



2010 Grand Am MS4.3 ECU Integration Terms

Release 1.0

Introduction

Purpose of this document is to ensure a trouble free implementation of the BOSCH Motorsport MS4.3 engine control package. This document contains information from our experiences with teams that have switched to the BOSCH system in the past and from these experiences BOSCH has developed a general list of common misunderstandings and “not thought” about tasks. In this general list, BOSCH will clarify the various roles and responsibilities of the parties involved in the integration process.

Most importantly, BOSCH is NOT an engine builder. Although BOSCH is happy to make suggestions, any mechanical modifications that are necessary parts of the integration process are within the team's or engine builder's responsibility.

Parts & Support included in the \$12,900.00 Continental Tire spec package fee:

a) Hardware

- 1 x Engine control unit MS4.3
- 1 x Data logger C40
- 1 x Calibration interface MSA-Box (USB)
- 1 x Engine harness
- 1 x Ignition loom (if applicable)
- 1 x Chassis harness (not included in Rolex kit)

b) Software

- 1 license of MODAS (on-track calibration and diagnostics tool)
- 1 license of DARAB light (data analysis tool)
- Installation CD with documentation, drivers, etc.
- ModasSport calibration tool

c) Support

- 5 days of free shared track support for the first five days the system is run at Grand Am sanctioned events
- 1 day of free dyno calibration support & training for new engine builders with the purchase of an additional day (including travel costs). A new engine builder is one who has no previous experience working with the MS4.3 ECU.
- Paid 2 day training seminar available

NOTE: Other components are not part of the package price as different applications require different sensors, actuators, etc. Parts included in the spec package have been specified by Grand Am in the same way for every competitor.

1 Team's Responsibility

For a smooth integration we highly recommend that each team spends sufficient time reading through the integration document provided by BOSCH. The latest version of the document should be downloaded from the BOSCH Motorsport website: www.bosch-motorsport.com well in advance of the actual integration.

If a spec. package has not been developed for your team's application, then the following must be provided to BOSCH prior to start of integration process in order to ensure a timely processing and delivery of the spec package.

- Full drawings of engine loom and, if applicable, the ignition loom. The drawing must have the correct pin outs and part numbers for the connectors to be used. BOSCH will generate a harness drawing with necessary changes to get Grand Am approval and for production purposes.
- OEM connectors that are determined to not be robust or can not be easily supplied to BOSCH will result in BOSCH specifying the connector with new sensor or actuator. BOSCH may elect to have the OEM sensor or actuator potted to a common connector. In case of a sensor or actuator being potted, BOSCH will specify what connector will be interfaced from the engine loom side.
- All OEM connectors that are not easily available (also housings, pins and crimp tools) have to be supplied at no charge by the team, or the team must choose a more readily available part.
- Full list of sensors and actuators to be used. Furthermore, the team must ensure each sensor meets the spec. requirements (see Hardware Changes section below). BOSCH is willing to make use of as many as the existing sensors as possible, but if the sensors do not match the spec. requirements and/or the team can NOT supply a robust, commercially available sensor prior to beginning of the integration process BOSCH will specify the sensors to be used.
- If an electronic throttle is to be used, the team must supply both the electronic throttle body and the electronic pedal to BOSCH for safety testing for a limited time. If the electronic throttle or pedal does not have integrated potentiometers, external potentiometers must be supplied with correct mounting hardware.
- BOSCH highly recommends adding a few additional sensors to the OEM engine configuration to provide improved troubleshooting and tuning capabilities. Although some sensors may not be used upon the first application, it is cheaper to have the connectors for additional sensors built into the harness instead of paying for a harness change afterwards

Accessory systems and mechanical engine parts must be up to par. Although the engine mapping can be made less aggressive, it is most likely that a higher output is desired along with more dynamic ignition timing and thus certain measures might become necessary at the engine and its peripherals.

As with any performance upgrade, other systems will be affected by the change to a racing engine controller e.g. by higher vibrations and higher temperatures. Therefore, it is the team's responsibility to ensure that accessory systems are capable of meeting the demands. These systems include, but are not limited to the fuel system, oiling system, cooling system, and ignition system.

2 Hardware Changes

The hardware changes here are a bullet list of spec. changes that each team must conform to. Each bullet point is covered in depth in the integration document.

- Crankshaft and camshaft trigger wheels must be to BOSCH layout and clocking specification.
- Crankshaft sensor must be inductive.
- Camshaft sensor must be a Hall Effect sensor.
- Knock sensors must meet BOSCH requirements (CC195 chip compatible).
- Lambda sensors must be BOSCH LSU 4.9
- Wheel speeds must input a Hall Effect signal.
- Electronic throttle and pedal must match BOSCH DVE electrical configuration.

3 Data Interpretation & Track Support

Each team must purchase a BOSCH flashcard (not included in package) for use in all Grand Am official events, per Grand Am rules. BOSCH flashcards are specially selected and tested to guarantee data reliability within a racecar environment. These cards have extended industrial temperature and vibration specification and an integrated power supply to endure power drops. Any commercial aftermarket flashcards are not recommended by BOSCH and BOSCH will not be liable for loss of data with any non-BOSCH flashcards.

It is the team's responsibility to provide the mandatory scrutineering data to the Grand Am officials. Furthermore, each team is responsible for analyzing basic engine data and performing basic electrical troubleshooting prior to consulting a BOSCH engineer with any problem pertaining to the BOSCH system.

A BOSCH engineer will be present at each Grand Am sanctioned event to help troubleshoot basic issues pertaining to the BOSCH system. Teams wishing for additional calibration assistance and advice are welcome to order for either full or shared support after free support days have concluded.

4 Acknowledgement of Terms

By signing this agreement, _____ (your team's name here) has read and understands the terms set forth by BOSCH Motorsport and Grand Am as stated in the integration document and the three sections noted above: Team's Responsibility, Hardware Changes, and Data Interpretation & Track Support.

Please contact BOSCH as soon as possible, even if you have not decided to order a package yet, as it best to discuss technical details and a possible timeline as early as possible. BOSCH appreciates your understanding that a certain lead time is necessary as it is not logistically feasible to support all integration projects at the same time.

Team Representative	_____	Date: _____
BOSCH Motorsport Representative	_____	Date: _____
Grand Am Representative	_____	Date: _____