M1 AUDI V10 FSI BUJ / LAMBORGHINI 07LY 2009 PACKAGE

Brands use is not an endorsement.

This product is specifically for use with M1 Series hardware.

This package, used with an activated M182, provides a tuning base for the V10 BUJ and V10 07LY direct injection engine as used in the Audi R8 (2009 onwards), the Lamborghini Gallardo LP560-4 and the Lamborghini Huracan LP610-4. It comes with preconfigured settings for reference mode, synchronisation, firing order, DI pump control and engine sensors.

Based on MoTeC's successful GPR-DI package, it is a versatile and adaptable platform for the operation of this engine.

➪ This package is not intended as an OEM ECU replacement. It provides a tuning base for engine modifications and requires further tuning. Also, no car integration is configured.

FEATURES

- Pre-configured sensor calibrations for Original Equipment (OE) sensors and engine triggers.
- Pre-configured DI pump control.
- Pre-configured control of the direct injectors.
- Support of additional port injectors ('high/low') with tuneable balance table.
- Pre-configured reference mode for engine synchronisation and control of 4 camshafts with tuneable inlet and exhaust timing tables.
- Pre-configured physical settings for Engine Displacement, Fuel Density, Stoichiometric Ratio, Fuel Pressure, and Injector Linearisation, which allow for simplified engine start-up prior to tuning.
- Comprehensive dual bank support - from airbox to inlet manifold all sensors, actuators and calculated engine control values are bank individual.
- Configurable turbocharger boost control (using a normal and inverted solenoid output), support of 2 boost pressure sensors.
- Fuel pump switched output and/or fuel pressure target closed loop control using PWM output.
- Dual bank fuel canister purge solenoid support.
- CAN transmits comply with version 3 of the general template.
- Configurable on-board knock for each cylinder with up to 4 assignable knock sensors (hardware dependant) and 4 selectable centre frequencies.
- Dual bank lambda control supported; requires optional LTC with Bosch LSU4.9 sensor or LTCN with NTK sensor.
- Easy and fast engine tuning using engine efficiency map.
- Engine load modelling based on inlet manifold pressure and inlet manifold temperature. Alternatively, for example, when using individual throttle bodies, throttle position can be used.
- Fuel volume calculation considers delay effects resulting from the secondary (high) injector installation position.
- Sensor calibrations available for many common automotive sensors.
- Support for analogue and digital (frequency or duty cycle) sensors.

- Transient fuelling compensation using physical modelling of fuel films.
- Support of MoTeC devices: ADR, E8XX, PDM, SLM, VCS
- Configurable anti-lag for single turbo with ignition timing limit, fuel volume trim, ignition cut, engine speed limit, boost aim and throttle aim tables.
- Supports 2 coolant fan outputs (PWM controlled).
- Configurable closed loop alternator system for PWM field winding control.
- Supports 2 switchable inlet manifold flaps with position feedback.
- Air conditioner support with switched output control.
- Coolant temperature compensations for engine speed limit, ignition timing, fuel volume, fuel mixture, boost limit.
- Coolant pump output with PWM control.
- Coolant pump after-run functionality, optionally with additional pump output.
- Engine speed limiting with ignition cut and/or fuel cut.
- Gearbox position detection via optional sensor or engine speed / wheel speed estimate.
- Gearbox shift request via Up Shift Switch / Down Shift Switch or Gear Lever Force sensor.
- Gearbox shift support with ignition cut, fuel cut, throttle blip and engine speed matching in forward gears.
- GPS acquisition and logging via CAN or RS232.
- Intercooler temperature and spray control.
- Lap distance, time and number via BR2 or switched input, with split and sector options.
- Configurable launch control with tables for engine speed, throttle limit, boost aim and fuel volume trim.
- Race time system with tables for ignition timing trim, fuel mixture aim, boost limit and throttle limit.
- Idle closed loop control system using ignition, drive by wire actuation or idle solenoid.
- Engine Load Average channel with tables for engine speed limit, ignition timing trim, fuel mixture aim, boost limit and throttle limit.
- Ease of engine start with dedicated fuel volume and idle compensations during crank and post start.
- Engine run time total for engine hour logging.
- Configurable security for multiple users with differing access options.
- Configuration of brake state using a switch or a pressure sensor.
- Configuration of clutch state using a switch, a position sensor or a pressure sensor.
- Calculation of clutch slip.
- ECU-internal G-force (acceleration) – longitudinal, lateral, vertical
- ECU CAN receive from a defined CAN ID for data reception from MoTeC devices. Support of 3 CAN buses.
- ECU CAN transmit of the most common channels using standard MoTeC CAN templates.
- 6 configurable switches, 4 rotary switches and 6 CAN switches with each of 9 positions simultaneously mappable to Launch Control, Pit Switch, Anti-Lag, Traction, Race Time Reset, Engine Speed Limit Maximum, Throttle Pedal Translation, Ignition Timing, Fuel Mixture Aim, Boost Limit, Traction Aim and Traction Control Range.
- Pulsed tachometer output with configurable output pin and scaling.
- Dual bank drive by wire throttle servo control.
- Configurable throttle sensor input, with 2 channel analogue or single wire digital (SENT) protocol.
- Throttle Pedal sensor with translation table. Hybrid OE pedals (for example Ford) are supported - one analogue and one digital channel.
- Differential pump output with differential temperature threshold and hysteresis control.
- Transmission pump output with transmission temperature threshold and hysteresis control.
- Traction control with tables for Aim Main, Aim Compensation and Control Range.
- Vehicle speed measurement using wheel speed sensors, estimation or GPS.
- Vehicle speed limiting (pit speed control).
- Configurable warning system with light and CAN output.
- Auxiliary time system with tables for ignition timing compensation, fuel volume trim and fuel mixture aim.
- 4 auxiliary outputs for PWM control of added actuators:
  - Duty cycle tables using Engine Speed and Throttle or Manifold Pressure Axis'
  - Activation based on inlet manifold pressure or throttle position
  - Auxiliary Output 1 includes tables for Ignition Timing Compensation, Fuel Volume Trim and Fuel Mixture Aim
- Optional channels for additional sensors via input pin and/or CAN message, including:
  - Airbox Mass Flow, Pressure and Temperature
  - Ambient Pressure and Temperature

- Boost Pressure
- Brake Pressure Front and Rear
- Brake Switch
- Clutch Pressure and Position
- Clutch Switch
- Coolant Pressure and Temperature
- Differential Temperature
- Engine Oil Pressure and Temperature
- Engine Crankcase Pressure
- Exhaust Pressure Bank 1 and Bank 2
- Exhaust Temperature (EGT) via TCA Thermocouple Amplifier, Generic CAN, or E888 for Collector, Bank 1 and 2 Collector, and Cylinders 1 to 10.
- Exhaust Lambda via LTC, LTCN, or PLM for Collector, Bank 1 and 2 Collector, and Cylinders 1 to 10
- Fuel Pressure and Temperature
- Fuel Tank Level (support for 2 level sensors)
- Gear Position
- Gear Lever Force
- Gear Neutral Switch
- Gear Shift Request
- Inlet Manifold Flap Position x 2
- Intercooler Temperature
- Steering Angle and Pressure
- Transmission Temperature
- Turbocharger Speed
- G-Force (acceleration) – Longitudinal, Lateral, Vertical
- Wheel Speed sensors front/rear left/right, wired or CAN input.

EXAMPLE M182 PINOUT

M182 Connector A — 55 way

Mating Connector: Autosport 55 way Green - (Deutsch) AS6-16-35SD – MoTeC #65032

Pin	Designation	Full Name	Description
A01	INJ_D1A_POS	Direct Injector 1A +	
A02	INJ_D2A_POS	Direct Injector 2A +	
A03	INJ_D2B_POS	Direct Injector 2B +	
A04	INJ_D4A_POS	Direct Injector 4A +	
A05	INJ_D1B_POS	Direct Injector 1B +	
A06	LA_NB2	Lambda Narrow Input 2	
A07	LA_NB1	Lambda Narrow Input 1	
A08	SEN_5V0_C	Sensor 5.0V C	ECU Sensor 5.0 C Voltage
A09	SEN_5V0_C	Sensor 5.0V C	ECU Sensor 5.0 C Voltage
A10	INJ_D4B_POS	Direct Injector 4B +	
A11	INJ_D1A_NEG	Direct Injector 1A -	Fuel Cylinder 1 Primary Output
A12	INJ_D1B_NEG	Direct Injector 1B -	Fuel Cylinder 7 Primary Output
A13	AV11	Analogue Voltage Input 11	Inlet Manifold Flap Position Bank 2 Sensor Voltage
A14	DIG2	Digital Input 2	
A15	RS232_RX	RS232 Receive	
A16	SEN_5V0_C	Sensor 5.0V C	ECU Sensor 5.0 C Voltage
A17	INJ_D6A_POS	Direct Injector 6A +	
A18	SEN_0V_C	Sensor 0V C	
A19	SEN_0V_C	Sensor 0V C	
A20	SEN_0V_C	Sensor 0V C	
A21	DIG1	Digital Input 1	
A22	LIN	LIN Bus	
A23	RS232_TX	RS232 Transmit	
A24	CAN2_HI	CAN Bus 2 High	
A25	INJ_D6B_POS	Direct Injector 6B +	
A26	INJ_D2A_NEG	Direct Injector 2A -	Fuel Cylinder 5 Primary Output
A27	AV15	Analogue Voltage Input 15	
A28	AV16	Analogue Voltage Input 16	
A29	AV17	Analogue Voltage Input 17	
A30	DIG3	Digital Input 3	
A31	CAN2_LO	CAN Bus 2 Low	
A32	INJ_D3A_POS	Direct Injector 3A +	
A33	INJ_D2B_NEG	Direct Injector 2B -	Fuel Cylinder 8 Primary Output
A34	AV13	Analogue Voltage Input 13	Throttle Servo Bank 2 Position Sensor Main Voltage
A35	AV12	Analogue Voltage Input 12	Engine Oil Pressure Sensor Voltage

Pin	Designation	Full Name	Description
A36	INJ_D6A_NEG	Direct Injector 6A -	
A37	DIG4	Digital Input 4	
A38	BAT_BAK	Battery Backup	
A39	CAN3_HI	CAN Bus 3 High	
A40	INJ_D3B_POS	Direct Injector 3B +	
A41	AV14	Analogue Voltage Input 14	Throttle Servo Bank 2 Position Sensor Tracking Voltage
A42	INJ_D3A_NEG	Direct Injector 3A -	Fuel Cylinder 2 Primary Output
A43	INJ_D4A_NEG	Direct Injector 4A -	Fuel Cylinder 3 Primary Output
A44	INJ_D5B_NEG	Direct Injector 5B -	Fuel Cylinder 10 Primary Output
A45	INJ_D6B_NEG	Direct Injector 6B -	
A46	CAN3_LO	CAN Bus 3 Low	
A47	INJ_D5A_POS	Direct Injector 5A +	
A48	INJ_D5B_POS	Direct Injector 5B +	
A49	INJ_D3B_NEG	Direct Injector 3B -	Fuel Cylinder 9 Primary Output
A50	INJ_D4B_NEG	Direct Injector 4B -	Fuel Cylinder 6 Primary Output
A51	INJ_D5A_NEG	Direct Injector 5A -	Fuel Cylinder 4 Primary Output -
A52	IGN_LS12	Low Side Ignition 12	
A53	IGN_LS9	Low Side Ignition 9	Ignition Cylinder 9 Output
A54	IGN_LS10	Low Side Ignition 10	Ignition Cylinder 10 Output
A55	IGN_LS11	Low Side Ignition 11	

M182 Connector B — 26 way

Mating Connector: Autosport 26 way Red - (Deutsch) AS6-16-26SN – MoTeC #65034

Pin	Designation	Full Name	Description
B_A	OUT_HB1	Half Bridge Output 1	Fuel Pressure Direct Bank 1 Pump Output
B_B	OUT_HB2	Half Bridge Output 2	Fuel Pressure Direct Bank 1 Pump Output
B_C	OUT_HB3	Half Bridge Output 3	Fuel Pressure Direct Bank 2 Pump Output
B_D	OUT_HB4	Half Bridge Output 4	Fuel Pressure Direct Bank 2 Pump Output
B_E	OUT_HB5	Half Bridge Output 5	Throttle Servo Bank 1 Motor Output
B_F	OUT_HB6	Half Bridge Output 6	Throttle Servo Bank 1 Motor Output
B_G	BAT_NEG1	Battery Negative	
B_H	BAT_POS1	Battery Positive	ECU Battery Voltage
B_J	BAT_POS2	Battery Positive	ECU Battery Voltage
B_K	BAT_POS3	Battery Positive	ECU Battery Voltage
B_L	BAT_POS4	Battery Positive	ECU Battery Voltage
B_M	OUT_HB10	Half Bridge Output 10	Inlet Manifold Flap Actuator Output
B_N	OUT_HB9	Half Bridge Output 9	
B_P	OUT_HB8	Half Bridge Output 8	Throttle Servo Bank 2 Motor Output
B_R	OUT_HB7	Half Bridge Output 7	Throttle Servo Bank 2 Motor Output
B_S	INJ_LS4	Low Side Injector 4	Exhaust Camshaft Bank 2 Actuator Output
B_T	INJ_LS6	Low Side Injector 6	
B_U	INJ_LS1	Low Side Injector 1	Inlet Camshaft Bank 1 Actuator Output
B_V	INJ_LS2	Low Side Injector 2	Exhaust Camshaft Bank 1 Actuator Output
B_W	BAT_NEG2	Battery Negative	
B_X	BAT_NEG3	Battery Negative	
B_Y	BAT_NEG4	Battery Negative	
B_Z	BAT_NEG5	Battery Negative	
B_a	INJ_LS5	Low Side Injector 5	Coolant Fan 1 Pin
B_b	INJ_LS3	Low Side Injector 3	Inlet Camshaft Bank 2 Actuator Output
B_c	BAT_NEG6	Battery Negative	

M182 Connector C — 55 way

Mating Connector: Autosport 55 way Red - (Deutsch) AS6-16-35SN – MoTeC #68090

Pin	Designation	Full Name	Description
C01	IGN_LS4	Low Side Ignition 4	Ignition Cylinder 4 Output
C02	IGN_LS3	Low Side Ignition 3	Ignition Cylinder 3 Output
C03	IGN_LS8	Low Side Ignition 8	Ignition Cylinder 8 Output
C04	IGN_LS6	Low Side Ignition 6	Ignition Cylinder 6 Output
C05	IGN_LS5	Low Side Ignition 5	Ignition Cylinder 5 Output
C06	AV8	Analogue Voltage Input 8	Fuel Pressure Direct Bank 2 Sensor Voltage
C07	AV10	Analogue Voltage Input 10	Inlet Manifold Flap Position Bank 1 Sensor Voltage
C08	IGN_LS2	Low Side Ignition 2	Ignition Cylinder 2 Output
C09	IGN_LS7	Low Side Ignition 7	Ignition Cylinder 7 Output
C10	UDIG8	Universal Digital Input 8	Inlet Camshaft Bank 2 Position
C11	AV6	Analogue Voltage Input 6	
C12	AV7	Analogue Voltage Input 7	Fuel Pressure Direct Bank 1 Sensor Voltage
C13	AV9	Analogue Voltage Input 9	Fuel Pressure Sensor Voltage
C14	SEN_0V_A	Sensor 0V A	
C15	SEN_0V_A	Sensor 0V A	
C16	IGN_LS1	Low Side Ignition 1	Ignition Cylinder 1 Output
C17	UDIG7	Universal Digital Input 7	
C18	UDIG1	Universal Digital Input 1	Engine Speed Reference
C19	UDIG12	Universal Digital Input 12	Wheel Speed Rear Drive Sensor Period
C20	UDIG11	Universal Digital Input 11	Engine Oil Pressure Low Switch
C21	UDIG10	Universal Digital Input 10	
C22	UDIG9	Universal Digital Input 9	Exhaust Camshaft Bank 2 Position
C23	SEN_0V_B1	Sensor 0V B	
C24	CAN1_HI	CAN Bus 1 High	
C25	UDIG3	Universal Digital Input 3	Exhaust Camshaft Bank 1 Position
C26	ETH_RX-	Ethernet Receive-	
C27	UDIG4	Universal Digital Input 4	
C28	AV4	Analogue Voltage Input 4	Throttle Servo Bank 1 Position Sensor Tracking Voltage
C29	AV5	Analogue Voltage Input 5	Throttle Pedal Sensor Tracking Voltage
C30	SEN_0V_B	Sensor 0V B	
C31	CAN1_LO	CAN Bus 1 Low	
C32	UDIG2	Universal Digital Input 2	Inlet Camshaft Bank 1 Position
C33	ETH_RX+	Ethernet Receive+	
C34	ETH_TX-	Ethernet Transmit-	
C35	AV3	Analogue Voltage Input 3	Throttle Servo Bank 1 Position Sensor Main Voltage
C36	AV2	Analogue Voltage Input 2	Inlet Manifold Pressure Sensor Voltage

Pin	Designation	Full Name	Description
C37	AT1	Analogue Temperature Input 1	Inlet Manifold Temperature Sensor Voltage
C38	AT3	Analogue Temperature Input 3	Engine Oil Temperature Sensor Voltage
C39	AT2	Analogue Temperature Input 2	Coolant Temperature Sensor Voltage
C40	UDIG5	Universal Digital Input 5	
C41	ETH_TX+	Ethernet Transmit+	
C42	AV1	Analogue Voltage Input 1	Throttle Pedal Sensor Main Voltage
C43	KNOCK3	Knock Input 3	
C44	KNOCK2	Knock Input 2	
C45	AT5	Analogue Temperature Input 5	Fuel Level Tank 1 Sensor Voltage
C46	AT4	Analogue Temperature Input 4	
C47	UDIG6	Universal Digital Input 6	
C48	SEN_5V0_A	Sensor 5.0V A	ECU Sensor 5.0 A Voltage
C49	KNOCK4	Knock Input 4	
C50	SEN_5V0_B	Sensor 5.0V B	ECU Sensor 5.0 B Voltage
C51	KNOCK1	Knock Input 1	Knock Cylinder 1
C52	AT6	Analogue Temperature Input 6	Transmission Temperature Sensor Voltage
C53	SEN_5V0_A	Sensor 5.0V A	ECU Sensor 5.0 A Voltage
C54	SEN_6V3	Sensor 6.3V	ECU Sensor 6.3 Voltage
C55	SEN_5V0_B	Sensor 5.0V B	ECU Sensor 5.0 B Voltage