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## The Development of a Flexible Hybrid Vehicle Control Unit

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### ABSTRACT

MAHLE Powertrain have developed a plug-in hybrid demonstrator vehicle. To support this one-off prototype, a flexible control unit has been developed, which is easily re-configurable and adaptable to any vehicle architecture. The unit operates using software developed in-house to achieve a fully configurable vehicle control unit (VCU), intended to provide a rapid and cost effective platform for the development of demonstrator and small validation prototype vehicle fleets. The executable code is auto-generated from graphical Simulink / TargetLink models, which greatly reduces development time and risk of errors. The graphical source code also provides comprehensive documentation for users of the system.

This paper describes the resulting vehicle control unit and gives details of the application of the unit within the plug-in hybrid demonstrator vehicle. The reconfiguration of the unit from a series hybrid application to a parallel application will also be used to illustrate the speed and ease with which the architecture of the controller can be adapted.