load sensing gear knob V2

This Load sensing gear knob operates using solid state hall effect sensing to accurately measure the force applied the gear knob these measurements are then processed by an on board 32bit processor to allow for various user-friendly features including:

- Adjustable digital trigger in both directions
- Invert option on digital output
- Adjustable scalable analog output
- Cut and inhibit timers on digital output
- 12x1.75, 10x1.5 & blank adaptor inserts allow easy fitment to most cars.
- Factory programmed so programming is not necessary
- H pattern and Sequential styles available
- Fault mode disables output

These features are to solve the common problems found interfacing with an ecu and the removable threaded inserts allow fitment to almost any lever.

Wiring Colours



Please note that the Green trace is very light on the cable and may be hard to see.

Wiring Descriptions

White/Green: connected to ground with the ecu ground.

White/Orange: 12v supply for gear knob

White/Blue: Digital output, this can be configured to switch to ground when activated or to be normally switched to ground then switch to open upon activation, in this way a

pull up resistor may be added to provide a positive trigger.

White/White: Analog output, 0-5V, 2.5V at zero force. This outputs a voltage relative to force.

Fitment

The gear knob is supplied with 3 adaptors to allow easy fitment to many vehicles, one of these is a blank to allow any custom installation to be completed without risking damage to the gear knob. An easy way to fit:

- Fit and tighten the appropriate adaptor to the lever.
- Remove outer shell from the gear knob and fit to the adaptor with the cable facing the right side of the car.
- Fit and tighten the 4 supplied grub screws.
- Fit gear knob

Once the cover is fitted the force will be read the same regardless of where you push on the

cover but with the cover off you must press on the upper threaded section.

Optional Programming

Various parameters can be changed via the usb connector under the top cover. The easiest way to get an understanding of these is to hover the headings with the mouse pointer to read the explanation. The software for this can be downloaded at www.s1sequential.com/hallgearknobdownload .

You will need a micro USB Cable for this, that's the one before type C that's used on the newest android phones.

Before connecting to your computer with USB disconnect any wiring to the car. Connect the USB before opening the software. Once the USB cable is connected click the **connect** button, It should now read connected and you should see force data coming in, next click **Get Data** to see the current configuration. The software can be a little buggy in that if you want to change the value of a parameter its normally best to clear

the cell then re-enter the number, once you have the desired settings click the **send** button twice, wait 2 seconds and click the **Get Data** button twice and check the data is still correct.

Low trig: This is the force in grams at which the digital output is triggered when pushing away from the driver. This will usually only be used on H pattern gearboxes. If you do not want to use this set the number to -60000 (please note the negative symbol which must be used).

High trig: Sets the force in grams that the digital output will be active at when the gear knob is pulled towards the driver. If you do not want to activate the output set to 60000.

Max force: Sets the force that the analog output will be scaled too.

Timer: This can be set to keep the digital output activated for a set time in milliseconds after the trigger threshold is first crossed. If you don't want to use this feature set to zero.

Wait: This prevents double cuts at the end of shift by deactivating the gear knob for the time

set here in milliseconds. If you don't want to use this feature set to zero.

Ground when active/floating when active

Ground when active will complete a path to ground when activated and will be floating (neither positive of negative) when disconnected.

Floating when active is the opposite and will be normally connected to ground and be floating when active. With the use of a pull up resistor this allows for a positive when switched output.

Digital output

The Digital output cannot be retriggered until.

1. The timer is up
2. The Wait timer is up
3. The force has bee released under the threshold after initiation of the shift

   For example, if you hold the lever back for 1 minute only the initial cut will occur.

Calibration area

This is used for factory programming but can be accessed by the user, the code 1234 will have to be entered to unlock this.

Set Zero is used to zero the sensor

Set 5kg is used when 5kg force is applied

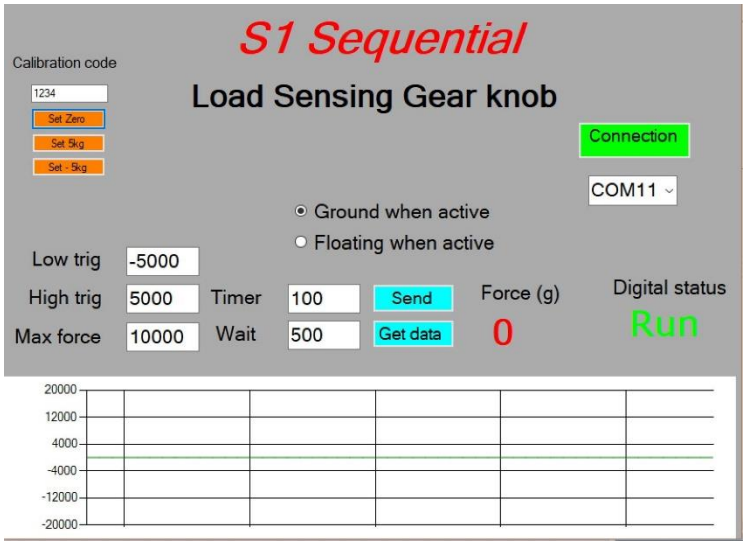
Set -5kg is used when -5kg force is applied

Fault Mode

A Recent update includes a fault mode, In the extremely unlikely event that the gear knob suffers from a failure it will turn off all cuts and the analog output will output a small square wave so it can be seen easily in your data logging. In this way a failure will not end a race.

Wiring Tricks

Running the cut through a clutch switch (conducting when clutch not pressed) will make shifts only occur when intended (no cut when engaging 1st/ Reverse or down shifts).


S1 Sequential
Calibration code
1234
Set Zero
Set 5kg
Set - 5kg
Load Sensing Gear knob
Connection
COM11
Ground when active
Floating when active
Low trig
-5000
High trig
5000
Timer
100
Send
Force (g)
Digital status
Max force
10000
Wait
500
Get data
0
Run
20000
12000
4000
-4000
-12000
-20000