



192-300301N8  
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# GVI

## Mobile Inverter

*CAN Message Database*



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## Production site:

### Germany

Parker Hannifin Manufacturing Germany GmbH & Co. KG  
Electromechanical & Drives Division Europe [EMDE]  
Robert-Bosch-Strasse 22  
77656 Offenburg (Germany)  
Tel.: + 49 (0781) 509-0  
Fax: + 49 (0781) 509-98176  
Internet: [www.parker.com/eme](http://www.parker.com/eme) <http://www.parker.com/eme>  
E-mail: [EM-Motion@parker.com](mailto:EM-Motion@parker.com) <mailto:EM-Motion@parker.com>

Certified according to ISO 9001:2015

Parker Hannifin Manufacturing Germany GmbH & Co KG - Sitz: Bielefeld - Amtsgericht: Bielefeld HRA 15699  
Partner liable to unlimited extent: Parker Hannifin GmbH, Sitz Bielefeld, Amtsgericht Bielefeld HRB 35489  
Geschäftsführung der PARKER Hannifin GmbH: Dr.-Ing. Hans-Jürgen Haas, Kees Veraart, Chairman of the board: Dr.-Ing. Gerd Scheffel

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# 1 Introduction

## 1.1 About this document

### 1.1.1 Definitions

In this documentation the product Global Vehicle Inverter is referred to as “The motor controller” or GVI. GVI is a family of motor controllers for use in systems with 24-650 DC (nominal) supply and power levels from 4,4 to 398 kVA. GVI frame sizes C, D, E are referred to as Low Voltage (LV) devices, frame sizes G and H are considered as High Voltage (HV) Devices. The GVI is suitable for most electric vehicle applications.

The GVI is a software configurable device. In a CAN (Controller Area Network) based system, the motor controller setup and operation can be managed by a vehicle master controller communicating over the CAN Bus.

This document describes the implemented communication objects like general CANopen messages, default CANopen PDO messages and J1939 messages.

For full documentation please refer to the document 192-30030Nx GVI Configuration Manual and appropriate manuals 192-300300Nx\_Product\_Manual\_for\_GVI-C\_D\_E (LV) or 192-300302Nx\_Product\_Manual\_for\_GVI-G\_H (HV) Terms and abbreviations

### 1.1.2 This revision

This revision replaces all previous revisions of this document. Parker has made every effort to ensure that this document is complete and accurate at the time of printing. In accordance with our policy of continuous product improvement, all data in this document is subject to change or correction without prior notice.

### 1.1.3 Scope

The motor controller is a software configurable device. In a CAN (Controller Area Network) based system, the motor controller setup and operation can be managed by a vehicle master controller communicating over the CAN Bus.

This document presents the general procedure for the startup and verification of a motor controller following installation in an operational system (vehicle).

Before continuing with the configuration, ensure the Start-up and Commissioning section from the hardware manual (see chapter 1.1.5) has been completed and is fully understood. It is also helpful to have the Object Dictionary, the list of all parameters and variables the motor controller has available via the CAN bus, when reading through this manual.

### 1.1.4 Warning, caution and information notices

Special attention must be paid to the information presented in warning, caution and information notices when they appear in this manual. Definitions of caution, warning and information notices are shown below:



## WARNING

**This section describes the risk of the hazard, for example High voltage - risk of personnel injury**

A Warning informs the user of a hazard or potential hazard that could result in serious or fatal injury and damage to the equipment if the precautions or instructions given in the warning notice are not observed/followed.



## CAUTION

**This section describes the risk of the hazard, for example Risk of damage to equipment**

A Caution informs the user of a hazard or potential hazard that could result in damage to the equipment if the precautions or instructions given in the caution notice are not observed/followed.



## NOTE

A note contains supplemental information or references to supplemental information on a topic.

### 1.1.5 Related documents

For more information about the inverter, see the following related documents.

Reference number	Document	Description
1	Product Manual for GVI-C D E	Parker Reference 192-300300Nx
2	Product Manual for GVI-G-H	Parker Reference 192-300302Nx
3	J1939 DBC File	ParkerGVI_J1939.dbc
4	Application Note: Integrating GVI with IQAN	Parker Reference 192-300305Nx

Table 1 References

## 2 CANopen Message Database



### NOTE

GVI inverters supplied or installed with firmware versions C03x04 and earlier use a different J1939 address range from those supplied with version C03x05, C04x01 or later. Please ensure that the correct section of this manual is referred to. Should a GVI supplied with C04x01 firmware or later be connected to a master previously configured for use with older firmware, it will be necessary to re-configure the master, or install the required earlier firmware into the GVI.

### 2.1 CAN Identifiers

GVI Inverter CAN identifiers are dependent on the hardware address of the GVI inverter, as described fully in the GVI Configuration manual and relevant hardware installation manuals.

Hardware ID	Digital Input Wiring	CANopen Node ID	J1939 Source Address
0	None	6h	200d
1	ID Pin 1 (18) to B+	7h	201d
2	ID Pin 2 (30) to B+	8h	202d
3	ID Pin 1 (18) and 2 (30) to B+	9h	203d

GVI Low Voltage CAN ID Connections

Hardware ID	Digital Input Wiring	CANopen Node ID	J1939 Source Address
0	None	6h	200d
1	ID Pin 1 (28) to GND (31)	7h	201d
2	ID Pin 2 (15) to GND (12)	8h	202d
3	ID Pin 1 (28) and 2 (15) to GND	9h	203d

GVI High Voltage CAN ID Connections

## 2.1.1 CANopen Identifiers

The protocol is based on CANopen with 11 bit identifier. Based on CiA Draft Standard 301, version 4.01

PARKER GVI: CANopen IDENTIFIERS									
CANopen Message	CANopen COB-ID	CANopen COB-ID	CANopen COB-ID	CANopen COB-ID	Default transmit rate	Message name	Type	Description	CANopen COB-ID
<b>GVI: HW-ID</b>	0	1	2	3					
Node ID	6h	7h	8h	9h					
<b>RxPDO1</b>	0x206	0x207	0x208	0x209	10 ms	Commands1			0x200 + Node ID
<b>RxPDO2</b>	0x306	0x307	0x308	0x309	10 ms	Commands2			0x300 + Node ID
<b>RxPDO3</b>	0x406	0x407	0x408	0x409	10 ms	Limits			0x400 + Node ID
<b>TxPDO1</b>	0x186	0x187	0x188	0x189	10 ms	Status			0x180 + Node ID
<b>TxPDO2</b>	0x286	0x287	0x288	0x289	10 ms	Diagnostics1			0x280 + Node ID
<b>TxPDO3</b>	0x386	0x387	0x388	0x389	10 ms	Diagnostics2			0x380 + Node ID
<b>TxPDO4</b>	0x486	0x487	0x488	0x489	100 ms	Diagnostics3			0x480 + Node ID
<b>NMT</b>	0x000	0x000	0x000	0x000		Command	U8	0x01: Go operational	0x80 + Node ID
								0x80: Go to pre-operational	
								0x82: Reset communication	
<b>EMCY</b>	0x86	0x87	0x88	0x89	"100 ms"	Node ID	U8	Range 1-31	0x80 + Node ID
						EMCY error code	U16	See firmware .htm file	
						EMCY register	U8		
						Not used	U8	See firmware .htm file	
						Event ID	U16		
System reaction	U8	See firmware .htm file							
<b>TxSDO</b>	0x586	0x587	0x588	0x589		Not used	U8	Standard 301, v4.01 See firmware .htm file	0x580 + Node ID
						Command byte	U8		
						Index	U16		
						Sub Index	U8		
<b>RxSDO</b>	0x606	0x607	0x608	0x609		Data	U32	Standard 301, v4.01 See firmware .htm file	0x600 + Node ID
						Command byte	U8		
						Index	U16		
						Sub Index	U8		
<b>Heartbeat</b>	0x706	0x707	0x708	0x709	100 ms	Data	U32	0x00: Bootup 0x04: Stopped 0x05: Operational 0x7F: Pre-operational	0x700 + Node ID
						Status	U8		

## 2.2 CANopen Messages

### 2.2.1 CANopen PDO Feedback messages

#### PARKER GVI: CANopen PDO Feedback Messages

Node ID: default 6 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier  
Based on CiA Draft Standard 301, version 4.01

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>TxPDO1-message: Status</b>			<b>Identifier: 0x180+Node ID</b>				<b>Transmit Rate: default 10ms</b>
0x2001	1	StatusAll	U16		1	0 - 65535	Bit 0: Ready To Switch On Dc bus is charged
							Bit 1: Switched On Drive is ready to enable
							Bit 2: Enabled Power stage enabled
							Bit 3: Tripped Power stage tripped due to error
							Bit 4: Current Ability Reduced
							Bit 5: Current Boost Activated
							Bit 6: Error Active If any error is active
							Bit 7: Warning Active If any warning is active
							Bit 8: Regeneration Power is from the drive to the battery
							Bit 9: High Side Switched On Only available with HV inverters
							Bit 10: Open Drain Output 1 On Only available with LV inverters
							Bit 11: Open Drain Output 2 On Only available with LV inverters
							Bit 12: Open Drain Output 3 On Only available with LV inverters
							Bit 13: Open Drain Output 4 On Only available with LV inverters
							Bit 14: Open Drain Output 5 On Only available with LV inverters
							Bit 15: Open Drain Output 6 On Only available with LV inverters
0x2052	19	CanSignalRotorSpeedInRpm	S16	rpm	1	-32768 - 32767	The actual filtered speed. Filter parameter: CanSignalSpeedFilterGain
0x2073	56	CanSignalRmsMotorCurrent	U16	Arms	1	0 - 2316	Scalar sum of filtered measured current & magnetisation current. Filter parameter: CanSignalRmsMotorCurrentFilterGain
0x2030	23	CanSignalFilteredVoltage	S16	Vdc	0.1	0 - 3276.7	Measured filtered DC bus voltage value. Filter parameter: CanSignalFilterGain

## PARKER GVI: CANopen PDO Feedback Messages

Node ID: default 6 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier  
Based on CiA Draft Standard 301, version 4.01

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>TxPDO2-message: Diagnostics1</b>			<b>Identifier: 0x280+Node ID</b>			<b>Transmit Rate: default 10ms</b>	
0x2076	8	CanSignalActTorque	S16	Nm	0.1	-3276.8 - 3276.7	Actual torque
0x2073	2	DcBusCurrent	S16	Adc	1	-1125 - 1125	Estimated and filtered dc bus current
0x2001	5	DigitalInStatus	U16		1	0 - 65535	Bit 0: LV: DI1, Forward HV: DI1, HW_ID1
							Bit 1: LV: DI2, Reverse HV: DI2, HW_ID2
							Bit 2: LV: DI3, Interface_Mode_Select_1 HV: DI3
							Bit 3: LV: DI4, Interface_Mode_Select_2 HV: DI4
							Bit 4: LV: DI5, HW_ID1 HV: not used
							Bit 5: LV: DI6, HW_ID2 HV: not used
							Bit 6: LV: DI7 HV: not used
							Bit 7: LV: DI8 HV: not used
							Bit 8: LV: DI9 HV: not used
							Bit 9-11: LV: not used HV: not used
							Bit 12: LV: Keyswitch HV: MTO IN1 (Pull_up)
							Bit 13: LV: not used HV: MTO_IN2 (Pull_down)
							Bit 14-15: LV: not used HV: not used
0x2095	9	AbilityAccelerationCurrent	S16	Arms	1	0 - 2316	Will be lower than limit if any reduction is active Reductions active due to physical reasons

## PARKER GVI: CANopen PDO Feedback Messages

Node ID: default 6 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier  
Based on CiA Draft Standard 301, version 4.01

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>TxPDO3-message: Diagnostics2</b>			<b>Identifier: 0x380+Node ID</b>				<b>Transmit Rate: default 10ms</b>
0x2095	19	ActualLimitationType	U8		1	0 - 15	Type of (reason for) actual limitation 0 = No limitation 1 = Event limitation 2 = Motor temperature limitation 3 = Low DC voltage limitation 4 = High DC voltage limitation 5 = Low speed limitation 6 = High speed limitation 8 = Dc power limitation
							9 = External current limitation 10 = External torque limitation 11 = Heatsink temperature limitation 12 = Energy limitation 13 = Max current limitation 14 = Max voltage angle limitation 15 = Switching frequency limitation
0x2075	2	RegulatorStatus	U8		1	0 - 3	0 = Field weakening control not active 1 = Field weakening control active with no limitation
							2 = Field weakening control active with current limitation 3 = Field weakening control active with angle limitation
0x2052	16	SensorAngle	S16	°	0.1	-180.0 - 179.9	Shows value from the active feedback sensor
0x2077	1	Iq	S16	Apk	1	-3276 - 3276	Measured instantaneous q-current
0x2077	2	Id	S16	Apk	1	-3276 - 3276	Measured instantaneous d-current

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>TxPDO4-message: Diagnostics3</b>			<b>Identifier: 0x480+Node ID</b>				<b>Transmit Rate: default 100ms</b>
0x2040	10	CanSignalMotorTemp	S16	°C	1	-32767 - 210	Motor Temperature Separately filtered motor temperature
0x2041	3	CanSignalInverterTemp	S16	°C	1	-50 - 130	Heatsink Temperature Separately filtered heat sink temperature
0x2020	13	ActualControlMode	U8		1	0 - 255	0 = Speed Mode 3 = AC Current Mode 5 = Torque Mode 8 = DC Voltage Mode
0x2029	6	ActiveEvents	U8		1	0 - 20	Number of active events

## 2.2.2 CANopen PDO Command messages

### PARKER GVI: CANopen PDO Command Messages

Node ID: default 6 (see GVI Configuration Manual)

Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier

Based on CiA Draft Standard 301, version 4.01

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>RxPDO1-message: Commands1</b>			<b>Identifier: 0x200 + Node ID</b>				<b>Transmit Rate: default 10 ms</b>
0x2000	1	CommandAll	U16		1	0 - 65535	Bit 0: Switch on Bit 1: Speed Neutral Brake Ramp Parameter set Bit 3: Enable Bit 4: Regulator Set Bit 5: Active Current Boost Bit 6,7: Speed Ramp Parameter Set Bit 8: Ignore Low DC Bus Bit 9: High Side Switch On (Pin 37) Bit 10: Open Drain Output 1 On Bit 11: Open Drain Output 2 On Bit 12: Open Drain Output 3 On Bit 13: Open Drain Output 4 On Bit 14: Open Drain Output 5 On Bit 15: Open Drain Output 6 On
							0 = set 0, 1 = set 1, 2 = set 2, 3 = set 3 Enable power stage Speed Controller PI Parameter set: 0 = set 0, 1 = set 1 0 = set 0, 1 = set 1, 2 = set 2, 3 = set 3 Only available with HV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters
0x2000	2	CommandSpeed	S16	Rpm	1	-32768 - 32767	Speed Command Used in Speed Mode Control
0x2000	5	CommandAccelerationChange	U8	Rpm/4ms	1	0 - 255	Acceleration slope in Speed mode Slope in rpm / dT: dT = 2 * SpeedChangeFactor
0x2000	6	CommandDecelerationChange	U8	Rpm/4ms	1	0 - 255	Deceleration slope in Speed mode Slope in rpm / dT: dT = 2 * SpeedChangeFactor

## PARKER GVI: CANopen PDO Command Messages

Node ID: default 6 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier  
Based on CiA Draft Standard 301, version 4.01

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>RxPDO2-message: Commands2</b>			<b>Identifier: 0x300 + Node ID</b>			<b>Transmit Rate: default 10 ms</b>	
0x2000	3	CommandTorque	S16	Nm	0.1	-3276.8 - 3276.7	Torque Command, used in TorqueModeControl.
0x2000	4	CommandAcCurrent	S16	Arms	1	-2317 - 2316	Current Command, used in AcCurrentModeControl.
0x2000	10	CommandVoltage	S16	Vdc	0.1	0 - 3276.7	Voltage Command used in DCVoltageModeControl (Generator)
0x2020	12	RequestedControlMode	U8		1	0 - 255	0 = Speed Mode 3 = AC Current Mode 5 = Torque Mode 8 = DC Voltage Mode

Index	SubIdx	Object Name	Type	Unit	Res.	Obj. Range	Description
<b>RxPDO3-message: Limits</b>			<b>Identifier: 0x400 + Node ID</b>			<b>Transmit Rate: default 10 ms</b>	
0x2099	6	AccTorqueLimit	S16	Nm	0.1	0 - 3276.7	Sets accelerating torque limit To be activated in ApplicationSetupWord
0x2099	7	BrakeTorqueLimit	S16	Nm	0.1	0 - 3276.7	Sets braking torque limit To be activated in ApplicationSetupWord
0x2094	3	PosDcCurrentLimit	S16	Adc	1	0 - 1039	Sets positive DC current limit To be activated in ApplicationSetupWord
0x2094	4	NegDcCurrentLimit	S16	Adc	1	0 - 1039	Sets negative DC current limit To be activated in ApplicationSetupWord

## 2.2.3 CANopen Misc

### PARKER GVI: CANopen NMT, EMCY, SDO, Heartbeat

Node ID: default 6 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on CANopen with 11 bit identifier  
Based on CiA Draft Standard 301, version 4.01

Command	Name	Type	Range	Description
<b>NMT</b>		<b>Identifier: 0x00 + Node ID</b>		
	NMT Command	U8	0 - 255	0x01, 1d = go to Operational 0x02, 2d = go to Stopped 0x80, 128d = go to Pre-operational 0x81, 129d = go to ResetNode 0x82, 130d: go to "Reset Communication"
	Node ID	U8	0 - 31	Requested state of the CANopen slave
<b>RxSDO1</b>		<b>Identifier: 0x600+Node ID</b>		
	Command byte	U8	0 - 255	Service Data Object, request from the CANopen Master Data: can vary from 1 - 4 bytes
	Index	U16	0 - 65535	
	Sub-Index	U8	0 - 255	
	Data	U32		
Feedback	Name	Type	Range	Description
<b>EMCY</b>		<b>Identifier: 0x80+Node ID</b>		
	Emergency Error Code	U16	0 - 65535	Emergency Error Code
	Error Register	U8	0 - 255	Emergency Register
	Not used	U8		
	Event ID	U16	0 - 65535	Unique Event ID
	SystemReaction	U8	0 - 255	
	Not used	U8		
<b>HEARTBEAT</b>		<b>Identifier: 0x700+Node ID</b>		<b>Transmit Rate: default 100ms</b>
	NMT_State	U8		Heartbeat, also called "Node Monitoring", Indicates the current state of the CANopen slave 0x00, 0d = Boot Up 0x04, 4d = Stopped 0x05, 5d = Operational 0x7F, 127d = Pre-operational
<b>TxSDO1</b>		<b>Identifier: 0x580+Node ID</b>		
	Command Byte	U8	0 - 255	Service Data Object, reply from the CANopen slave Data: can vary from 1 - 4 bytes
	Index	U16	0 - 65535	
	Sub-Index	U8	0 - 255	
	Data	U32		

## 3 J1939 Message Database



### NOTE

GVI inverters supplied or installed with firmware versions C03x04 and earlier use a different J1939 address range from those supplied with version C03x05, C04x01 or later. Please ensure that the correct section of this manual is referred to. Should a GVI supplied with C04x01 firmware or later be connected to a master previously configured for use with older firmware, it will be necessary to re-configure the master, or install the required earlier firmware into the GVI.

### 3.1 CAN Identifiers

GVI Inverter CAN identifiers are dependent on the hardware address of the GVI inverter, as described fully in the GVI Configuration manual and relevant hardware installation manuals.

Hardware ID	Digital Input Wiring	CANopen Node ID	J1939 Source Address
0	None	6h	200d
1	ID Pin 1 to B+	7h	201d
2	ID Pin 2 to B+	8h	202d
3	ID Pin 1 and 2 to B+	9h	203d

GVI Low Voltage CAN ID Connections

Hardware ID	Digital Input Wiring	CANopen Node ID	J1939 Source Address
0	None	6h	200d
1	ID Pin 1 to GND	7h	201d
2	ID Pin 2 to GND	8h	202d
3	ID Pin 1 and 2 to GND	9h	203d

GVI High Voltage CAN ID Connections

### 3.1.1 J1939 Identifiers : Firmware C03x04 and earlier

29-bit identifiers. Command and feedback messages only. DM1 not supported. Address claiming not supported. All messages in the peer to peer range (PDU1)

PARKER GVI: J1939 IDENTIFIERS										
Message Name	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	PGN number	PGN number	PGN number	PGN number	Default Priority	Transmit Rate
<b>GVI: HW-ID</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>		
<b>SA_master</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>		
<b>Commands1</b>	0x0CC8C8C7	0x0CC8C9C7	0x0CC8CAC7	0x0CC8CBC7	51200	51200	51200	51200	3	10ms
<b>Commands2</b>	0x0CC7C8C7	0x0CC7C9C7	0x0CC7CAC7	0x0CC7CBC7	50944	50944	50944	50944	3	10ms
<b>Limits</b>	0x0CC9C8C7	0x0CC9C9C7	0x0CC9CAC7	0x0CC9CBC7	51456	51456	51456	51456	3	10ms
<b>SA_GVI</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>		
<b>Status</b>	0x18CDC7C8	0x18CDC7C9	0x18CDC7CA	0x18CDC7CB	52480	52480	52480	52480	6	10ms
<b>Diagnostics1</b>	0x18CAC7C8	0x18CAC7C9	0x18CAC7CA	0x18CAC7CB	51712	51712	51712	51712	6	10ms
<b>Diagnostics2</b>	0x18CCC7C8	0x18CCC7C9	0x18CCC7CA	0x18CCC7CB	52224	52224	52224	52224	6	10ms
<b>Diagnostics3</b>	0x18CFC7C8	0x18CFC7C9	0x18CFC7CA	0x18CFC7CB	52992	52992	52992	52992	6	100ms
<b>Events</b>	0x18CEC7C8	0x18CEC7C9	0x18CEC7CA	0x18CEC7CB	52736	52736	52736	52736	6	100ms

### 3.1.2 J1939 Identifiers : Firmware C03x05

29-bit identifiers. Command and feedback messages only. DM1 not supported. Address claiming not supported. All messages in the peer to peer range (PDU1)

PARKER GVI: J1939 IDENTIFIERS										
Message Name	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	PGN number	PGN number	PGN number	PGN number	Default Priority	Transmit Rate
<b>GVI: HW-ID</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>		
<b>SA_master</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>		
<b>Commands1</b>	0x0CC8C8C7	0x0CC8C9C7	0x0CC8CAC7	0x0CC8CBC7	51200	51200	51200	51200	3	10ms
<b>Commands2</b>	0x0CC7C8C7	0x0CC7C9C7	0x0CC7CAC7	0x0CC7CBC7	50944	50944	50944	50944	3	10ms
<b>Limits</b>	0x0CC9C8C7	0x0CC9C9C7	0x0CC9CAC7	0x0CC9CBC7	51456	51456	51456	51456	3	10ms
<b>SA_GVI</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>		
<b>Status</b>	0x18CDC7C8	0x18CDC7C9	0x18CDC7CA	0x18CDC7CB	52480	52480	52480	52480	6	10ms
<b>Diagnostics1</b>	0x18CAC7C8	0x18CAC7C9	0x18CAC7CA	0x18CAC7CB	51712	51712	51712	51712	6	10ms
<b>Diagnostics2</b>	0x18CCC7C8	0x18CCC7C9	0x18CCC7CA	0x18CCC7CB	52224	52224	52224	52224	6	10ms
<b>Diagnostics3</b>	0x18CFC7C8	0x18CFC7C9	0x18CFC7CA	0x18CFC7CB	52992	52992	52992	52992	6	100ms
<b>Events</b>	0x18D1C7C8	0x18D1C7C9	0x18D1C7CA	0x18D1C7CB	53504	53504	53504	53504	6	100ms

### 3.1.3 J1939 Identifiers : Firmware C04x01

29-bit identifiers. Command and feedback messages only. DM1 not supported. Address claiming not supported. All messages in the proprietary broadcast range (PDU2)

PARKER GVI: J1939 IDENTIFIERS										
Message Name	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	J1939 CAN ID	PGN number	PGN number	PGN number	PGN number	Default Priority	Transmit Rate
<b>GVI: HW-ID</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>		
<b>SA_master</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>	<b>199d</b>		
<b>Commands1</b>	0x0CFF28C7	0x0CFF2DC7	0x0CFF32C7	0x0CFF37C7	65320	65325	65330	65335	3	10ms
<b>Commands2</b>	0x0CFF29C7	0x0CFF2EC7	0x0CFF33C7	0x0CFF38C7	65321	65326	65331	65336	3	10ms
<b>Limits</b>	0x0CFF2AC7	0x0CFF2FC7	0x0CFF34C7	0x0CFF39C7	65322	65327	65332	65337	3	10ms
<b>SA_GVI</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>	<b>200d</b>	<b>201d</b>	<b>202d</b>	<b>203d</b>		
<b>Status</b>	0x18FF3CC8	0x18FF3CC9	0x18FF3CCA	0x18FF3CCB	65340	65340	65340	65340	6	10ms
<b>Diagnostics1</b>	0x18FF3DC8	0x18FF3DC9	0x18FF3DCA	0x18FF3DCB	65341	65341	65341	65341	6	10ms
<b>Diagnostics2</b>	0x18FF3EC8	0x18FF3EC9	0x18FF3ECA	0x18FF3ECB	65342	65342	65342	65342	6	10ms
<b>Diagnostics3</b>	0x18FF3FC8	0x18FF3FC9	0x18FF3FCA	0x18FF3FCB	65343	65343	65343	65343	6	100ms
<b>Events</b>	0x18FF40C8	0x18FF40C9	0x18FF40CA	0x18FF40CB	65344	65344	65344	65344	6	100ms

## 3.2 J1939 Messages

### 3.2.1 J1939 Feedback messages

#### PARKER GVI: J1939 Feedback Messages

Source Address: default 200 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on the J1939 std with 29 bit identifier  
DM1 functionality is not supported. Address Claiming is not supported

SPN Name	Length	Unit	Res.	Offset	SPN Range	Description	
<b>Fdbk-message: Status</b>			<b>Priority: 6</b>			<b>Transmit Rate: default 10ms</b>	
StatusAll	16		1	0	0 - 65535	Bit 0: Ready To Switch On	Dc bus is charged
						Bit 1: Switched On	Drive is ready to enable (Main contactor is on, if used)
						Bit 2: Enabled	Power stage enabled
						Bit 3: Tripped	Power stage tripped due to error
						Bit 4: Current Ability Reduced	
						Bit 5: Current Boost Activated	
						Bit 6: Error Active	If any error is active
						Bit 7: Warning Active	If any warning is active
						Bit 8: Regeneration	Power is from the drive to the battery
						Bit 9: High Side Switched On	Only available with HV inverters
						Bit 10: Open Drain Output 1 On	Only available with LV inverters
						Bit 11: Open Drain Output 2 On	Only available with LV inverters
						Bit 12: Open Drain Output 3 On	Only available with LV inverters
						Bit 13: Open Drain Output 4 On	Only available with LV inverters
						Bit 14: Open Drain Output 5 On	Only available with LV inverters
						Bit 15: Open Drain Output 6 On	Only available with LV inverters
CanSignalRotorSpeedInRpm	16	rpm	1	-32768	-32768 - 31487	The actual filtered speed. Filter parameter: CanSignalSpeedFilterGain	
CanSignalRmsMotorCurrent	16	Arms	1	0	0 - 2316	Scalar sum of filtered measured current & magnetisation current. Filter parameter: CanSignalRmsMotorCurrentFilterGain	
CanSignalFilteredVoltage	16	Vdc	0.1	-3276.8	0 - 3276.7	Measured filtered DC bus voltage value. Filter parameter: CanSignalFilterGain	

**PARKER GVI: J1939 Feedback Messages**

Source Address: default 200 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on the J1939 std with 29 bit identifier  
DM1 functionality is not supported. Address Claiming is not supported

SPN Name	Length	Unit	Res.	Offset	SPN Range	Description	
<b>Fdbk-message: Diagnostics1</b>			<b>Priority: 6</b>			<b>Transmit Rate: default 10ms</b>	
CanSignalActTorque	16	Nm	0.1	-3276.8	-3276.8 - 3148.7	Actual torque	
DcBusCurrent	16	Adc	1	-32768	-1125 - 1125	Estimated and filtered dc bus current	
DigitalInStatus	16		1	0	0 - 64255	Bit 0: LV: DI1	HV: DI1, HW_ID1
						Bit 1: LV: DI2	HV: DI2, HW_ID2
						Bit 2: LV: DI3, Interface_Mode_Select_1	HV: DI3
						Bit 3: LV: DI4, Interface_Mode_Select_2	HV: DI4
						Bit 4: LV: DI5, HW_ID1	HV: not used
						Bit 5: LV: DI6, HW_ID2	HV: not used
						Bit 6: LV: DI7	HV: not used
						Bit 7: LV: DI8	HV: not used
						Bit 8: LV: DI9	HV: not used
						Bit 9-11: LV: not used	HV: not used
						Bit 12: LV: Keyswitch	HV: MTO IN1 (Pull_up)
						Bit 13: LV: not used	HV: MTO_IN2 (Pull_down)
						Bit 14-15: LV: not used	HV: not used
AbilityAccelerationCurrent	16	Arms	1	0	0 - 64255	Will be lower than limit if any reduction is active	Reductions will be active due to physical reasons
<b>Fdbk-message: Diagnostics2</b>			<b>Priority: 6</b>			<b>Transmit Rate: default 10ms</b>	
ActualLimitationType	8		1	0	0 - 15	Type of (reason for) actual limitation	
						0 = No limitation	9 = External current limitation
						1 = Event limitation	10 = External torque limitation
						2 = Motor temperature limitation	11 = Heatsink temperature limitation
						3 = Low DC voltage limitation	12 = Energy limitation
						4 = High DC voltage limitation	13 = Max current limitation
						5 = Low speed limitation	14 = Max voltage angle limitation
						6 = High speed limitation	15 = Switching frequency limitation
						8 = Dc power limitation	
RegulatorStatus	8		1	0	0 - 3	0 = Field weakening control not active	2 = Field weakening control active with current limitation
						1 = Field weakening control active with no limitation	3 = Field weakening control active with angle limitation
SensorAngle	16	°	0.1	-3276.8	-180.0 - 179.9	Shows value from the active feedback sensor	
Iq	16	Apk	1	-3276	-3276 - 3276	Measured instantaneous q-current	
Id	16	Apk	1	-3276	-3276 - 3276	Measured instantaneous d-current	

### PARKER GVI: J1939 Feedback Messages

Source Address: default 200 (see GVI Configuration Manual)  
 Baudrate: default 250 kbit/s

The protocol is based on the J1939 std with 29 bit identifier  
 DM1 functionality is not supported. Address Claiming is not supported

SPN Name	Length	Unit	Res.	Offset	SPN Range	Description	
<b>Fdbk-message: Diagnostics3</b>			<b>Priority: 6</b>			<b>Transmit Rate: default 100ms</b>	
CanSignalMotorTemp	16	°C	1	-32768	-32767 - 210	Motor Temperature	Separately filtered motor temperature
CanSignalInverterTemp	16	°C	1	-32768	-32767 - 210	Heatsink Temperature	Separately filtered heat sink temperature
ActualControlMode	8		1	0	0 - 255	See RequestedControlMode in J1939 Cmd	
						0 = Speed Mode	5 = Torque Mode
						3 = AC Current Mode	8 = DC Voltage Mode
ActiveEvents	8		1	0	0 - 20	Number of active events	
<b>Fdbk-message: Events</b>			<b>Priority: 6</b>			<b>Transmit Rate: default 100ms</b>	
Event 1	16		1	0	0 - 64255	Event 1 ID	Active Event1
Event 2	16		1	0	0 - 64255	Event 2 ID	Active Event2
Event 3	16		1	0	0 - 64255	Event 3 ID	Active Event3
Event 4	16		1	0	0 - 64255	Event 4 ID	Active Event4

### 3.2.2 J1939 Command messages

#### PARKER GVI: J1939 Feedback Messages

Source Address: default 200 (see GVI Configuration Manual)  
Baudrate: default 250 kbit/s

The protocol is based on the J1939 std with 29 bit identifier  
DM1 functionality is not supported. Address Claiming is not supported

SPN Name	Length	Unit	Res.	Offset	SPN Range	Description		
<b>Cmd-message: Commands1</b>			<b>Priority: 3</b>			<b>Transmit Rate: default 10ms</b>		
CommandAll	16		1	0	0 - 65535	Bit 0: Switch on Bit 1,2: Speed Neutral Brake Ramp Parameterset Bit 3: Enable Bit 4: Regulator Set Bit 5: Active Current Boost Bit 6,7: Speed Ramp Parameter Set Bit 8: Ignore Low DC Bus Bit 9: Enable High Side Out (Pin 37) Bit 10: Open Drain Output 1 On Bit 11: Open Drain Output 2 On Bit 12: Open Drain Output 3 On Bit 13: Open Drain Output 4 On Bit 14: Open Drain Output 5 On Bit 15: Open Drain Output 6 On	0 = set 0, 1 = set 1, 2 = set 2, 3 = set 3 Enable power stage Speed Controller PI Parameterset: 0 = set 0, 1 = set 1 0 = set 0, 1 = set 1, 2 = set 2, 3 = set 3 Only available with HV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters Only available with LV inverters	
CommandSpeed	16	Rpm	1	-32768	-32768 - 31478	Speed Command	Used in Speed Mode Control	
CommandAccelerationChange	8	Rpm/4ms	1	0	0 - 250	Acceleration slope in Speed mode	Slope in rpm / dT: dT = 2 * SpeedChangeFactor	
CommandDecelerationChange	8	Rpm/4ms	1	0	0 - 250	Deceleration slope in Speed mode	Slope in rpm / dT: dT = 2 * SpeedChangeFactor	
<b>Cmd-message: Commands2</b>			<b>Priority: 3</b>			<b>Transmit Rate: default 10ms</b>		
CommandTorque	16	Nm	0.1	-3276.8	-3276.7 - 3148.7	Torque Command, used in TorqueModeControl.		
CommandAcCurrent	16	Arms	1	-32768	-2317 - 2316	Current Command, used in AcCurrentModeControl.		
CommandVoltage	16	Vdc	0.1	-3276.8	0 - 3148.7	Voltage Command used in DCVoltageModeControl (Generator)		
RequestedControlMode	8		1	0	0 - 255	0 = Speed Mode 3 = AC Current Mode	5 = Torque Mode 8 = DC Voltage Mode	
<b>Cmd-message: Limits</b>			<b>Priority: 3</b>			<b>Transmit Rate: default 10ms</b>		
AccTorqueLimit	16	Nm	0.1	-3276.8	0 - 3148.7	Sets accelerating torque limit	To be activated in ApplicationSetupWord	
BrakeTorqueLimit	16	Nm	0.1	-3276.8	0 - 3148.7	Sets braking torque limit	To be activated in ApplicationSetupWord	
PosDcCurrentLimit	16	Adc	1	-32768	0 - 1039	Sets positive DC current limit	To be activated in ApplicationSetupWord	
NegDcCurrentLimit	16	Adc	1	-32768	0 - 1039	Sets negative DC current limit	To be activated in ApplicationSetupWord	