



**FORCE GDI**

# Quick Start Guide

This is only a quick start guide.  
A full wiring and installation  
manual is included in **PCLink**.

[linkecu.com](http://linkecu.com)



# Installer I/O Table

Wire Description	Installer Connection	Typical Application
+14V Bat	Full time fused (15A) Battery	
+14V	Ignition Wire	
GDI Pump	High Pressure Pump	
Trigger 1	Crank Angle Sensor	Reluctor, Proximity, Optical or Hall
Trigger 2		
Analogue Temp Input 1		NTC Thermistor sensors only Temp 1 & 2 have selectable / no pullups
Analogue Temp Input 2		
Analogue Temp Input 3		
Analogue Temp Input 4		
Analogue Volt 1		0-5V Input from sensor or external controller
Analogue Volt 2		
Analogue Volt 3		
Analogue Volt 4		
Analogue Volt 5		
Analogue Volt 6		
Analogue Volt 7		
Analogue Volt 8		
Analogue Volt 9		
Analogue Volt 10		
Analogue Volt 11		0-5V Input from sensor or external controller Not TPS, APS or Map
+5V Out	TPS and MAP sensor power	+5V Power OUT
+8V Out		+8V Power OUT
Ignition 1		Ignition Amplifier Drivers Use spare Ignition channels for switching type Axillary Outputs
Ignition 2		
Ignition 3		
Ignition 4		
Inj 1+		Supplies the positive side of Injectors switching with Inj 1A, Inj 1B
Inj 2+		Supplies the positive side of Injectors switching with Inj 2A, Inj 2B
Injection 1A		Switches the negative sides of four injectors

Injection 1B		
Injection 2A		
Injection 2B		
Auxiliary Output 1		High Frequency PWM or VVT Control
Auxiliary Output 2		Three Wire ISC Solenoid must be wired to Aux1 and Aux2
Auxiliary Output 3		Flywheeled, Low side only
Auxiliary Output 4		Cannot be used if E-throttle is used
Auxiliary Output 5		PWM less than 300 Hz or general switching functions
Auxiliary Output 6		Flywheeled, High / Low side Drives
Auxiliary Output 7		ISC Stepper (4 or 6 terminal)
Auxiliary Output 8		
Auxiliary Output 9		If using E-throttle, this should go to one side of the e-throttle motor
Auxiliary Output 10		
E-throttle 1		If using E-throttle, this should go to one side of the e-throttle motor
Knock 1		Knock Sensors Only
Knock 2		
Digital Input 1		
Digital Input 2		
Digital Input 3		
Digital Input 4		
Digital Input 5		
Digital Input 6		
Digital Input 7		
Digital Input 8		
Digital Input 9		
Digital Input 10		
MES	Sensor Green Wire (pin 5)	LSU 4.9 Wideband Lambda Sensor
RE	Sensor Black Wire (pin 6)	
Heater	Sensor White Wire (pin 3)	
IPE	Sensor Yellow Wire (pin 2)	
APE	Sensor Red Wire (pin 1)	
CAN 1		
CAN 2		

# Wiring Information

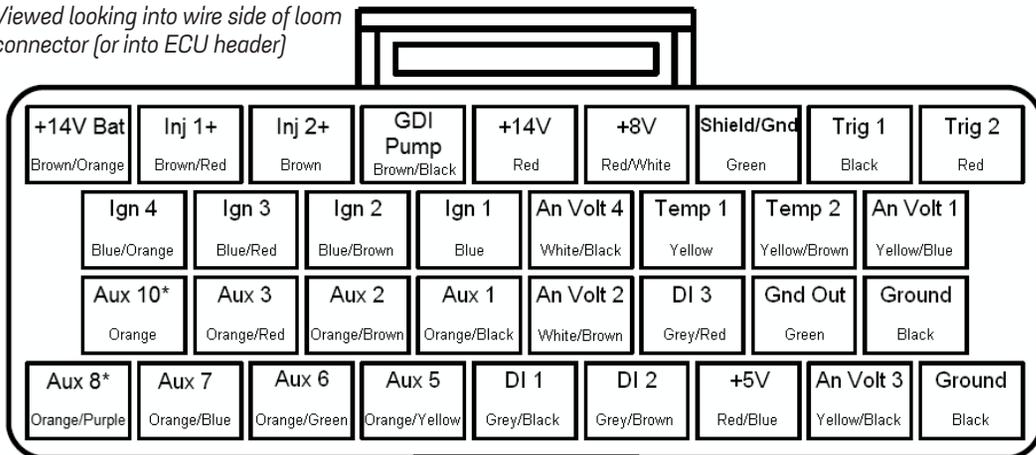
It is recommended that your Link G4+ Force GDI ECU is installed by a trained professional. Incorrect installation can result in damage to the ECU or the vehicle — extreme care must be taken.

The following pin diagram shows the inputs and outputs available with the G4+ Force GDI ECU. Application wiring examples are provided in the full Wiring and Installation Manual available in PCLink G4+.

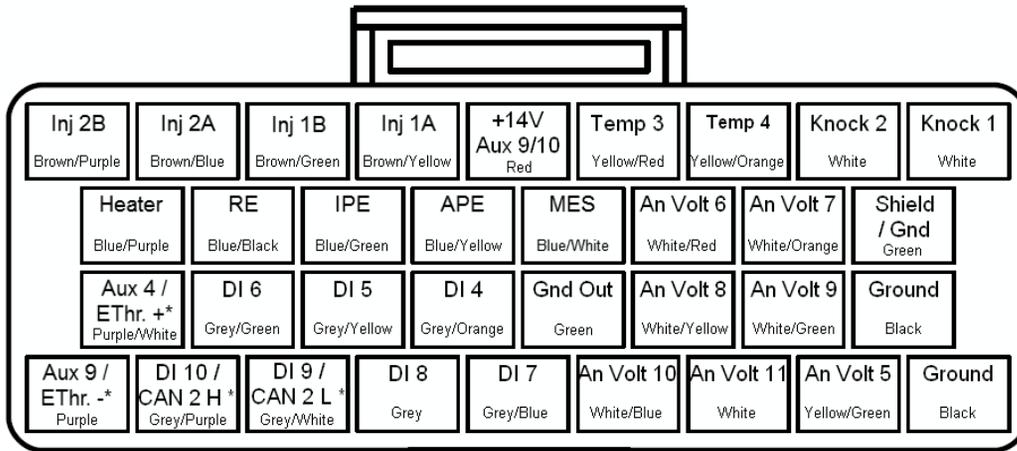
It is recommended that the installer fills out the 'Installer I/O Table' as a reference to keep with the ECU. This table is provided on the previous pages.

## A LOOM

Viewed looking into wire side of loom connector (or into ECU header)



\* Aux 8, Aux 10 only on serial numbers 32384 and greater. Otherwise Aux 8 is blank and Aux 10 pin is assigned to Aux 4.

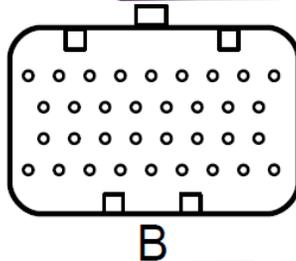
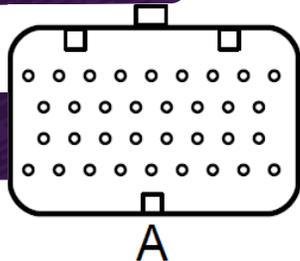


\* Aux 4 can not be used if ETHrottle is used

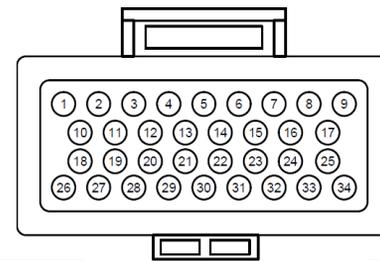
\* DI 9/10 can be used as CAN2 or Digital Input

\* ETHr 1 & 2: See Force GDI Specific Wiring for ETHrottle wiring requirements

## A & B CONNECTOR KEYS



## PIN NUMBER LAYOUT



# Force GDI Special Wiring Considerations

The Link G4+ Force GDI requires some special wiring considerations. Most pins on the ECU have the same functionality as on other Link G4+ ECUs and can be wired as per the relevant instructions. The most significant difference between the Force GDI and other ECUs is how the injectors and injector power supply must be wired.

## GDI INJECTION WIRING

---

**Note:** If running saturated driven (high impedance) injectors with the Force GDI, refer to the Injector Wiring instructions found in the Wiring Information section of the PCLink Help under Injector Outputs. When running in saturated mode, the Inj 1+ and Inj 2+ pins should be left unconnected. The +14V Bat wire must still be connected.

GDI Injectors are very low impedance. They open for very short durations and against a high fuel pressure so require a special high current driver circuit. Information on driver operation can be found in the PCLink Help under Injector Drivers. The Force GDI contains an advanced driver controller that generates and switches the high voltages and currents required for GDI injectors. The following header pins are driven by this controller:

+14V Bat – Supplies the high current for the high voltage generation circuit and injector high side driving.

Inj 1A, Inj 1B, Inj 2A, Inj 2B – Switches the negative sides of four injectors.

Inj 1+ – Supplies the positive side of Injectors switching with Inj 1A, Inj 1B.

Inj 2+ – Supplies the positive side of Injectors switching with Inj 2A, Inj 2B.

GDI Pump – Control the high pressure fuel pumps delivery volume control valve.

## +14V BAT WIRING

This supply powers the ECU high voltage converter. It is essential that this connection is as low resistance as possible. It should be connected directly to the battery with a 15A fuse at the battery end. Make sure to use a suitable sized wire for the cable length (note that the supplied Link loom wire may not be suitable depending on length).

## INJECTOR DRIVERS.....

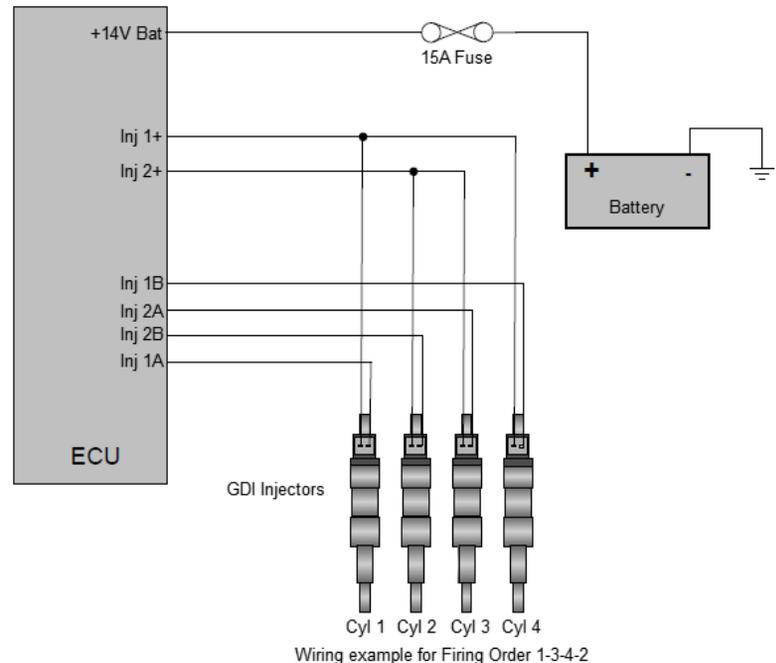
The matching of cylinders injectors to driver pins depends on the engines firing order. The reason for this is that only one injector of each pair (1A, 1B or 2A, 2B) can be turned on at a time ie 1A and 1B can not be on at the same time as there is only one positive supply 1+. The follow table shows wiring configurations for various four cylinder firing orders:

Firing Order 1, 3, 4, 2 or 1, 2, 4, 3	Injector Negative	Injector Positive
Cylinder 1	1A	1+
Cylinder 2	2B	2+
Cylinder 3	2A	2+
Cylinder 4	1B	1+

Firing Order 1, 3, 2, 4	Injector Negative	Injector Positive
Cylinder 1	1A	1+
Cylinder 2	1B	1+
Cylinder 3	2A	2+
Cylinder 4	2B	2+

*continued on next page*



## GDI PUMP

---

The GDI Pump pin is dedicated to controlling the high pressure fuel pumps delivery volume control valve (sometimes called a spill valve). Connect the negative side of the solenoid to this pin. The positive side of the solenoid should be wired to the EFI main relay power supply (usually same power supply as the ECU and other engine control solenoids).

## E-THROTTLE WIRING

---

The Force GDI ECU uses an electronic throttle (E-Throttle) wiring arrangement that differs slightly from other Link G4+ wire in ECUs. Aux 4 is shared with the EThr. 1 pin. Only one of these pins can be used at a time. If not using electronic throttle, Aux 4 and Aux 9 can be used as general purpose outputs. If using electronic throttle then wire as follows:

Aux 4, MUST remain disconnected.

Aux 9, Connect to positive terminal of throttle actuator motor.

EThr. 1, Connect to negative terminal of throttle actuator motor.

When using electronic throttle, configure the ECUs Auxiliary Outputs as:

Aux 4, set function to EThrottle Signal 1

Aux 9, set function to EThrottle Signal 2

# Important Information

## G4+ ECUS SHIPPED LOCKED

---

G4+ ECUs are shipped as locked and must be enabled before they are used. The ECU can be installed and configured using PCLink, but will not read engine RPM or run the engine until unlocked. Contact your ECU supplier to obtain an unlock code.

## SUPPORT OPTIONS

---

- PCLink G4+ help — press F1 while running PCLink G4+. Includes help on wiring, PCLink G4+ and ECU functions
- Contact your nearest Link dealer. A Link dealer list is available on [linkecu.com](http://linkecu.com)
- Link website: [linkecu.com](http://linkecu.com)
- Technical Support email: [tech@linkecu.com](mailto:tech@linkecu.com)
- Online Discussion Forum: [linkecu.com/forums](http://linkecu.com/forums)

Most questions received by the technical support team are answered in the PCLink G4+ Help section. Please consult the manuals to make sure that your question has not already been answered.

## PCLINK G4+

---

All Link G4+ ECUs are tuned and configured by our PCLink G4+ software package. Connection to the ECU is established through on-board USB.

The latest version of PCLink G4+ can be downloaded from [linkecu.com](http://linkecu.com). Included with PCLink G4+ are the USB drivers for connecting to the ECU.

*continued on next page*

## IMPORTANT

---

Before connecting the ECU to your PC, the correct USB drivers must be installed. Failure to install the drivers on your PC first may result in Windows assigning incorrect drivers. These drivers will not work with the ECU and are difficult to uninstall.

After installation, consult PCLink G4+ Help (press F1) for instructions on connecting to the ECU.

Once you have the ECU connected to PCLink, check the ECU firmware and upgrade to the latest version if it is not already.

## GENERAL ECU MOUNTING GUIDELINES

---

The following requirements should be taken into account during the installation of the ECU;

- The ECU should be fitted inside the vehicle cabin in a location that avoids exposure to excessive temperatures and the risk of water ingress. The location of the ECU should also be physically separated from the ignition components or any other components that may cause interference.
- Allow enough room at both ends of the ECU for the main wiring harness and tuning cables to be connected.
- The mounting bracket provided should be installed on a flat surface, with the ECU firmly fitted to the bracket. Alternative brackets should not be used and under no circumstances should holes be drilled in the ECU case. Any modifications to the case will render the warranty invalid and may cause internal damage.
- It is recommended that the ECU is rubber mounted in order to isolate the ECU from vibration.
- For motorsport applications, the ECU should be located in a position that minimises the risk of physical damage in the event of the vehicle being involved in a crash. ECUs used for speedway applications should be mounted securely within the cockpit area, protected from the elements, isolated from vibration and utilise an additional retention strap for protection from high impacts.

Please refer to the Wiring Information section in PCLink G4+ help for additional information.

## LIFETIME WARRANTY

---

### LINK ENGINE MANAGEMENT LTD – LIMITED LIFETIME WARRANTY

All Engine Control Units (ECUs) manufactured or distributed by LINK Engine Management Ltd are subject to the following LIMITED LIFETIME WARRANTIES, and no others.

LINK Engine Management Ltd warrants only to the original purchaser of the ECU, for the lifetime of the ECU, (subject to the limitations set out below), that the ECU shall be free from defects of materials and workmanship in the manufacturing process. This warranty ceases to apply and does not apply to ECUs that have not been manufactured or distributed by LINK Engine Management Ltd for a period of greater than one year.

An ECU claimed to be defective must be returned to the place of purchase. LINK Engine Management Ltd, at its sole option, may replace the defective ECU with a comparable new ECU or repair the defective ECU.

This limited lifetime warranty is not transferrable and does not apply to any ECU not properly installed or properly used by the purchaser or end user, or to any ECU damaged or impaired by external forces. The above warranties are the full extent of the warranties available on the ECU. LINK Engine Management Ltd has no liability to the original purchaser or any other person for any loss, injury or damage to persons or property resulting from the use of the ECU or any failure of or defect in the ECU whether by general, special, direct, indirect, incidental, consequential, exemplary, punitive, or any other damages of any kind or nature whatsoever. LINK Engine Management Ltd specifically disclaims and disavows all other warranties, express or implied, including, without limitation, all warranties of fitness for a particular purpose, warranties of description, warranties of merchantability, trade usage or warranties of trade usage.

For off-road use only. Not intended for highway vehicles. This ECU contains a user-configurable software programme, which is updated by LINK Engine Management Ltd from time to time. The user must ensure the current correct version of this programme is downloaded from the website of LINK Engine Management Ltd and installed in the ECU prior to use.

This limited lifetime warranty does not apply where the ECU has been installed with the incorrect version of the software programme. The user is solely responsible for the setup and testing of all user-configurable features.

### LINK ENGINE MANAGEMENT LTD LICENSE AGREEMENT

The software programme in this ECU is licensed not sold. LINK Engine Management Ltd grants the user a license for the programme only in the country where the programme was acquired. No other rights are granted under this license and the programme may only be used on one machine at a time. If the programme is transferred a copy of this license and all other documentation must be transferred at the same time. The license may be terminated by the user at any time. LINK Engine Management Ltd may terminate the license if the user fails to comply with the terms and conditions of this license. In either event the copy of the programme must be destroyed.



EXHILARATION  
STARTS HERE



[linkecu.com](https://linkecu.com)