



The MoTeC USA Suzuki GSXR1000 17 – 19 plug and play kit is a fully programmable replacement for the OEM ECU. The integrated adapter solution allows for seamless plug and play functionality without the need for an external adapter harness.

Included are several ancillary features commonly found on race vehicles such as rolling launch, driver switches, gearbox control, launch control, traction control, and nitrous control.

User definable outputs are also provided for with user definable axis for systems that do not fall within MoTeC USA Motorcycle Drag standard functionality.

The product fully integrates with other MoTeC devices, providing pre-defined CAN messaging for all current Displays/Loggers, LTC's, E888, GPS and SLMs.

KIT CONTENTS: RG.KT.PV0076.01

Hardware

- #M130 – M130 ECU
- #RG.DV.PV0077.03 RaceGrade Adaptor box
- #M H 3800-PP001A RaceGrade Spares Loom – wired for Ethernet and LTC
- #M LTC – LTC LSU 4.9
- #M 0258 001 – LSU 4.9 Sensor

Licenses (required to run the plug-in kit)

- #23351 – Motorcycle Drag Race 1.4 Ref 103

DRAG SPECIFIC FEATURES

- General purpose fuel trim and ignition trim tables that allow user selection of X & Y axis of relevant package channels.
- Throttle limit control based on time or launch state for motorcycles equipped with electronic throttle bodies.

STANDARD FEATURES

- Applicable to port injected engines from 1 to 4 cylinders
- Configurable engine synchronisation modes for many common engine types.
- Configurable top dead centre for each cylinder allows for odd- fire engines
- Configurable on-board knock for each cylinder with up to 4 assignable knock sensors (hardware dependent)
- Physical settings for engine displacement, fuel density + molar mass, stoichiometric ratio, and injector characteristics allow for simplified engine start up prior to tuning.
- Dual bank lambda control supported; requires optional LTC with Bosch LSU4.9 sensor or LTC NTK with NTK sensor
- Configurable camshaft control from 1 to 4 cams, plus 1 switched camshaft
- Engine efficiency load based on either manifold pressure, throttle position, or a ratio of manifold pressure and ambient pressure
- Engine load modelling based on inlet manifold pressure and inlet manifold temperature or throttle position
- High / Low Control of 2 port injectors (peak and hold or saturated) per cylinder with tuneable contribution table
- Tuneable delay of the secondary injection system
- Built-in calibrations for common automotive sensors/actuators
- Transient fuelling compensations using a throttle rate of change-based calculation
- Entry/exit parameters for closed loop against transient events
- Turbocharger boost pressure control using standard pneumatic valves
- Control of two variable speed (PWM) Fans with independent or combined control of each fan
- Coolant pump control with after-run functionality
- Engine speed limiting with ignition and/or fuel cut
- Multiple fuel pump switched outputs
- Closed loop PWM fuel pressure control
- Gear position detection via sensor or engine speed/wheel speed estimate
- Gear shift request via Up/Down Shift switch
- GPS acquisition and logging via CAN or RS232

SPECIFICATIONS

- **Supply Voltage:** 8V to 32V
- **Base Logging Capability:** fixed log set of 100 channels

Analogue CAN receive:

Firmware Resource 6	Gear Voltage
Firmware Resource 7	Ambient Pressure voltage
Firmware Resource 8	Tip Over Sensor Voltage

Digital CAN Receive:

Firmware Resource 9	TC Level
Firmware Resource 10	Drive Mode Switch
Firmware Resource 11	Box Highlighted on Dash
Firmware Resource 12	Clutch Switch

OPERATION

ECU Power

The M1 ECU will be powered when the ignition switch is on via the factory ignition switch.

Engine Start

The Factory starter button maintains OEM style engine start using the 'Manual Start' selection in the M1 package. By utilizing the 'Auto Start' selection the bike will hold the starter output on for the time specified in 'Crank Timeout' or until Engine State is 'Run'.

Driver Switches

Various bike switches and analogue inputs are received directly into the adaptor box and transmitted to the ECU via internal CAN set up. These are visible in the OEM section of the M1 package. Inputs received via CAN are listed with their firmware resources above.

Spares Connector

The adaptor box 34 pin spares connector provides the ethernet communications and LTC connectivity in its basic form. This loom can be modified to allow with various spares inputs/outputs for additional sensors and controls available in the M1 package. See the Spare connector pin-out listing below for detailed information on what spares are available.

Ignition Coils

The Suzuki OEM coils are driven by integrated high current ignition transistors on the adaptor board. Do not replace the factory coils with 'smart' self-charging inductors or damage may occur.

UNSUPPORTED FACTORY FEATURES

- Antilock Braking System
- Exhaust Control Valve Actuator (EXCVA)
- Steering Damper Control
- Pulse Air Intake Reed Valve (PAIR) Solenoid control

DRAG SPECIFIC FEATURES

- Rear wheel speed control allowing for ignition timing adjustments based on a user-defined run curve.
- Four stage mass flow based nitrous control with user-defined activate/reset parameters and ramp-in/ramp-out parameters for ignition/fuel compensations.
- Rolling launch functionality allows for turbo spool-up in a rolling launch scenario through use of variable boost aim and ignition timing adjustments.
- Ride height control allowing for ignition timing adjustments based on a user-defined maximum allowable ride height.
- Engine speed rate of change control allowing for ignition timing adjustments based on a user-defined maximum allowable engine speed rate of change.
- Auto up-shift control based on gear and engine speed.
- Auxiliary outputs with X & Y user-selectable axis of relevant package channels.
- Generic input user-defined channels for use with output functions that allow axis selection.
- Wastegate CO2 control with main target and scramble target functionality.
- Launch control with ignition timing adjustment functionality, engine limiting, and spool mode to aid in build-up of turbo speed on the speed launch.
- Intercooler temperature and spray control based on differential temperature with dedicated temperature sensor and switched pump output
- Differential oil temperature control with dedicated temperature sensor and switch pump output
- Engine Charge Temperature calculation to compensate for heat soak and cooling due to injection events
- Closed loop Idle control using ignition, drive by wire actuation, or an idle solenoid
- Closed loop charging system control
- Configurable security for multiple users
- Flex Fuel support for use with an ethanol composition sensor to vary fuel properties, ignition timing, and boost levels with ethanol content.
- ECU internal G-Force (acceleration) – longitudinal, lateral, and vertical axis
- ECU CAN Receive for various MoTeC and RaceGrade devices such as E8xx expanders, LTC lambda modules, TC8 thermo couple amplifiers, and RaceGrade IMU inertial measurement units.
- ECU CAN Transmits most of the common channels using standard MoTeC CAN templates
- Eight configurable switches and eight rotary switches (wired or CAN input) as well as CAN keypad functionality all mappable to race functions such as rolling launch, traction control, and launch control
- Dual bank Drive by Wire throttle servo control
- Throttle Grip sensor with translation table
- Vehicle speed measurement using wheel speed sensors, estimation, or GPS
- Configurable warning system with physical warning light and CAN output control

SPECIFICATIONS

- **Adaptor Box Base Material:** Anodized Aluminium
- **Weight:** 1.63 lbs [0.74kg]
- **Operating Temp:** -20°C to 85° C
- **Operating Voltage:** 8V to 32v
- **Dimensions:** 6.25" x 6.0" x 2.25"
159 mm x 153 mm x 58 mm



INSTALLATION

The adaptor box and Motec M130 install in the factory ECU location as shown in the figure. Simply remove the factory ECU and replace it with the adapter which plugs directly into the factory wiring.

The adaptor box should be secured to the bike using dual-lock Velcro due to the highly dynamic nature of the motorcycle environment.

Note: The spares loom is necessary to communicate with the M1 ECU and to use the LTC for closed loop lambda control. However, the lambda system is not required for the ECU to run the engine properly. Closed loop fuel control will not be available without the use of the LTC system.

