GCU700 Gearbox Control Unit
Models ZR014-1, ZR015-1

Introduction:

The GCU700 is tightly packaged pneumatic valve block with a built in sophisticated transmission controller and logger. Weighing in at only 707g, the custom housing is CNC machined from billet aluminium and anodised for extra durability and protection. Connectivity is through a commonly available and durable 26 way connector.
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.
GCU700 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 GCU700 to maximise data storage space. This combines with full diagnostics and live state machines to allow simple set up and analysis. Data may also be transmitted to vehicle data loggers.

Model shown is 2 way FBW version

Summary:

Full closed loop 3 stage shift control
9 analogue inputs including 2 differential inputs
1 dedicated speed input
3 valve driver outputs
Direct USB communication
Auto upshift strategy
Off condition shifts (on throttle down shift, off throttle up shift)
On board burst data logging with built in 2GB capacity
Sophisticated diagnostics and state machines
Torque controlled shift functionality
Fully detailed 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
Reverse battery, over-voltage and load dump protection.
Supports FBW or pneumatic blip – select when ordering
Filtered dash 6 JIC air feed into block
Dash 4 JIC pneumatic outputs for gearbox actuator and throttle blipper
Proven durability in 24hr races

System requirements:

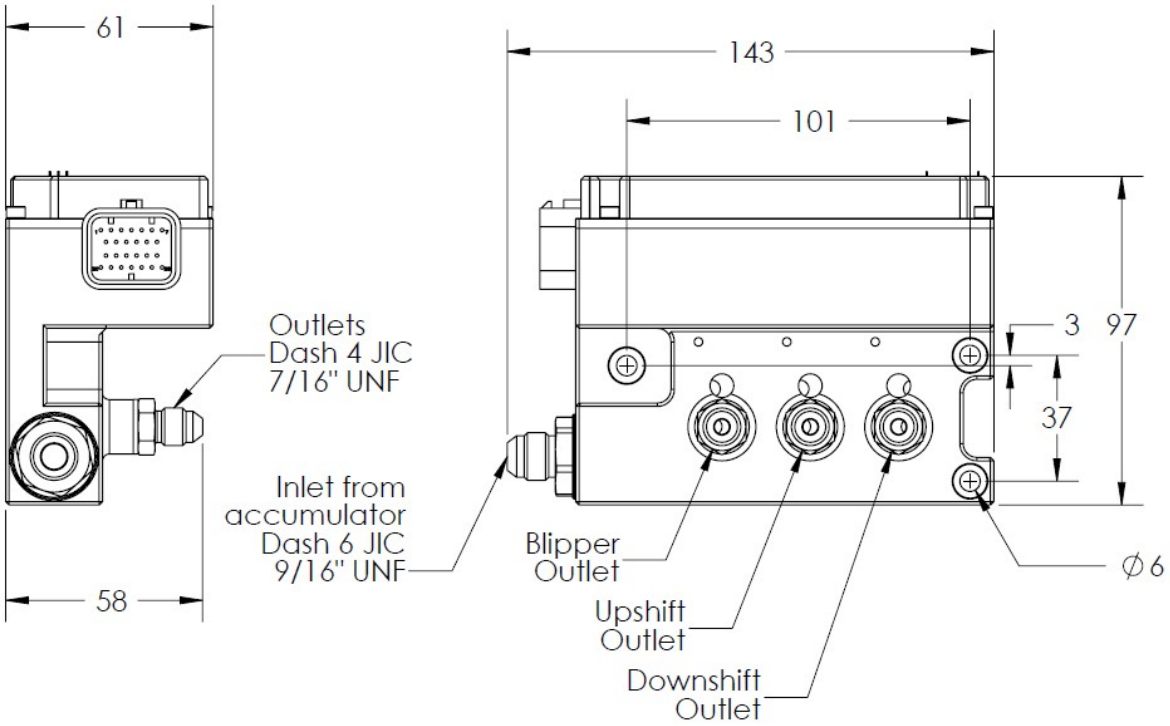
Electrical supply	.....	8-18 V
Recommended working temperature	.....	-20 to +80 °C
Environmental protection	.....	IP66
Computer requirements	.....	Windows XP to Windows 10
Maximum air supply pressure	.....	10 bar
Installation notes	.....	See Appendix 2

Technical data:

Processor	.....	80MHz 32 bit dedicated processor
Data Logging	.....	2GB capacity
Communication	.....	CAN 2.0B USB 2.0
Analogue inputs	.....	7 x 0-5V 10bit
Differential An inputs	.....	2 x 0-5V differential 10 bit
Speed inputs	.....	1
Outputs	.....	3 x low side drivers - PWM capable
Internal sensors	.....	Supply voltage, GCU temperature
CAN termination	.....	Selectable at build, default unterminated
Wiring connector fitted	.....	TE Connectivity Superseal 6437288-6
Chassis loom connector reqd	.....	TE Connectivity Superseal 3-1437290-7
Pin out	.....	See Appendix 1

Dimensions:

Length	.....	143	mm
Width	.....	61	mm
Height	.....	97	mm
Weight	.....	707	g



Ordering information:

Description	Part number
GCU700 Integrated Shift Controller 3 way	ZR014-1
GCU701 Integrated Shift Controller 2 way FBW	ZR015-1

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Appendix 1
Connector pin out

Connector fitted	TE Connectivity Superseal 6437288-6	**Mating half**	TE Connectivity Superseal 3-1437290-7

Pin	Description	Notes
1	Analogue 7	Analogue
2	Output 1	
3	Down Paddle Input (Analogue 4)	Pulled up with 1K to 5V
4	Up Paddle Input (Analogue 3)	Pulled up with 1K to 5V
5	Gear Position Input (Analogue 6)	Differential Analogue +Ve
6	USB 5V	PC USB 5 V
7	USB GND	PC USB GND
8	CAN Lo	
9	CAN Hi	
10	Detent Switch Input(Analogue 2)	Pulled up with 1K to 5 Volts
11	Mode/Fail Switch Input (Analogue 1)	Pulled up with 1K to 5 Volts
12	Output 3	
13	USB DM	Data – from USB
14	Analogue 9	
15	Analogue 8	Analogue
16	TPS Input (Analogue 5)	Differential ground reference
17	Gear Position Input (Analogue 6)	Differential ground reference
18	GND	GND
19	Sensor 5V	Output for Sensors
20	GND	GND
21	Output 2	5 Amp low side driver
22	TPS Signal Input (Analogue 5)	Differential Analogue +Ve
23	USB DP	Data + from USB
24	Speed 1 Input	12V capable
25	GND	Chassis GND
26	+12 Volt	Power supply +12V

Appendix 2
Installation and running notes

- Install using 3 x M6 AV mounts supplied with unit
- Keep away from direct sources of heat and vibration
- May be mounted in any orientation
- Keep pipe lengths to actuator and blipper to a minimum. Recommended not more than 400mm.
- Do not subject to direct pressure washing or similar
- Unit is sealed and must be returned to Shiftec for any work required
- Service recommended after 30hrs or 6000km use

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