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Document and Product Description User Manual TTT802 Gearshift Controller – Spec(L) Firmware		

TTT802 Gearshift Controller Part # 12-620-9

Overview:

Gearshift Controller for 4 or 5 speed sequential operated gearboxes. With 58 mm large red gear indicator display and Rpm / shift-light-bar with green, yellow, red white Led lamps.

Key features:

- Gear Position Indicator
- Rpm / Shift-light Led-bar
- Closed Loop Flat-shift control
- Measuring Gearshift times in 1/1000 sec.
- Measuring Gearbox Race time
- Rpm limiter
- Launch control
- Automatic display intensity
- Special functions on request

Built in computer port gives easy access to all parameters for flat-shift and Rpm limiter as well as other functions such as measured gear change times, gearbox running time, shift counter etc. We supply an easy to use Windows-application that supports all these functions. The installation of the program is done thru our website www.ttt-racing.com

The system is completely controlled by the 3 sensors, "Lever", "Neutral" and "Gear Change" and there is no need for any calibration.

Housing:

Black anodized aluminium with polycarbonate front panel

Size:

65 x 110 x 30 mm

Weight:

220 grams

Power Supply:

12-14 Volt DC, Average current 100mA (max. 300mA)

Fuse:

Recommended fuse 0,5 – Max. 1 Amp must be installed In the power supply line

Connections:

There are 2 connectors located on the rear, one 16 pole, A, and one 22 pole, B.



Order # 12-620-9-L
Spec(L) Firmware





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Functions:

Gear Pos Indicator

The sensors are continuously sensed and the controller converts the reading into gear in position. The 7 different possible positions are R - N - 1 - 2 - 3 - 4 - 5. Up until the N sensor has been detected for the first time after power on the display indicates “-“.

Rpm- / Shift-light Bar

By measuring the connected ignition pulses the rpm is calculated and compared to the settings for each level of the bar. The result of the comparison controls how many Leds are lit. The setting for each bar level can be individually entered for each gear position. It is possible to chose between 3 different “bar types”. One dot from left & right, two dots from left & right or the default one, fill from left & right.

Rpm Limiter

The Gearshift Controller limits the rpm to the maximum allowed rpm corresponding to the setting for the particular gear position. The maximum rpm setting can be individually entered for each gear position.

Launch Control

Holding down the Start switch being in 1st gear position limits the rpm to a preset start value. By connecting a Start Rpm limit adjust potentiometer it can then be used to increase or decrease the actual start rpm limit. When the Start switch is released the allowed rpm increases with time until it has reach the rpm limit setting for 1st gear. How fast it increases depends on the start ramp time setting. By connecting a Ramp time adjust potentiometer it can then be used to increase or decrease the actual start ramp time. The “Quick Trim” unit with part # 12-660-5 have 2 potentiometers and can be directly connected to the cable harness if the harness is complemented with the QT cable harness “addon”, part # 12-639-9.

Firmware 1.3: The positions of the Launch Control potentiometers are indicated on the Rpm-bar while they are adjusted. At the same time the Gear Pos Indicator displays a small “T” when the Ramp time is adjusted and a “^” is displayed when the Start Rpm limit is adjusted.

Closed Loop Flat-shift Control

The 3 main sensors used by the control continuously informs the controller about any attempt to change gear. When the controller detects a beginning shift-up it manipulates the ignition pulses and they are not completely activated again until we are in a safe position to do so. There are user settings to enable/disable shift-up gear cut on each gear to customize the function to specific ideas and needs. Thanks to the closed loop system the driver can shift fast or slow, just the way he likes, which is a big advantage compared to more simple timing controlled flat-shift systems. Shifting fast really means fast.

Firmware 1.3: In the Windows program TTT802L Manager the user can chose if the Gear Pos Indicators decimal dot should indicate the flatshift “cut” of the ignition.

There is a choice of using an analog Lever sensor and if so turning this on and setting up the limit for the sensor etc. is done in the Windows program TTT802L Manager.

Gear Shift counter

Firmware 1.3: The total number of gear shift up, gear 1, 2, 3, 4, (5) is counted and can be read and cleared using the Windows program TTT802L Manager.

Gear Shift time measurement

Firmware 1.3: The shortest Gear Shift time in 1/1000 sec. between each gear, gearing up and down, is measured and can be read and cleared using the Windows program TTT802L Manager.



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Gearbox race time

Firmware 1.3: The race time in gear 1, 2, 3, 4, (5), total and on each gear, are measured and can be read and cleared using the Windows program TTT802L Manager.

Display test / Show Firmware version

Firmware 1.3: When the TTT802L is powered up the display shows “V” “1” “.” “3” (if firmware = 1.3) and then the display and bar segments are toggled for aprox. 4 second. If there is Rpm input and the gear position is not “N” the display test will be bypassed.

Oil change Interval

Firmware 1.3: During the first 10-15 seconds after the TTT802L has been powered up the “N” for Neutral position will be replaced with a “0” if the Oil change interval has been reached. The interval can be setup and the oil change confirmed using the Windows program TTT802L Manager.

Function test Sensors:

Testing the Gearbox sensor function - “Lever”, “Neutral” & “Gear Change”

To initiate the test procedure just “wave” with a magnet in front of the rpm / shift-light bar. By doing so the display will indicate the status of the 3 sensors and the dot will flash. The “mid” position indicates the “Neutral”, the “top” position indicates the “Gear Change” and the “bottom” position indicates the “Lever” sensor. “Wave” again to turn off the function test.

Note: The Lever sensor has a safety time and if the sensor is active for a longer period than this time, the sensor will indicate off even if its on. The safety time is normally set to 1 sec.

Related products.

Part # 12-645-2	TTT802 Cable harness type L
Part # 12-627-2	TTT802 Cable kit with “flying wires”
Part # 12-639-9	TTT802-QT Cable harness “add-on” for startswitch and Quick Trim unit
Part # 12-649-8	Communication cable RS232 for TTT802. 1,5m.
Part # 12-650-6	Extension cable 500mm 4-pole DR25.
Part # 12-660-5	TTT905 Quick Trim unit (Launch Control)
Part # 12-671-3	TTT748 Ignition Interface (for carburettor motors with Hal-sensor distributors)
Part # 12-678-6	TTT937 Power Switch, Ignition cut when used with ECU without cut input. Interrupts ignition coil power (Vbat)
Part # 30-515-6	N-sensor and Gear Change sensor
Part # 30-521-9	Gear Lever sensor.



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Connections:

A - 16-pole Matching Connector, Molex Microfit 3,0 430251600

A:1	Ground, PC Com interface
A:2	Tx, PC Com interface RS232 level – Transmit data
A:3	Rx, PC Com interface RS232 level – Receive data
A:4	DO1, Digital FET output, 0 – 12 VDC, <u>RPM-out</u> Ignition pulses to RPM-meter
A:5	DI1, Ground
A:6	DI1, Digital input 5 - 15VDC Ignition Pulse
A:7	DO2, Galvanic Isolated ground for output ECU/Ignition Cut
A:8	DO2, Galvanic Isolated output, open collector, for <u>ECU/Ignition</u> Cut
A:9	DO5, Ground
A:10	DO5, Digital FET output, active low (Spare)
A:11	DO4, Ground
A:12	DO4, Digital FET output, active low (Spare)
A:13	DO3, Ground
A:14	DO3, Digital FET output, active low (Spare)
A:15	Powersupply (Ground)
A:16	Powersupply 12 VDC (+) Note!!! Fuse 0,5 – Max.1 Amp. must be installed in the powerline

B – 22-pole Matching Connector, Molex Microfit 3,0 430252200

B:1	DI5, DI6, DI7 (Gnd)	
B:2 (*)	DI7, Digital input 12VDC (Spare)	<i>(DI6 input on prototypes)</i>
B:3 (*)	DI6, Digital input 12 VDC <u>Speed</u> sensor	<i>(Gnd on prototypes)</i>
B:4	DI5, Digital input 12 VDC Gear <u>Lever</u> sensor	
B:5 (*)	12 VDC for sensors and switches	<i>(Gnd on prototypes)</i>
B:6 (*)	12 VDC for sensors and switches	<i>(DI4 input on prototypes)</i>
B:7 (*)	DI4, Digital input 12VDC N-R-Interlock / Start switch	<i>(Gnd on prototypes)</i>
B:8	DI3, Digital input 12VDC <u>Gear Change</u> sensor	
B:9	DI2, DI3, DI4, Ground	
B:10	DI2, Digital input 12VDC <u>Neutral</u> sensor	
B:11	AI4, Analog Ground	
B:12	AI4, +5VDC	
B:13	AI3, Analog Ground	
B:14	AI4, Analog input Start Ramp time adjust potentiometer	
B:15	AI3, +5VDC	
B:16	AI3, Analog input Start Rpm limit adjust potentiometer	
B:17	AI2, Analog Ground	
B:18	AI2, Analog input (Spare / Analog Lever sensor)	
B:19	AI2, +5VDC	
B:20	AI1, Analog input (Spare)	
B:21	AI1, Analog Ground	
B:22	AI1, +5VDC	

(*) Different functions compared to prototype units!!!