

GCU_H v1.0 Software Manual

Summary of Operation:

Our newest Gearbox Control Unit brings the features of our sequential transmission module to any car with a manual transmission.

No-Lift Shifting at Wide Open Throttle (WOT) via spark cut allows for quick, smooth and consistent shifts.

While braking, during downshifts a throttle blip provides seamless rev matching.

WOT Shift Spark Cut (Closed Loop)

The spark cut period is variable (closed loop) based on clutch press IN/OUT. After clutch out spark is ramped back from the cut % to full power linearly over the Torque Recovery period. This softens the reintroduction of power thru the drivetrain to minimize shock and improve traction. But it can also be set to zero to the quickest application of power.

Minimum Throttle Pedal % input must be met for Spark Cut to be active.

NOTE: If the clutch IN/OUT period exceeds the igncut timeout period (example: 300ms) the spark energy is returned to the engine.

Downshift Throttle Blip

A throttle blip (to a programmable % and duration) will occur when the brake pedal is pressed followed by a clutch press.

NOTE: Special cases

Coasting into PIT or traffic with the clutch pedal pressed.

If the clutch is pressed first and then the brake, no blip will occur.

Launching the car from a stop with the clutch pedal pressed.

If the clutch is pressed first and then WOT, no cut will occur.

Connection

Connect the PC to your GCU USB Port BEFORE opening the software.

1. Select COM Port # of the GCU from the drop down menu
The settings will automatically load from the GCU into the software.

File Tab

The file tab allows the user to read/write the entire calibration file into the GCU. This is used to backup and restore of the settings.

The easier way to configure the GCU is by using the **Settings Tab** and making changes only to the parameters that need adjustment.

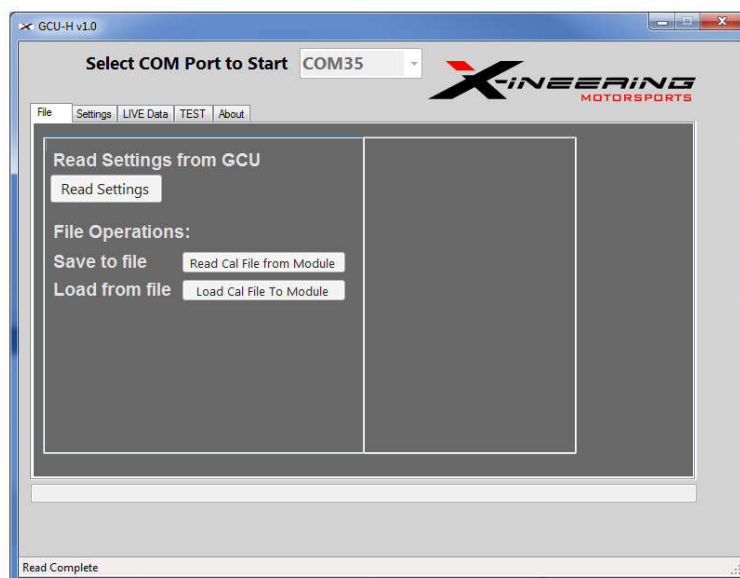
To read all calibration settings FROM the GCU and save it to a file.

- Click **Read Cal File from Module**
- Enter filename, Click OK.

To load a calibration file INTO the GCU

- Click **Load Cal File To Module**
- Select a cal file from windows file dialog
- Click OK to open the file

It will load the file and confirm in the status bar at the bottom of the program.



Settings Tab

The first time the GCU connects it will automatically read out the settings. Click **Read Settings** at anytime to populate current settings from GCU into the software. Click on any parameter name to show a description.

Downshift Blips

Blip % - Target accelerator pedal % for blip

Blip Duration - Duration (ms) of the blip event

PreDelay - Delay (ms) after blip event trigger (Brake + Clutch) before blip (Default 0 ms)

Upshift Spark Cut

Spark Cut% - 'Depth' of Ignition Cut from coil on plug power

IgnCut Timeout - Max. Spark Cut Duration (ms) ie Timeout if clutch pedal is not released

TrqRecovery Duration - Time (ms) AFTER the Cut that spark is linearly ramped back in to full power

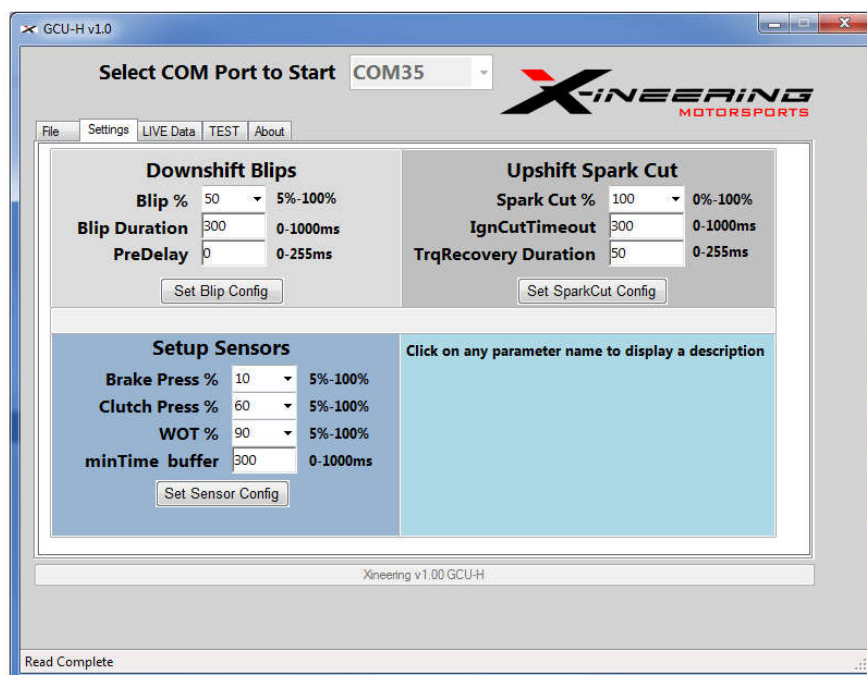
Setup Sensors

Brake Press % - Brake Pedal Sensor % Pressed to register a 'Brake' Event

Clutch Press % - Clutch Pedal Sensor % Pressed to register a 'Clutch' Event

WOT % - Accelerator Pedal Sensor % Pressed to register a Wide Open Throttle - 'WOT' Event

minTime buffer - minimum amount of time between two blip/cut events, prevents double blips/cuts

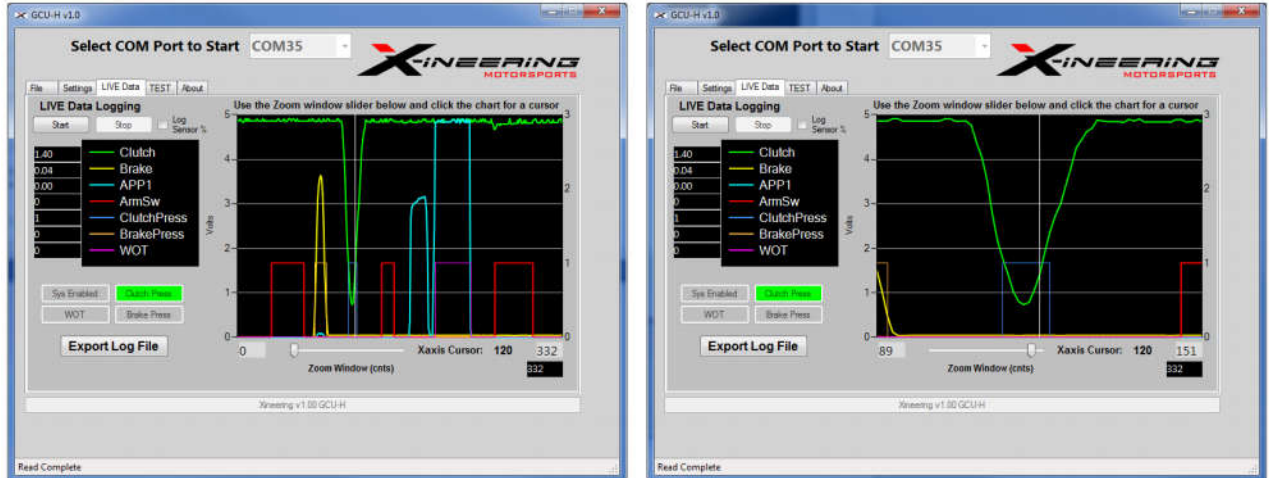


LIVE Data Tab

Click Start Log to monitor real-time sensor data

No Blip or Cut events will occur during LIVE logging, even if the Arming switch is ON. This is used for debugging operation of all the sensors and pedal press events.

"Export Log File" will save data in a tab delimited text table format (Excel or Notepad)



Test Tab

Manual Test Buttons

Manually command a Test Blip or Test Cut for the duration in the Test Duration(ms) box. The Blip % and Cut % will be performed based on the values stored in the GCU calibration.

NOTE: These tests can be run with the engine running. Please be aware of engine run conditions before testing. Normal testing the car is not moving and the clutch pedal is fully depressed.

Manually Test Ignition Cut (Cut % from Settings)
12V Ignition Coil Cut Output
100 TEST IgnCut
0-1000ms

Manually Test Blip Output (Blip % from Settings)
Active Blip Output
100 TEST Blip
0-1000ms

Windows GCU USB Driver Installation, if needed

Download and Extract the GCU Software zip file to a location on your hard drive.

- GCU_H_v1 Folder (GCU PC interface software)
- CH340Driver Folder (USB Driver Installer)

Note: Driver installation is only needed if the GCU does NOT show a COM port in the Device Manager when connected with USB.

It must be performed before running software to connect to the GCU.

The GCU does NOT have to be powered by the vehicle for USB connection to be established.

Driver Installation Procedure

Run the Setup.exe from the CH340Driver folder.

NOTE: On windows 10 the installer will say failed, Click OK. The install of the driver will still be successful

To view your GCU Comport #

- Connect the box to the PC via supplied USB cable
- Press the WINDOWS key (between Left Ctrl and Left ALT buttons)
- Type Device manager, press enter.
- Expand Ports (COM & LPT), it will show the COM port # assigned to the box.

