

# PCLINK > TUNING

- > Compatible with all G4+ based ECUs
- > The most comprehensive, integrated ECU tuning and logging software
- > Windows [XP, Vista, 7 & 8]
- > Mouse or Keyboard driven
- > Fully configurable multi-page layout
- > Large number of different "views" for displaying ECU and log data
- > Advanced time saving tuning features and shortcuts
- > Single key access to all critical runtime values
- > Single key to convert metric-imperial



## ECU CONFIGURATION

- > Logically organised tree style navigation of ECU settings
- > Comprehensive context that is sensitive help for all features

## TUNING

- > Pop-out settings menu that saves screen space
- > Interactive 3D surface graph
- > Multiple table display
- > Configurable gauges, plotting and runtime values
- > Warnings and Status Information
- > All runtime displays automatically change based on selected table



## GAUGES

- > A variety of configurable gauge types
- > Highly visible warnings

## LOGGING

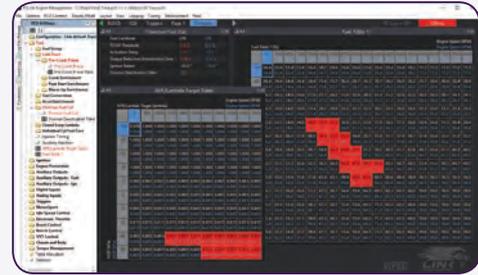
- > Record, save, download and analyse data log files
- > Customisable colour themes
- > Log analysis views: Time Plot, Navigator, XY Plot, Statistics, Histogram, Value List, Parameter List
- > Overlay and offset laps and files for comparison
- > Global time and cursor linking
- > Record, analyse and compare logs while tuning an ECU

## COMPARE BASE MAPS

PCLink has been updated and gained a really useful feature: compare two base maps and show exactly where the differences are and what has changed. Select a tune from some time ago and compare with today's tune. Be suspicious, compare the engine's tune with the tune you kept on file to see if the tune has changed since the car was last in your shop.

Simply open a compare file and it is automatically compared against the currently open file or connected ECU. Changes are highlighted in the settings tree so you can drill down to the exact setting that has been changed.

Download the latest version of PCLink for free from [linkecu.com](http://linkecu.com)



## DIGITAL WIDEBAND

### OUR CONTROL IS DIGITAL!

Other ECU manufacturers use cheap old analogue controllers that are easy and fast for the ECU designers to implement but ignore the capabilities of modern O2 sensors error correction & diagnostics abilities. Worse still, many ECUs and after-market wideband controllers use their own basic, bare bones circuit designs to control the sensor.

The wideband controller IC in the G4+ Fury and G4+ Thunder is so comprehensive, that if we were to build it out of discrete components, it would be as complex as our entire ECU and still not as excellent as the IC we use.

### OUR DIGITAL WIDEBAND CONTROLLER

- > Current OEM technology wideband Lambda sensor control
- > Full digital sensor control and interface. No loss of signal measurement precision
- > All sensor control is performed using a Digital Signal Processor (DSP) which eliminate risks, delays and measures errors caused by analog alternatives
- > Advanced sensor protection such as automatic blackening prevention
- > High speed sampling (1.5 kHz) results in fast sensor response – that's one thousand five hundred samples per second!
- > Uses sensors with internal reference cell to prevent drift with ageing
- > Advanced sensor and circuit diagnostics not available in analog controllers
- > Makes full use of sensor OEM calibration resistor to avoid the need for manual per-sensor calibration
- > Continuous measurement, correction and compensation to correct for all wiring, component and circuit errors and changes
- > Exhaust temperature correction
- > Shortest startup to sensor measurement valid time
- > Automatic shutoff and protection for sensor wiring short circuits

# SMOOTH WITH GRIP

## 1. TRACTION CONTROL



### Hold on Tight

Not as simple as it sounds but when its done properly, it is amazing and we sure have done it properly.

Controlled tyre slip to improve vehicle safety, driveability and performance

- > Lockout for engine speed, throttle position, and non-driven wheel speed
- > Specify the amount of slip per gear before traction control activates, traction control will adjust engine torque to maintain the slip specified
- > A second switchable traction control table is available for different road or track conditions

*Traction is not available on some ECUs*

## 2. GEAR SHIFT CONTROL

### Quick, Smooth Gear Shifting

- > Simple clutch (switched) system through to full closed loop sequential gearbox
- > Start gear shift control via:
  - » digital input (clutch switch)
  - » gear lever force (H pattern gearbox)
  - » gear lever force (sequential gearbox) or
  - » gear barrel position sensor
- > End gear shift by time, digital input, or gear barrel position
- > Configurable for each type of gear shift:
  - » driven up shift
  - » driven down shift
  - » overrun up shift
  - » overrun down shift
- > Configure settings per gear
- > Throttle blip by solenoid or electronic throttle body
- > Lockout for engine speed, throttle position, and driven wheel speed
- > Gear lever force calibration for strain lever output (volts to newtons)



## OTHER FEATURES

- > Input Shaft Speed – for optimising torque converters and clutches for drag racing
- > Latched Launch RPM Mode – rolling race starts
- > Multiple VVT Tables – allows for different levels of tune without the need to change base maps
- > Rotary Limiting – this new mode reduces exhaust temperatures
- > Additional Analog Calibration Tables – 4 more calibration tables

Full descriptions of all firmware features at [linkecu.com](http://linkecu.com)

# FUEL EQUATIONS



## TWO NEW FUEL EQUATIONS

### Traditional Fuel Equation

The popular, existing fuel equation has been retained allowing tuners to use their existing maps. The traditional fuel equation is recommended for tuners wanting to get an engine tuned promptly for budget customers.

### New Fuel Equations

1. Modelled Fuel Equation – Tune the Volumetric Efficiency (VE) table once. Changes not effecting the VE of the engine i.e. injectors, lambda targets, fuel pressures, etc. can be made without having to alter the VE table.
2. Modelled Multi-Fuel Equation – Modelled Fuel Equation (above) plus run any blend of two compatible fuel types and the ECU will inject the correct amount of fuel.

The additional data the ECU receives for the two new modelled fuel modes results in more accurate fueling than the traditional mode.

## JAPANESE PCLINK



- > Alternate between English and Japanese
- > 700+ pages of help

# FEATURES

## INDIVIDUAL CYLINDER, CLOSED LOOP, KNOCK CONTROL

Knock, also known as detonation, refers to the spontaneous combustion of an air/fuel mixture inside a combustion chamber.

Knock is induced by excessive pressure within the combustion chamber causing the air/fuel mixture to self detonate. These pressures can be a result of high engine temperature, inappropriate turbo boost pressure, excessive inlet air temperature, and ignition timing which is over advanced.

The Link G4+ ECUs are capable of detecting knock by using factory, or after market knock sensors. By applying user configurable 'time windowing' techniques and filtering options, the G4+ will determine which cylinder has knock, and the severity of the knock. 3D knock level threshold tables are used to prevent false detection caused by mechanical engine noise.

Each individual cylinder can be assigned with a 3D knock ignition trim table. These tables are generally spanned using 'RPM' and 'Load' as their axis, and zones within these tables are modified dynamically by the ECU upon detection of knock. Timing is retarded on detection of knock in the particular zone, using configurable sensitivity and clamping properties. This all happens within the bounds of microseconds.

The G4+ ECU can be configured to gradually re-introduce timing advance, at a rate governed by the speed and delay of which the user has specified in the settings when knock is no longer detected.



## UP TO SIX DIMENSIONS OF FUEL & IGNITION TUNING

Under most circumstances a 3D Fuel Table is sufficient. RPM is typically used for one axis with load (typically represented by MAP or MGP) on another axis. The 3rd axis/dimension is the fuel zone value.

This 3D mapping will be very familiar to the average tuner and the 3D surface representing the fueling can be easily visualised or physically displayed by selecting Surface Graph.

In special cases, 3D mapping may not be adequately flexible to cope with all operating parameters.

Multi-throttle turbo charged engines typically show an example of this. With the throttle wide-open at a MAP value of, for example, 200kPa and an engine speed of 5000rpm the engine will have considerably different fueling requirements than with the throttle half open and the same MAP and engine speed. In this case the 4D Fuel Table may be used. This second table may be spanned using throttle position on the load axis.

When a 4D/5D/6D table is turned on, its Table Activation mode can be selected. This allows the 4D or 5D Fuel Table to become active only under certain conditions. This is useful if an external switch or switching output is required to activate the table [e.g. switching in the 4D Fuel Table when the nitrous solenoid becomes active]. If the table is required to be always active, set this adjustment to Always ON.

As with all tables, 4D and 5D Fuel Tables can have their X and Y axis parameters selected and their row/column locations adjusted.



## QUICKTUNE YOUR FUEL

Using PCLink, QuickTune is an interactive tuning tool that assists in time efficient fuel tuning. A graphical display of Target AFR (desired AFR) and Actual AFR (measured AFR) is provided. A dual pointer gauge allows the tuner to quickly see how close Actual AFR is to the Target AFR. QuickTune can be setup to operate over the entire fuel table or just over a particular area. QuickTune can be used in Manual or Automatic modes. In Manual mode, QuickTune guides you to cell centering and advises you when is a suitable time to make a fuel table adjustment. With the press of a key a calculated adjustment is made. Often only one or two adjustments are required to tune each cell. In Automatic mode QuickTune does all the adjustments for you. This leaves the tuner free to operate the Dyno or perform other tuning work such as making ignition or cam angle adjustments.

# G4 KNOCKLINK

*The G4 KnockLink Digital Warning is designed for both street and race use and is the only self calibrating knock warning instrument on the market.*

*"Ignition timing can make or break an engine and the effects of too much timing or a bad batch of gas can really ruin your day.*

*The team at Link have been hard at work with knock detection devices and off the back of the G4 KnockBlock comes the G4 KnockLink.*

*The G4 KnockLink is a stand alone Knock Detection warning light that is simple to install and actually works. I was surprised at how well the KnockLink worked either with factory sensors or noisy engines – the KnockLink picked up detonation that if left alone would have destroyed an engine.*

*The KnockLink is perfect as a warning device in all cars for that peace of mind as well as a handy tuning tool!"*

**> David Heerdegen**  
Dtech Motorsport



## WHY CHOOSE THE KNOCKLINK OVER OTHER PRODUCTS ON THE MARKET?

The KnockLink G4 is the only device on the market that requires no setup. Other systems require time consuming gain, frequency and noise settings to be adjusted. Without proper knock listening tools, this can prove difficult if not impossible. The KnockLink requires none of this, just wire in and start the engine.

Even light detonation will damage an engine over time. The G4 KnockLink's microprocessor continuously scans the knock signal and warns for any knock occurring. The engine's RPM and load is automatically 3D profiled by the KnockLink, continuously storing and dynamically adjusting this noise profile map while looking for the particular knock frequency.

If knock does occur, the KnockLink warns the driver with a high intensity red flash. Connect additional sensor (sold separately).

The KnockLink uses advanced signal processing techniques to determine actual engine knock, whilst normal engine noise is completely discarded. It is housed in an anodized black aluminium enclosure, providing sleek looks along with high durability.

## TYPICAL CAUSES OF ENGINE KNOCK:

Engine knock is one of the most damaging effects in any engine. Detonation (knock) can destroy your engine in seconds. You need to know when knock occurs, instantly.

### Knock can happen when there is:

- > Poor fuel quality
- > Incorrectly rated spark plugs
- > Engine cooling problems
- > Engine management problems



## FEATURES

- > Intelligent self learning digital system
- > High detection accuracy (90%+ based on feedback from professional tuners)
- > No complicated calibration process
- > Green glow during operation with high intensity red warning flash when knock detected
- > Bracket or panel mount

# G4+ KNOCKBLOCK

*Link's new G4+ KnockBlock is an audio interface that lets you hear knock (detonation and pre-ignition).*

*The G4+ KnockBlock is an essential tool for tuning and can aid in the early detection of incorrect ignition timing, lean air / fuel mixtures and mechanical issues.*



## FEATURES

- > Listen to one or two knock sensors
- > Special filtering design improves signal to noise ratio
- > Can be used with ear buds, ear phones and noise cancelling ear muffs
- > Long life lithium rechargeable battery
- > Can be used to interface directly to a laptop for recording of engine noise or knock sensor frequency analysis (using PCLink G4+)
- > Rugged CNC aluminium enclosure
- > Flying lead headphones connector
- > Can be used with all OEM knock sensors

## OPERATING

- > Install the knock sensor/s in a suitable location on the engine [typically on a solid mounting point on the block near the cylinder head]
- > If only using one sensor, leave the unused sensor cable disconnected
- > Turn the volume control clockwise until it clicks. The LED indicator will turn blue when the KnockBlock is operating
- > Turn the volume to the minimum setting [most anti-clockwise]
- > Connect headphones to the 3.5mm audio jack
- > Run the engine and carefully increase the volume [clockwise] until engine mechanical noise can be heard. Adjust to a comfortable listening volume

## Charging

- > Turn off the KnockBlock by turning the volume control anti-clockwise until it clicks
- > Connect the USB charging cable to the KnockBlock's Mini USB connector. Can be charged from any standard USB charger PC, laptop, car or cell phone charger [2.1A at 5V max]
- > The LED indicator will show red while charging. When the indicator turns off, the battery is fully charged
- > Charge the G4+ KnockBlock after use and before storage

## WHAT'S IN THE BOX?

- > G4+ KnockBlock
- > 2 sensor looms [attached]
- > 1 headphone loom [attached]
- > Quick Start Guide
- > 1 USB cable mini
- > 2 Bosch type doughnut OEM knock sensors
- > 2 small Link Engine Management stickers

## DASH



Use in competition or road vehicles.

The Dash's construction is of the highest quality with an aluminium frame and military spec connectors, so it is suitable for both open and closed top vehicles as well as motorcycles.

## COMPATIBILITY

*ECUs are compatible with all leading after-market dashes via CAN or serial stream.*

## Plug into Link ECUs

- > Custom LCD panel dashboard display, clearly visible under any light condition
- > Water resistant for open top or motorcycle applications
- > Compact and slim, easy to fit
- > Suitable for any engine installation with a fully configurable RPM scale
- > Optimise your gear changes with the configurable ultra bright shift lights
- > Road legal, everything required for an MOT or SVA testing including tamper proof odometer, backlit display and mandatory warning lights
- > Lap and sector time display using a separate data logger
- > Stand alone operation. Connect up to 4 engine or gearbox sensors as well as RPM and wheel speed
- > Display information directly from your ECU using CAN or serial interface\*
- > Monitor your engine and display high/low alarms for any parameter
- > Gear position indicator. Calculated or using a gearbox sensor
- > User selectable units MPH/miles or KPH/km
- > Display the information you want to see with 5 user defined screens
- > Control the Dash and a data logger with the external button set (optional)
- > Easy to use configuration software

*\*Link CAN cable required*

