

# **J1939 Communication Driver**

# Information Sheet for Crimson v3.0+

## **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) or J1939 module (GMJ1939, CMJ1939) is mandatory to use the J1939 communications driver.

#### **Overview**

J1939 data access involves Parameter Group Numbers or PGNs. There are two types of PGNs to consider:

<u>Global</u> – PGNs that have a most significant byte greater than 240.

<u>Destination Specific</u> – PGNs that have a most significant byte of 240 or less. The least significant byte of a destination specific PGN indicates the destination device's drop number. Red Lion's J1939 driver will automatically insert the target devices ECU Drop Number in the least significant byte of the PGN number.

The remainder of this information sheet describes configuration and data access details.

## **Driver Selection**

<u>When using the CAN Option Card</u>, within the Communications category of Crimson, select the Option Card item of the Communications tree.

| 😌 🕑 🗈 😁 🗟 😕 🖻 🐞 🌾 💌 |   |
|---------------------|---|
| Navigation Pane X   | Communications - Opt Option Card Select the type of option card installed in the G3 |
| 🔊 New + 🗙           | Card Selection  |
| Communications      |   |
| RS-232 Program Port | Option Card: None Fitted Pick   |
| RS-232 Comms Port   |   |
| RS-485 Comms Port   | Card Commands   |
| 🖃 🐢 Network         |   |
| Y Protocol 1        | Remove Option Card  |
| 🍟 Protocol 2        |   |
| 🌾 Protocol 3        |   |
| 🎸 Protocol 4        |   |
| 🖃 🖨 USB Host Ports  |   |
| Memory Stick        |   |
| iiii Keyboard       |   |
| o Mouse             |   |
| 🗄 🍔 Services        |   |
| 🤣 Option Card       |   |
|                     |   |

Click on the Pick... button in the Communication Options Card Selection group.



Upon selection of the CAN Option Card, use the Pick... button to configure the J1939 driver in the CAN Interface element of the tree.

| lanufacturer   |   | <u>D</u> river              |              |
|--|---|-----------------------------|--------------|
| < System><br>3 Point Solutions<br>Boulder Wind Power<br>CAN<br>CANOpen<br>Dometic<br>Parker<br>SAE | * | No Driver Selected<br>J1939 | Version 1.08 |
|  | * |                             | ~            |

<u>When using the J1939 Module</u>, within the Communications category of Crimson, select a Slot within the Comms Modules item of the Communications tree.

| Navigation Pane X       | Communications - Comms Modules - Slot 1 |
|-------------------------|---|
| 💰 New 🗸 🗙               | Module Selection                        |
| Communications          |   |
| Post Network            | Module: None Fitted Pick                |
| Yrotocol 1              |   |
| Protocol 2              | Module Commands                         |
| Protocol 3              | Remove Module                           |
| Protocol 4              |   |
| ☐ ♥() Serial Ports      |   |
| =0 RS-232 Program Port  |   |
| - M PS 232 Comms Port   |   |
| -10 PS 485 Comms Port B |   |
|                         |   |
| Memory Stick            |   |
| IIII Keyboard           |   |
| Kouse 🗞                 |   |
| 🖃 🍔 Services            |   |
| OPC UA Server           |   |
| Time Manager            |   |
| OPCWorx Proxy           |   |
| ETP Server              |   |
| 🤒 Sync Manager          |   |
| Mail Manager            |   |
| SQL Sync                |   |
|                         |   |
| Slot 2                  |   |
| Slot 3                  |   |
| 101 D                   |   |

Click on the Pick... button in the Communications Module Selection group.



Upon selection of the J1939 Module, use the Pick... button to configure the J1939 driver in the J1939 Interface element of the tree.

| Driver Picker for J1939 Port | X                            |
|------------------------------|------------------------------|
| SAE                          | Driver                       |
|                              |                              |
| OK Cancel                    | Total of 1 Driver Available. |

<u>Select the J1939 Interface</u>. In the Driver Settings group indicate the Source Address of the J1939 Red Lion device. Remember each device address on a J1939 bus must be unique.

| Navigation Pane X  | Communications - Comms Modules - Slot 1 - J1939 Interface  |
|--|--|
| 🕵 New 🗸 📉  | Driver Selection   |
|  | Driver: SAE J1939 Pick Driver Settings Source Address: 2 * Manage User Defined PGNs Manage Port Settings Baud Rate: 125000 |
| Qir         CPC VVOX PTONY           Qir         CPC VVOX PTONY           Qir         CPC VVOX PTONY           Qir         Since Vir Vox Ptony | Port Commands<br>Clear Port Settings<br>Add Additional Device  |

In the Port Settings group configure the baud rate of the J1939 bus.

# **Device Configuration**

Add a device or ECU for each device that will require data transfer in the application. Right click on the J1939 Interface and select Add Device from the popup menu.



Select the ECU device. In the Device Settings group indicate the Drop Number of the J1939 target device. Remember each device address on a J1939 bus must be unique.

| Navigation Pane   | Communications - Comms Modules - Slot 1 - J1939 Interface - ECU1   |
|---|--|
| Navigation Pane<br>Key Network<br>Protocol 1<br>Protocol 2<br>Protocol 3<br>Protocol 4  | Communications - Comms Modules - Slot 1 - J1939 Interface - ECU1 Device Settings Enable Device: Yes Device Settings Drop Number: 1 |
| <ul> <li>■ (1) Serial Ports</li> <li>■ (1) RS-232 Program Port</li> <li>■ (1) RS-435 Comms Port A</li> <li>■ (1) RS-435 Comms Port B</li> </ul>   | Minimum Polling Delay: 200 📩 ms<br>Clear DTC's: No 💌   |
| Image: Services         Image: Services         Image: Services         Image: Services         Image: OPC UA Server         Image: OPC UA Server         Image: OPC VA Server <td< td=""><td>Delete This Device<br/>Add Gateway Block<br/>E</td></td<> | Delete This Device<br>Add Gateway Block<br>E   |
| Slot 2<br>Slot 3<br>Slot 3<br>Slot 4<br>Slot 4<br>Slot 5  |  |

Configure the remaing device settings as required by the application.

Options are as follows:

<u>Minimum Polling Delay</u> – Indicate the minimum amount of time the driver should wait to send a request. This setting will only have an affect upon blocks that are set to a Direction of Device to Red Lion and have the PGN's Send Data Request enabled.

<u>Clear DTC's</u> – Indicate whether Diagnostic Trouble Codes should be cleared when not included in the most recent diagnostic message (PGNs 65226, 65227).

# **Gateway Block Configuration**

Add a Gateway Block to each ECU for each PGN (Parameter Group Number) transferred to and/or from that ECU. Right click on the ECU device and select Add Block from the popup menu.

| 🖃 🍔 Services                | E |
|-----------------------------|---|
| OPC UA Server               |   |
| 📷 Time Manager              |   |
| OPCWorx Proxy               |   |
| 🚡 FTP Server                |   |
| 🔊 Sync Manager              |   |
| 🚔 Mail Manager              |   |
| 🚱 SQL Sync                  |   |
| 🖃 🎆 Comms Modules           |   |
| 🖃 📲 Slot 1 - J1939          |   |
| 🖃 🛋 J1939 Interface - J1939 |   |
|                             |   |
| Slot 2                      |   |
| 📲 Slot 3 🗙 Delete           |   |
| Slot 4                      |   |
| Slot 5 rind Usage           |   |
| Slot 6 TI Rename            |   |
| 👔 Slot 7                    | - |

With the newly created Block element selected click on the Pick... button to activate the Select PG dialog box.

| Navigation Pane X   | Communications - Comms Modules - Slot 1 - J1939 Interface - ECU1 - Block1 |                     |  |  |
|---------------------|---|---------------------|--|--|
| 🔊 New - 🗙           | Block Settings  |                     |  |  |
| E Communications    |   | block settings      |  |  |
| 🖃 🐢 Network         | Start Address:  | None Pick           |  |  |
| T Protocol 1        |   |                     |  |  |
| 👸 Protocol 2        | Block Size:   |                     |  |  |
| 🌾 Protocol 3        | Direction   | G12 to Davisa       |  |  |
| 🖗 Protocol 4        | Directori   | diz to benice       |  |  |
| 🖃 🖏 Serial Ports    | Tag Data:   | Use Scaled Values 🔍 |  |  |
| RS-232 Program Port |   |                     |  |  |
| RS-485 Comms Port A | Update Policy:  | Automatic 👻         |  |  |
| RS-232 Comms Port   | Lindate Period:   | 500 ms              |  |  |
| RS-485 Comms Port B |   | ×                   |  |  |
| 🖃 🖨 USB Host Ports  | Block Control   |                     |  |  |
| Memory Stick        | DIOCK CONTON  |                     |  |  |
| E Keyboard          | Request:  | ▼ General Edit      |  |  |
| The Mouse           |   |                     |  |  |
| E Services          | Acknowledge:  | ▼ General Edit      |  |  |
| OPC UA Server       |   |                     |  |  |
| Time Manager        | Block Commands  |                     |  |  |
| OPCWorx Proxy       |   |                     |  |  |
| E FIP Server        | Delete This Block   | k                   |  |  |
| Sync Manager        | Import Mapping  | 15                  |  |  |
| Mail Manager        | Export Mapping  | s                   |  |  |
| SQL Sync            |   |                     |  |  |
| Commis Modules      |   |                     |  |  |
| 1050 1050 1050 1050 |   |                     |  |  |
|                     |   |                     |  |  |
| Block1              |   |                     |  |  |
| I Slot 2            |   |                     |  |  |
| 18 5002             |   |                     |  |  |

| <pgn></pgn>             | No Selection                    | <abbr></abbr>        |  |  |
|-------------------------|---------------------------------|----------------------|--|--|
|                         | Torque/Speed Control 1          | -TSC1                |  |  |
| 256                     | Transmission Control 1          | -TC1                 |  |  |
| 1024                    | External Brake Request          | -XBR                 |  |  |
| 1792                    | General Purpose Valve Pressure  | -GPV4                |  |  |
| 2048                    | Auxiliary I/O Status 5          | -AUXIO5              |  |  |
| 39936                   | Auxiliary I/O Status 7          | -AUXIO7              |  |  |
| 40192                   | Auxiliary I/O Status 6          | -AUXIO6              |  |  |
| 42240                   | Auxilary I/O Status 4           | -AUXIO4              |  |  |
| 42496                   | Auxilary I/O Status 3           | -AUXIO3              |  |  |
| 42752                   | Auxilary I/O Status 2           | -AUXIO2              |  |  |
| 43008                   | Text Display                    | -DISP1               |  |  |
| 43264                   | Forward Lane Image Command      | -FLIC                |  |  |
| 44544                   | Tire Pressure Reference Setting | -TPRS                |  |  |
| <u>)</u> ptions<br>Prio | rity Level: 3                   | 🗐 Send Data Requests |  |  |
| Rep                     | etition Rate (ms): 10           |                      |  |  |

Select the desired PGN from the Parameter Group listbox. Each PGN will set the options to it's default settings. Options settings are as follows:

<u>Priority Level</u> – The priority for any PGN is selectable from 0 which represents the highest priority to 7 which represents the lowest priority. Priority is used to optimize message latency of bus transmissions.

<u>Repetition Rate (ms)</u> – The Repetition Rate in milliseconds determines how often a PGN will be transmitted on the bus. Received data associated with the PGN will timeout at a rate of 3 times the Repetition Rate. Data transmission will occur at Repetition Rate intervals and On Event. When the Repetition Rate is a value of zero data will be only transmitted On Event.

<u>Send Data Requests</u> – The Send Data Requests checkbox should only be checked if the target device requires a request for a PGN transmission to occur. When enabled, PGN requests are sent at an interval based upon the "Minimum Polling Delay" device option.

If different settings are needed for the application make the appropriate changes then click OK.

PGN(s) are comprised of SPN(s) (Suspect Parameter Numbers) which appear within each Gateway Block after defining the Gateway Block Size found in the Block Settings.

| Navigation Pane   | Communications - Comms Modules - Slot 1 - J1939 Interface - ECU1 - Block1 |
|---|---|
| 🔊 New + 🗙   | Block Settings  |
| Communications  | block settings  |
| Retwork   | Start Address: TSC1-695.2 bit Pick  |
| Protocol 1  |   |
| Protocol 2  | Block Size: 3   |
| Protocol 3  |   |
| Protocol 4  | GI2 to Device   |
| 🖃 📹 Serial Ports  | Tag Data: Use Scaled Values   |
| RS-232 Program Port   |   |
| RS-485 Comms Port A   | Update Policy: Automatic 🔻  |
| RS-232 Comms Port   | Undate Deviadu 500  |
| RS-485 Comms Port B   | opuate Periou: Joo IIIs   |
| 🖃 🖨 USB Host Ports  |   |
| Memory Stick  | Block Control   |
| 🗰 Keyboard 🗧  | Pequestr Ceneral Edit   |
| Mouse   | Concertar Concertar   |
| 🖃 🎇 Services  | Acknowledge: The General Edit   |
| OPC UA Server   |   |
| Time Manager  | Block Commands  |
| OPCWorx Proxy   | block commands  |
| ETP Server  | Delete This Block   |
| ᇕ Sync Manager  | Import Mappings   |
| 🔁 Mail Manager  | Constant Managinary   |
| 🧑 SQL Sync  | Export Mappings   |
| 🖃 🎆 Comms Modules   |   |
| 🖃 👔 Slot 1 - J1939  |   |
| Illing and Illing a |   |
|   |   |
| Block1  |   |
| X TSC1-695.2 bit  |   |
| ISC1-696.2 bit  |   |
| ISC1-897.2 bit  |   |
| I Slot 2  | r   |
|   |   |
| Communications  |   |

Also, set each Gateway Block to the direction desired.

SPNs are available for Tags and/or PLC data mappings 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.

Since the J1939 driver maintains a PGN list it is necessary to rebuild communications blocks after references have been manipulated/deleted. The Rebuild Comms Block utility can be found in the Utilities submenu of Crimson's File menu as shown below.

| -c <b>i</b> - | U           | Intitled File - G12 - Crimson 3.0                              |        |     |  |  |  |
|---------------|-------------|--|--------|-----|--|--|--|
| Ei            | ile         | <u>E</u> dit <u>V</u> iew <u>G</u> o <u>L</u> ink <u>H</u> elp |        |     |  |  |  |
| E             | 2           | <u>N</u> ew  | Ctrl+N | 1 🛷 |  |  |  |
| 6             | Open Ctrl+O |  |        | ×   | X Communications - RS-232 Program Port |  |  |
|               |             | Import   |        |     | Driver Selection                       |  |  |
| l.            | ł           | <u>S</u> ave   | Ctrl+S |     |  |  |  |
|               |             | Save <u>A</u> s  |        |     | Driver: No Driver Selected Pick        |  |  |
|               |             | Save Con <u>v</u> ersion                                       |        |     | Port Commands                          |  |  |
|               |             | Save I <u>m</u> age  |        |     | Clear Port Settings                    |  |  |
|               |             | Prot <u>e</u> ction  |        |     | Add Additional Device                  |  |  |
|               |             | <u>U</u> tilities  | Þ      | Rec | ompile Database                        |  |  |
| ×             | <           | E <u>x</u> it  |        | Reb | uild <u>C</u> omms Blocks              |  |  |

# **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. All PGN(s) created are added to the Parameter Group list shown in the Select PG dialog box as described previously.

To begin select the J1939 Interface – J1939 element in the communications tree then click on the Manage button in the Manage User Defined PGNs group. This will activate the Manage User Defined PGNs dialog box.

| Image User Defined PON         Image User Defined ROM         Image User Defined R   | 🔏 New 🕶 📉                                 |  | Deliver Colorfice  |   |      |
|---|---|--|--|---|------|
| Image Lase Defined PGNs   | Communications                            |  | Driver Selection   |   |      |
| Protected 1   Protected 2   Protected 2 </td <td>P P Network</td> <td></td> <td>Driver: SAE J193</td> <td>9</td> <td>Pick</td>  | P P Network                               |  | Driver: SAE J193   | 9   | Pick |
| Wange User Defined PONs          Water Defined PONs         Control         Water Defined PONs         Port Commands         Water Defined PONs         Water Defined PONs         Water Defined PONs         Port Defined PONs         Portice Defined PONs   | Protocol 1                                |  |  |   |      |
| Studie Policy     Studie  | Protocol 2     Protocol 3                 |  | Driver Settings  |   |      |
| Image: User Defined FGNs         Image: Us   | Protocol 4                                |  | Source Address:  | 2   |      |
| ES-322 Program Port 4<br>B 5-323 Comms Port 4<br>B 7-323 Comms Port 4<br>B 7-323 Comms Port 4<br>B 7-323 Comms Port 4<br>B 7-323 Comms Port 4<br>B 7-325 Comms Port | 🖃 🐗 Serial Ports                          |  |  |   |      |
| Statistics Solutions Point Point Settings Point Settings Point Settings Point Settings Point Settings Point Settings Add Additional Device Point Settings Add Additional Device Point Settings Solutions  | 📣 RS-232 Program Port                     |  | Manage User Define   | d PGNs  |      |
| Port Settings          Port Settings         Budd Rate:         Budd Rate:<   | RS-485 Comms Port A                       |  | Manage   |   |      |
| Image: Sol Synthesis     Image:   | RS-232 Comms Port     PS-485 Comms Port B |  |  |   |      |
| Baud Rate: 12500     Moure     Service     Servic   | G S USB Host Ports                        |  | Port Settings  |   |      |
| Keybeard  | Memory Stick                              |  | Baud Rate: 125   | 000 -   |      |
| Would       Mould Server         Server       Server         Server       Server         Manager       Mould Manager  | iiii Keyboard                             | -  |  |   |      |
| AddAdditional Device          Image User Defined PGNs         EVALUATE:         EVALUATE:         Image User Defined PGNs             EVALUATE:           EVALUATE:           Image:     EVALUATE:                   Image:     EVALUATE:                   Image:     EVALUATE: <b>Class Point Setting: Add Additional Device Add Additional Device Solution: Solution: Solution: Solution: Solution: Solution: Solution: Solution: Solution: Profix: Device: Device: Profix: Device: Device: Device: Device: Device: Device: Device: Device: Device</b>   | Mouse                                     | =  | Port Commands  |   | <br> |
| Add Additional Derice PP Stever Nami Manager Status Add Additional Derice Status Status Add Additional Derice Add Additional Derice Status  | Services     OPC US Server                |  | Clear Port Setting   | 10  |      |
| Addational Verke  | Time Manager                              |  | Add Additional D   | 92<br>Norther   |      |
| Server   FP Sever FP Sever For Sever F  | Gr OPCWorx Proxy                          |  | Add Additional L   | evice   |      |
| Yner Manager     York Manager     Y   | 🚡 FTP Server                              |  |  |   |      |
| Mail Manager   I Not Notice   I Not All Not All Notice   I Not All Not  | 🚇 Sync Manager                            |  |  |   |      |
| Commis Modules     Sold 1-11939     Sold 1-11939     Sold 2-201     Sold 2-2   | Mail Manager                              |  |  |   |      |
| Isid 11039         Brock         Isid 21039         Isid 31039         I   | Generation Solutions                      |  |  |   |      |
| Image User Defined PONs         Stot 2   | Slot 1 - J1939                            |  |  |   |      |
| Vanage User Defined PONS  | 😑 =0) J1939 Interface - J1939             |  |  |   |      |
| Stot 2   Stot 2 <td>ECU1</td> <td></td> <td></td> <td></td> <td></td>   | ECU1                                      |  |  |   |      |
| State 3662 bit         State  | Block1                                    |  |  |   |      |
| Shi 2   | X ISC1-695.2 bit                          |  |  |   |      |
| Sint 2         Sint 2         Sint 3         CN List         Connex         Conne   | TSC1-897.2 bit                            |  |  |   |      |
| Box List       Custom PGN         CDN List       Custom PGN         PGN Number:       Description:         Description:       Prefix:         Diagnostic Function:       None         Mrf Assigned Direction:       Bidirectional         Offault Repetition Rate (ms):       1000         Quantity of SPNs:       1         SPN 02:       0         SPN 03:       0         SPN 04:       0         SPN 05:       0         SPN 06:       0         SPN 07:       0         SPN 08:       0         SPN 09:       0         SP   | Slot 2                                    |  |  |   |      |
| Manage User Defined PGNs       Set Ust         PGN List       Custom PGN         Set Ust       PGN Number:         Description:       Description:         Diagnostic Function:       None         Mfr Assigned Direction:       Eidirectional         Default Repetition Rate (ms):       1000         Quantity of SPNs:       1         SPN Sizes (bits)       0         SPN 02:       0         SPN 03:       0         SPN 04:       0         SPN 05:       0         SPN 06:       0         SPN 08:       0         SPN 08:       0         SPN 08:       0         SPN 08:       0  | No. Slot 3                                |  |  |   |      |
| Manage User Defined PGNs         PGN List         Strones <pgn lists<="" td="">         PGN Number:         Description:         Prefix:         Diagnostic Function:         None         Wfr Assigned Direction:         Bidirectional         Offault Priority Level:         6         Outling of SPNs:         1         SPN Sizes (bits)         SPN 02:         O         SPN 03:         O         SPN 04:         O         SPN 05:         O         SPN 06:         O         SPN 08:         O         SPN 08:         O         SPN Page:</pgn>  |   |  |  |   |      |
| SPN 07: 0<br>SPN 08: 0<br>SPN Page: 1   |   | Prefix<br>Diagr<br>Enha<br>Mfr A<br>Defau<br>Quan<br><u>S</u> PN | :<br>nostic Function:<br>ssigned Direction:<br>uit Priority Level:<br>uit Repetition Rate (ms)<br>tity of SPNs:<br>Sizes (bits)<br>Sizes (bits)<br>SPN 01:<br>SPN 02:<br>SPN 04:<br>SPN 05:<br>SPN 05: | None         •           None         •           Bidirectional         •           6         •           1         0           1         0           0         0           0         0           0         0           0         0           0         0           0         0 |      |
| see Page. 1   |   |  | SPN 07:<br>SPN 08:   |   |      |
| Add/Edit PGN Remove PGN   | •   |  | Add/Edit PGN   | Remove PGN  |      |

PGN configuration settings are as follows:

<u>PGN Number</u> – Enter the desired PGN number in decimal form. Keep in mind that the least significant byte of the PGN number for device specific PGNs should be zero as the Drop Number in the ECU device options will designate this byte during communications.

<u>Description</u> – Enter text to describe the PGN data. This will be used to show this PGN in the PG Select dialog box.

 $\underline{Prefix}$  – Enter short text to describe the PGN. The prefix will be used in the PG Select dialog box as well as in the Gateway Block designation.

<u>Diagnostic Function</u> – See Diagnostic Function section below for details.

Enhanced Function – See Enhanced Function section below for details.

<u>Mfr Assigned Direction</u> – This selection is available in J1939 driver versions 1.09. It is used to determine data direction for Manufacturer Assigned PGNs. This selection is only available when a PGN number is entered that uses manufacturer designated data (PGNs that have a most significant byte of 0xEF or 0xFF, or PGN 65229 (DM4)). Either Bidirectional or Transmit/Receive PGNs are allowed. Bidirectional PGN's cannot coexist with Transmit or Receive PGNs.

<u>Default Priority Level</u> – The priority for any PGN is selectable from 0 which represents the highest priority to 7 which represents the lowest priority. Priority is used to optimize message latency for bus transmissions. This is the default value only, each ECU configuration can hold its own values for this parameter.

<u>Default Repetition Rate (ms)</u> – The Repetition Rate in milliseconds determines how often a PGN will be transmitted on the bus. Received data associated with the PGN will timeout at a rate of 3 times the Repetition Rate. Data transmission will occur at Repetition Rate intervals and On Event. When the Repetition Rate is a value of zero, data will be only transmitted On Event. This is the default value only, each ECU configuration can hold its own values for this parameter.

<u>Quantity of SPNs</u> – Enter the number of SPNs contained in this PGN. This will enable the appropriate fields to be enabled for SPN configuration.

# SPN Configuration

Enter the size in bits of each SPN in consecutive order in the SPN xx fields enabled with the Quantity of SPNs designation.

Consider the example below:

| Manage User Defined PGNs                            |                              |              | 23         |
|---|------------------------------|--------------|------------|
| PGN List  | Custom PGN                   |              | ]          |
| <none> <pgn list=""> <prefix></prefix></pgn></none> | PGN Number:                  |              | 65000      |
|   | Description:                 |              | My New PGN |
|   | Prefix:                      |              | New1       |
|   | Diagnostic Function:         | None         | -          |
|   | Enhanced Function:           | None         | •          |
|   | Mfr Assigned Direction:      | Bidirectiona |            |
|   | Default Priority Level:      | 6            | •          |
|   | Default Repetition Rate (ms) |              | 1000       |
|   | Quantity of SPNs:            |              | 10         |
|   | SPN Sizes (bits)             |              |            |
|   | SPN 01:                      |              | 2          |
|   | SPN 02:                      |              | 4          |
|   | SPN 03:                      |              | 1          |
|   | SPN 04:                      |              | 1          |
|   | SPN 05:                      |              | 8          |
|   | SPN 06:                      |              | 8          |
|   | SPN 07:                      |              | 8          |
|   | SPN 08:                      |              | 8          |
|   | SPN Page:                    |              | 1          |
|   |                              |              |            |
|   | Add/Edit PGN                 | Ren          | nove PGN   |

With 10 SPNs SPN Page 2 will need to be accessed.

| Nanage User Defined PGNs                            |                               | ×               |
|---|-------------------------------|-----------------|
| PGN List  | Custom PGN                    |                 |
| <none> <pgn list=""> <prefix></prefix></pgn></none> | PGN Number:                   | 65000           |
|   | Description:                  | My New PGN      |
|   | Prefix:                       | New1            |
|   | Diagnostic Function:          | None 🔻          |
|   | Enhanced Function:            | None 🔻          |
|   | Mfr Assigned Direction:       | Bidirectional 👻 |
|   | Default Priority Level:       | 6 💌             |
|   | Default Repetition Rate (ms): | 1000            |
|   | Quantity of SPNs:             | 10              |
|   | SPN Sizes (bits)              |                 |
|   | SPN 09:                       | 8               |
|   | SPN 10:                       | 8               |
|   | SPN 12:                       | 0               |
|   | SPN 13:                       | 0               |
|   | SPN 14:                       | 0               |
|   | SPN 15:                       | 0               |
|   | SPN 16:                       | 0               |
|   | SPN Page:                     | 2               |
|   | Add/Edit PGN                  | Remove PGN      |

After entering the remaining SPN sizes click on the Add/Edit PGN button.

| inage User              | Defined PGNs              |                   |                               | 23              |
|-------------------------|---------------------------|-------------------|-------------------------------|-----------------|
| <u>P</u> GN List –      |                           |                   | Custom PGN                    |                 |
| <none><br/>65000</none> | < PGN List><br>My New PGN | <prefix></prefix> | PGN Number:                   |                 |
|                         | ,                         |                   | Description:                  |                 |
|                         |                           |                   | Prefix:                       |                 |
|                         |                           |                   | Diagnostic Function:          | None            |
|                         |                           |                   | Enhanced Function:            | None 👻          |
|                         |                           |                   | Mfr Assigned Direction:       | Bidirectional 👻 |
|                         |                           |                   | Default Priority Level:       | 6 💌             |
|                         |                           |                   | Default Repetition Rate (ms): | 1000            |
|                         |                           |                   | Quantity of SPNs:             | 1               |
|                         |                           |                   | SPN Sizes (bits)              |                 |
|                         |                           |                   | SPN 02:                       | 0               |
|                         |                           |                   | SPN 03:                       | 0               |
|                         |                           |                   | SPN 04:                       | 0               |
|                         |                           |                   | SPN 05:                       | 0               |
|                         |                           |                   | SPN 06:                       | 0               |
|                         |                           |                   | SPN 07:                       | 0               |
|                         |                           |                   | SPN 08:                       | 0               |
|                         |                           | -                 | SPN Page:                     | 1               |
| -                       |                           |                   |                               |                 |

Close the Manage User Defined PGNs dialog by clicking on the red X in the upper right corner.

Right click on the ECU device and select Add Block from the popup menu. From the Block Settings group click on the Pick... button then find the newly added PGN and click OK.

| <u>P</u> aramet              | er Group                                   |        |   |
|------------------------------|--|--------|---|
| 64998                        | Hydraulic Braking System                   | -HBS   |   |
| 64999                        | Bus #1/Utility Sync Check Status -BUSC     |        |   |
| 65000                        | My New PGN-New1                            |        |   |
| 65001                        | Bus #1 Phase C Basic AC Quantities         | -BPCAC |   |
| 65002                        | Bus #1 Phase B Basic AC Quantities         | -BPBAC |   |
| 65003                        | Bus #1 Phase A Basic AC Quantities         | -BPAAC |   |
| 65004                        | Bus #1 Average Basic AC Quantities -BAAC   |        |   |
| 65005                        | Utility Total AC Energy                    | -UTACE | _ |
| 65006                        | Utility Phase C AC Reactive Power -UPCACR  |        |   |
| 65007                        | Utility Phase C AC Power -UPCACP           |        |   |
| 65008                        | Utility Phase C AC Basic Quantities -UPCAC |        |   |
| 65009                        | Utility Phase B AC Reactive Power -UPBACR  |        |   |
| 65010                        | Utility Phase B AC Power -UPBACP           |        |   |
| 65011                        | Utility Phase B AC Basic Quantities        | -UPBAC | Ŧ |
| ⊇ptions<br>Priority Level: 6 |  |        |   |

The user defined PGN is available for mapping to Tags and/or PLC data.

| Navigation Pane X  | Communications - Comms Modules - Slot 1 - J1939 Interface - ECU1 - Block2 |
|--|---|
| 🔊 New - 🗙  | Block Settings  |
| & Mouse  |   |
| - Services   | Start Address: New1-1.2 bit Pick  |
| OPC IIA Server   |   |
| The Manager  | Block Size: 10  |
| Concernational and the second se |   |
| CPCWOIX Proxy  | Direction: G12 to Device 👻  |
| E FIP Server   |   |
| Sync Manager   | Tag Data: Use Scaled Values 👻   |
| 🖾 Mail Manager   | Undate Policy Automatic   |
| 🚱 SQL Sync   | Automatic +   |
| E Comms Modules  | Update Period: 500 ms   |
| 🖃 👔 Slot 1 - J1939   |   |
| Illian J1939 Interface - J1939   | Place Control   |
| 🖃 🏥 ECU1   | Biock Control   |
| E C Block1   | Requests and Consume  |
| 🗉 🙆 Block2   | Request: V General  |
| New1-1,2 bit   | Idrouteday - Canaral  |
| New1-2.4 bit   | Ackilowiedge: V General   |
| New1-3.1 bit   |   |
| New1-4.1 bit   | Block Commands  |
| New 58 bit   | Delete This Black   |
| New - 5.8 bit  | Delete mis block  |
| New1-6.6 Dit   | Import Mappings   |
| New1-7.6 Dit   | Export Mappings   |
| New1-8.8 Dit   |   |
| New1-9.8 bit   |   |
| New1-10.8 bit  |   |
| Slot 2   |   |
| Slot 3   |   |
| Slot 4   |   |
| Slot 5   |   |
| Slot 6   |   |
| Slot 7   |   |

# **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 Red Lion 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 PPPPPPSS where P is the PGN number and S is the source node. SPN values are initialized to a value of 0xFFFFFFF.

## **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. 08/30/18 - Updated to new Crimson 3.0+ information sheet format.

# **Cable Information**

