

Geartronics GCU shift control CAN message definition – rev1.

The Geartronics GCU-3 can transmit torque reduction or throttle ‘blip’ requests either via hard-wired signals that switch to ground when active, or via a dedicated CANbus message. The format of the CAN message is as follows:

	Byte-0	Byte-1	Byte-2	Byte-3	Byte-4	Byte-5	Byte-6	Byte-7
Function	Ignition/fuel cut active Yes/No	Ignition/fuel Cut level %	Ignition retard (degrees)	Throttle blip active Yes/No	Throttle blip percentage	Gear position RAW 10-bit	Gear position RAW 10-bit	Gear Number
Value	LSB 0=inactive 1= ignition cut or retard 2= fuel cut	0-100 (0x00h - 0x64h)	0-60 (0x00h – 0x3Ch)	LSB 0=inactive 1=active	0-100 (0x00h - 0x64h)	Bits 15.....8	Bits 7.....0	User defined (see notes)

Notes:

1. Bus speed is 1 Mbps
2. The message address is user defined, but should be high priority (low address)
3. Message id is 11-bit
4. Message transmit rate is nominally 10Hz when system is idle
5. Message transmit rate increases to 1000Hz during gear shift event
6. The data value for gear number in byte-7 can be defined individually for each gear
7. Ignition or fuel cut level in byte-2 should use ECU standard cut pattern randomiser
8. Ignition retard value in byte-3 is relative to current map value. For example: if current map value = 28 degrees BTDC and byte-3 contains a value of 45 then ignition angle should be set to 17 degrees ATDC.
9. If byte-0 is set to zero then bytes 1 & 2 are irrelevant and no cut or retard is applied
10. If byte-3 is set to zero then byte-4 is irrelevant and no blip is applied
11. It must be possible to activate cut/retard and blip simultaneously
12. Cut/retard & blip requests must be acted upon immediately a message is received, i.e. when byte-0 or byte-3 is set to 1. The cut/retard or blip activate message can be transmitted by the GCU at any time during the 100mS wait period between idle refresh messages.
13. There must be no minimum period between successive cut/retard requests
14. Cut/retard requests must be serviced at all RPM, TP & GEAR values
15. Blip requests must be serviced at all RPM & GEAR values
16. Overrun fuel cut must be disabled immediately upon receipt of a blip request regardless of throttle pedal position.
17. A timeout period of 500mS should be applied in case of CANbus failure

The GCU also needs to receive the following channels:

Engine RPM

Throttle position (butterfly, not pedal)

Vehicle speed (optional)

Wheel slip (optional)

Gearbox temperature (optional)

ABS status (optional)

The GCU is fully configurable in terms of message id's, data offset, byte ordering (endian) and scaling for the above channels with the exception of RPM which should be scaled 1-bit/RPM. ECU transmit frequency of the above channels should be at least 100Hz.