GCU500, GCU501 Gearbox Control Units
Model ZE057-1

Introduction:

The GCU500 is a cost effective yet powerful transmission controller and logger. It is packaged in a compact and durable environmentally sealed ABS casing with two mounting lugs. Connectivity is with standard DTM connectors. Communication link is via a simple direct USB connection and programming is done through easy to use bespoke Shiftec software which features ready set up tabs and templates.
Vehicle connectivity may either be hard wired or linked over a CAN system.
GCU500 allows sophisticated closed loop 3 stage control over the shift strategy and the ability to cope with 'off condition' shifts as well as options to suit different gearbox lay outs.
Inbuilt burst enabled data logging allows GCU500 to maximise data storage space. This combines with full diagnostics and live state machines to allow simple set up and analysis.

Summary:

Outputs for valves / compressor / blip – cut signal / shift lights etc
6 analogue inputs including 2 differential inputs
Dedicated Speed input
Direct USB communication
Full closed loop 3 stage shift control
Auto upshift strategy
Off condition shifts (on throttle down shift, off throttle up shift)
On board burst data logging
Sophisticated diagnostics and state machines
CAN link enabled
Torque controlled shift functionality
Fully featured safety features and fail safe parameters
Fail/manual mode
CAN analyser functionality with direct PC logging, transmit, engineering conversion for all formats and bit packing, 'dbc' import, user friendly interface, user configurable gauges/dials etc, CAN statistic/error analysis
CAN baud rate selectable
Clutch interface
Supports FBW and pneumatic blip
Reverse battery, over-voltage and load dump protection.

GCU501 features TPS input/output control and processing.

System requirements:

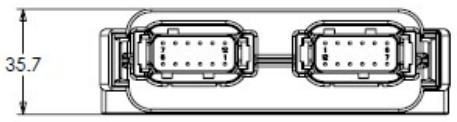
Electrical supply	8-18	V
Recommended working temperature	-20 to +80	°C
Environmental	n/a	
Computer requirements	Windows XP to Windows 10	

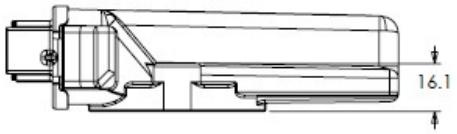
Technical data:

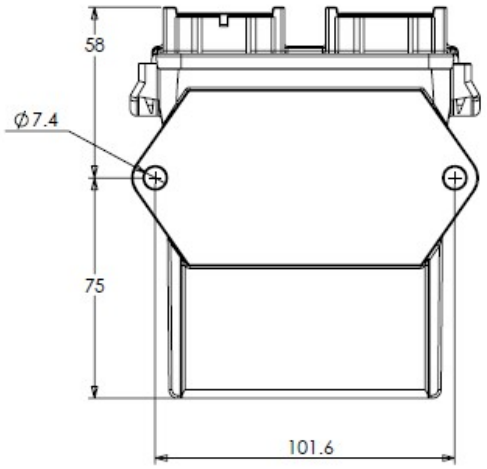
Processor	80MHz 32 bit dedicated processor
Data Logging	2GB capacity
Communication	CAN 2.0B USB 2.0
Analogue inputs	4 x 0-5V 10bit
Differential An inputs	2 x 0-5V differential 10 bit
Speed inputs	1
Outputs	5 x low side drivers - PWM capable
Internal sensors	Supply voltage, GCU temp
CAN termination	Selectable at build
Wiring connector fitted	Deutsch DTM13-12PA-12PB-R008
Chassis loom connectors reqd	Deutsch DTM06-12SA Deutsch DTM06-12SB
Pin out	See Appendix 1

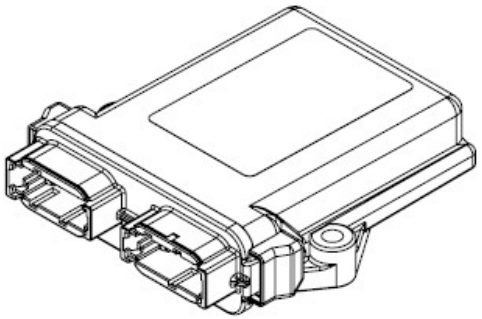
Dimensions:

Length	133	mm
Width	119	mm
Height	36	mm
Weight	245	g









Ordering information:

Description	Part number
GCU500 Gearbox Control Unit	ZE057-1
GCU501 Gearbox Control Unit with Pedal Link	ZE066-1

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Appendix 1: GCU500 connector pinout details

ZE057-1 GCU500	Connector on GCU	DTM13-12PA-12PB-R008	
	Loom Connector 1	DTM06-12SA	
	Loom Connector 2	DTM06-12SB	
Connector - Pin	Function	Notes	Suggested use
1-1	Analogue 1		P sys
1-2	Analogue 4	Pulled up 2Kohm	Switch DOWN
1-3	Speed	Pull up is hardware option, signal needs to go from ground to +3V min	
1-4	CAN H	Hardware termination option	CAN Hi
1-5	CAN L		CAN Lo
1-6	Analogue 6 (+Ve)	Signal of differential Input (0-5V) 120Kohm pull down	TPS_1
1-7	BATT 12V	Battery supply	+ 12V batt
1-8	BATT GND	Battery Ground	GND batt
1-9	Sensor GND		
1-10	Sensor 5V		
1-11	Low side output 1	5 AMPS max low side (can PWM)	Valve up signal
1-12	Low side output 2	5 AMPS max low side (can PWM)	Valve down signal
2-1	Low side output 3	5 AMPS max low side (can PWM)	Blippper signal
2-2	Low side output 4	5 AMPS max low side (can PWM)	$Cut\ signal_2$
2-3	Low side output 5	5 AMPS max low side (can PWM)	Compressor relay
2-4	Analogue 3	Pulled up 2Kohm	Switch UP
2-5	Analogue 2	Pulled up 2Kohm	Switch DETENT
2-6	Analogue 5 (+Ve)	Signal of differential Input (0-5V) 120Kohm pull down	Gear Pot
2-7	Analogue 6 (Gnd)	Reference GND for differential Input	$TPS\ GND_1$
2-8	Analogue 5 (Gnd)	Reference GND for differential Input	Gear Pot GND
2-9	USB 5V	PC USB 5V	USB comms
2-10	USB GND	PC USB GND	USB comms
2-11	USB Data +	PC USB Data +	USB comms
2-12	USB Data -	PC USB Data -	USB comms

CONNECTIONS REQUIRED

	Steering wheel connection in
	USB comms
	Outputs to actuator up/down and blipper
	Cut output to ECU
	Gear position signal in
	RPM in
	TPS in
	System pressure signal in
	CAN connections
	12v power and GND

Notes:

1 Recommended to source RPM, TPS from ECU CAN link
2 Cut signal to ECU hard wire or CAN link

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