

**EvoBus GmbH
NEOMAN Bus GmbH**

**Scania CV
Volvo Bus Corporation**

**IrisBus S.L.
VDL Bus International B.V.**

Bus FMS-Standard Interface description

Vers. 00.01

21.10.2005

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation		IrisBus S.L. VDL Bus International B.V.		Name of document Bus FMS-Standard			Page 2 (26)				
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group						Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939													
General annotations													
- Data might be not available during ignition off / main switch off - Physical Layer according to ISO 11898 (250kb/s) - Application Layer according SAE J1939-71 (issued 1994-08, revised 2003-12) - Data Link Layer according SAE J1939-21 - If there is a discrepancy between definitions in this document and the SAE, the SAE documents are the valid only, except broadcast for PGN 00FEE6 (Time/Date) - The priority/source address of each partner is different and has to be masked by connected Bus FMS-ECU. - There is a terminating resistor on the vehicle side. It is necessary to terminate the CAN bus on the connected systems side. - If the information is delivered the function/data has to be sent according Bus FMS-standard definition. - If the information is not available the function/data has to be sent as not available according to SAE - The physical connector is standardized and described in Chapter 3. - “not used in Bus FMS-standard” means that there might be data sent according SAE but not used in Bus FMS-standard interface. If no information is sent, then it has to be sent as “not available” (don’t care). - “reserved” means that as long as there is no definition it is sent “FF (not available)” - Byte 2 to 5 of PGN 00FDD1 indicates the supported Bus-and Truck Version of the FMS-Standard (see example) - For the door configuration in PGN 00FE4E and PGN 00FDA5 please contact the manufacturer of the vehicle													

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation		IrisBus S.L. VDL Bus International B.V.		Name of document Bus FMS-Standard			Page 3 (26)				
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group						Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939													
1 PARAMETERS FOR FMS GATEWAY (ACCORDING SAE J1939) ALWAYS MSB FIRST4													
1.1 Cruise Control/Vehicle Speed : CCVS4													
1.2 Electronic Engine Controller #2 : EEC25													
1.3 Fuel Consumption : LFC6													
1.4 Dash Display : DD7													
1.5 Electronic Engine Controller #1 : EEC18													
1.6 Engine Hours, Revolutions : HOURS.....9													
1.7 Vehicle Identification : VI10													
1.8 FMS-standard Interface Identity / Capabilities : FMS11													
1.9 High Resolution Vehicle Distance : VDHR.....12													
1.10 Tachograph : TCO113													
1.11 Engine Temperature 1 : ET1.....14													
1.12 Ambient Conditions : AMB.....15													
1.13 Door Control 1: DC116													
1.14 Door Control 2 (preliminary) : DC2.....17													
1.15 Time / Date : TD18													
1.16 Air Supply Pressure : AIR1.....19													
1.17 Alternator Speed (preliminary) : AS20													
1.18 Electronic Transmission Controller 2 : ETC2.....21													
1.19 Air Suspension Control 4 : ASC422													
2 EXAMPLES23													
2.1 Broadcast Announce Message (BAM) for Vehicle ID longer than 8 Byte23													
2.2 Example SW Identification for buses and/or trucks25													
3 CONNECTOR DESCRIPTION26													

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 4 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1 Parameters for FMS gateway (according SAE J1939)

always MSB First

1.1 Cruise Control/Vehicle Speed : CCVS

00FEF1																								PGN Hex																									
65,265																								PGN																									
100 ms																								Rep. Rate																									
Data Byte 1								Data Byte 2								Data Byte 3								Data Byte 4								Data Byte 5				Data Byte 6				Data Byte 7				Data Byte 8				Byte No	
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1																	Bit No	
Not used in Bus FMS-Standard								Wheel based speed								Wheel based speed								Clutch switch								Not used in Bus FMS-Standard				Not used in Bus FMS-Standard				Not used in Bus FMS-Standard				Not used in Bus FMS-Standard				Name values values values values SPN	
								1/256 km/h Bit gain 0 km/h offset								1/256 km/h Bit gain 0 km/h offset								00 = pedal released 01 = pedal pressed																								Name values values values values SPN	
								SPN 84								SPN 84								SPN 598																									
Parking Brake Switch 00 = Parking brake not set 01 = Parking brake set SPN 70																								Brake switch																								Name values values values values SPN	
																								00 = pedal released 01 = pedal depressed																									
																								SPN 597																									
																Not used in Bus FMS-Standard																																	
																Cruise control active 00 = switched off 01 = switched on																								Name values values values values SPN									
																SPN 595																																	

1.2 Electronic Engine Controller #2 : EEC2

00F003									PGN Hex					
61,443									PGN					
50 ms									Rep. Rate					
Data Byte 1	Data Byte 2							Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
	8	7	6	5	4	3	2	1						Bit No
Not used in Bus FMS-Standard	Accelerator pedal position 0,4 % / Bit gain 0 % offset SPN 91							Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name Name values values values values SPN

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 6 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1.3																												Fuel Consumption : LFC																											

1.4 Dash Display : DD

00FEFC														PGN Hex
65,276														PGN
1000 ms														Rep. Rate
Data Byte 1	Data Byte 2							Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
	8	7	6	5	4	3	2	1						Bit No
Not used in Bus FMS-Standard	Fuel Level 0,4 % / Bit gain 0 % offset SPN 96							Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name values values value SPN

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation			IrisBus S.L. VDL Bus International B.V.			Name of document Bus FMS-Standard			Page 8 (26)				
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group									Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939																

1.5
Electronic Engine Controller #1 : EEC1

00F004																			PGN Hex			
61,444																			PGN			
20 ms																			Rep. Rate			
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4							Data Byte 5							Data Byte 6	Data Byte 7	Data Byte 8	Byte No		
			8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1				Bit No
Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Engine speed 0.125 rpm / Bit gain 0 rpm offset							Engine speed 0.125 rpm / Bit gain 0 rpm offset							Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name values values values value SPN		
			SPN 190							SPN 190												

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation		IrisBus S.L. VDL Bus International B.V.		Name of document Bus FMS-Standard			Page 10 (26)		
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group					Date 21.10.2005		Approved		Issue 00.01		Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939											

1.7 Vehicle Identification : VI

00FEEC								PGN Hex
65,260								PGN
10.000 ms								Rep. Rate
Variable 1-n	Variable 1-n	Variable 1-n	Variable 1-n	Variable 1-n	Variable 1-n	Variable 1-n	Variable 1-n	Byte No
								Bit No
Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Vehicle identification number ASCII up to 200 characters * = Delimiter SPN 237	Name Name values values values values SPN

Annotations:

- 1) If the Vehicle ID is up to 8 Bytes (including) then it is broadcasted with PGN 00FEEC containing the vehicle ID and filled with “FF” at the unused bytes.
- 2) If the Vehicle ID contains more than 8 Bytes then a TP.CM (PGN 00EC00) with a minimum of two TP.DT (PGN 00EB00) will be used.

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 11 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group					Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939								

1.8 FMS-standard Interface Identity / Capabilities : FMS

00FDD1																												PGN Hex																									
64,977																												PGN																									
10.000 ms																												Rep. Rate																									
Data Byte 1				Data Byte 2				Data Byte 3				Data Byte 4				Data Byte 5				Data Byte 6				Data Byte 7				Data Byte 8				Byte No																					
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1				Bit No																		
Reserved								SW-version supported for trucks Version number in the format ab.cd where this byte represents “a” ASCII SPN 2806								SW-version supported for trucks Version number in the format ab.cd where this byte represents “b” ASCII SPN 2806								SW-version supported for buses and coaches Version number in the format ab.cd where this byte represents “c” ASCII SPN 2806								SW-version supported for buses and coaches Version number in the format ab.cd where this byte represents “d” ASCII SPN 2806								Reserved				Reserved				Reserved				Name values values values values values values SPN	
Requests supported 00 = request is not supported 01= request is supported 10 = reserved 11 = don’t care SPN 2805																																				Name values values values values values values SPN																	
Diagnostics supported 00 = diagnostics is not supported 01 = diagnostics is supported 10 = reserved 11 = don’t care SPN 2804																																				Name values values values values values values SPN																	

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 13 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1.10 Tachograph : TCO1

00FE6C																								PGN Hex																																															
65,132																								PGN																																															
20 ms/50 ms																								Rep. Rate																																															
Data Byte 1								Data Byte 2								Data Byte 3								Data Byte 4								Data Byte 5	Data Byte 6	Data Byte 7								Data Byte 8								Byte No																					
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1			8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	Bit No.																					
Drive recognize 00 = Vehicle motion not detected 01 = vehicle motion detected SPN 1611								Overspeed 00 = No overspeed 01 = Overspeed SPN 1614								Not used in Bus FMS-Standard could be sent as “not available” or “don’t care”								Direction indicator 00 = Forward 01 = Reverse SPN 1619								Not used in Bus FMS-Standard								Not used in Bus FMS-Standard								Tachogr. vehicle speed 1/256 km/h Bit gain 0 km/h offset SPN 1624								Tachogr. Vehicle speed 1/256 km/h Bit gain 0 km/h offset SPN 1624								Name values values values values values values SPN							
Driv. 2 working state 000 = Rest 001 = Driver available 010 = Work 011 = Drive 110 = Error 111 = not available SPN 1613								Driver 1 card 00 = Card not present 01= Card present SPN 1615								Driver 2 card 00 = Card not present 01= Card present SPN 1616								Tachgraph performance 00 = Normal performance 01 = Performance analysis SPN 1620																								Name values values values values values values SPN																							
Driv. 1 working state 000 = Rest 001 = Driver available 010 = Work 011 = Drive 110 = Error 111 = not available SPN 1612								Driv. 1 time rel states 0000 = normal 0001 = 15 min bef. 4 ½ h 0010 = 4 ½ h reached 0011 = 15 min bef. 9 h 0100 = 9 h reached 0101 = 15 min bef. 16 h 0110 = 16h reached 1110 = Error 1111 = not available SPN 1617								Driv 2 time rel. states 0000 = normal 0001 = 15 min bef. 4 ½ h 0010 = 4 ½ h reached 0011 = 15 min before 9 h 0100 = 9 h reached 0101 = 15 min bef. 16 h 0110 = 16h reached 1110 = Error 1111 = not available SPN 1618								Handling information 00 = no handling information 01 = handling information SPN 1621																																Name values values values values values values SPN															
																								System event 00 = no tachogr. Event 01 = tachogr. Event SPN 1622																																								Name values values values values values values SPN							

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 14 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group					Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939								

1.11 Engine Temperature 1 : ET1										
00FEEE									PGN Hex	
65,262									PGN	
1000 ms									Rep. Rate	
Data Byte 1		Data Byte 2		Data Byte 3		Data Byte 4		Data Byte 5		Data Byte 6
Data Byte 7		Data Byte 8								Byte No
8	7	6	5	4	3	2	1			Bit No
Engine Coolant Temperature		Not used in Bus FMS-Standard		Not used in Bus FMS-Standard		Not used in Bus FMS-Standard		Not used in Bus FMS-Standard		Name
1 °C / Bit gain										values
- 40 °C offset										values
SPN 110										SPN

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation			IrisBus S.L. VDL Bus International B.V.			Name of document Bus FMS-Standard			Page 15 (26)				
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group									Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939																

1.12
Ambient Conditions : AMB

00FEF5																		PGN Hex				
65,269																		PGN				
1000 ms																		Rep. Rate				
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4							Data Byte 5							Data Byte 6	Data Byte 7	Data Byte 8	Byte No		
			8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1				Bit No
Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Ambient Air Temperature 0.03125 °C / Bit gain - 273 °C offset							Ambient Air Temperature 0.03125 °C / Bit gain - 273 °C offset							Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name Name values values values values SPN		
			SPN 171							SPN 171												

EvoBus GmbH NEOMAN Bus GmbH Scania CV Volvo Bus Corporation IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 16 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group	Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939				

1.13 Door Control 1: DC1

00FE4E															PGN Hex
65,102															PGN
100 ms															Rep. Rate
Data Byte 1								Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
8	7	6	5	4	3	2	1								Bit No.
Status 2 of doors 00 = all bus doors disabled 01 = at least 1 bus door enabled 10 = error 11 = not avialable SPN 3411(prelim.)								Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Not used in Bus-FMS-Standard	Name values values values values values SPN
Ramp/Wheel chairlift 00 = inside bus 01 = outside bus 10 = Error 11 = not available SPN 1820															Name values values values values values SPN
Position of doors 0000 = at least 1 door is open 0001 = closing last door 0010 = all doors closed 0011-1101 not defined 1110 = Error 1111 = not avialable SPN 1821															Name values values values values values values values SPN

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 17 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1.14 Door Control 2: DC2

00FDA5																																PGN Hex																																
64,933																																PGN																																
100 ms																																Rep. Rate																																
Data Byte 1								Data Byte 2								Data Byte 3								Data Byte 4								Data Byte 5								Data Byte 6								Data Byte 7								Data Byte 8								Byte No
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	Bit No.								
Lock Status Door 2 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3415								Open Status Door 3 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3419								Enable Status Door 4 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3423								Lock Status Door 6 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3427								Open Status Door 7 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3431								Enable Status Door 8 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3435								Lock Status Door 10 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3439								Not defined								Name values values values values SPN
Enable Status Door 1 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3414								Lock Status Door 3 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3418								Open Status Door 4 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3422								Enable Status Door 5 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3426								Lock Status Door 7 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3430								Open Status Door 8 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3434								Enable Status Door 9 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3438								Not defined								Name values values values values SPN
Open Status Door 1 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3413								Enable Status Door 2 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3417								Lock Status Door 4 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3421								Open Status Door 5 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3425								Enable Status Door 6 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3429								Lock Status Door 8 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3433								Open Status Door 9 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3437								Enable Status Door 10 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3441								Name values values values values SPN
Lock Status Door 1 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3412								Open Status Door 2 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3416								Enable Status Door 3 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3420								Lock Status Door 5 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3424								Open Status Door 6 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3428								Enable Status Door 7 00 = Disabled 01 = Enabled 10 = Error 11 = Not available SPN 3432								Lock Status Door 9 00 = Unlocked 01 = Locked 10 = Error 11 = Not available SPN 3436								Open Status Door 10 00 = Closed 01 = Open 10 = Error 11 = Not available SPN 3440								Name values values values values SPN

Remark: Lock Status: locked -> doors cannot be operated by the driver or a passenger
 unlocked -> door may be operated by the driver or a passenger
 Enable Status: disabled -> door cannot be opened by a passenger
 enabled -> door can be opened by a passenger

Open Status: closed -> door is completely closed
 open -> door is not completely closed

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation		IrisBus S.L. VDL Bus International B.V.		Name of document Bus FMS-Standard			Page 18 (26)		
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group						Date 21.10.2005		Approved		Issue 00.01		Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939												

1.15 Time / Date : TD

00FEE6																												PGN Hex						
65,254																												PGN						
1000 ms																												Rep. Rate						
Data Byte 1				Data Byte 2				Data Byte 3				Data Byte 4				Data Byte 5				Data Byte 6				Data Byte 7		Data Byte 8		Byte No						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1			Bit No.
Seconds				Minutes				Hours				Month				Day				Year				Not used in Bus FMS-Standard		Not used in Bus FMS-Standard		Name values values values values SPN						
0.25 s/Bit 0 Offset				1 min /Bit 0 offset				1 hr/Bit 0 offset				1 month/Bit 0 offset				0.25 day/Bit 0 offset				1 year/Bit 1985 years offset														
SPN 959				SPN 960				SPN 961				SPN 963				SPN 962				SPN 964														

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 19 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group					Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939								

1.16 Air Supply Pressure : AIR1

00FEAE																	PGN Hex					
65,198																	PGN					
1000 ms																	Rep. Rate					
Data Byte 1	Data Byte 2	Data Byte 3							Data Byte 4							Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No		
		8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1					Bit No.
Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Service Brake Air Pressure Circuit #1 8 kPa/Bit 0 offset							Service Brake Air Pressure Circuit #2 8 kPa/Bit 0 offset							Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name Name values values values SPN		
		SPN 1087							SPN 1088													

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 20 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1.17 Alternator Speed (preliminary) : AS

00FED5														PGN Hex	
65,237														PGN	
1000 ms														Rep. Rate	
Data Byte 1	Data Byte 2	Data Byte 3								Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
		8	7	6	5	4	3	2	1					Bit No.	
Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Alternator Status 4 00 = not charging 01 = charging 10 = error 11 = not available SPN 3356 (preliminary)								Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name values values values values values SPN
		Alternator Status 3 00 = not charging 01 = charging 10 = error 11 = not available SPN 3355 (preliminary)													Name values values values values values SPN
		Alternator Status 2 00 = not charging 01 = charging 10 = error 11 = not available SPN 3354 (preliminary)													Name values values values values values SPN
		Alternator Status 1 00 = not charging 01 = charging 10 = error 11 = not available SPN 3353 (preliminary)													Name values values values values values SPN

1.18 Electronic Transmission Controller 2 : ETC2

00F005													PGN Hex
61,445													PGN
100 ms													Rep. Rate
Data Byte 1		Data Byte 2		Data Byte 3		Data Byte 4		Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No	
8	7	6	5	4	3	2	1					Bit No.	
Selected Gear 1 gear value/Bit -125 offset negative gear are reverse gears 00000000 = neutral 11111011 = park SPN 524		Not used in Bus FMS-Standard		Not used in Bus FMS-Standard		Current Gear 1 gear value/Bit -125 offset negative gear are reverse gears 00000000 = neutral 11111011 = park SPN 523		Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Not used in Bus FMS-Standard	Name values values values values values values SPN	

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard			Page 22 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01	Reg. no.
Subject Bus FMS-Standard interface description according SAE J1939							

1.19 Air Suspension Control 4 : ASC4

00FE58								PGN Hex
65,112								PGN
100 ms								Rep. Rate
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
8 - 1	8 - 1	8 - 1	8 - 1	8 - 1	8 - 1	8 - 1	8 - 1	Bit No.
Bellow Pressure Front Axle Left 0.1 kPa/Bit 0 offset	Bellow Pressure Front Axle Left 0.1 kPa/Bit 0 offset	Bellow Pressure Front Axle Right 0.1 kPa/Bit 0 offset	Bellow Pressure Front Axle Right 0.1 kPa/Bit 0 offset	Bellow Pressure Rear Axle Left 0.1 kPa/Bit 0 offset	Bellow Pressure Rear Axle Left 0.1 kPa/Bit 0 offset	Bellow Pressure Rear Axle Right 0.1 kPa/Bit 0 offset	Bellow Pressure Rear Axle Right 0.1 kPa/Bit 0 offset	Name Name values values values SPN
SPN 1725	SPN 1725	SPN 1726	SPN 1726	SPN 1727	SPN 1727	SPN 1728	SPN 1728	

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation			IrisBus S.L. VDL Bus International B.V.			Name of document Bus FMS-Standard			Page 23 (26)	
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group						Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939													

2 Examples

2.1 Broadcast Announce Message (BAM) for Vehicle ID longer than 8 Byte Transport Protocol – Connection Management (TP.CM)

00ECFF								PGN Hex
60,671								PGN
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte No
								Bit No
Control byte should be filled with (20 ₁₆)	Total message size, number of bytes	Total message size, number of bytes	Total number of packets	Reserved should be filled with FF ₁₆	Parameter Group Number of packeted message	Parameter Group Number of packeted message	Parameter Group Number of packeted message	Name Name Name values values values SPN

Transport Protocol – Data Transfer (TP.DT)

00EBFF								PGN Hex
60,415								PGN
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte No
								Bit No
Sequence Number	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Name values values values values values SPN

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation			IrisBus S.L. VDL Bus International B.V.			Name of document Bus FMS-Standard			Page 24 (26)				
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group									Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939																

In the situation shown in Figure 1, a node indicates to the network that it is about to transfer a multipacket message utilizing the service of the transport protocol.
In this example, the PGN 00FEEC₁₆ (Vehicle Identification) is being broadcasted to the network.
The length of the Vehicle ID in this example is 17.
The unused bytes in the last TP.DT are filled with FF₁₆.
The originating node first transmits a TP.CM Broadcast Announce Message (BAM) followed by the data packets.
No acknowledgment is performed by any of the responders.

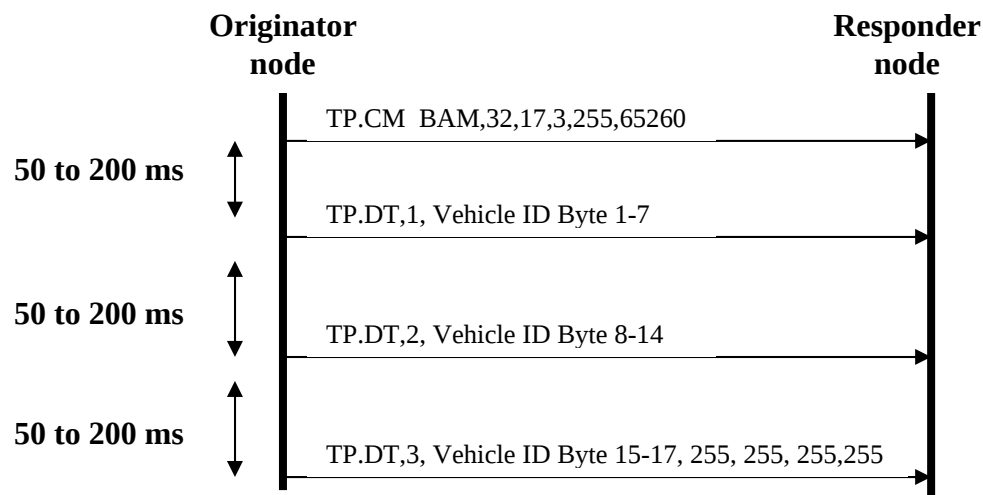


Figure 1

Time (ms)	ID	DLC	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
0	1C EC FF SA ₁₆	8	20 ₁₆	11 ₁₆	00 ₁₆	03 ₁₆	FF ₁₆	EC ₁₆	FE ₁₆	00 ₁₆
50	1C EB FF SA ₁₆	8	01 ₁₆	Vehicle ID byte 1 – 7						
100	1C EB FF SA ₁₆	8	02 ₁₆	Vehicle ID byte 8 – 14						
150	1C EB FF SA ₁₆	8	03 ₁₆	Vehicle ID byte 15	Vehicle ID byte 16	Vehicle ID byte 17	FF ₁₆	FF ₁₆	FF ₁₆	FF ₁₆

EvoBus GmbH NEOMAN Bus GmbH			Scania CV Volvo Bus Corporation			IrisBus S.L. VDL Bus International B.V.			Name of document Bus FMS-Standard			Page 25 (26)	
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group						Date 21.10.2005		Approved		Issue 00.01		Reg. no.	
Subject Bus FMS-Standard interface description according SAE J1939													

2.2 Example SW Identification for buses and/or trucks

	ID	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Supporting Bus-FMS-Standard Version 01	00 FD D1 ₁₆	00 ₁₆	30 ₁₆	30 ₁₆	30 ₁₆	31 ₁₆	FF ₁₆	FF ₁₆	FF ₁₆
Supporting Truck-FMS-Standard Version 01	00 FD D1 ₁₆	00 ₁₆	30 ₁₆	31 ₁₆	30 ₁₆	30 ₁₆	FF ₁₆	FF ₁₆	FF ₁₆
Supporting Bus FMS-Standard Version 01 and Truck FMS-Standard Version 01	00 FD D1 ₁₆	00 ₁₆	30 ₁₆	31 ₁₆	30 ₁₆	31 ₁₆	FF ₁₆	FF ₁₆	FF ₁₆

Remark: **Byte 2 – Byte 5 are ASCII**
30₁₆ = “0” ASCII
31₁₆ = “1” ASCII

EvoBus GmbH NEOMAN Bus GmbH		Scania CV Volvo Bus Corporation	IrisBus S.L. VDL Bus International B.V.	Name of document Bus FMS-Standard		Page 26 (26)
Issuer (dept., name, phone, sign) Bus FMS-Standard Working Group				Date 21.10.2005	Approved	Issue 00.01
Subject Bus FMS-Standard interface description according SAE J1939				Reg. no.		

3

Connector description

DIN 72585 connector 4-Pin male type (vehicle side)

AMP Chassis part (vehicle) Coding 1 (black)

Housing w/o pin/socket locking	1-967402-1
Pin (Sn plated) 0-929974-1	0-929974-1
Seal 828920-1	828920-1
Cap (for not used connector)	1394277-2

AMP FMS side (cable)

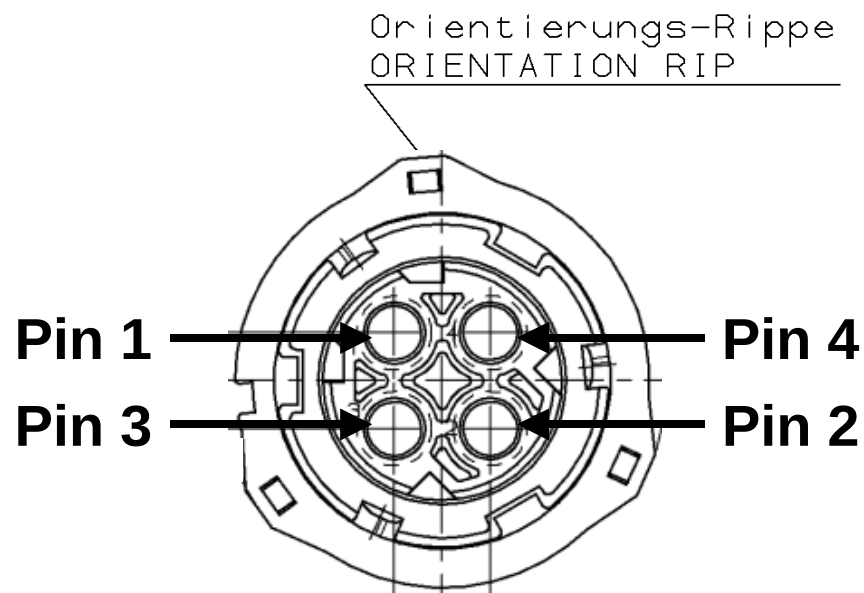
Housing	1-967325-1
Socket (Sn plated)	0-929967-1
Seal	828920-1

GH Chassis part (vehicle)

Housing	18337.000.000
Pin/socket locking	16052.598.613
Pin (Sn plated)	26634.201.184
Seal	14414.627.626
Cap (for not used connector)	N/A

GH FMS side (cable)

Housing	17984.000.002
Pin/socket locking	16052.598.613
Socket (Sn plated)	26570.201.184
Seal	14414.627.626



Pin Layout:

Pin 1	CAN high
Pin 2	CAN low
Pin 3	Option CAN ground
Pin 4	not used by Bus-FMS-Standard