Title	Emerald generic CAN protocol information
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Introduction

This document details the Emerald generic CAN protocol. This is a general purpose protocol that may be freely used with other devices such as data-loggers, dashboard displays, etc.

This generic protocol can be enabled on Emerald K3 ECU's that have a firmware version v1.05 or higher.

Communications specification

CAN baud rate	1Mbit/s
Standard	CAN 2.0B, 29-bit ID, extended frame
Transmission frequency	20Hz

Protocol description

This protocol consists of 4 data packets each with a unique identifier.

Packet ID	**0x1000**	
Byte	**Data**	**Data conversion**
0:1	RPM	= [msb:lsb] (rpm)
2:3	MAP	= [msb:lsb] / 10 (KPa)
4:5	BARO	= [signed msb:lsb] + 1000 (mBar)
6	TPS%	= [byte] (%)
7	Coil on-time	= [byte] * 0.0488 (mS)

Packet ID	**0x1001**	
Byte	**Data**	**Data conversion**
0:1	EGT	= [msb:lsb] (°C)
2:3	Road speed	= [msb:lsb] * (2.25/256) (mph)
4:5	AFR/Lambda_1	= [msb:lsb] / 10 (afr)
6:7	AFR/Lambda_2	= [msb:lsb] / 10 (afr)

Packet ID	0x1002	
Byte	**Data**	**Data conversion**
0:1	Status flags	
2:3	Error flags	
4:5	Primary injector bank on-time	= [msb:lsb] * 1.526e-3 (mS)
6:7	Secondary injector bank on-time	= [msb:lsb] * 1.526e-3 (mS)

Packet ID	0x1003	
Byte	**Data**	**Data conversion**
0	Air temp	= [byte] - 40 (°C)
1	Coolant temp	= [byte] - 40 (°C)
2	Aux temp	= [byte] - 40 (°C)
3	Ignition advance	= [signed byte] / 2 (°BTDC)
4	Injector duration	= [byte] (%)
5	Gear	= [byte] (0=1st, 1=2nd, etc)
6	Selected map	= [byte] (0=map1, 1=map2, 2=map3)
7	Battery	= [byte] / 11 (Volts)