



AN400 Rev C– Application Note
CAN Bus Protocol for PE3 Series ECUs
 Release Date 12/20/16

Firmware/Software Version:	PE3 V3.04.01 and higher
Relevant Hardware:	All PE3 controllers with installed CAN Bus
Additional Notes:	This document defines the CAN based parameters that the PE3 is broadcasting for the firmware listed above. The PE3 ECU contains a 120 ohm termination resistor.

CAN Bus Details

- 250 kbps Rate
- Broadcast parameters are based on SAE J1939 standard
- All 2 byte data is stored [LowByte, HighByte]
 $Num = HighByte * 256 + LowByte$
- Conversion from 2 bytes to signed int is per the following:
 $Num = HighByte * 256 + LowByte$
 if (Num > 32767) then
 $Num = Num - 65536$
 endif

CAN ID (hex)	Name	Rate (ms)	Start Position	Length	Name	Units	Resolution per bit	Range	Type
0CFFF048	PE1	50	1-2	2 bytes	Rpm	rpm	1	0 to 30000	unsigned int
			3-4	2 bytes	TPS	%	0.1	0 to 100	signed int
			5-6	2 bytes	Fuel Open Time	ms	0.1	0 to 30	signed int
			7-8	2 bytes	Ignition Angle	deg	0.1	-20 to 100	signed int
0CFFF148	PE2	50	1-2	2 bytes	Barometer	psi or kpa	0.01	0-300	signed int
			3-4	2 bytes	MAP	psi or kpa	0.01	0-300	signed int
			5-6	2 bytes	Lambda	lambda	0.01	0-10	signed int
			7.1	1 bit	Pressure Type			0 - psi, 1 - kPa	unsigned char
0CFFF248	PE3	100	1-2	2 bytes	Analog Input #1	volts	0.001	0 to 5	signed int
			3-4	2 bytes	Analog Input #2	volts	0.001	0 to 5	signed int
			5-6	2 bytes	Analog Input #3	volts	0.001	0 to 5	signed int
			7-8	2 bytes	Analog Input #4	volts	0.001	0 to 5	signed int
0CFFF348	PE4	100	1-2	2 bytes	Analog Input #5	volts	0.001	0 to 5	signed int
			3-4	2 bytes	Analog Input #6	volts	0.001	0 to 5	signed int
			5-6	2 bytes	Analog Input #7	volts	0.001	0 to 5	signed int
			7-8	2 bytes	Analog Input #8	volts	0.001	0 to 22	signed int
0CFFF448	PE5	100	1-2	2 bytes	Frequency 1	hz	0.2	0 to 6000	signed int
			3-4	2 bytes	Frequency 2	hz	0.2	0 to 6000	signed int
			5-6	2 bytes	Frequency 3	hz	0.2	0 to 6000	signed int
			7-8	2 bytes	Frequency 4	hz	0.2	0 to 6000	signed int
0CFFF548	PE6	1000	1-2	2 bytes	Battery Volt	volts	0.01	0 to 22	signed int
			3-4	2 bytes	Air Temp	C or F	0.1	-1000 to 1000	signed int
			5-6	2 bytes	Coolant Temp	C or F	0.1	-1000 to 1000	signed int
			7.1	1 bit	Temp Type			0 - F, 1 - C	unsigned char
0CFFF648	PE7	1000	1-2	2 bytes	Analog Input #5 - Thermistor	C or F	0.1	-1000 to 1000	signed int
			3-4	2 bytes	Analog Input #7 - Thermistor	C or F	0.1	-1000 to 1000	signed int
			5	1 byte	Version Major		1	0-255	unsigned char
			6	1 byte	Version Minor		1	0-255	unsigned char
			7	1 byte	Version Build		1	0-255	unsigned char
			8	1 byte	TBD				



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CAN ID (hex)	Name	Rate (ms)	Start Position	Length	Name	Units	Resolution per bit	Range	Type
0CFFF748	PE8	100	1-2	2 bytes	RPM Rate	rpm/sec	1	-10,000 to 10,000	signed int
			3-4	2 bytes	TPS Rate	%/sec	1	-3,000 to 3,000	signed int
			5-6	2 bytes	MAP Rate	psi/sec or kpa/sec	1	-3,000 to 3,000	signed int
			7-8	2 bytes	MAF Load Rate	g/rev/sec	0.1	-300 to 300	signed int
0CFFF848	PE9	100	1-2	2 bytes	Lambda #1 Measured	lambda	0.01	0 to 10	signed int
			3-4	2 bytes	Lambda #2 Measured	lambda	0.01	0 to 10	signed int
			5-6	2 bytes	Target Lambda	lambda	0.01	0 to 2.5	signed int
0CFFF948	PE10	100	1	1 byte	PWM Duty Cycle #1	%	0.5	0 to 100	unsigned char
			2	1 byte	PWM Duty Cycle #2	%	0.5	0 to 100	unsigned char
			3	1 byte	PWM Duty Cycle #3	%	0.5	0 to 100	unsigned char
			4	1 byte	PWM Duty Cycle #4	%	0.5	0 to 100	unsigned char
			5	1 byte	PWM Duty Cycle #5	%	0.5	0 to 100	unsigned char
			6	1 byte	PWM Duty Cycle #6	%	0.5	0 to 100	unsigned char
			7	1 byte	PWM Duty Cycle #7	%	0.5	0 to 100	unsigned char
			8	1 byte	PWM Duty Cycle #8	%	0.5	0 to 100	unsigned char
0CFFFA48	PE11	100	1-2	2 bytes	Percent Slip	%	0.1	-3000 to 3000	signed int
			3-4	2 bytes	Driven Wheel Rate of Change	ft/sec/sec	0.1	-3000 to 3000	signed int
			5-6	2 bytes	Desired Value	%	0.1	-3000 to 3000	signed int
0CFFFB48	PE12	100	1-2	2 bytes	Driven Avg Wheel Speed	ft/sec	0.1	0 to 3000	unsigned int
			3-4	2 bytes	Non-Driven Avg Wheel Speed	ft/sec	0.1	0 to 3000	unsigned int
			5-6	2 bytes	Ignition Compensation	deg	0.1	0 to 100	signed int
			7-8	2 bytes	Ignition Cut Percent	%	0.1	0 to 100	signed int
0CFFFC48	PE13	100	1-2	2 bytes	Driven Wheel Speed #1	ft/sec	0.1	0 to 3000	unsigned int
			3-4	2 bytes	Driven Wheel Speed #2	ft/sec	0.1	0 to 3000	unsigned int
			5-6	2 bytes	Non-Driven Wheel Speed #1	ft/sec	0.1	0 to 3000	unsigned int
			7-8	2 bytes	Non-Driven Wheel Speed #2	ft/sec	0.1	0 to 3000	unsigned int
0CFFFD48	PE14	100	1-2	2 bytes	Fuel Comp - Accel	%	0.1	0 to 500	signed int
			3-4	2 bytes	Fuel Comp - Starting	%	0.1	0 to 500	signed int
			5-6	2 bytes	Fuel Comp - Air Temp	%	0.1	0 to 500	signed int
			7-8	2 bytes	Fuel Comp - Coolant Temp	%	0.1	0 to 500	signed int
0CFFFE48	PE15	100	1-2	2 bytes	Fuel Comp - Barometer	%	0.1	0 to 500	signed int
			3-4	2 bytes	Fuel Comp - MAP	%	0.1	0 to 500	signed int
			5-6	2 bytes	-				
			7-8	2 bytes	-				
0CFFFD048	PE16	100	1-2	2 bytes	Ignition Comp - Air Temp	deg	0.1	-20 to 20	signed int
			3-4	2 bytes	Ignition Comp - Coolant Temp	deg	0.1	-20 to 20	signed int
			5-6	2 bytes	Ignition Comp - Barometer	deg	0.1	-20 to 20	signed int
			7-8	2 bytes	Ignition Comp - MAP	deg	0.1	-20 to 20	signed int