

J1939 Communication Driver

Information Sheet for Crimson v2.0+

Compatible Devices

Support for J1939 PGN / SPN access and J1939 network management as defined in the J1939 standards.

General Information

A Red Lion CAN option card (G3CN, XCCN) is mandatory in using the J1939 communications driver.

Accessing Data

Within the Communications category of Crimson, select the root of the G3 tree. Upon selection of the CAN Option Card, the J1939 driver can then be selected in the CAN Interface element of the tree.

Overview

Each device or ECU that will require data transfer should be added under the J1939 driver. A Gateway Block will need to be added to each ECU for each PGN (Parameter Group Number) that will be transferred to and/or from that ECU. PGN(s) are comprised of SPN(s) (Suspect Parameter Numbers) which appear within each Gateway Block after the Gateway Block Size has been selected. Tags and/or PLC data can then be mapped to each SPN as needed for the application.

Please note, all predefined PGN(s) and SPN(s) are as defined by SAE. Should you have questions regarding the definitions, please refer to SAE 1939 standards documents or contact Red Lion Technical Support.

User Defined PGN Support

In the event that PGN(s) used on the J1939 network are not predefined by SAE standards, PGN(s) as well as its SPN(s) can be created and configured as needed. This can be achieved by clicking on the Manage button which is shown when the CAN Interface – J1939 element is highlighted in the communications tree.

All PGN(s) needed for the J1939 network should be created and configured via this Custom PGN dialog box. Please note that the Priority Level and the Repetition Rate configured here are default values only. Each ECU configuration can hold its own values for these parameters. All PGN(s) created will be added to the PGN list shown in the Parameter Group selection dialog box as described below.

Gateway Block Configuration

For each Gateway Block, select the appropriate PGN within the Parameter Group selection box. If the target device requires that data be requested, please select "Send Data Requests". When this checkbox is enabled, requests will be sent at an interval based upon the "Minimum Polling Delay" device option. PGN Priority Level may also be changed in this selection box. Access to PGN Repetition Rate was added in v1.01+. The Repetition Rate is defined in milliseconds and can be changed as needed for the specific application. Received data timeout is based upon 3 times the Repetition Rate. Data will be transmitted at Repetition Rate intervals and On Event. When the Repetition Rate is set to 0, data will be only transmitted On Event. PGN Priority and Repetition Rate are initially set to the default setting as defined.

Ensure that each Gateway Block is set to the direction desired. If data for a PGN will be transported in both directions, configure two Gateway Blocks to service that PGN, one for each direction.

Diagnostic Function

Diagnostic functionality has been provided within the User Defined PGN area in J1939 driver versions 1.05+. After a User Defined PGN has been created, a Diagnostic Function drop down list is provided. Each Gateway Block that uses this PGN should be set to a direction of Device to G3 unless this PGN is to be sent to another device for informational purposes.

NOTE: Diagnostic functions have been provided as a useful tool to interrogate the J1939 bus during database construction and should not be used for any other purpose.

Functions Supported:

Report Network Nodes - This function will report all active nodes on the J1939 network. Values are initialized to 0 and re-initialized to 255 (since a node can be an address of 0) after J1939 bus communications have been established.

Report Network PGNs (Crimson 3.0+) - This function will report all PGNs and their source node on the J1939 network. Each SPN under this function should be set to a size of 32 bits. When viewed in 8 digit hexadecimal format each SPN value is defined as PPNPPSS where P is the PGN number and S is the source node. SPN values are initialized to a value of 0xFFFFFFFF.

Enhanced Function

Enhanced functionality has been provided within the User Defined PGN area in J1939 driver versions 1.08+. After a User Defined PGN has been created, an Enhanced Function drop down list is provided.

Functions Supported:

Rapid Fire Message - Only use Rapid Fire Message enhancement when receiving PGN's that send multiple packet data within the same 8 byte frame overwriting the previous data. The first byte of each transaction will be considered a sequence number and will not be transferred as data. Set the repetition rate to the minimum interval that this PGN will be received to ensure proper 'end of burst' detection.

Revision History

03/26/08 – v1.01+ - Added PGN Repetition Rate (See Gateway Block Configuration)
06/03/08 – v1.03+ - Added User Defined PGN support (See User Defined PGN Support)
11/24/08 – v1.05+ - Added Diagnostic Function support (See Diagnostic Function)
12/23/10 – v1.07+ - Added Diagnostic Function – Report Network PGNs
03/13/12 – v1.08+ - Added Enhanced Function – Rapid Fire Message
05/20/16 – Added Diagnostic Function note, updated Report Network Nodes description.

Cable Information

