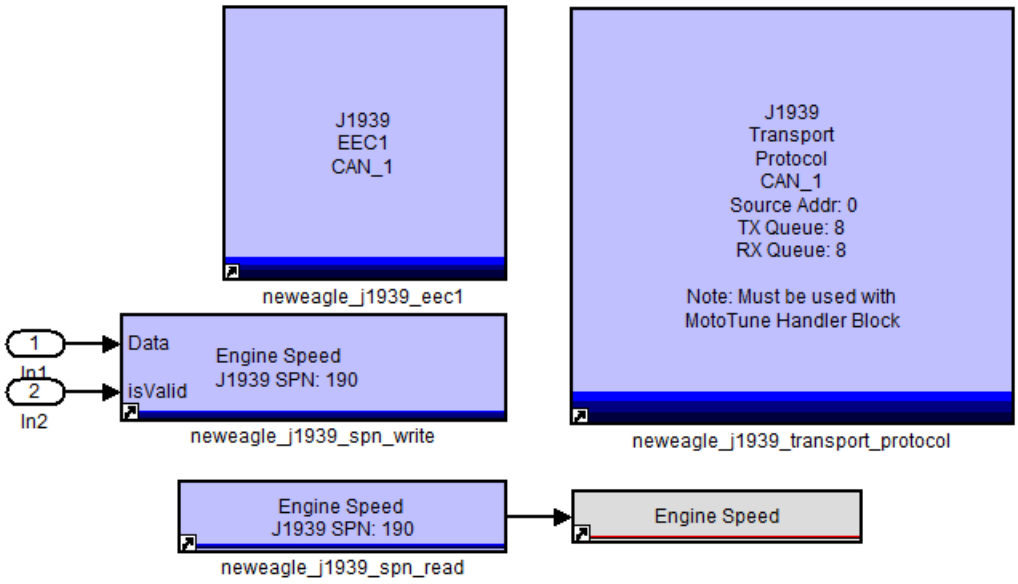
CONTROL SYSTEM SOLUTIONS

New Eagle J1939 Library v1.0

New Eagle Products

Datasheet

2012-3-28



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Overview New Eagle J1939 Library for MotoHawk

The New Eagle J1939 (EMD/OBD) Protocol Libraries for MotoHawk offer an easy to use approach to add J1939 protocol support to any existing or new MotoHawk project. They abstract all the complex network management and transmission requirements of the J1939 protocol, allowing fast development of a J1939 compatible application.

The J1939 OBD Library seamlessly interfaces with the Woodward OBD Fault Manager blocks to provide a large number of J1939 Diagnostic Messages. All the functions required to create an OBD-HD compliant application are included in the New Eagle J1939 OBD Library. We believe the block-set provides excellent value vs re-implementing the dynamic pieces of J1939 such as the transport protocol (multi-packet messages, BAM, RTS/CTS, etc), address claiming, and connection management within MotoHawk.

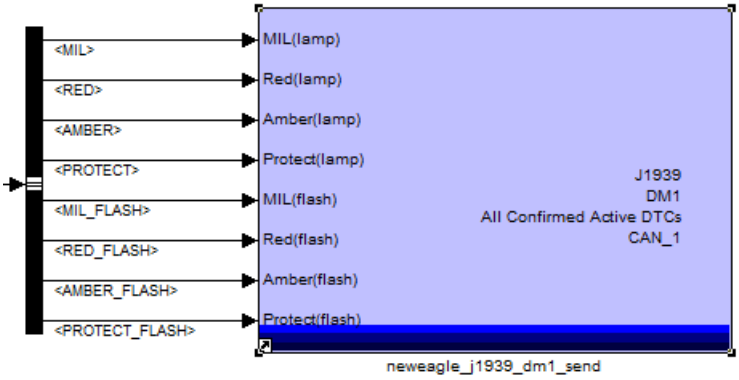
New Eagle can add custom extensions to the block-set if there are additional messages or features you require. Please contact sales for details.

Technical Overview

The New Eagle J1939 EMD and OBD Libraries implement the Network Management, Data Link and Application layers as described in the J1939 protocol specification. Custom built Simulink blocks and code generation provide simple support for the complex features of J1939. The New Eagle J1939 Library includes support for BAMs, RQSTs, ACK/NACK, RTS/CTS, optimized multi-frame PGN transport, and Address Claiming, among other considerations.

The blocks that make up the New Eagle J1939 Libraries use a combination of custom S-functions as and existing MotoHawk blocks to allow the user to efficiently add the J1939 protocol to any project. This ensures continued compatibility with future MotoHawk releases and controller families.

The New Eagle J1939 Library uses the J1939 structure of PGNs and SPNs. This makes it simple to integrate into an existing model by allowing the user to define SPNs throughout the model. The Library will automatically collect and manage the SPN data required for each PGN message, optimizing speed and memory usage and simplifying the model layout. The separation of SPNs and PGNs greatly simplifies the process of adding support for additional PGNs. It allows the communication functions (PGNs) of the module to be collected in a common location in the Simulink model to simplify network management functions and allows the SPNs to be set near where they are calculated to minimize signal routing in



the model.

The J1939 Diagnostic Message blocks integrate seamlessly with the Woodward OBD Fault Manager blocks to provide access to available fault status and freeze frame data. The OBD Custom Fields feature of the fault manager is used to define SPN, FMI, and occurrence count values for each fault and manage the additional information required for J1939 compliance.

Diagnostic Message Support

New Eagle offers two levels of Diagnostic Message support with the J1939 Protocol Library:

- CCR 1971 – Engine Manufacturers Diagnostics (EMD)
- CCR 1971.1 – Onboard Diagnostics for Heavy Duty (HD-OBD)

NE_J1939_EMD_LIB

J1939 Supported Functions:

- Data Link Layer – SAE J1939-21
- Application Layer (see Supported PGNs below) – SAE J1939-71 & SAE J1939-73
- Network Management – SAE J1939-81

Supported PGNs:

Diagnostic Messages

- DM1
- DM2
- DM3
- DM4
- DM5
- DM8
- DM11
- DM19

- Managed PGNs
  - CBI
  - CCVS
  - CI
  - DD
  - DLCC1
  - EC1
  - EEC1
  - EEC2
  - EEC3
  - EFL_P1
  - EGF1
  - ET1
  - ET3
  - HOURS
  - IC1
  - IO
  - IT6
  - LFC
  - LFE
  - LFI
  - LTFI
  - VD
  - VDHR
  - VEP1
  - VH
  - VI
- Single-frame transmitted and received PGNs

NE_J1939_OBD_LIB

J1939 Supported Functions

- Data Link Layer – SAE J1939-21
- Application Layer (see Supported PGNs below) – SAE J1939-71 & SAE J1939-73
- Network Management – SAE J1939-81

Supported PGNs

Diagnostic Messages

- DM1
- DM2
- DM3
- DM4
- DM5
- DM6
- DM7
- DM8
- DM11
- DM12
- DM19
- DM20
- DM21
- DM22
- DM23
- DM24
- DM25
- DM26
- DM27
- DM28
- DM29
- DM30
- DM33
- DM34

- Managed PGNs
  - CBI
  - CCVS
  - CI
  - DD
  - DLCC1
  - EC1
  - EEC1
  - EEC2
  - EEC3
  - EFL_P1
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  - HOURS
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  - IT6
  - LFC
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  - VDHR
  - VEP1
  - VH
  - VI
- Single-frame transmitted and received PGNs

Validation Test Model/Scripts

- J1939 Test Model and validation scripts provided to get you started.

The New Eagle Network Toolbox can be used with the J1939 CAN database file to quickly handle all single frame PGN's. For more information on the New Eagle Network Toolbox see the wiki at:
http://www.neweagle.net/support/wiki/index.php?title=New_Eagle_DBC_CAN_Networking_Toolbox

Additional PGN Support

New Eagle is actively expanding supported PGN's in the library all the time. Please contact New Eagle for information on additional PGN message support.

Future Development

- Proprietary PGNs
    - A framework for easily defining Proprietary PGN messages and linking them to the library's network management is under consideration