

PLUS+1® GUIDE Software

PLUS+1® Function Block Library—J1939
Function Blocks



Revision history*Table of revisions*

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Library Introduction

The SAE J1939 protocol is a vehicle communications bus standard designed for use in the off highway and heavy truck markets.

J1939

Standards documents can be obtained through SAE International.

Structure

The function blocks in this library are organized into several types:

- PGN Receivers – Designed to receive J1939 application data that is broadcasted onto the CAN bus. Reference information can be found in SAE J1939-DA.
- PGN Transmitters – Designed to transmit J1939 application data onto the CAN bus. Reference information can be found in SAE J1939-DA.
- PGN Requesters – Designed to transmit requests for J1939 application data. Reference information can be found in SAE J1939-21.
- Network Management – Designed to manage the various devices on the network. Typical tasks include claiming a network source address and tracking the source address of other devices. Reference information can be found in SAE J1939-81.
- Diagnostics – Designed to support the various diagnostic needs of the system. Reference information can be found in SAE J1939-73.

Not all messages defined by J1939 are implemented in the library. This collection contains some of the more commonly used messages in the off highway and heavy truck industries.

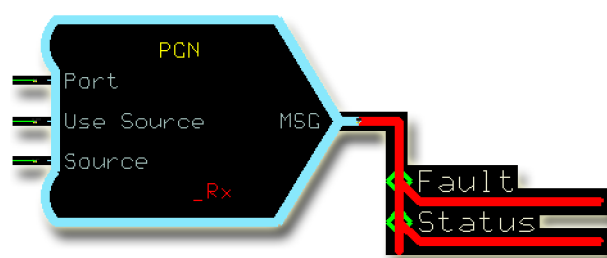
An application can use the **AddrClaim_Tx_Rx** function block to determine its J1939 address. The **Address** and **Claimed** output of this block can be used to drive enable and address inputs for the transmitting blocks in the library.

Fault and Status Outputs

For most PGN receive function blocks, there are two sub-busses within the **MSG** output data bus.

The **Fault** bus contains a duplicate set of signals of the **MSG** bus, but appended with **_Flt**. If there is an error indicated for a particular signal, the corresponding **_Flt** signal is true. This error code is sent in place of the actual data and is not related to receiving DM1 data. This signal is true no matter which specific error code is sent.

The **Status** bus contains a duplicate set of signals of the **MSG** bus, but appended with **_NA**. If data is not available for a particular signal, the corresponding **_NA** signal is true.



Not all signals have **_Flt** or **_NA** counterparts. This occurs when the standard does not define this information for a signal. In some cases, the error information defined is complex and is better handled in a different way.

PGN Receivers

PGN receivers receive J1939 data broadcast on the CAN bus.

A1DEFI1_Rx—Aftertreatment 1 Diesel Exhaust Fluid Information 1 Receiver

The **A1DEFI1_Rx** function block receives the A1DEFI1 message.



PGN: 64923 (0xFD9B)

Inputs

The inputs to the **A1DEFI1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **A1DEFI1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
DslExhstFldTmp2	S16	-40-210	Diesel Exhaust Fluid Temperature 2. Resolution: 1° C [° C]	3515
DslExhstFldCncntrtn	U16	0-6250	Diesel Exhaust Fluid Concentration. Resolution: 0.25% [0.01%]	3516
DslExhstFldCndctvty	U16	0-1250	Diesel Exhaust Fluid Conductivity. Resolution: 5 µSiemens/mm [1 µSiemens/mm]	3518
DslExhstFldTemp2PrelFMI	U8	0-31	Diesel Exhaust Fluid Temperature 2 Preliminary FMI.	3519
DslExhstFldPrprtsPrelFMI	U8	0-31	Diesel Exhaust Fluid Properties Preliminary FMI.	3520
DslExhstFldPrprty	U8	0-15	Diesel Exhaust Fluid Property.	3521
DslExhstFldSpdSnd	S32	0-64255	Diesel Exhaust Fluid Speed of Sound. Resolution: 0.1 m/s [0.1 m/s]	7346
Rx_A1DEFI1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	—

A2DEFT111_Rx—Aftertreatment 2 Diesel Exhaust Fluid Tank 1 Information For Receiver

The **A2DEFT111_Rx** function block receives the A2DEFT111 message.



PGN: 64821 (0xFD35)

Inputs

The inputs to the **A2DEFT111_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **A2DEFT111** function block are described.

Name	Type	Range	Description [Unit]	SPN
Volume	U16	0-10000	Aftertreatment 2 Diesel Exhaust Fluid Tank Volume. [0.01%]	4426
Temp	S16	-40-210	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature. [° C]	4427
Level	U16	0-64255	Aftertreatment 2 Diesel Exhaust Fluid Tank Level. [0.1 mm]	4428
FMI_Vol_Level	U8	0-31	Aftertreatment 2 Diesel Exhaust Fluid Tank Volume/Level Preliminary FMI. A volume of 31 indicates no failure or not supported.	4429
FMI_Temp	U8	0-31	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature.	4430
Heater	U16	0-10000	Aftertreatment 2 Diesel Exhaust Fluid Tank Heater. [0.01%]	4431

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
FMI_Heater	U8	0-31	Aftertreatment 2 Diesel Exhaust Fluid Tank 1 Heater Preliminary FMI. A value of 31 indicates no failure or not supported.	4432
Rx_A2DEFT111	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	---

AAI_Rx—Auxiliary Analog Information Receiver

The **AAI_Rx** function block receives the AAI message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65164 (0xFE8C)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_AAI signal.

Inputs

The inputs to the **AAI_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0-255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

Outputs

The outputs of the **AAI_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
AuxTemp1	S16	-40–210	Auxiliary Temperature 1 [° C]	441
AuxTemp2	S16	-40–210	Auxiliary Temperature 2. [° C]	442
AuxPress1	U16	0–4000	Auxiliary Pressure 1. [kPa]	1387
AuxPress2	U16	0–4000	Auxiliary Pressure 2. [kPa]	1388
AuxLevel	U16	0–64255	Auxiliary Level [0.1 mm]	3087
RelHumidity	U16	0–10000	Relative Humidity [0.01%]	354
Rx_AAI	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

ACCS_Rx—Acceleration Sensor Receiver

The **ACCS_Rx** function block receives the ACCS message.



PGN: 61485 (0xF02D)

Inputs

The inputs to the **ACCS_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

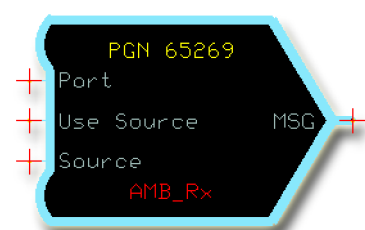
Outputs

The outputs of the **ACCS_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Lat_Accel	S16	-32000-32255	Lateral acceleration along the Y-axis. [0.01 m/s ²]	5347
Long_Accel	S16	-32000-32255	Longitudinal acceleration along the X-axis.	5348
Vert_Accel	S16	-32000-32255	Vertical acceleration along the Z-axis. [0.01 m/s ²]	5349
Lat_FOM	U8	0-3	Figure of merit for lateral acceleration measurement. 0: Fully functional, data is within sensor specification. 1: Degraded, data is suspect. 2: Error. 3: Not available.	5350
Long_FOM	U8	0-3	Figure of merit for longitudinal acceleration measurement. 0: Fully functional, data is within sensor specification. 1: Degraded, data is suspect. 2: Error. 3: Not available.	5351
Vert_FOM	U8	0-3	Figure of merit for vertical acceleration measurement. 0: Fully functional, data is within sensor specification. 1: Degraded, data is suspect. 2: Error. 3: Not available.	5352
Supp_VTRRAS	U8	0-3	Support variable transmission repetition rate for acceleration sensor. Indicates which transmission rates are supported.. 0: Reserved. 1: Reserved. 2: 20 ms rate supported. 3: Device only supports standard 10 ms rate.	5353
Rx_ACCS	BOOL	T/F	True during the first program cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	---

AMB_Rx—Ambient Conditions Receiver

The **AMB_Rx** function block receives the AMB message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65269 (0xFE5)

PGN Receivers

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_AMB signal.

Inputs

The inputs to the **AMB_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **AMB_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
BarometricP	U16	0–1250	Barometric Pressure. [0.1 kPa]	108
CabIntTemp	S32	-27300000–173496875	Cab Interior Temperature. [0.00001° C]	170
AmbientTemp	S32	-27300000–173496875	Ambient Air Temperature. [0.00001° C]	171
EngAirInletT	S16	-40–210	Engine Air Inlet Temperature. [° C]	172
RoadSurfaceT	S32	-27300000–173496875	Road Surface Temperature [0.00001° C]	79
Rx_AMB	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

AT1S1_Rx—Aftertreatment 1 Service 1 Receiver

The **AT1S1_Rx** function block receives the AT1S1 message defined by J1939-DA.



PGN Receivers

It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64891 (0xFD7B)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_AT1S1 signal.

Inputs

The inputs to the **AT1S_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **AT1S1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
SootLoad1Pct	U8	0–250	Diesel Particulate Filter 1 Soot Load Percent. [%]	3719
AshLd1Pct	U8	0–250	Diesel Particulate Filter 1 Ash Load Percent. [%]	3720
TmSinceRegen1	U32	0–4211081215	Diesel Particulate Filter 1 Time Since Last Active Regeneration. [second]	3721
StLdRegenThr1	U32	0–1606375	Aftertreatment 1 Diesel Particulate Filter Soot Load Regeneration Threshold. [0.0001 %]	5466
Rx_AT1S1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

AT1S2_Rx—Aftertreatment 1 Service 2 Receiver

The **AT1S2_Rx** function block receives the AT1S2 message.



PGN: 64697 (0xFCB9)

Inputs

The Inputs to the **AT1S2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

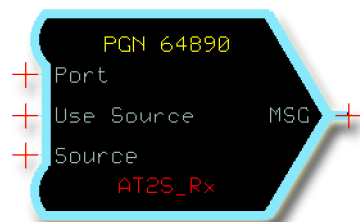
The outputs of the **AT1S2_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
DslPartFiltrTimeToReg	U32	0-4211081215	Diesel Particulate Filter Time to Next Active Regeneration. Resolution: 1 second [second]	5978
SCRSystemTimeLastCleanEv	U32	0-4211081215	SCR System Time Since Last System Cleaning Event. Resolution: 1 second [second]	6941
Rx_AT1S2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	—

PGN Receivers

AT2S_Rx—Aftertreatment 2 Service Receiver

The **AT2S_Rx** function block receives the AT2S message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64890 (0xFD7A)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_AT2S signal.

Inputs

The inputs to the **AT2S_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **AT2S_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
SootLoad2Pct	U8	0–250	Diesel Particulate Filter 2 Soot Load Percent [%]	3722
AshLd2Pct	U8	0–250	Diesel Particulate Filter 2 Ash Load Percent [%]	3723
TmSinceRegen2	U32	0–4211081215	Diesel Particulate Filter 2 Time Since Last Active Regeneration [second]	3724
StLdRegenThr2	U32	0–1606375	Aftertreatment 2 Diesel Particulate Filter Soot Load Regeneration Threshold [0.0001 %]	5467
Rx_AT2S	BOOL	T/F	True during the first program cycle that new data is received.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

AT1T1I_Rx—Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information Receiver

The **AT1T1I_Rx** function block receives the AT1T1I_Rx message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65110 (0xFE56)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_AT1T1I signal.

Inputs

The inputs to the **AT1T1I_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **AT1T1I_Rx** function block are described.

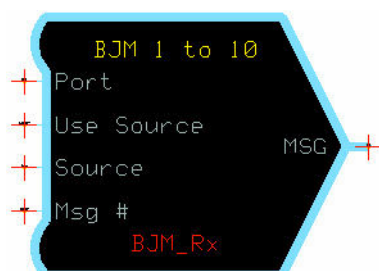
Name	Type	Range	Description [Unit]	SPN
Level	U16	0–10000	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Level. [0.01%]	1761
Temperature	S16	–40–210	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Temperature. [°C]	3031
Level_2	U16	0–64255	Aftertreatment 1 Diesel Exhaust Fluid Tank Level 2. [0.1 mm]	3517
LevelPrelimFMI	U8	0–31	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Preliminary FMI.	3532
LowLevelIndicator	U8	0–7	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Low Level Indicator.	5245
TempPrelimFMI	U8	0–31	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Temperature Preliminary FMI.	4365
SCROperInducSeverity	U8	0–7	Aftertreatment SCR Operator Inducement Severity.	5246
Heater	U16	0–10000	Aftertreatment SCR Operator Inducement Tank 1 Heater. [0.01%]	3363
HeaterPrelimFMI	U8	0–31	Aftertreatment SCR Operator Inducement Tank 1 Heater Preliminary FMI.	4366

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Rx_AT1T1I	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

BJM_Rx—Basic Joystick Message Receiver

The **BJM_Rx** function block receives the BJM message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

CAN message timeout detection is included in this function block.

This block reports all signals as Not Available previous to receiving data from the joystick when the application starts.

Inputs

The inputs to the **BJM_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.
Msg Num	U8	1–10	Messages are received for this basic joystick number.
Protected	BOOL	T/F	Save the first message or save the last message. T: Saves the first message received in the loop. F: Saves the last message received in the loop.
Time Out	U16	0–10000	Maximum time, in ms, between messages before a timeout fault is triggered.

PGN Receivers

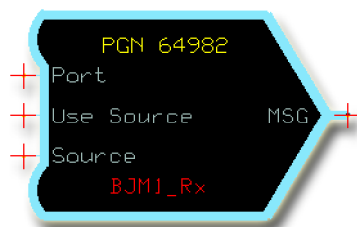
Outputs

The outputs of the **BJM_Rx** function block are described.

Name	Type	Range	Description [Unit]
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.
X_Axis_Psn	S16	-10000-10000	Joystick X-Axis Position. [0.01%]
Y_Axis_Psn	S16	-10000-10000	Joystick Y-Axis Position. [0.01%]
X_Axis_Det	BOOL	T/F	Joystick X-Axis Detent Switch. T: Active. F: Inactive.
Y_Axis_Det	BOOL	T/F	Joystick Y-axis detent switch. T: Active. F: Inactive.
Btn	BOOL	T/F	Joystick Buttons 1 to 12. T: Button X is pressed. F: Button X is released.
Rx_BJM	BOOL	T/F	True during the first program cycle that new data is received. T: Received new data. F: Did not receive new data.
Status	BUS	—	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: At least one parameter is out of range.

BJM1_Rx—Basic Joystick Message 1 Receiver

The **BJM1_Rx** function block receives the BJM1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64982 (0xFDD6)

CAN message timeout detection is included in this function block.

This block reports all signals as Not Available previous to receiving data from the joystick when the application starts.

PGN Receivers

Inputs

The inputs to the **BJM1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.
Time Out	U16	0–65535	The Time Out parameter is located on the inside of this function block. If this function block receives no message within the time set by this parameter, it: - Sets all its Fault signals to true. - Then holds these Fault signals true until it receives another message.

Outputs

The outputs of the **BJM1_Rx** function block are described.

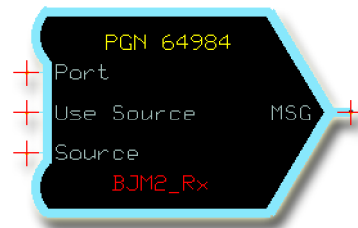
Name	Type	Range	Description [Unit]	SPN
JS1_X_Axis_Psn	S16	–10000–10000	Joystick 1 X-Axis Position. [0.01%]	2660
JS1_Y_Axis_Psn	S16	–10000–10000	Joystick 1 Y-Axis Position. [0.01%]	2661
JS1_X_Axis_Det	BOOL	T/F	Joystick 1 X-Axis Detent Switch. T: Active. F: Inactive.	2680
JS1_Y_Axis_Det	BOOL	T/F	Joystick 1 Y-Axis Detent Switch. T: Active. F: Inactive.	2681
JS1_Btn1	BOOL	T/F	Joystick 1 Button 1 Pressed Status. T: Button is pressed. F: Button is released.	2685
JS1_Btn2	BOOL	T/F	Joystick 1 Button 2 Pressed Status. T: Button is pressed. F: Button is released.	2686
JS1_Btn3	BOOL	T/F	Joystick 1 Button 3 Pressed Status. T: Button is pressed. F: Button is released.	2687
JS1_Btn4	BOOL	T/F	Joystick 1 Button 4 Pressed Status. T: Button is pressed. F: Button is released.	2688
JS1_Btn5	BOOL	T/F	Joystick 1 Button 5 Pressed Status. T: Button is pressed. F: Button is released.	2689
JS1_Btn6	BOOL	T/F	Joystick 1 Button 6 Pressed Status. T: Button is pressed. F: Button is released.	2690
JS1_Btn7	BOOL	T/F	Joystick 1 Button 7 Pressed Status. T: Button is pressed. F: Button is released.	2691

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
JS1_Btn8	BOOL	T/F	Joystick 1 Button 8 Pressed Status. T: Button is pressed. F: Button is released.	2692
JS1_Btn9	BOOL	T/F	Joystick 1 Button 9 Pressed Status. T: Button is pressed. F: Button is released.	2693
JS1_Btn10	BOOL	T/F	Joystick 1 Button 10 Pressed Status. T: Button is pressed. F: Button is released.	2694
JS1_Btn11	BOOL	T/F	Joystick 1 Button 11 Pressed Status. T: Button is pressed. F: Button is released.	2695
JS1_Btn12	BOOL	T/F	Joystick 1 Button 12 Pressed Status. T: Button is pressed. F: Button is released.	2696
Rx_BJM1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

BJM2_Rx—Basic Joystick Message 2 Receiver

The **BJM2_Rx** function block receives the BJM2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64984 (0xFDD8)

CAN message timeout detection is included in this function block.

This block reports all signals as Not Available previous to receiving data from the joystick when the application starts.

PGN Receivers

Inputs

The inputs to the **BJM2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.
Time Out	U16	0–65535	The Time Out parameter is located on the inside of this function block. If this function block receives no message within the time set by this parameter, it: - Sets all its Fault signals to true. - Then holds these Fault signals true until it receives another message.

Outputs

The outputs of the **BJM2_Rx** function block are described.

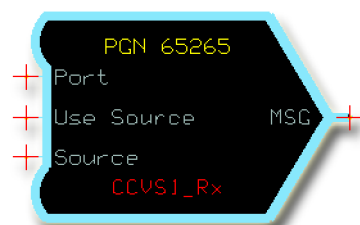
Name	Type	Range	Description [Unit]	SPN
JS2_X_Axis_Psn	S16	–10000–10000	Joystick 2 X-Axis Position. [0.01%]	2697
JS2_Y_Axis_Psn	S16	–10000–10000	Joystick 2 Y-Axis Position. [0.01%]	2698
JS2_X_Axis_Det	BOOL	T/F	Joystick 2 X-Axis Detent Switch. T: Active. F: Inactive.	2717
JS2_Y_Axis_Det	BOOL	T/F	Joystick 2 Y-Axis Detent Switch. T: Active. F: Inactive.	2718
JS2_Btn1	BOOL	T/F	Joystick 2 Button 1 Pressed Status T: Button is pressed. F: Button is released.	2722
JS2_Btn2	BOOL	T/F	Joystick 2 Button 2 Pressed Status. T: Button is pressed. F: Button is released.	2723
JS2_Btn3	BOOL	T/F	Joystick 2 Button 3 Pressed Status. T: Button is pressed. F: Button is released.	2724
JS2_Btn4	BOOL	T/F	Joystick 2 Button 4 Pressed Status. T: Button is pressed. F: Button is released.	2725
JS2_Btn5	BOOL	T/F	Joystick 2 Button 5 Pressed Status. T: Button is pressed. F: Button is released.	2726
JS2_Btn6	BOOL	T/F	Joystick 2 Button 6 Pressed Status. T: Button is pressed. F: Button is released.	2727
JS2_Btn7	BOOL	T/F	Joystick 2 Button 7 Pressed Status. T: Button is pressed. F: Button is released.	2728

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
JS2_Btn8	BOOL	T/F	Joystick 2 Button 8 Pressed Status. T: Button is pressed. F: Button is released.	2729
JS2_Btn9	BOOL	T/F	Joystick 2 Button 9 Pressed Status. T: Button is pressed. F: Button is released.	2730
JS2_Btn10	BOOL	T/F	Joystick 2 Button 10 Pressed Status. T: Button is pressed. F: Button is released.	2731
JS2_Btn11	BOOL	T/F	Joystick 2 Button 11 Pressed Status. T: Button is pressed. F: Button is released.	2732
JS2_Btn12	BOOL	T/F	Joystick 2 Button 12 Pressed Status. T: Button is pressed. F: Button is released.	2733
Rx_BJM2	BOOL	T/F	True during the first program cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

CCVS1_Rx—Cruise Control/Vehicle Speed 1 Receiver

The **CCVS1_Rx** function block receives the CCVS1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65265 (0xFEf1)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_CCVS1 signal.

PGN Receivers

Inputs

The inputs to the **CCVS1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **CCVS1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
BrakeSwitch	BOOL	T/F	Brake Switch. T: Active. F: Inactive.	597
ClutchSwitch	BOOL	T/F	Clutch Switch. T: Active. F: Inactive.	598
CrCtrlSetSpd	U8	0–255	Cruise Control Set Speed. T: Active. F: Inactive. [km/h]	86
CrsCtrlAccel	BOOL	T/F	Cruise Control Accelerate Switch. T: Active. F: Inactive.	602
CrsCtrlCoast	BOOL	T/F	Cruise Control Coast (Decelerate) Switch. T: Active. F: Inactive.	600
CrsCtrlPause	BOOL	T/F	Cruise Control Pause Switch. T: Active. F: Inactive.	1633
CrsCtrlResume	BOOL	T/F	Cruise Control Resume Switch. T: Active. F: Inactive.	601
CrsCtrlSetSw	BOOL	T/F	Cruise Control Set Switch. T: Active. F: Inactive.	599
CrsCtrlState	U8	0–6	Cruise Control State: 0: Off/disabled. 1: Hold. 2: Accelerate. 3: Decelerate. 4: Resume. 5: Set. 6: Accelerator override.	527
CruisCtrlAct	BOOL	T/F	Cruise Control Active. T: Active. F: Inactive.	595

PGN Receivers

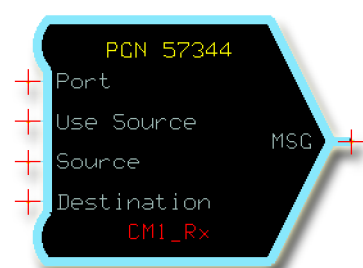
Name	Type	Range	Description [Unit]	SPN
CruisCtrlEnbl	BOOL	T/F	Cruise Control Enable Switch. T: Active. F: Inactive.	596
EngIdleDecSw	BOOL	T/F	Engine Idle Decrement Switch. T: Active. F: Inactive.	967
EngIdleIncSw	BOOL	T/F	Engine Idle Increment Switch. T: Active. F: Inactive.	968
EngShtDwOvSw	BOOL	T/F	Engine Shutdown Override Switch. T: Active. F: Inactive.	1237
EngTestModSw	BOOL	T/F	Engine Test Mode Switch. T: Active. F: Inactive.	966
PTOState	U8	0–19	PTO governor state: 0: Off/disabled. 1: Hold. 2: Remote hold. 3: Standby. 4: Remote standby. 5: Set. 6: Decelerate/coast. 7: Resume. 8: Accelerate. 9: Accelerator override. 10: Preprogrammed set speed 1. 11: Preprogrammed set speed 2. 12: Preprogrammed set speed 3. 13: Preprogrammed set speed 4. 14: Preprogrammed set speed 5. 15: Preprogrammed set speed 6. 16: Preprogrammed set speed 7. 17: Preprogrammed set speed 8. 18: PTO set speed memory 1. 19: PTO set speed memory 2.	976
ParkBrakeSw	BOOL	T/F	Park Brake Switch. T: Active. F: Inactive.	70
PrkBrkRelInh	BOOL	T/F	Park Brake Release Inhibit Request. T: Active. F: Inactive.	3807
TwoSpdAxelSw	BOOL	T/F	Two-Speed Axle Switch. T: High speed. F: Low speed.	69
WhlBasedVSpd	U32	0–250996	Wheel Based Vehicle Speed. [0.001 km/h]	84
Rx_CCVS1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName _NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName _Flt is true, this indicates a fault condition exists for this signal.	---

CM1_Rx—Cab Message 1 Receiver

The **CM1_Rx** function block receives the CM1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 57344 (0xE000)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_CM1 signal.

J1939-DA prescribes priorities for SPNs 3695 and 3696. This function block only reports the transmitted values of these signals and does not enforce priorities.

The CM1 message can be sent to a single node (point-to-point) or all nodes on the CAN bus (broadcast). If more than one **CM1_Rx** function block is used in a single PLUS+1® GUIDE application, only the first block receives and processes the broadcast message.

Inputs

The inputs to the **CM1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0-253	Address of the transmitting device. Only applies if Use Source is True.
Destination	---	0-255	Address of the receiving device.

PGN Receivers

Outputs

The outputs of the **CM1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
ReqPercntFanSpd	U16	0–10000	Requested Percent Fan Speed. Resolution: 0.4% [0.01%]	986
CabInterTmpCmd	S32	-27300000–173496875	Cab Interior Temperature Command. Resolution: 0.03125° C [0.00001° C]	1691
AuxlHeatCoolPmpReq	U8	0–3	Auxiliary Heater Coolant Pump Request. 0: Deactivate water pump. 1: Activate water pump. 2: Reserved. 3: Do not care/take no action.	1684
BatMainSwHldReq	U8	0–3	Battery Main Switch Hold Request. 0: Release Battery Main Switch 1. 1: Hold Battery Main Switch. 2: Undefined. 3: Do not care/take no action.	1682
OperStDirSw	BOOL	T/F	Operator Seat Direction Switch. T: Operator seat facing forward. F: Operator seat not facing forward.	1714
StBeltSw	BOOL	T/F	Seat Belt Switch. T: Seat belt buckled. F: Seat belt not buckled.	1856
PrkBrkCmd	U8	0–3	Park Brake Command. 0: Park Brake apply not requested. 1: Park Brake apply requested. 2: Reserved. 3: Do not care/take no action.	5630
VehLmtSpdGovrnDecSw	BOOL	T/F	Vehicle Limiting Speed Governor Decrement Switch. T: Switch in the on state - decrease. F: Switch in the off state.	1655
VehLmtSpdGovrnIncSw	BOOL	T/F	Vehicle Limiting Speed Governor Increment Switch. T: Switch in the on state - increase. F: Switch in the off state.	1654
VehLmtSpdGovrnEnSw	BOOL	T/F	Vehicle Limiting Speed Governor Enable Switch. T: Switch enabled. F: Switch disabled.	1653
DslPartFiltRegnInhbSw	BOOL	T/F	Diesel Particulate Filter Regeneration Inhibit Switch. T: Active. F: Inactive.	3695
DslPartFiltRegnForceSw	BOOL	T/F	Diesel Particulate Filter Regeneration Force Switch. T: Active. F: Inactive.	3696
AutoGrShifEnSw	BOOL	T/F	Automatic Gear Shifting Enable Switch. T: Automated gear shifting enabled. F: Automated gear shifting disabled.	1666
EngAutoStartEnSw	BOOL	T/F	Engine Automatic Start Enable Switch. T: Switch in the on state. F: Switch in the off state.	1656

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
AuxlHeatModReq	U8	0–15	Auxiliary Heater Mode Request. 0: De-activate auxiliary heater. 1: Off due to ADR per European Regulations for Transport of hazardous materials. 2: Economy mode. 3: Normal mode. 4 -13: Not defined. 14: Reserved. 15: Do not care/take no action.	1683
ReqEngZonHeat	U8	0–3	Request Engine Zone Heating. 0: Do not heat engine zone. 1: Heat engine zone. 2: Reserved. 3: Do not care/take no action.	1685
ReqCabZonHeat	U8	0–3	Request Cab Zone Heating. 0: Do not heat cab engine zone. 1: Heat cab engine zone. 2: Reserved. 3: Do not care/take no action.	1686
SelctMaxVehSpdLmt	U8	0–7	Selected Maximum Vehicle Speed Limit.	2596
Rx_CM1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
CM1_Source	U8	0–255	J1939 address of the transmitting device.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

DD_Rx—Dash Display Receiver

The **DD_Rx** function block receives the DD message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65276 (0xFEFC)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_DD signal.

PGN Receivers

Inputs

The inputs to the **DD_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **DD_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
WashFluidLev	U16	0–10000	Washer Fluid Level. [0.01%]	80
FuelLevel	U16	0–10000	Fuel Level 1. [0.01%]	96
FuelFiltDifP	U16	0–5000	Engine Fuel Filter Differential Pressure. [0.1 kPa]	95
OilFiltDifP	U16	0–1250	Engine Oil Filter Differential Pressure. [0.1 kPa]	99
CargoAmbTemp	S32	–27300000–173496875	Cargo Ambient Temperature. [0.00001° C]	169
FuelLevel2	U16	0–10000	Fuel Level 1. [0.01%]	38
Rx_DD	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

DLCC1_Rx—Direct Lamp Control Command Receiver

The **DLCC1_Rx** function block receives the direct lamp control command message.



PGN: 64775 (0xFD07)

PGN Receivers

Inputs

The inputs to the **DLCC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **DLCC1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngPrtLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Protect Lamp. T: Lamp on. F: Lamp off.	5077
EngAmbrWrnLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Amber Warning Lamp. T: Lamp on. F: Lamp off.	5078
EngRedStpLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Red Stop Lamp. T: Lamp on. F: Lamp off.	5079
OBDM1fctIndLmpCmd	BOOL	T/F	Command signal directly controlling the OBD Malfunction Indicator Lamp. T: Lamp on. F: Lamp off.	5080
EngBrkeActLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Brake Active Lamp, used for engine based retarders. T: Lamp on. F: Lamp off.	5081
CmprssnBrkEnSwchIndctrLmpCmd	BOOL	T/F	Command signal directly controlling Compression Brake Enable Switch Indicator Lamp. The compression brake switch indicator signals the status of the compression brake enable switch to the operator. T: Lamp on. F: Lamp off.	3987
EngOilPrssrLowLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Oil Pressure Low Lamp. T: Lamp on. F: Lamp off.	5082
EngClntTmPHghLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Coolant Temperature High Lamp. T: Lamp on. F: Lamp off.	5083
EngClntLvlLowLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Coolant Level Low Lamp. T: Lamp on. F: Lamp off.	5084

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
EngIdlMngmntActLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Idle Management Active Lamp. T: Lamp on. F: Lamp off.	5085
EngAirFltrRstrctnLmpCmd	BOOL	T/F	Command signal controlling the Engine Air Filter Restriction Lamp. T: Lamp on. F: Lamp off.	5086
EngFuelFltrRstrctnLmpCmd	BOOL	T/F	Command signal controlling the Engine Fuel Filter Restricted Lamp. T: Lamp on. F: Lamp off.	5469
EngCntrlMdle1RdyForUseLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Control Module 1 Ready For Use Lamp. T: Lamp on. F: Lamp off.	6205
EngCntrlMdle2RdyForUseLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Control Module 2 Ready For Use Lamp. T: Lamp on. F: Lamp off.	6206
EngCntrlMdle3RdyForUseLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Control Module 3 Ready For Use Lamp. T: Lamp on. F: Lamp off.	6207
EngSpdHghLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Speed High Warning Lamp. T: Lamp on. F: Lamp off.	6709
EngSpdVryHghLmpCmd	BOOL	T/F	Command signal directly controlling the Engine Speed Very High Warning Lamp. T: Lamp on. F: Lamp off.	6710
VhclAcclrtnRteLmtLmpCmd	BOOL	T/F	Command signal directly controlling the Vehicle Acceleration Rate Limit Lamp. T: Lamp on. F: Lamp off.	6899
Rx_DLCC1	BOOL	T/F	Indicates that a message has been received T: New message received. F: No message received.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	---

PGN Receivers

DPFC1_Rx—Diesel Particulate Filter Control 1 Receiver

The **DPFC1_Rx** function block receives the DPFC1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64892 (0xFD7C)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_DPFC1 signal.

Inputs

The inputs to the **DPFC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **DPFC1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
DPFLampCmd	U8	0–6	Diesel Particulate Filter Lamp Command. 0: Off. 1: On – solid. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: On – fast blink (1 HZ). 5: Reserved for SAE assignment. 6: Reserved for SAE assignment.	3697
DPFPasvRegenStat	BOOL	T/F	Diesel Particulate Filter Passive Regeneration Status. T: Active. F: Inactive.	3699
DPFActvRegenStat	U8	0–3	Diesel Particulate Filter Active Regeneration Status. 0: Not active. 1: Active. 2: Regeneration needed - automatically initiated active regeneration imminent.	3700

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
DPFilterStat	U8	0–7	Diesel Particulate Filter Status. 0: Regeneration not needed 1: Regeneration needed - lowest level. 2: Regeneration needed - moderate level. 3: Regeneration needed - highest level. 4: Reserved for SAE assignment. 5: Reserved for SAE assignment. 6: Reserved for SAE assignment.	3701
ActRegenInhStat	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Status. T: Inhibited. F: Not inhibited.	3702
ActRegenInhDueToSw	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch. T: Inhibited. F: Not inhibited.	3703
ActRegenInhDueToClch	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Clutch Disengaged. T: Inhibited. F: Not inhibited.	3704
ActRegenInhDueToSvcBrk	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Service Brake Active. T: Inhibited. F: Not inhibited.	3705
ActRegenInhDueToPTO	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to PTO Active. T: Inhibited. F: Not inhibited.	3706
ActRegenInhDueToAcc	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Accelerator Pedal Off Idle. T: Inhibited. F: Not inhibited.	3707
ActRegenInhDueToNeut	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Out of Neutral. T: Inhibited. F: Not inhibited.	3708
ActRegenInhDueToSpdAbv	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Above Allowed Speed. T: Inhibited. F: Not inhibited.	3709
ActRegenInhDueToPkBrk	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Parking Brake Not Set. T: Inhibited. F: Not inhibited.	3710
ActRegenInhDueToLowGasT	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Gas Temperature. T: Inhibited. F: Not inhibited.	3711
ActRegenInhDueToSysFlt	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to System Fault Active. T: Inhibited. F: Not inhibited.	3712
ActRegenInhDueToSysTO	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout. T: Inhibited. F: Not inhibited.	3713

PGN Receivers

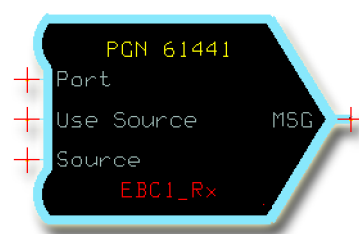
Name	Type	Range	Description [Unit]	SPN
ActRegenInhDueToTmpLO	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Temporary System Lockout. T: Inhibited. F: Not inhibited.	3714
ActRegenInhDueToPrmLO	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Permanent System Lockout. T: Inhibited. F: Not inhibited.	3715
ActRegenInhDueToEngNotWrm	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Engine Not Warmed Up. T: Inhibited. F: Not inhibited.	3716
ActRegenInhDueToSpdBel	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Below Allowed Speed. T: Inhibited. F: Not inhibited.	3717
ActRegenInitConfig	BOOL	T/F	Diesel Particulate Filter Automatic Active Regeneration Initiation Configuration. T: Enabled. F: Not enabled.	3718
ExhHighTLampCmd	U8	0–7	Exhaust System High Temperature Lamp Command. 0: Off. 1: On – solid. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: Reserved for SAE assignment. 5: Reserved for SAE assignment. 6: Reserved for SAE assignment.	3698
ActRegenForcedStat	U8	0–7	Diesel Particulate Filter Active Regeneration Forced Status. 0: Not active. 1: Active – Forced by Switch. (See SPN 3696). 2: Active – Forced by Service Tool. 3: Reserved for SAE assignment. 4: Reserved for SAE assignment. 5: Reserved for SAE assignment. 6: Reserved for SAE assignment.	4175
HCDPurgEn	U8	0–3	Hydrocarbon Doser (HCD) Purging Enable. 0: Purging not enabled. 1: Purging enabled. Less urgent. 2: Purging enabled. Urgent 3: Unavailable.	5504
ActRegenInhDueToLowExhP	BOOL	T/F	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Pressure. T: Inhibited. F: Not inhibited.	5629
NotMetForActRegen	BOOL	T/F	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration. T: Inhibited. F: Not inhibited.	3750
Rx_DPFC1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

EBC1_Rx—Electronic Brake Controller 1 Receiver

The **EBC1_Rx** function block receives the EBC1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 61441 (0xF001)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EBC1 signal.

Inputs

The inputs to the **EBC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **EBC_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
ASREngCtrlAct	U8	0-2	ASR Engine Control Active: 0: ASR engine control passive but installed. 1: ASR engine control active. 2: Reserved.	561
ASRBrkCtrlAct	U8	0-2	ASR Brake Control Active: 0: ASR brake control passive but installed. 1: ASR brake control active. 2: Reserved.	562

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
ABSActive	U8	0–2	ABS Brake Control Active: 0: ABS passive but installed. 1: ABS active. 2: Reserved.	563
EBSBrakeSw	BOOL	T/F	EBS Brake Switch. T: Active. F: Inactive.	1121
BrakePedalPsn	U16	0–10000	Brake Pedal Position. Resolution: 0.4% [0.01%]	521
ABSOFFRoadSw	BOOL	T/F	ABS Off-road Switch.	575
ASROFFRoadSw	BOOL	T/F	ASR Off-road Switch.	576
ASRHillHoldSw	BOOL	T/F	ASR "Hill Holder" Switch.	577
TracCtrlOvrRdSw	BOOL	T/F	Traction Control Override Switch. T: Active. F: Inactive.	1238
AccelInterSw	BOOL	T/F	Accelerator Interlock Switch. T: Active. F: Inactive.	972
EngDerateSw	BOOL	T/F	Engine Derate Switch. T: Active. F: Inactive.	971
EngAuxShutDnSw	BOOL	T/F	Engine Auxiliary Shutdown Switch. T: Active. F: Inactive.	970
RmtAccelEnblSw	BOOL	T/F	Remote Accelerator Enable Switch. T: Active. F: Inactive.	969
EngRetarderSel	U16	0–10000	Engine Retarder Selection. Resolution: 0.4% [0.01%]	973
ABSFullOper	U8	0–2	ABS Fully Operational: 1: Fully operational. 0: Not fully operational. 2: Reserved.	1243
EBSRedWarnSig	U8	0–2	EBS Red Warning Signal: 0: Off. 1: On. 2: Reserved.	1439
EBSABSAmbWarnSig	U8	0–2	ABS/EBS Amber Warning Signal (Powered Vehicle): 0: Off. 1: On. 2: Reserved.	1438
ATCASRInfoSig	U8	0–2	ATC/ASR Information Signal: 0: Off. 1: On. 2: Reserved.	1793
BrakeCtrlngSA	U8	0–253	Source Address of Controlling Device for Brake Control	1481
HaltBrakeSw	BOOL	T/F	Halt brake switch. T: Active. F: Inactive.	2911

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
TrailABSStat	U8	0–2	Trailer ABS Status: 0: Trailer ABS status information available but not active. 1: Trailer ABS active. 2: Reserved.	1836
TrctrMntTrailABSWarnSig	U8	0–2	Tractor-Mounted Trailer ABS Warning Signal: 0: Off. 1: On. 2: Reserved.	1792
Rx_EBC1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

EEC1_Rx—Electronic Engine Controller 1 Receiver

The **EEC1_Rx** function block receives the EEC1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 61444 (0xF004)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EEC1 signal.

Inputs

The inputs to the **EEC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

Outputs

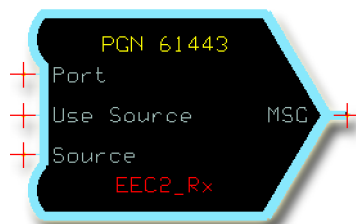
The outputs of the **EEC1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngineTorqMode	U8	0–15	Engine Torque Mode. 0: Low idle governor/no request (default mode). 1: Accelerator pedal/operator selection. 2: Cruise control. 3: PTO governor. 4: Road speed governor. 5: ASR control. 6: Transmission control. 7: ABS control. 8: Torque limiting. 9: High speed governor. 10: Braking system. 11: Remote accelerator. 12: Service procedure. 13: Not defined. 14: Other. 15: Not available.	899
ActEnginePctTorq_HiRes	U16	0–875	Actual Engine—Percent Torque High Resolution. Resolution: 0.125% Note that the resolution of this signal is limited to 0.125%. [0.001%]	4154
DrvrDmndEngTorq	S16	0–12500	Driver's Demand Engine - Percent Torque. [0.01%]	512
ActEnginePctTorq	S16	0–12500	Actual Engine - Percent Torque. [0.01%]	513
EngineSpeed	U16	0–8031	Engine Speed. [RPM]	190
SrcAddrEngCtrl	U8	0–253	Source Address of Controlling Device for Engine Control.	1483
EngStartMode	U8	0–12	Engine Starter Mode: 0: Start not requested. 1: Starter active, gear not engaged. 2: Starter active, gear engaged. 3: Start finished; starter not active after having been actively engaged (after 50ms mode goes to 0000). 4: Starter inhibited due to engine already running. 5: Starter inhibited due to engine not ready for start (preheating). 6: Starter inhibited due to driveline engaged or other transmission inhibit. 7: Starter inhibited due to active immobilizer. 8: Starter inhibited due to starter over-temp. 9–11: Reserved. 12: Starter inhibited - reason unknown.	1675
EngDemandPctTorq	S16	-12500-12500	Engine Demand - Percent Torque. [0.01%]	2432
Rx_EEC1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

EEC2_Rx—Electronic Engine Controller 2 Receiver

The **EEC2_Rx** function block receives the EEC2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 61443 (0xF003)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EEC2 signal.

Inputs

The inputs to the **EEC2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **EEC2_Rx** function block are described.

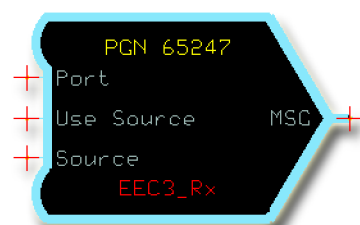
Name	Type	Range	Description [Unit]	SPN
AccPed1LowIdleSw	BOOL	T/F	Accelerator Pedal 1 Low Idle Switch. T: Active. F: Inactive.	558
AccPedKickdownSw	BOOL	T/F	Accelerator Pedal Kickdown Switch. T: Active. F: Inactive.	559
RoadSpdLmtStat	BOOL	T/F	Road Speed Limit Status. T: Inactive. F: Active.	1437
AccPed2LowIdleSw	BOOL	T/F	Accelerator Pedal 2 Low Idle Switch. T: Active. F: Inactive.	2970
AccPed1Psn	U16	0–10000	Accelerator Pedal 1 Position. [0.01%]	91
EngPctLoadAtSpd	U16	0–12500	Engine Percent Load At Current Speed. [0.01%]	92
RemoteAccPedalPstn	U16	0–10000	Remote Accelerator Pedal Position. [0.01%]	974

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
AccPed2Psn	U16	0–10000	Accelerator Pedal 2 Position. [0.01%]	29
AccRateLmtd	BOOL	T/F	Vehicle Acceleration Rate Limit Status. T: Active. F: Inactive.	2979
MmtEngMaxPwrEnFbk	U8	0–3	Momentary Engine Maximum Power Enable Feedback: 0: Disabled. 1: Supported. 2: Reserved. 3: Don't care/take no action.	5021
DPFThermMgmtAct	U8	0–3	DPF Thermal Management Active: 0: Inactive. 1: Active. 2: Reserved. 3: Don't care/take no action.	5399
SCRThermMgmtAct	U8	0–3	SCR Thermal Management Active: 0: Inactive. 1: Active. 2: Reserved. 3: Don't care/take no action.	5400
ActMaxPctTrq	U16	0–10000	Actual Maximum Available Engine - Percent Torque. [0.01%]	3357
EstPumpPctTrq	S16	-12500-12500	Estimated Pumping - Percent Torque. [0.01%]	5398
Rx_EEC2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName _NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName _Flt is true, this indicates a fault condition exists for this signal.	---

EEC3_Rx—Electronic Engine Controller 3 Receiver

The **EEC3_Rx** function block receives the EEC3 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65247 (0xFEDF)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EEC3 signal.

PGN Receivers

Inputs

The inputs to the **EEC3_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **EEC3_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
NomFricPctTorq	S16	-12500-12500	Nominal Friction - Percent Torque. [0.01%]	514
EngDesOpSpd	U16	0–8031	Engine's Desired Operating Speed. [RPM]	515
DesOpSpdAsAdj	U8	0–250	Engine's Desired Operating Speed Asymmetry Adjustment. Values > 125 indicate preference for higher engine speed if target speed is not possible while values < 125 indicate preference for lower engine speed.	519
ParLossPctTorq	S16	-12500-12500	Estimated Engine Parasitic Losses - Percent Torque. [0.01%]	2978
ExhGasMassFlw	U16	0–12851	Aftertreatment 1 Exhaust Gas Mass Flow. [kg/h]	3236
IntDewPt1	BOOL	T/F	Aftertreatment 1 Intake Dew Point. T: Exceeded. F: Not exceeded.	3237
ExhDewPt1	BOOL	T/F	Aftertreatment 1 Exhaust Dew Point. T: Exceeded. F: Not exceeded.	3238
IntDewPt2	BOOL	T/F	Aftertreatment 2 Intake Dew Point. T: Exceeded. F: Not exceeded.	3239
ExhDewPt2	BOOL	T/F	Aftertreatment 2 Exhaust Dew Point. T: Exceeded. F: Not exceeded.	3240
Rx_EEC3	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

EFL_P1_Rx—Engine Fluid Level/Pressure 1 Receiver

The **EFL_P1_Rx** function block receives the EFL/P1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65263 (0xFEED)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EFL_P1 signal.

Inputs

The inputs to the **EFL_P1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **EFL_P1_Rx** function block are described.

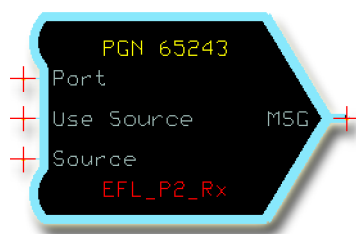
Name	Type	Range	Description [Unit]	SPN
EngFuelDvryPress	U16	0–1000	Engine Fuel Delivery Pressure. [kPa]	94
EngExtCrnkBlwPr	U16	0–1250	Engine Extended Crankcase Blow-by Pressure. [0.01 kPa]	22
EngineOilLevel	U16	0–10000	Engine Oil Level. [0.01%]	98
EngineOilPress	U16	0–1000	Engine Oil Pressure. [kPa]	100
EngCrnkcasePress	S16	–25000–25199	Engine Crankcase Pressure. [0.01 kPa]	101
CoolantPressure	U16	0–500	Engine Coolant Pressure. [kPa]	109
EngCoolantLevel	U16	0–10000	Engine Coolant Level. [0.01%]	111
Rx_EFL_P1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

EFL_P2_Rx—Engine Fluid Level/Pressure 2 Receiver

The **EFL_P2_Rx** function block receives the EFL/P2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65243 (0xFEDB)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_EFL_P2 signal.

Inputs

The inputs to the **EFL_P2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **EFL_P2_Rx** function block are described.

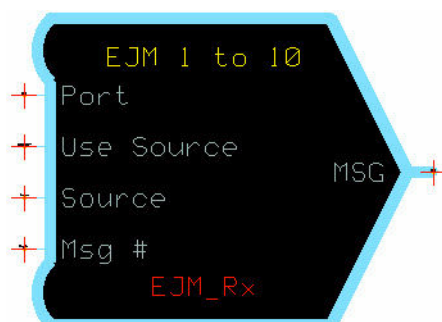
Name	Type	Range	Description [Unit]	SPN
EngInjCtrlP	U32	0–250996	Engine Injection Control Pressure. [0.001 MPa]	164
InjMetRail1P	U32	0–250996	Engine Injector Metering Rail 1 Pressure. [0.001 MPa]	157
InjTmRail1P	U32	0–250996	Engine Injector Timing Rail 1 Pressure. [0.001 MPa]	156
InjMetRail2P	U32	0–250996	Engine Injector Metering Rail 2 Pressure. [0.001 MPa]	1349

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Rx_EFL_P2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

EJM_Rx—Extended Joystick Message Receiver

The **EJM_Rx** function block receives the EJM message for messages 1-10.



Inputs

The inputs to the **EJM_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0-253	Address of the transmitting device. Only applies if Use Source is True.
Msg_Num	U8	1-10	Messages are received for this EJM number.
Protected	BOOL	T/F	Save the first message or save the last message. T: Save the first message received in the loop. F: Save the last message received in the loop.
Time Out	U16	0-10000	Maximum time between messages before a timeout fault is triggered. [ms]

PGN Receivers

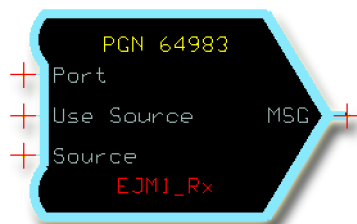
Outputs

The outputs of the **EJM_Rx** function block are described.

Name	Type	Range	Description [Unit]
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.
XGrp/YGrp/T/ XGrp_Det/ YGrp_Det/T_Det_NA	BUS	—	Indicates if the signal is not configured/not enabled. T: Signal X is not enabled/not configured. F: Signal X is enabled/configured.
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.
XGrp/YGrp/T/ XGrp_Det/ YGrp_Det/T_Det_Flt	BOOL	T/F	T: Signal X is faulted. F: Signal X is OK.
Timeout_EJM	BOOL	T/F	T: Message timed out. F: Message is OK.
NoMsgReceived_EJM	BOOL	T/F	T: No message received since power on. F: A message has been received since power on.
XGrp_Psn	S16	-10000-10000	X Proportional Grip Switch Position. [0.01%]
YGrp_Psn	S16	-10000-10000	Y Proportional Grip Switch Position. [0.01%]
T_Axis_Psn	S16	-10000-10000	Theta Axis Position. [0.01%]
XGrp_Det	BOOL	T/F	X Proportional Grip Detent Switch. T: Active. F: Not active.
YGrp_Det	BOOL	T/F	Y Proportional Grip Detent Switch. T: Active. F: Not active.
T_Axis_Det	BOOL	T/F	Theta Axis Detent Switch. T: Active. F: Not active.
Rx_EJM	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
Status	U16	—	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: At least one parameter is out of range

EJM1_Rx—Extended Joystick Message 1 Receiver

The **EJM1_Rx** function block receives the EJM1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN Receivers

PGN: 64983 (0xFDD7)

CAN message timeout detection is included in this function block.

This block reports all signals as Not Available previous to receiving data from the joystick when the application starts.

Inputs

The inputs to the **BJM1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.
Time Out	U16	0–65535	The Time Out parameter is located on the inside of this function block. If this function block receives no message within the time set by this parameter, it: - Sets all its Fault signals to true. - Then holds these Fault signals true until it receives another message.

Outputs

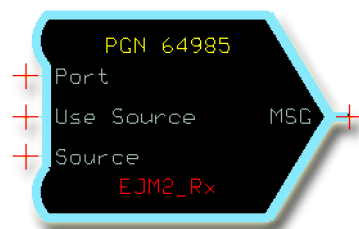
The outputs of the **EJM1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
JS1_XGrp_Psn	S16	-10000-10000	Joystick 1 Grip X-Axis Position [0.01%]	2662
JS1_YGrp_Psn	S16	-10000-10000	Joystick 1 Grip Y-Axis Position [0.01%]	2663
JS1_T_Axis_Psn	S16	-10000-10000	Joystick 1 Theta-Axis Position [0.01%]	2664
JS1_XGrp_Det	BOOL	T/F	Joystick 1 Grip X-Detent Position Status. T: Active. F: Inactive.	2682
JS1_YGrp_Det	BOOL	T/F	Joystick 1 Grip Y-Detent Position Status. T: Active. F: Inactive.	2683
JS1_T_Axis_Det	BOOL	T/F	Joystick 1 Theta-Detent Position Status. T: Active. F: Inactive.	2684
Rx_EJM1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

EJM2_Rx—Extended Joystick Message 2 Receiver

The **EJM2_Rx** function block receives the EJM2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 64985 (0xFDD9)

CAN message timeout detection is included in this function block.

This block reports all signals as Not Available previous to receiving data from the joystick when the application starts.

Inputs

The inputs to the **EJM2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.
Time Out	U16	0–65535	The Time Out parameter is located on the inside of this function block. If this function block receives no message within the time set by this parameter, it: - Sets all its Fault signals to true. - Then holds these Fault signals true until it receives another message.

Outputs

The outputs of the **EJM2_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
JS2_XGrp_Psn	S16	-10000-10000	Joystick 2 Grip X-Axis Position [0.01%]	2699
JS2_YGrp_Psn	S16	-10000-10000	Joystick 2 Grip Y-Axis Position. [0.01%]	2700
JS2_T_Axis_Psn	S16	-10000-10000	Joystick 2 Theta-Axis Position. [0.01%]	2701
JS2_XGrp_Det	BOOL	T/F	Joystick 2 Grip X-Detent Position Status. T: Active. F: Inactive.	2719
JS2_YGrp_Det	BOOL	T/F	Joystick 2 Grip Y-Detent Position Status. T: Active. F: Inactive.	2720

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
JS2_T_Axis_Det	BOOL	T/F	Joystick 2 Theta-Detent Position Status. T: Active. F: Inactive.	2721
Rx_EJM2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

EOI_Rx—Engine Operating Information Receiver

The **EOI_Rx** function block receives the EOI message defined by J1939-DA.



PGN: 64914 (0xFD92)

Inputs

The inputs to the **EOI_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0-253	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

Outputs

The outputs of the **EOI_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngOpState	U8	0-7	Engine Operating State. 0: Engine stopped. 1: Pre-start. 2: Starting. 3: Warm-up. 4: Running. 5: Cool-down. 6: Engine stopping. 7: Post-run.	3543
FuelPumpPrimerCtrl	U8	0-3	Fuel Pump Primer Control. Activates or deactivates a priming system on the fuel transfer system. 0: Deactivate. 1: Activate. 2: Reserved. 3: Unavailable.	4082
EngStarterMtrRelayCtrl	U8	0-3	Engine Starter Motor Relay Control. Indicates if the engine starter motor relay is activated. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	6385
TmRemain_EngOpState	U16	0-64255	Time Remaining in Engine Operating State. [second]	3544
EngFuelShutoffVentCtrl	U8	0-3	Engine Fuel Shutoff Vent Control. 0: Vent closed. 1: Vent open. 2: Reserved. 3: Don't care/take no action.	3608
EngFuelShutoff1Ctrl	U8	0-3	Engine Fuel Shutoff 1 Control. 0: Open. 1: Closed. 2: Reserved. 3: Don't care/take no action.	632
EngFuelShutoff2Ctrl	U8	0-3	Engine Fuel Shutoff 2 Control. 0: Open. 1: Closed. 2: Reserved. 3: Don't care/take no action.	2807
EngFuelShutoffVLTC	U8	0-3	Engine Fuel Shutoff Valve Leak Test Control. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	3601
EngOilPrimePumpCtrl	U8	0-3	Engine Oil Priming Pump Control. 0: Off. 1: On. 2: Reserved. 3: Unavailable.	3589
EngOilPrimePreHeatCtrl	U8	0-3	Engine Oil Pre-Heater Control. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	3602

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
EngElecSysPwrConservCtrl	U8	0-3	Engine Electrical System Power Conservation Control. 0: Off. 1: On. 2: Reserved. 3: Unavailable.	3603
EngPreHeatCtrl	U8	0-3	Engine Pre-Heater Control. 0: Off. 1: On. 2: Reserved. 3: Unavailable.	3604
EngCoolPumpCtrl	U8	0-3	Engine Coolant Pump Control. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	3605
EngEmcyShutdownRqst	U8	0-3	Engine Controlled Shutdown Request. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	3606
EngEmcyShutdownInd	U8	0-3	Engine Emergency Shutdown Indication. A signal that the engine is shutting down immediately. 0: Off. 1: On. 2: Reserved. 3: Don't care/take no action.	3607
EngColdAmbElevIdleStat	U8	0-3	Engine Cold Ambient Elevated Idle Status. 0: No Idle Elevation Active - standard idle speed 1: Idle Elevation Active 2: Reserved. 3: Unavailable.	6884
EngDesiredTorqRqst	S16	0-12500	Engine Desired Torque Request. [0.01%]	6807
EngDerateRqst	U16	0-10000	Engine Derate Request. [0.01%]	3644
Rx_EOI	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	—

ERC1_Rx—Engine Retarder Control Receiver

The **ERC1_Rx** function block receives the Engine Retarder Control message.

It is used by several types of retarding devices, such as engine compression release brakes, exhaust system restriction brakes, and driveline retarders using hydraulic, electric, or mechanical friction to slow the vehicle.

PGN Receivers



PGN: 61440 (0xF000)

Inputs

The inputs to the **ERC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source. • F: Receive this message from any address.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **ERC1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	—
RtdrTorqMode	U8	0-15	Retarder Torque Mode. Indicates which retarder torque mode is currently generating, limiting, or controlling the torque. 0: No braking. 1-15: A torque request or the identified function is controlling the retarder.	900
RtdrEn_BrkAstSw	BOOL	T/F	Retarder Enable Brake Assist Switch. Indicates whether the retarder is enabled for braking assist. T: Brake assist enabled. F: Brake assist disabled.	571
RtdrEn_ShftAstSw	BOOL	T/F	Retarder Enable Shift Assist Switch. Indicates if the retarder is enabled for transmission shift assist. T: Shift assist enabled. The transmission can activate the retarder. F: Shift assist disabled.	572
ActRtdr_PctTorq	S16	-12500-0	Actual Retarder Percent Torque. Actual braking torque of the retarder as a percent of retarder configuration. [0.01%]	520

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
IntdedRtdr_Pct_Torq	S16	-12500-0	Intended Retarder Percent Torque. Braking torque of retarder that the retarder is currently trying to achieve. [0.01%]	1085
EngCoolantLoadInc	BOOL	T/F	Engine Coolant Load Increase Status. Status of an event, external to the engine, that may increase the nominal temperature of the engine coolant liquid. T: Coolant load increase possible. F: No coolant load increase.	1082
RtdrRqstBrkLght	U8	0-3	Retarder Requesting Brake Light. Indicates whether the retarder is requesting that the brake lights illuminate. 0: No request for brake lights to illuminate. 1: Request for brake lights to illuminate. 2: Reserved. 3: Don't care/take no action.	1667
RtdrRoadSpdLmtSw	BOOL	T/F	Retarder Road Speed Limit Switch. T: Road speed limiting by retarder is enabled. F: Road speed limiting by retarder is disabled.	4233
RtdrRoadSpdExcdStat	U8	0-3	Retarder Road Speed Exceeded Status. 0: Road speed is below threshold. 1: Road speed is above threshold, retarder can be activated.	4234
ScrAddrCtrlDevRtdr	U8	0-253	Address of the device controlling the retarder.	1480
DriversDemandRtdr_PctTorq	S16	-12500-0	Drivers demand retarder, percent torque. The maximum torque selected by the driver when one or more modes are selected. [0.01%]	1715
RtdrSelection_NonEng	U16	0-10000	Retarder selection, non-engine. The position of the driver's selector for retarders that are not part of the engine system, expressed as percent and determined by the ratio of current position to the maximum possible position. [0.01%]	1716
ActMaxAvailRtdr_PctTorq	S16	-12500-0	Actual maximum available retarder percent torque. The maximum amount of torque that the retarder can immediately deliver. [0.01%]	1717
Rx_ERC1	BOOL	T/F	Indicates whether new electronic retarder controller 1 is received. True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	3606
Status	U16	---	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: At least one parameter is out of range.	---

ET1_Rx—Engine Temperature 1 Receiver

The **ET1_Rx** function block receives the ET1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN Receivers

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_ET1 signal.

PGN: 65262 (0xFEFE)

Inputs

The inputs to the **ET1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

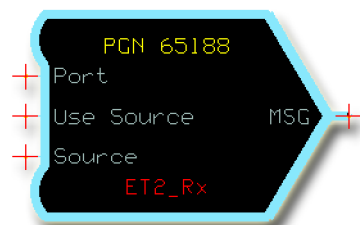
The outputs of the **ET1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngCoolantTemp	S16	-40–210	Engine Coolant Temperature [° C]	110
EngineFuelTemp1	S16	-40–210	Engine Fuel Temperature 1 [° C]	174
EngineOilTemp1	S32	-27300000–173496875	Engine Oil Temperature 1 [0.00001° C]	175
EngTurboOilTemp	S32	-27300000–173496875	Engine Turbocharger Oil Temperature [0.00001° C]	176
EngIntcoolTemp	S16	-40–210	Engine Intercooler Temperature [° C]	52
EngIntcoolTherm	U16	0–10000	Engine Intercooler Thermostat Opening [0.01%]	1134
Rx_ET1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

ET2_Rx—Engine Temperature 2 Receiver

The **ET2_Rx** function block receives the ET2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65188 (0xFE4)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_ET2 signal.

Inputs

The inputs to the **ET2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **ET2_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngOilTemp2	S32	-27300000–173496875	Engine Oil Temperature 2. [0.00001° C]	1135
EngECUTemp	S32	-27300000–173496875	Engine ECU Temperature. [0.00001° C]	1136
EngEGR1DiffP	S32	-25000–25199	Engine Exhaust Gas Recirculation 1 Differential Pressure. [0.01 kPa]	411
EngEGR1Temp	S32	-27300000–173496875	Engine Exhaust Gas Recirculation 1 Temperature. [0.00001° C]	412
Rx_ET2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

ET3_Rx—Engine Temperature 3 Receiver

The **ET3_Rx** function block receives the ET3 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65129 (0xFE69)

The application can detect this by monitoring the Rx_ET3 signal.

Inputs

The inputs to the **ET3_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

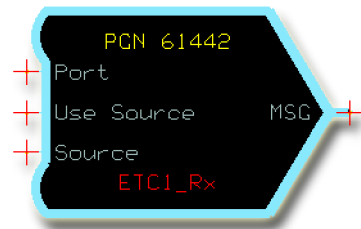
The outputs of the **ET3_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngIntMan1AirTempHR	S32	-27300000–173496875	Engine Intake Manifold 1 Air Temperature (High Resolution). [0.00001° C]	1636
EngCoolTempHR	S32	-27300000–173496875	Engine Coolant Temperature (High Resolution). [0.00001° C]	1637
EngInVlvActSysOilT	S32	-27300000–173496875	Engine Intake Valve Actuation System Oil Temperature. [0.00001° C]	2986
EngChrgAirCool1OutT	S32	-27300000–173496875	Engine Charge Air Cooler 1 Outlet Temperature. [0.00001° C]	2630
Rx_ET3	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

ETC1_Rx—Electronic Transmission Controller 1 Receiver

The **ETC1_Rx** function block receives the ETC1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 61442 (0xF002)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_ETC1 signal.

Inputs

The inputs to the **ETC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **ETC1_Rx** function block are described.

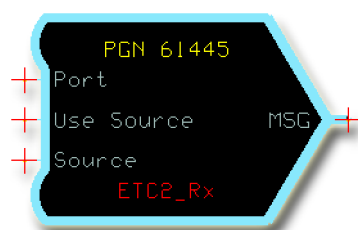
Name	Type	Range	Description [Unit]	SPN
EngMmtOvEnbl	BOOL	T/F	Engine Momentary Overspeed Enable. T: Momentary engine overspeed enabled. F: Momentary engine overspeed disabled.	606
PctClutchSlip	U16	0–10000	Percent Clutch Slip. [0.01%]	522
PrgShftDisbl	BOOL	T/F	Progressive Shift Disable. T: Progressive shift disabled. F: Progressive shift is not disabled.	607
SrcAdrTrnCtr	U8	0–253	Source Address of Controlling Device for Transmission Control.	1482
TrnDrvEngage	BOOL	T/F	Transmission Driveline Engaged. T: Driveline engaged. F: Driveline disengaged.	560
TrnInShfSpd	U32	0–80318	Transmission Input Shaft Speed. [0.1 RPM]	161
TrnInShfSpd_HiRes	U32	0–8031875	High Resolution Transmission Input Shaft Speed. [0.001 RPM]	161
TrnOutShfSpd	U32	0–80318	Transmission Output Shaft Speed. [0.1 RPM]	191

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
TrnOutShfSpd_HiRes	U32	0–8031875	High Resolution Transmission Output Shaft Speed. [0.001 RPM]	191
TrnShftPrcss	BOOL	T/F	Transmission Shift In Process. T: Shift in process. F: Shift not in process.	574
TrnTrqCnvLck	BOOL	T/F	Transmission Torque Converter Lockup Engaged. T: Torque converter lockup engaged. F: Torque converter lockup disengaged.	573
TrnTrqCnvLckTrsnPrs	BOOL	T/F	Transmission Torque Converter Lockup Transition in Process. T: Transition is in process. F: Transition is not in process.	4816
MmtEngMaxPwr	BOOL	T/F	Momentary Engine Maximum Power Enable. T: Momentarily requesting maximum power available. F: Not requesting maximum power available.	5015
Rx_ETC1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

ETC2_Rx—Electronic Transmission Controller 2 Receiver

The **ETC2_Rx** function block receives the ETC2 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 61445 (0xF005)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_ETC2 signal.

PGN Receivers

Inputs

The inputs to the **ETC2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

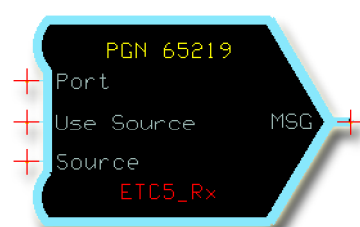
Outputs

The outputs of the **ETC2_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
TransCurRngCharA	U8	0-255	Transmission Current Range, First Character. [ASCII]	163
TransCurRngCharB	U8	0-255	Transmission Current Range, Second Character. [ASCII]	163
TransReqRngCharA	U8	0-255	Transmission Requested Range, First Character. [ASCII]	162
TransReqRngCharB	U8	0-255	Transmission Requested Range, Second Character. [ASCII]	162
TransSelGear	S16	-125-125	Transmission Selected Gear. 251: Park	524
TrnActGearRt	U16	64255	Transmission Actual Gear Ratio. [0.001]	526
TrnsCurrGear	S16	-125-125	Transmission Current Gear. 251: Park	523
Rx_ETC2	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

ETC5_Rx—Electronic Transmission Controller 5 Receiver

The **ETC5_Rx** function block receives the ETC5 message defined by J1939-DA.



PGN Receivers

It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65219 (0xFEC3)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_ETC5 signal.

Inputs

The inputs to the **ETC5_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

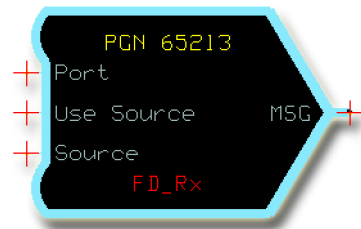
The outputs of the **ETC5_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
TransHighRngSensSW	BOOL	T/F	Transmission High Range Sense Switch. T: Active. F: Inactive.	778
TransLowRngSensSW	BOOL	T/F	Transmission Low Range Sense Switch. T: Active. F: Inactive.	779
TransRvsDirSW	BOOL	T/F	Transmission Reverse Direction Switch. T: Active. F: Inactive.	767
TransNeutralSW	BOOL	T/F	Transmission Neutral Switch. T: Active. F: Inactive.	604
TransFwdDirSW	BOOL	T/F	Transmission Forward Direction Switch. T: Active. F: Inactive.	903
Rx_ETC5	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

FD_Rx—Fan Drive Receiver

The **FD_Rx** function block receives the FD message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65213 (0xFEED)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_FD signal.

Inputs

The inputs to the **FD_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **FD_Rx** function block are described.

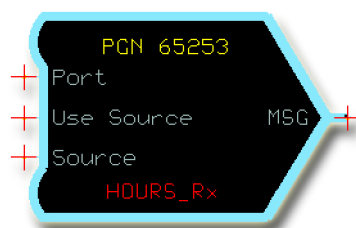
Name	Type	Range	Description [Unit]	SPN
EstPctFanSpd	U16	0–10000	Estimated Percent Fan Speed. [0.01%]	975
FanDriveState	U8	0–15	Fan Drive State: 0: Fan off. 1: Engine system—general. 2: Excessive engine air temperature. 3: Excessive engine oil temperature. 4: Excessive engine coolant temperature. 5: Excessive transmission oil temperature. 6: Excessive hydraulic oil temperature. 7: Default operation. 8: Reverse operation. 9: Manual control. 10: Transmission retarder. 11: A/C system. 12: Timer. 13: Engine brake. 14: Other. 15: Not available.	977

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
FanSpeed	U16	0–8031	Fan Speed. [RPM]	1639
HydrFanMtrP	U32	0–321275	Hydraulic Fan Motor Pressure. [0.1 kPa]	4211
FanDrvBypsCmdStatus	U16	0–10000	Fan Drive Bypass Command Status. [0.01%]	4212
Rx_FD	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

HOURS_Rx—Engine Hours, Revolutions Receiver

The **HOURS_Rx** function block receives the HOURS message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65253 (0xFEE5)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_HOURS signal.

Inputs

The inputs to the **HOURS_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

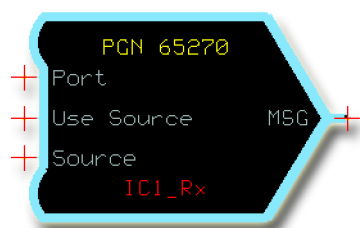
Outputs

The outputs of the **HOURS_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngTotHoursOper	U32	0–210554060	Engine Total Hours of Operation. [hours]	247
EngTotalRevs	U32	0–4211081215	Engine Total Revolutions. [1000 revolutions]	249
Rx_HOURS	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

IC1_Rx—Intake/Exhaust Conditions 1 Receiver

The **IC1_Rx** function block receives the IC1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65270 (0xFE6)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_IC1 signal.

Inputs

The inputs to the **IC1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

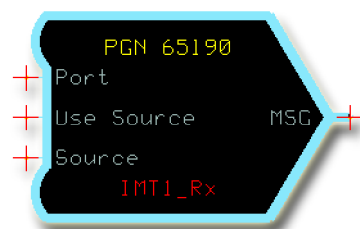
Outputs

The outputs of the **IC1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
PartclTrapInPres	U16	0–1250	Engine Diesel Particulate Filter Intake Pressure. [0.1 kPa]	81
IntakeMan1Pres	U16	0–5000	Engine Intake Manifold #1 Pressure. [0.1 kPa]	102
IntakeManTemp	S16	–40–210	Engine Intake Manifold 1 Temperature. [° C]	105
AirInletPres	U16	0–5000	Engine Air Inlet Pressure. [0.1 kPa]	106
AirFilt1DifPres	U16	0–1250	Engine Air Filter 1 Differential Pressure. [0.01 kPa]	107
ExhaustGasTemp	S32	–27300000– 173496875	Engine Exhaust Gas Temperature. [0.00001° C]	173
CoolFiltDifPres	U16	0–1250	Engine Coolant Filter Differential Pressure. [0.1 kPa]	112
Rx_IC1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

IMT1_Rx—Intake Manifold Information 1 Receiver

The **IMT1_Rx** function block receives the IMT1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65190 (0xFE6)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_IMT1 signal.

PGN Receivers

Inputs

The inputs to the **IMT1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **IMT1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Turbo1BoostP	U32	0–8032875	Engine Turbocharger 1 Boost Pressure. [0.0000001°]	1127
Turbo2BoostP	U32	0–8032875	Engine Turbocharger 2 Boost Pressure. [0.0000001°]	1128
Turbo3BoostP	U32	0–8032875	Engine Turbocharger 3 Boost Pressure. [0.0000001°]	1129
Turbo4BoostP	U32	0–8032875	Engine Turbocharger 4 Boost Pressure. [0.0000001°]	1130
Rx_IMT1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

LFC_Rx - Fuel Consumption (Liquid) Receiver

The **LFC_Rx** function block receives the LFC message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65257 (0xFEE9)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_LFC signal.

PGN Receivers

Inputs

The inputs to the **LFC_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **LFC_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngTripFuel	U32	0–2105540607	Engine Trip Fuel. [liter]	182
EngTotalFuelUsed	U32	0–2105540607	Engine Total Fuel Used. [liter]	250
Rx_LFC	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

LFE_Rx—Fuel Economy (Liquid) Receiver

The **LFE_Rx** function block receives the LFE message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65266 (0xFE2)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_LFE signal.

PGN Receivers

Inputs

The inputs to the **LFE_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

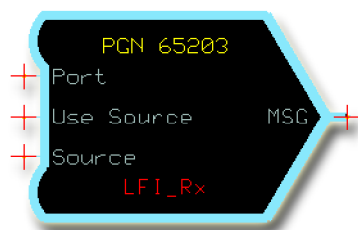
Outputs

The outputs of the **LFE_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EngineFuelRate	U32	0–321275	Engine Fuel Rate. [0.01 L/h]	183
EngineInstEcon	U32	0–12550	Engine Instantaneous Fuel Economy. [0.001 km/L]	184
EngineAvgEcon	U32	0–12550	Engine Average Fuel Economy. [0.001 km/L]	185
EngineThrtlePsn	U16	0–10000	Engine Throttle Valve 1 Position 1. [0.01%]	51
EngineThrtlePsn2	U16	0–10000	Engine Throttle Valve 2 Position [0.01%]	3673
Rx_LFE	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

LFI_Rx—Fuel Information (Liquid) Receiver

The **LFI_Rx** function block receives the LFI message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65203 (0xFEB3)

CAN message timeout detection is not included in this function block.

PGN Receivers

The application can detect this by monitoring the Rx_LFI signal.

Inputs

The inputs to the **LFI_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

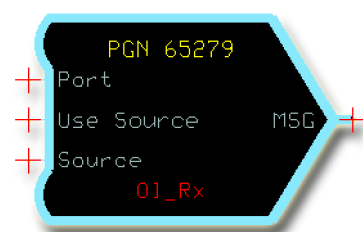
Outputs

The outputs of the **LFI_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
PTOFuelUsed	U32	0–2105540607	Total Engine PTO Governor Fuel Used. [L]	1028
TrpAvgFuelRt	U32	0–321275	Trip Average Fuel Rate. [0.01 L/h]	1029
FlexFuelPt	U32	0–1606375	Flexible Fuel Percentage. [0.0001%]	5458
Rx_LFI	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

OI_Rx—Operator Indicators Receiver

The **OI_Rx** function block receives the OI message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65279 (0xFEFF)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_OI signal.

PGN Receivers

Inputs

The inputs to the **OI_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **OI_Rx** function block are described.

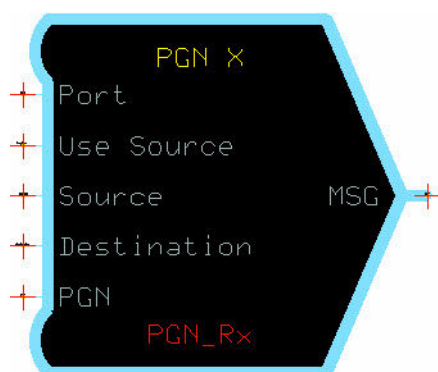
Name	Type	Range	Description [Unit]	SPN
WaterInFuelInd	BOOL	T/F	Water In Fuel Indicator: T: Yes. F: No.	97
OperaShiftPrompt	U8	0–3	Operator shift prompt. 0: Indicators inactive. 1: Upshift indicator active. 2: Downshift indicator active. 3: Do not care/take no action.	5675
DrivWarnSysIndicator	U8	0–7	Driver Warning System Indicator Status. 0: Off - Used when driver warning system is non-active - which, by requirement, means the low-level and severe inducement systems are also non-active 1: On – solid. Used when driver warning system is activated for any relevant malfunction. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: Reserved for SAE assignment. 5: On – fast blink (1 Hz). Used for the second driver warning system detection threshold for diesel exhaust fluid level, where the visual alarm of the driver warning system is required to escalate in intensity. 6: Reserved for SAE assignment.	5825
ECSOInducedSeverity	U8	0–7	Emission Control System Operator Inducement Severity. 0: Driver warning, low-level inducement, and severe inducement non-active. 1: Inducement level 1. 2: Inducement level 2. 3: Inducement level 3. 4: Inducement level 4. 5: Inducement level 5. 6: Temporary override of inducement. 7: Not available.	5826
Rx_OI	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

PGN_Rx—Parameter Group Number Receiver

The **PGN_Rx** function block can receive any PGN from a device.



The function block supports Page 1, Page 2, PDU1, and PDU2 PGNs.

Inputs

The inputs to the **PGN_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Protected	BOOL	T/F	T: Saves the first message received in the execution loop. Following messages do not overwrite the first message. F: Saves the last message received in the execution loop. The last message overwrites preceding messages.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.
Destination	---	0–255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
PGN	U32	0-0x3FFFF	The J1939 parameter group number. If the PF value is less than 240, LSB is set to 0. Otherwise, LSB is set to the value of the group extension field.

PGN Receivers

Outputs

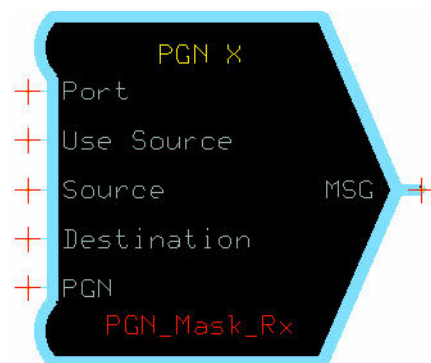
The outputs of the **PGN_Rx** function block are described.

Name	Type	Range	Description [Unit]
Status	U16	----	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: PGN is too large or the PGN is invalid for the PDU1 format.
ID_Used	U32	0– 0xFFFFFFFF	The ID of the receiver.
Data	ARRAY[8]U8	0– 255	Array of data received from requested PGN.
Length	U8	0–8	Number of bytes received.
ID	U32	0– 0xFFFFFFFF	ID of the received message.
Address	U8	0– 255	The address from which the most recent data is received.
PDU2	BOOL	----	Indicates that the PGN is using the PDU2 format. T: PGN is using PDU2. F: PGN is using PDU1.
Updated	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.

PGN_Mask_Rx—Parameter Group Number Mask Receiver

The **PGN_Mask_Rx** function block receives any PGN from a device.

The function block also filters messages by using a data mask. It supports Page 1, Page 2, PDU1, and PDU2 PGNs.



Inputs

The inputs to the **PGN_Mask_Rx** function block are described.

Name	Type	Range	Description
Port	Port	----	Determines which physical CAN port of the hardware is used to receive the message.
Protected	BOOL	T/F	T: Saves the first message received in the execution loop. Following messages do not overwrite the first message. F: Saves the last message received in the execution loop. The last message overwrites preceding messages.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.

PGN Receivers

Name	Type	Range	Description
Source	---	0-255	Address of the transmitting device. Only applies if Use Source is True.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
PGN	U32	0-0x3FFFF	The J1939 parameter group number. If the PF value is less than 240, LSB is set to 0. Otherwise, LSB is set to the value of the group extension field.
Data[]	(ARRAY[x]U8)	---	Used with Data Mask and Mask Len to filter a message on its data content.
Data[]Mask	(ARRAY[x]U8)	---	Indicates the care mask applied to the data. 0: Do not care 1: Care.
Mask Len	U8	0-8	Number of bytes in Data[]Mask to use.

Outputs

The outputs of the **PGN_Mask_Rx** function block are described.

Name	Type	Range	Description [Unit]
Status	U16	---	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: PGN is too large or the PGN is invalid for the PDU1 format.
ID_Used	U32	0-0xFFFFFFFF	The ID of the receiver.
Data	ARRAY[8]U8	0-255	Array of data received from requested PGN.
Length	U8	0-8	Number of bytes received.
ID	U32	0-0xFFFFFFFF	ID of the received message.
Address	U8	0- 255	The address from which the most recent data is received.
PDU2	BOOL	T/F	Indicates that the PGN is using the PDU2 format. T: PGN is using PDU2. F: PGN is using PDU1.
Updated	BOOL	T/F	True during the first program cycle that new data is received. T: Received new data. F: Did not receive new data.

SCRSC_Rx—Selective Catalytic Reduction System Cleaning Receiver

The **SCRSC_Rx** function block receives the SCRSC message defined by J1939-DA.



PGN: 64586 (0xFC4A)

PGN Receivers

Inputs

The inputs to the **SCRSC_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **SCRSC_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
SCR LampCmd	U8	0-7	SCR System Cleaning Lamp Command. 0: Off. 1: On – solid. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment 4: On. Fast blink (1 HZ). 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Not available.	6915
SCRStatus	U8	0-3	SCR System Cleaning Status. 0: Inactive. 1: Active. 2: SCR system cleaning is needed. 3: Unavailable.	6916
SCRInhibitStat	BOOL	T/F	SCR System Cleaning Inhibited Status. T: Inhibited. F: Not inhibited.	6917
SCRInhibitDueToSw	BOOL	T/F	SCR System Cleaning Status Inhibited Due to Inhibit Switch. T: Inhibited. F: Not inhibited.	6918
SCRInhibitDueToCltch	BOOL	T/F	SCR System Cleaning Status Inhibited Due to Clutch Disengaged. T: Inhibited. F: Not inhibited.	6919
SCRInhibitDueToSvcBrk	BOOL	T/F	SCR System Cleaning Status Inhibited Due to Service Brake Active. T: Inhibited. F: Not inhibited.	6920
SCRInhibitDueToPTO	BOOL	T/F	SCR System Cleaning Status Inhibited Due To PTO Active. T: Inhibited. F: Not inhibited.	6921
SCRInhibitDueToAcc	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Accelerator Pedal Off Idle. T: Inhibited. F: Not inhibited.	6922
SCRInhibitDueToNeut	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Out of Neutral. T: Inhibited. F: Not inhibited.	6923

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
SCRInhibitDueToSpdAbv	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Vehicle Speed Above Allowed Speed. T: Inhibited. F: Not inhibited.	6924
SCRInhibitDueToPkBrk	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Parking Brake Not Set. T: Inhibited. F: Not inhibited.	6925
SCRInhibitDueToLowGasT	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Low Exhaust Gas Temperature. T: Inhibited. F: Not inhibited.	6926
SCRInhibitDueToSysFlt	BOOL	T/F	SCR System Cleaning Status Inhibited Due To System Fault Active. T: Inhibited. F: Not inhibited.	6927
SCRInhibitDueToSysTO	BOOL	T/F	SCR System Cleaning Status Inhibited Due To System Timeout. T: Inhibited. F: Not inhibited.	6928
SCRInhibitDueToTmpLO	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Temporary System Lockout. T: Inhibited. F: Not inhibited.	6929
SCRInhibitDueToPrmLO	BOOL		SCR System Cleaning Status Inhibited Due To Permanent System Lockout. T: Inhibited. F: Not inhibited.	6930
SCRInhibitDueToEngNotWrm	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Engine Not Warmed Up. T: Inhibited. F: Not inhibited.	6931
SCRInhibitDueToSpdBel	BOOL	T/F	SCR System Cleaning Status Inhibited Due To Vehicle Speed Below Allowed Speed. T: Inhibited. F: Not inhibited.	6932
SCRAutoInitConfig	BOOL	T/F	SCR System Cleaning Status Automatic Initiation Configuration. T: Enabled. F: Not enabled.	6933
SCRForcedStat	U8	0-7	SCR System Cleaning Forced Status. 0: Not Active 1: Active. Forced by switch. 2: Active. Forced by Service Tool. 3: Reserved for SAE assignment. 4: Reserved for SAE assignment. 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Unavailable	6934
NotMetForSCR	BOOL	T/F	SCR System Cleaning Status Inhibited For Active Regeneration. T: Inhibited. F: Not inhibited.	7848
Rx_SCRSC	BOOL	T/F	True during the first program cycle that new data is received. T: Received new data. F: Did not receive new data.	—

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	---

SEP1_Rx—Sensor Electrical Power 1 Receiver

The **SEP1_Rx** function block receives the SEP1 message defined by J1939-DA.



PGN: 64925 (0xFD9D)

Inputs

The Inputs to the **SEP1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . • T: Only receive this message when transmitted from the address specified by Source . • F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **SEP1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
SnsrSupply1	U32	0-3212750	Sensor ECU Supply voltage 1. Resolution: 50 mV [mV]	3509
SnsrSupply2	U32	0-3212750	Sensor ECU Supply voltage 2. Resolution: 50 mV [mV]	3510
SnsrSupply3	U32	0-3212750	Sensor ECU Supply voltage 3. Resolution: 50 mV [mV]	3511
SnsrSupply4	U32	0-3212750	Sensor ECU Supply voltage 4. Resolution: 50 mV [mV]	3512

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Rx_SEP1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, then a fault condition exists for this signal.	---

SHUTDN_Rx—Shutdown Receiver

The **SHUTDN_RX** function block receives the SHUTDN message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65252 (0xFEE4)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_SHUTDN signal.

Inputs

The inputs to the **SHUTDN_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

PGN Receivers

Outputs

The outputs of the **SHUTDN_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
EISHasShutDwnEng	BOOL	T/F	Diesel Engine Idle Shutdown has Shutdown Engine. T: Yes. F: No.	593
EISDrvrAlertMode	BOOL	T/F	Engine Idle Shutdown Driver Alert Mode. T: Active. F: Inactive.	594
EISTimerOverride	BOOL	T/F	Engine Idle Shutdown Timer Override. T: Active. F: Inactive.	592
EISTimerState	BOOL	T/F	Engine Idle Shutdown Timer State. T: Active. F: Inactive.	590
EISTimerFunc	BOOL	T/F	Engine Idle Shutdown Timer Function. T: Enabled in calibration. F: Disabled in calibration.	591
ACHighPressFanSW	BOOL	T/F	A/C High Pressure Fan Switch. T: Pressure high. Fan may be engaged. F: Pressure normal.	985
RefrigLowPressSW	BOOL	T/F	Refrigerant Low Pressure Switch. T: Pressure too low. Compressor clutch may be disengaged. F: Pressure normal.	875
RefrigHiPressSW	BOOL	T/F	Refrigerant High Pressure Switch. T: Pressure too high. Compressor clutch may be disengaged. F: Pressure normal.	605
EngWaitToStartLmp	BOOL	T/F	Engine Wait to Start Lamp. T: On. F: Off.	1081
PrtctSysShutDwnEng	BOOL	T/F	Engine Protection System has Shutdown Engine. T: Yes. F: No.	1110
PrtctSysApprchShutDwn	BOOL	T/F	Engine Protection System Approaching Shutdown. T: Approaching. F: Not approaching.	1109
PrtctSysTmrOverride	BOOL	T/F	Engine Protection System Timer Override. T: Active. F: Inactive.	1108
PrtctSysTmrState	BOOL	T/F	Engine Protection System Timer State. T: Active. F: Inactive.	1107
PrtctSysConfig	BOOL	T/F	Engine Protection System Configuration. T: Enabled in calibration. F: Disabled in calibration.	1111
EngAlarmAck	BOOL	T/F	Engine Alarm Acknowledge. T: Active. F: Inactive.	2815
EngAlarmOutCmdStat	BOOL	T/F	Engine Alarm Output Command Status. T: Active. F: Inactive.	2814
EngAirShutoffCmdStat	BOOL	T/F	Engine Air Shutoff Command Status. T: Enabled, attempting to shut off engine air supply. F: Disabled, not attempting to shut off engine air supply.	2813

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
EngOverspeedTest	BOOL	T/F	Engine Overspeed Test. T: Active. F: Inactive.	2812
EngAirShutoffStat	BOOL	T/F	Engine Air Shutoff Status. T: Airflow restricted. F: Airflow allowed to engine.	3667
PTOShutDwnEng	BOOL	T/F	PTO Shutdown has Shutdown Engine. T: Yes. F: No.	5404
CoolantLevEngProtShut	BOOL	T/F	Coolant Level Engine Protection Shutdown Status. T: Enabled. F: Not enabled.	5566
Rx_SHUTDN	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName _NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName _Flt is true, this indicates a fault condition exists for this signal.	—

TCO1_Rx—Tachograph 1 Receiver

The **TCO1_Rx** function block receives the TCO1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65132 (0xFE6C)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_TCO1 signal.

PGN Receivers

Inputs

The inputs to the **TCO1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **TCO1_Rx** function block are described.

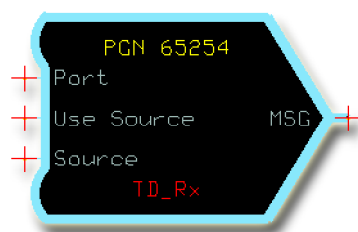
Name	Type	Range	Description [Unit]	SPN
Drv1WorkSt	U8	0–5	Driver 1 working state: 0: Rest - sleeping. 1: Driver available – short break. 2: Work – loading, unloading, working in an office. 3: Drive – behind wheel. 4 – 5: Reserved.	1612
Drv2WorkSt	U8	0–5	Driver 2 working state: 0: Rest - sleeping. 1: Driver available – short break. 2: Work – loading, unloading, working in an office. 3: Drive – behind wheel. 4 – 5: Reserved.	1613
VehclMotion	BOOL	T/F	Vehicle Motion. T: Motion detected. F: Motion not detected.	1611
Drv1TimeSt	U8	0–13	Driver 1 Time Related States: 0: Normal/No limits reached. 1: Limit #1 – 15 min before 4 ½ h. 2: Limit #2 – 4 ½ h reached. 3: Limit #3 – 15 min before 9 h. 4: Limit #4 – 9 h reached. 5: Limit #5 – 15 min before 16 h (not having 8h rest during the last 24h). 6: Limit #6 – 16 h reached. 7 – 12: Reserved. 13: Other.	1617
DriverCard1	BOOL	T/F	Driver Card Driver 1. T: Card present. F: Card not present.	1615
VehclOverSpd	BOOL	T/F	Vehicle Overspeed. T: Overspeed. F: No overspeed.	1614

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
Drv2TimeSt	U8	0–13	Driver 2 Time Related States: 0: Normal/No limits reached. 1: Limit #1 – 15 min before 4 ½ h. 2: Limit #2 – 4 ½ h reached. 3: Limit #3 – 15 min before 9 h. 4: Limit #4 – 9 h reached. 5: Limit #5 – 15 min before 16 h (not having 8h rest during the last 24h). 6: Limit #6 – 16 h reached. 7 – 12: Reserved. 13: Other.	1618
DriverCard2	BOOL	T/F	Driver Card Driver 2. T: Card present. F: Card not present.	1616
SystemEvent	BOOL	T/F	System Event. T: Tachograph event. F: No tachograph event.	1622
HandlingInfo	BOOL	T/F	Handling information T: Handling information. F: No handling information.	1621
TachPerform	BOOL	T/F	Tachograph Performance. T: Performance analysis. F: Normal performance.	1620
DirectionInd	BOOL	T/F	Direction Indicator. T: Reverse. F: Forward.	1619
TgOutShftSpd	U16	0–8031	Tachograph Output Shaft Speed. [RPM]	1623
TachVehclSpd	U32	0–250996	Tachograph Vehicle Speed. [0.001 km/h]	1624
Rx_TCO1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

TD_Rx—Time/Date Receiver

The **TD_Rx** function block receives the TD message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65254 (0xFEE6)

PGN Receivers

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_TD signal.

Inputs

The inputs to the **TD_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

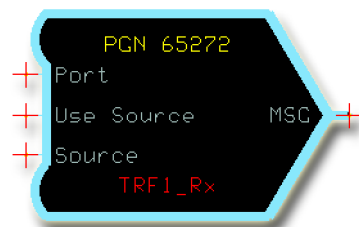
The outputs of the **TD_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Seconds	U8	0–59	Seconds [second]	959
Minutes	U8	0–59	Minutes [min]	960
Hours	U8	0–23	Hours [h]	961
Month	U8	1–12	Month [month]	963
Day	U8	0–31	Day [day]	962
Year	U8	1985–2235	Year [year]	964
LocalMinOffset	S8	-59-59	Local Minute Offset [min]	1601
LocalHrOffset	S8	-23-23	Local Hour Offset [h]	1602
Rx_TD	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Receivers

TRF1_Rx—Transmission Fluids 1 Receiver

The **TRF1_Rx** function block receives the TD message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65272 (0xFE8)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_TRF1 signal.

Inputs

The inputs to the **TRF1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **TRF1_Rx** function block are described.

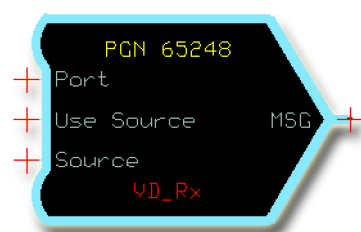
Name	Type	Range	Description [Unit]	SPN
ClutchPressure	U16	0–4000	Clutch Pressure. [kPa]	123
TransOilLevel	U16	0–10000	Transmission Oil Level. [0.01%]	124
TransFiltDifPres	U16	0–500	Transmission Filter Differential Pressure. [kPa]	126
TransOilPressure	U16	0–4000	Transmission Oil Pressure. [kPa]	127
TransOilTemp	S32	-27300000–173496875	Transmission Oil Temperature. [0.00001° C]	177
TransOilLevHiLow	S16	-625–625	Transmission Oil Level High / Low. [0.1 L]	3027

PGN Receivers

Name	Type	Range	Description [Unit]	SPN
TransOilLevTimer	U8	0–13	Transmission Oil Level Countdown Timer. 0: Less than one minute. 1: One minute. 2: Two minutes. 3: Three minutes. 4: Four minutes. 5: Five minutes. 6: Six minutes. 7: Seven minutes. 8: Eight minutes. 9: Nine minutes. 10: Ten minutes. 11: Eleven minutes. 12: Twelve minutes. 13: Thirteen minutes. [minutes]	3028
OilLevMeasStatus	U8	0–13	Transmission Oil Level Measurement Status: 0: Conditions valid for transmission oil level measurement. 1: Conditions not valid – Settling timer still counting down. 2: Conditions not valid – Transmission in gear. 3: Conditions not valid – Transmission fluid temperature too low. 4: Conditions not valid – Transmission fluid temperature too high. 5: Conditions not valid – Vehicle moving; output shaft speed too high. 6: Conditions not valid – Vehicle not level. 7: Conditions not valid – Engine speed too low. 8: Conditions not valid – Engine speed too high. 9: Conditions not valid – No request for reading. 10: Not defined. 11: Not defined. 12: Not defined. 13: Conditions not valid - Other.	3026
Rx_TRF1	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

VD_Rx—Vehicle Distance Receiver

The **VD_Rx** function block receives the VD message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65248 (0xFEE0)

PGN Receivers

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_VD signal.

Inputs

The inputs to the **VD_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

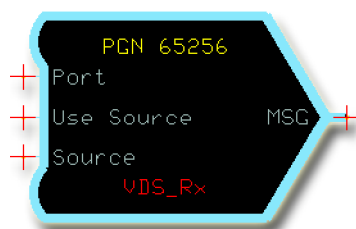
Outputs

The outputs of the **VD_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
TripDistance	U32	0–526385151	Trip Distance. [km]	244
TotVehclDist	U32	0–526385151	Total Vehicle Distance. [km]	245
Rx_VD	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

VDS_Rx—Vehicle Direction/Speed Receiver

The **VDS_Rx** function block receives the VDS message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65256 (0xFEE8)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_VDS signal.

PGN Receivers

Inputs

The inputs to the **VDS_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **VDS_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
CompassBear	U32	0–501990	Compass Bearing. [0.001°]	165
NavVehclSpd	U32	0–250996	Navigation-Based Vehicle Speed. [0.001 km/h]	517
Pitch	S32	–200000–301992	Pitch. [0.001°]	583
Altitude	S32	–2500000–5531875	Altitude. [0.001 m]	580
Rx_VDS	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

VEP1_Rx—Vehicle Electrical Power Receiver

The **VEP1_Rx** function block receives the VEP1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65271 (0xFE7)

CAN message timeout detection is not included in this function block.

PGN Receivers

The application can detect this by monitoring the Rx_VEP signal.

Inputs

The inputs to the **VEP1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	---	0–255	Address of the transmitting device. Only applies if Use Source is True.

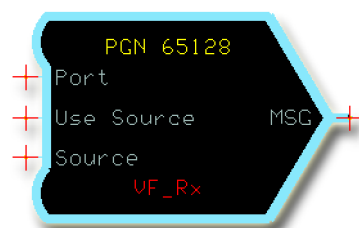
Outputs

The outputs of the **VEP1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
NetBattCurrent	S16	-125–125	Net Battery Current. [amps]	114
AltCurrent	U8	0–250	Alternator Current. [amps]	115
AltVoltage	U32	0–321275	Charging System Potential (Voltage). [0.01 V]	167
ELVoltage	U32	0–321275	Battery Potential / Power Input 1. [0.01 V]	168
BattVoltage	U32	0–321275	Keyswitch Battery Potential. [0.01 V]	158
Rx_VEP	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---
Status	BUS	---	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	---
Fault	BUS	---	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	---

VF_Rx—Vehicle Fluids Receiver

The **VF_Rx** function block receives the VF message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN Receivers

PGN: 65128 (0xFE68)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_VF signal.

Inputs

The inputs to the **VF_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **VF_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
HydraulicTemp	S16	-40–210	Hydraulic Temperature. [° C]	1638
HydrOilFiltResSw	BOOL	T/F	Hydraulic Oil Filter Restriction Switch. T: Restriction exists. F: No restriction.	1713
WinchOilPressSw	BOOL	T/F	Winch Oil Pressure Switch. T: OK. F: Not OK.	1857
HydraulicOilLev	U16	0–10000	Hydraulic Oil Level. [0.01%]	2602
Rx_VF	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

VP1_Rx—Vehicle Position Receiver 1

The **VP1_Rx** function block receives the VP message defined by J1939-DA.



PGN Receivers

It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65267 (0xFE3)

CAN message timeout detection is not included in this function block.

The application can detect this by monitoring the Rx_VP signal.

Inputs

The inputs to the **VP_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . - T: Only receive this message when transmitted from the address specified by Source. - F: Receive this message from any address.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **VP_Rx** function block are described.

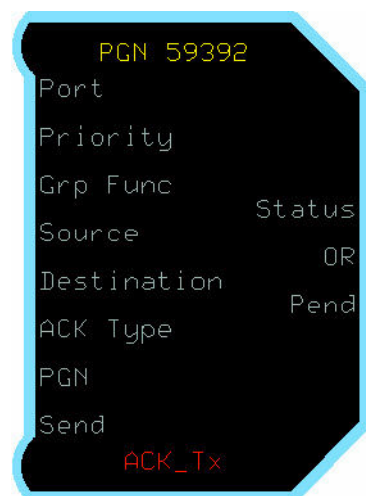
Name	Type	Range	Description [Unit]	SPN
Latitude	S32	- 210000000–2111081215	Latitudinal position of the machine. [0.0000001°]	584
Longitude	S32	- 210000000–2111081215	Longitudinal position of the machine. [0.0000001°]	585
Rx_VP	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	—
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message. If the SignalName_NA is true, then that signal is not available.	—
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message. If the SignalName_Flt is true, this indicates a fault condition exists for this signal.	—

PGN Transmitters

PGN transmitters transmit J1939 data broadcast on the CAN bus.

ACK_Tx—Acknowledge Transmitter

The **ACK_Tx** function block transmits an acknowledge message to an address that is requesting information.



PGN: 59392 (0xE800)

Inputs

The inputs to the **ACK_Tx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Grp Func	U8	0-255	Group function value.
Source	—	0-253	Address of the transmitting device. Only applies if Use Source is True.
Destination	—	0–255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
ACK_Type	U8	0–3	Acknowledgment type: 0: Positive acknowledgment (ACK). 1: Negative acknowledgment (NACK). 2: Access denied. 3: Cannot respond.
PGN	U32	0-0x3FFFF	The J1939 parameter group number. $PGN = EDP \ll 17 + DP \ll 16 + PF \ll 8 + LSB$ EDP and DP are usually zero. LSB: If the PF value is less than 240, LSB is set to zero. Otherwise, it is set to the value of the group extension field.
Send	BOOL	T/F	Used to trigger message transmission. T: Send message. F: Do not send message.

PGN Transmitters

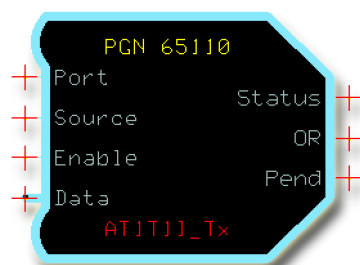
Outputs

The outputs of the **ACK_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

AT1T11_Tx—Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information Transmitter

The **AT1T11_Tx** function block transmits the AT1T1 message defined by J1939-DA.



It provides data signals scaled to application-compatible formats. If data is not available or has an error, the function block also reports this.

PGN: 65110 (0xFE56)

Inputs

The inputs to the **AT1T11_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	—	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—
Level	U16	0–10000	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Level. [0.01%]	1761

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
Temperature	S16	-40–210	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Temperature. [° C]	3031
Level_2	U16	0–64255	Aftertreatment 1 Diesel Exhaust Fluid Tank Level 2. [0.1 mm]	3517
LevelPrelimFMI	U8	0–31	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Preliminary FMI.	3532
LowLevelIndicator	U8	0–7	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Low Level Indicator. 0: Off. Indicates adequate DEF level. 1: On solid. Indicates low DEF level. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: On. Fast blink. Indicates the DEF level is lower than the level indicated by the solid illumination (state 1). 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Not available.	5245
TempPrelimFMI	U8	0–31	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Temperature Preliminary FMI.	4365
SCROperInducSeverity	U8	0–7	Aftertreatment SCR Operator Inducement Severity. 0: Driver warning, low-level inducement, and severe inducement non-active 1: Inducement level 1. DEF warning. 2: Inducement level 2. DEF warning, second level. 3: Inducement level 3. Low-Level Inducement Active 4: Inducement level 4. Severe Inducement Enabled. 5: Inducement level 5. Final Inducement Enabled 6: Temporary override of inducement. 7: Not viable.	5246
Heater	U16	0–10000	Aftertreatment SCR Operator Inducement Tank 1 Heater. [0.01%]	3363
HeaterPrelimFMI	U8	0–31	Aftertreatment SCR Operator Inducement Tank 1 Heater Preliminary FMI.	4366

Outputs

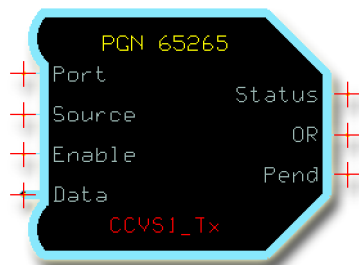
The outputs of the **AT1T1I_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Transmitters

CCVS1_Tx—Cruise Control/Vehicle Speed 1 Transmitter

The **CCVS1_Tx** function block transmits the CCVS1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 65265 (0xFEf1)

Inputs

The inputs to the **CCVS1_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	—	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive CCVS1 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—
TwoSpdAxelSw	—	0–3	Two Speed Axle Switch. 0: Low speed range. 1: High speed range. 2: Error. 3: Unavailable.	69
ParkBrakeSw	—	0–3	Park Brake Switch 0: Parking brake not set. 1: Parking brake set. 2: Error. 3: Unavailable.	70
CrsCtrlPause	—	0–3	Cruise Control Pause Switch. 0: Off. 1: On. 2: Error. 3: Take No Action.	1633
PrkBrkRelInh	—	0–3	Park Brake Release Inhibit Request. 0: Park Brake Release Inhibit not requested. 1: Park Brake Release Inhibit requested. 2: SAE reserved. 3: Unavailable.	3807

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
WhlBasedVSpd	---	0–250996	Wheel Based Vehicle Speed. Resolution: 0.00390625 km/h. [0.001 km/h]	84
CrsCtrlAct	---	0–3	Cruise Control Active. 0: Cruise control switched off. 1: Cruise control switched on. 2: Error. 3: Unavailable.	595
CrsCtrlEnbl	---	0–3	Cruise Control Enable Switch. 0: Cruise control disabled. 1: Cruise control enabled. 2: Error. 3: Unavailable.	596
BrakeSwitch	---	0–3	Brake Switch: 0: Brake pedal released. 1: Brake pedal depressed. 2: Error. 3: Unavailable.	597
ClutchSwitch	---	0–3	Clutch Switch. 0: Clutch pedal released. 1: Clutch pedal depressed. 2: Error. 3: Unavailable.	598
CrsCtrlSetSw	---	0–3	Cruise Control Set Switch: 0: Cruise control activator not in the position "set." 1: Cruise control activator in position "set." 2: Error. 3: Unavailable.	599
CrsCtrlCoast	---	0–3	Cruise Control Coast (Decelerate) Switch. 0: Cruise control activator not in the position "coast." 1: Cruise control activator in position "coast." 2: Error. 3: Unavailable.	600
CrsCtrlResume	---	0–3	Cruise Control Resume Switch. 0: Cruise control activator not in the position "resume." 1: Cruise control activator in position "resume." 2: Error. 3: Unavailable.	601
CrsCtrlAccel	---	0–3	Cruise Control Accelerate Switch. 0: Cruise control activator not in the position "accelerate." 1: Cruise control activator in position "accelerate." 2: Error. 3: Unavailable.	602
CrCtrlSetSpd	---	0–250	Cruise Control Set Speed. [km/h]	86

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
PTOGovState	----	0–31	PTO Governor State. 0: Off/Disabled. 1: Hold. 2: Remote hold. 3: Standby. 4: Remote standby. 5: Set. 6: Decelerate/Coast. 7: Resume. 8: Accelerate. 9: Accelerator override. 10: Preprogrammed set speed 1. 11: Preprogrammed set speed 2. 12: Preprogrammed set speed 3. 13: Preprogrammed set speed 4. 14: Preprogrammed set speed 5. 15: Preprogrammed set speed 6. 16: Preprogrammed set speed 7. 17: Preprogrammed set speed 8. 18: PTO set speed memory 1. 19: PTO set speed memory 2. 20: PTO set speed memory 3. 21–30: Not defined. 31: Not available.	976
CrsCtrlState	----	0–7	Cruise Control State. 0: Off/Disabled. 1: Hold. 2: Accelerate. 3: Decelerate. 4: Resume. 5: Set. 6: Accelerator override. 7: Unavailable.	527
EngIdleIncSw	----	0–3	Engine Idle Increment Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	968
EngIdleDecSw	----	0–3	Engine Idle Decrement Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	967
EngTestModSw	----	0–3	Engine Test Mode Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	966
EngShtDwOvSw	----	0–3	Engine Shutdown Override Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	1237

PGN Transmitters

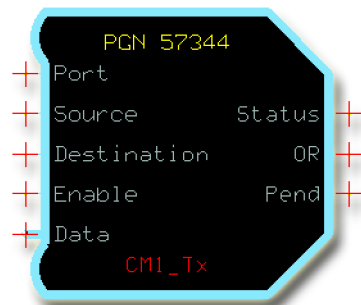
Outputs

The outputs of the **CCVS1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

CM1_Tx—Cab Message 1 Transmitter

The **CM1_Tx** function block transmits the CM1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 57344 (0xE000)

J1939-DA prescribes priorities for SPNs 3695 and 3696. This function block only transmits the reported values of these signals and does not enforce any prioritization.

Inputs

The inputs to the **CM1_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Destination	—	0–255	J1939 address of the receiving device. Use the global broadcast address of 255 to send the message to all devices.	—
Enable	BOOL	—	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	—	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.	—

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
Tx Rate	---	0–65535	Time between consecutive CM1 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	---
ReqPrcntFanSpd	---	0–10000	Requested Percent Fan Speed. [0.01%]	986
CabInterTmpCmd	---	-27300000–173496875	Cab Interior Temperature Command. Resolution: 0.03125° C [0.00001° C]	1691
CabInterTmpCmd_NA	BOOL	T/F	Indicates the signal is not available. T: Signal is not available. F: Signal is available	1691
AuxlHeatCoolPmpReq	---	0–3	Auxiliary Heater Coolant Pump Request. 0: Deactivate water pump. 1: Activate water pump. 2: Reserved. 3: Do not care/take no action.	1684
BatMainSwHldReq	---	0–3	Battery Main Switch Hold Request. 0: Release battery main switch. 1: Hold battery main switch. 2: Undefined 3: Do not care/take no action.	1682
OperStDirSw	---	0–3	Operator Seat Direction Switch. 0: Operator seat not facing forward. 1: Operator seat is facing forward. 2: Error. 3: Not available.	1714
StBeltSw	---	0–3	Seat Belt Switch. 0: Not Buckled. 1: OK - Seat Belt is buckled. 2: Error. Switch state cannot be determined. 3: Not available.	1856
PrkBrkCmd	---	0–3	Park Brake Command. 0: Park Brake apply not requested. 1: Park Brake apply requested. 2: Reserved. 3: Do not care/take no action.	5630
VehLmtSpdGovrnDecSw	---	0–3	Vehicle Limiting Speed Governor Decrement Switch. 0: Switch in the off state. 1: Switch in the on state - decrease. 2: Error. 3: Not available.	1655
VehLmtSpdGovrnIncSw	---	0–3	Vehicle Limiting Speed Governor Increment Switch. 0: Switch in the off state. 1: Switch in the on state - increase. 2: Error. 3: Not available.	1654
VehLmtSpdGovrnEnSw	---	0–3	Vehicle Limiting Speed Governor Enable Switch. 0: Switch disabled. 1: Switch enabled. 2: Error. 3: Not available.	1653

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
DslPartFiltRegnInhbtSw	---	0-3	Diesel Particulate Filter Regeneration Inhibit Switch. 0: Not active. 1: Active. 2: Error. 3: Not available.	3695
DslPartFiltRegnForceSw	---	0-3	Diesel Particulate Filter Regeneration Force Switch. 0: Not active. 1: Active. 2: Error. 3: Not available.	3696
AutoGrShifEnSw	---	0-3	Automatic Gear Shifting Enable Switch. 0: Switch disabled. 1: Switch enabled. 2: Error. 3: Not available.	1666
EngAutoStartEnSw	---	0-3	Engine Automatic Start Enable Switch. 0: Switch in the off state. 1: Switch in the on state. 2: Error. 3: Not available.	1656
AuxlHeatModReq	---	0-15	Auxiliary Heater Mode Request. 0: De-activate auxiliary heater. 1: Off due to ADR per European Regulations for Transport of hazardous materials. 2: Economy mode. 3: Normal mode. 4: Heater pump upkeep. 5-13: Not defined. 14: Reserved. 15: Do not care/take no action.	1683
ReqEngZonHeat	---	0-3	Request Engine Zone Heating. 0: Do not heat engine zone. 1: Heat engine zone. 2: Reserved. 3: Do not care/take no action.	1685
ReqCabZonHeat	---	0-3	Request Cab Zone Heating. 0: Do not heat cab engine zone. 1: Heat cab zone. 2: Reserved. 3: Do not care/take no action.	1686
SelctMaxVehSpdLmt	---	0-7	Selected Maximum Vehicle Speed Limit. 0: No maximum vehicle speed selected. 1-7: Valid selectable speed limits.	2596

PGN Transmitters

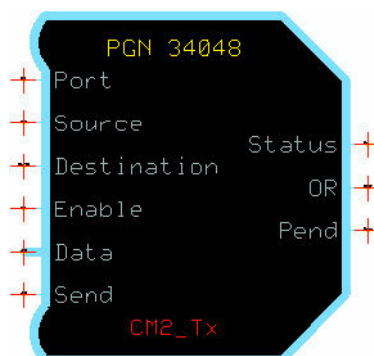
Outputs

The outputs of the **CM1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

CM2_Tx—Cab Message 2 Transmitter

The **CM2_Tx** function block transmits the CM2 message.



PGN: 34048 (0x8500)

Send this message at least every 1 second and upon a change, but send the message no faster than every 100ms.

Inputs

The inputs to the **CM2_Tx** function block are described.

Name	Type	Range	Description	SPN
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.	---
Source	U8	0-253	J1939 address of the transmitting device.	---
Destination	---	0-255	Address to which the message is sent.	---
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	---
Priority	U8	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.	---
Send	BOOL	T/F	Determines if message is transmitted. T: Trigger message transmission. F: No message transmission	---

PGN Transmitters

Name	Type	Range	Description	SPN
EngFan2RqstSpd	U16	0-10000	Requested Percent Fan 2 Speed. Resolution: 0.4% [0.01%]	6730
PerfBiasSel	U16	0-10000	Performance Bias Selection. Resolution: 0.4% [0.01%]	6874
SCROplndOvrSw	U8	0-3	SCR Operator Inducement Override Switch. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	6881
HeatExDebPurgInhbtSw	U8	0-3	Heat Exchanger Debris Purge Inhibit Switch. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	7033
HeatExDebPurgForceSw	U8	0-3	Heat Exchanger Debris Purge Force Switch. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	7034
PredCrsCtrlEnSw	U8	0-3	Predictive Cruise Control Enable Switch. 0: Predictive cruise control is not enabled. 1: Predictive cruise control is enabled. 2: Error. 3: Unavailable.	7436
PredCrsCtrlDeactRqst	U8	0-3	Predictive Cruise Control Deactivation Request. 0: Predictive cruise control is not requested to be deactivated. 1: Predictive cruise control is requested to be deactivated. 2: Error. 3: Unavailable.	7437
EngStopStrtDisCmd	U8	0-3	Engine Stop Start Disable Command. 0: Automatic engine stop-start allowed. 1: Automatic engine stop-start disabled. 2: Reserved. 3: Don't care/take no action.	7759
ElevEngSpdAllowedSw	U8	0-3	Elevated Engine Speed Allowed Switch. 0: Not allowed to elevate engine speed. 1: Allowed to elevate engine speed. 2: Error. 3: Unavailable.	7579
AftrtrtmntRegenEngSpdAl low	U8	0-3	Aftertreatment Regeneration Engine Speed Allowed. 0: Aftertreatment regeneration is not allowed when engine speed exceeds regeneration threshold. 1: Aftertreatment regeneration is allowed when engine speed exceeds regeneration threshold. 2: Error. 3: Unavailable.	7580
PredCrsCtrlMaxPosOffset	U16	0-31250	Predictive Cruise Control Maximum Positive Offset. Resolution: 0.125 km/h [0.001 km/h]	7438

PGN Transmitters

Name	Type	Range	Description	SPN
PredCrsCtrlMaxNegOffset	S16	-31250-0	Predictive Cruise Control Maximum Negative Offset. 0: Off. Transmission does not respond to auto-neutral (manual return) requests made through SPN 7695 or other designated input. 1: On. Transmission can respond to auto-neutral (manual return) requests made through SPN 7695 or other designated input. 2: Error. 3: Unavailable. Resolution: 0.125 km/h [0.001 km/h]	7439
TransAutoNeutEn	U8	0-3	Transmission Auto-Neutral (Manual Return) Enable.	7694
AfttrtmntSysEnCmd	U8	0-3	Aftertreatment System Enable Command. 0: De-activate aftertreatment system. 1: Activate aftertreatment system. 2: Reserved. 3: Don't care/take no action.	8148
ActShiftConsoleRqst	U8	0-3	Active Shift Console Request. 0: Use primary shift console. 1: Use secondary shift. 2: Reserved. 3: Don't care/take no action.	8855
EngIdleMgmtPendEvOvrd	U8	0-3	Engine Idle Management Pending Event Override. 0: Off. Not requesting an override. 1: On. Requesting an override. 2: Error. 3: Unavailable.	9374

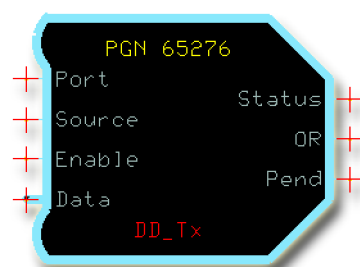
Outputs

The outputs of the **CM2_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

DD_Tx—Dash Display Transmitter

The **DD_Tx** function block transmits the DD message defined by J1939-DA.



PGN Transmitters

It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 65276 (0xFEFC)

Inputs

The inputs to the **DD_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	----	Determines which physical CAN port of the hardware is used to transmit the message.	----
Source	----	0–253	J1939 address of the transmitting device.	----
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	----
Priority	----	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	----
Tx Rate	----	0–65535	Time between consecutive DD message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	----
WashFluidLev	----	0–10000	Washer Fluid Level. Resolution: 0.4% [0.01 %]	80
FuelLevel1	----	0–10000	Fuel Level 1. Resolution: 0.4% [0.01 %]	96
FuelFiltDifP	----	0–5000	Engine Fuel Filter Differential Pressure. Resolution: 0.2 kPa [0.1 kPa]	95
OilFiltDifP	----	0–1250	Engine Oil Filter Differential Pressure. Resolution: 0.5 kPa [0.1 kPa]	99
CargoAmbTemp	----	-27300000–173496875	Cargo Ambient Temperature. Resolution: 0.03125° C [0.00001° C]	169
FuelLevel2	----	0–10000	Fuel Level 2. Resolution: 0.4% [0.01 %]	38

PGN Transmitters

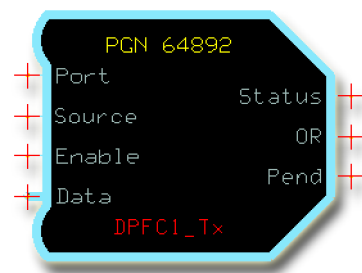
Outputs

The outputs of the **DD_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

DPFC1_Tx—Diesel Particulate Filter Control 1 Transmitter

The **DPFC1_Tx** function block transmits the DPFC1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 64892 (0xFD7C)

Inputs

The inputs to the **DPFC1_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	—	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive DPFC1 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
DPFLampCmd	---	0-7	Diesel Particulate Filter Lamp Command. 0: Off. 1: On – solid. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: On – fast blink (1 HZ). 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Unavailable.	3697
DPFPasvRegenStat	---	0-3	Diesel Particulate Filter Passive Regeneration Status. 0: Inactive. 1: Active. 2: Reserved for SAE assignment. 3: Unavailable.	3699
DPFActvRegenStat	---	0-3	Diesel Particulate Filter Active Regeneration Status. 0: Inactive. 1: Active. 2: Regeneration needed - automatically initiated active regeneration imminent. 3: Unavailable.	3700
DPFFilterStat	---	0-7	Diesel Particulate Filter Status. 0: Regeneration not needed. 1: Regeneration needed - lowest level. 2: Regeneration needed - moderate level. 3: Regeneration needed - highest level. 4:: Reserved for SAE assignment. 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Not available.	3701
ActRegenInhStat	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Status. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3702
ActRegenInhDueToSw	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3703
ActRegenInhDueToClutch	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Clutch Disengaged. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3704
ActRegenInhDueToSvcBrk	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Service Brake Active. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3705
ActRegenInhDueToPTO	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to PTO Active. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3706

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
ActRegenInhDueToAcc	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Accelerator Pedal Off Idle. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3707
ActRegenInhDueToNeut	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Out of Neutral. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3708
ActRegenInhDueToSpdAbv	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Above Allowed Speed. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3709
ActRegenInhDueToPkBrk	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Parking Brake Not Set. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3710
ActRegenInhDueToLowGasT	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Gas Temperature. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3711
ActRegenInhDueToSysFlt	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to System Fault Active. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3712
ActRegenInhDueToSysTO	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3713
ActRegenInhDueToTmpLO	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Temporary System Lockout. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3714
ActRegenInhDueToPrmLO	—	0–3	Diesel Particulate Filter Active Regeneration Inhibited Due to Permanent System Lockout. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3715

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
ActRegenInhDueToEngNotWrm	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Engine Not Warmed Up. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3716
ActRegenInhDueToSpdBel	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Below: Allowed Speed. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3717
ActRegenInitConfig	---	0-3	Diesel Particulate Filter Automatic Active Regeneration Initiation Configuration. 0: Not enabled. 1: Enabled. 2: Reserved for SAE assignment. 3: Unavailable.	3718
ExhHighTLampCmd	---	0-7	Exhaust System High Temperature Lamp Command. 0: Off. 1: On - solid 2: Reserved for SAE assignment. 3: Reserved for SAE Assignment. 4: Reserved for SAE Assignment. 5: Reserved for SAE Assignment. 6: Reserved for SAE Assignment. 7: Unavailable.	3698
ActRegenForcedStat	---	0-7	Diesel Particulate Filter Active Regeneration Forced Status. 0: Inactive. 1: Active – Forced by Switch. 2: Active – Forced by Service Tool. 3: Reserved for SAE Assignment. 4: Reserved for SAE Assignment. 5: Reserved for SAE Assignment. 6: Reserved for SAE Assignment. 7: Unavailable.	4175
HCDPurgEn	---	0-3	Hydrocarbon Doser (HCD) Purging Enable. 0: Purging not enabled. 1: Purging enabled, less urgent. 2: Purging enabled, urgent. 3: Unavailable.	5504
ActRegenInhDueToLowGasP	---	0-3	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Pressure. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	5629
NotMetForActRegen	---	0-3	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration. 0: Not inhibited. 1: Inhibited. 2: Reserved for SAE assignment. 3: Unavailable.	3750

PGN Transmitters

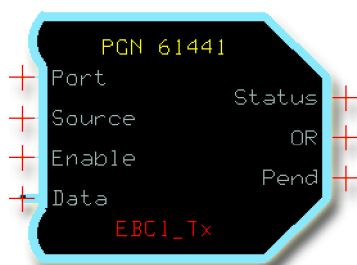
Outputs

The outputs of the **DPFC1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

EBC1_Tx—Electronic Brake Controller 1 Transmitter

The **EBC1_Tx** function block transmits the EBC1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 61441 (0xF001)

Inputs

The inputs to the **EBC1_Tx** function block are described.

Name	Type	Range	Description [Unit]	—
Port	BOOL	T/F	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive EBC1 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—

PGN Transmitters

Name	Type	Range	Description [Unit]	---
ASREngCtrlAct	---	0–3	ASR Engine Control Active: 0: ASR engine control passive but installed. 1: ASR engine control active. 2: Reserved. 3: Unavailable.	561
ASRBrkCtrlAct	---	0–3	ASR Brake Control Active. 0: ASR brake control passive but installed. 1: ASR brake control active. 2: Reserved. 3: Unavailable.	562
ABSActive	---	0–3	ABS Brake Control Active. 0: ABS passive but installed. 1: ABS active. 2: Reserved. 3: Unavailable.	563
EBSBrakeSw	---	0–3	EBS Brake Switch. 0: Brake pedal is not being pressed. 1: Brake pedal is being pressed. 2: Error. 3: Unavailable.	1121
BrakePedalPsn	---	0–10000	Brake Pedal Position Resolution of 0.4% [0.01%]	521
ABSOFFRoadSw	---	0–3	ABS Off-road Switch. 0: ABS off-road switch passive. 1: ABS off-road switch active. 2: Error. 3: Unavailable.	575
ASROFFRoadSw	---	0–3	ASR Off-Road Switch. 0: ASR off-road switch passive. 1: ASR off-road switch active. 2: Error. 3: Unavailable.	576
ASRHillHoldSw	---	0–3	ASR Hill Holder Switch 0: ASR hill holder switch passive. 1: ASR hill holder switch active. 2: Error. 3: Unavailable.	577
TracCtrlOvrRdSw	---	0–3	Traction Control Override Switch: 0: Off. 1: On. 2: Error. 3: Unavailable.	1238
AccelInterSw	---	0–3	Accelerator Interlock Switch: 0: Off. 1: On. 2: Error. 3: Unavailable.	972
EngDerateSw	---	0–3	Engine Derate Switch: 0: Off. 1: On. 2: Error. 3: Unavailable.	971

PGN Transmitters

Name	Type	Range	Description [Unit]	---
EngAuxShutDnSw	---	0–3	Engine Auxiliary Shutdown Switch: 0: Off. 1: On. 2: Error. 3: Unavailable.	970
RmtAccelEnblSw	---	0–3	Remote Accelerator Enable Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	969
EngRetarderSel	---	0–10000	Engine Retarder Selection. Resolution: 0.4% [0.01%]	973
ABSFULLOper	---	0–3	ABS Fully Operational. 0: Not fully operational. 1: Fully operational. 2: Reserved. 3: Unavailable.	1243
EBSRedWarnSig	---	0–3	EBS Red Warning Signal. 0: Off. 1: On. 2: Reserved. 3: Unavailable.	1439
EBSABSAmbWarnSig	---	0–3	ABS/EBS Amber Warning Signal (Powered Vehicle): 0: Off. 1: On. 2: Reserved. 3: Do not care/take no action.	1438
ATCASRInfoSig	---	0–3	ATC/ASR Information Signal: 0: Off. 1: On. 2: Reserved. 3: Do not care/take no action.	1793
BrakeCtrlngSA	---	0–253	Source Address of Controlling Device for Brake Control	1481
HaltBrakeSw	---	0–3	Halt brake switch. 0: Halt brake switch passive. 1: Halt brake switch active. 2: Error. 3: Unavailable.	2911
TrailABSStat	---	0–3	Trailer ABS Status. 0: Trailer ABS status information available but not active. 1: Trailer ABS active. 2: Reserved. 3: Unavailable.	1836
TrctrMntTrailABSWarnSig	---	0–3	Tractor-Mounted Trailer ABS Warning Signal: 0: Off. 1: On. 2: Reserved. 3: Do not care/take no action.	1792

PGN Transmitters

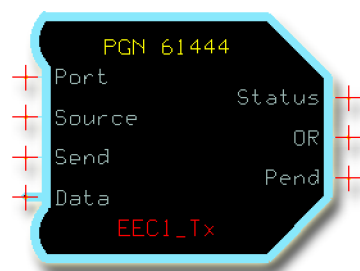
Outputs

The outputs of the **EBC1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

EEC1_Tx—Electronic Engine Controller 1 Transmitter

The **EEC1_Tx** function block transmits the EEC1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 61444 (0xF004)

Inputs

The inputs to the **EEC1_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	BOOL	T/F	Determines which physical CAN port of the hardware is used to transmit the message.	---
Source	---	0–253	J1939 address of the transmitting device.	---
Send	BOOL	T/F	The message is sent on a false to true transition.	---
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	---

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
EngineTorqMode	----	0–15	Engine Torque Mode. 0: Low idle governor/no request (default mode). 1: Accelerator pedal/operator selection. 2: Cruise control. 3: PTO governor. 4: Road speed governor. 5: ASR control. 6: Transmission control. 7: ABS control. 8: Torque limiting. 9: High speed governor. 10: Braking system. 11: Remote accelerator. 12: Service procedure. 13: Not defined. 14: Other. 15: Not available.	899
ActEnginePctTorq_HiRes	U16	0-875	Actual Engine – Percent Torque High Resolution. Resolution: 0.125% [0.001%]	4154
DrvrDmndEngTorq	----	0–125	Driver's Demand Engine - Percent Torque. [%]	512
ActEnginePctTorq	----	0–125	Actual Engine - Percent Torque. [%]	513
EngineSpeed	----	0–8031	Engine Speed. [RPM]	190
SrcAddrEngCtrl	----	0–253	Source Address of Controlling Device for Engine Control.	1483
EngStartMode	----	0–15	Engine Starter Mode. 0: Start not requested. 1: Starter active, not engaged. 2: Starter active, engaged. 3: Start finished; starter not active after having been actively engaged (after 50 ms mode goes to 0000). 4: Starter inhibited due to engine already running. 5: Starter inhibited due to engine not ready for start (preheating). 6: Starter inhibited due to driveline engaged or other transmission inhibit. 7: Starter inhibited due to active immobilizer. 8: Starter inhibited due to starter over-temp. 9: Starter inhibited due to intake air shutoff valve being active. 10: Starter inhibited due to active emissions control system condition. 11: Starter inhibited due to ignition key cycle required. 12: Starter inhibited - reason unknown. 13: Starter inhibited - reason unknown. 14: Error. 15: Not available.	1675
EngDemandPctTorq	----	-125-125	Engine Demand - Percent Torque [%]	2432

PGN Transmitters

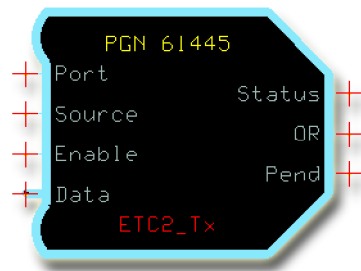
Outputs

The outputs of the **EEC1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

ETC2_Tx—Electronic Transmission Controller 2 Transmitter

The **ETC2_Tx** function block transmits the ETC2 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 61445 (0xF005)

Inputs

The inputs to the **ETC2_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	BOOL	T/F	Determines which physical CAN port of the hardware is used to transmit the message.	---
Source	---	0–253	J1939 address of the transmitting device.	---
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	---
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	---
Tx Rate	---	0–65535	Time between consecutive ETC2 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	---
TransCurRngCharA	---	0-255	Transmission Current Range, First Character [ASCII]	163
TransCurRngCharB	---	0-255	Transmission Current Range, Second Character [ASCII]	163

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
TransReqRngCharA	---	0-255	Transmission Requested Range, First Character [ASCII]	162
TransReqRngCharB	---	0-255	Transmission Requested Range, Second Character. [ASCII]	162
TransSelGear	---	-125-125,251	Transmission Selected Gear.	524
TrnActGearRt	---	0-64255	Transmission Actual Gear Ratio. [0.001]	526
TrnsCurrGear	---	-125-125,251	Transmission Current Gear.	523

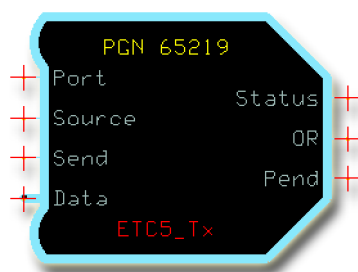
Outputs

The outputs of the **ETC2_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0-65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

ETC5_Tx—Electronic Transmission Controller 5 Transmitter

The **ETC5_Tx** function block transmits the ETC5 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 65219 (0xFEC3)

Inputs

The inputs to the **ETC5_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	T/F	Determines which physical CAN port of the hardware is used to transmit the message.	---
Source	---	0-253	J1939 address of the transmitting device.	---
Send	BOOL	T/F	The message is sent on a false to true transition.	---

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	---
TransHighRngSensSW	---	0–3	Transmission High Range Sense Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	778
TransLowRngSensSW	---	0–3	Transmission Low Range Sense Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	779
TransRvsDirSW	---	0–3	Transmission Reverse Direction Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	767
TransNeutralSW	---	0–3	Transmission Neutral Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	604
TransFwdDirSW	---	0–3	Transmission Forward Direction Switch. 0: Off. 1: On. 2: Error. 3: Unavailable.	903

Outputs

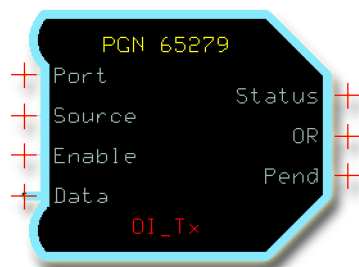
The outputs of the **ETCS_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Transmitters

OI_Tx—Operator Indicators Transmitter

The **OI_Tx** function block transmits the OI message defined by J1939-DA.



PGN: 65279 (0xFEFF)

It encodes data provided from the application and broadcasts it on the CAN bus.

Inputs

The inputs to the **OI_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	BOOL	T/F	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive OI message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—
WaterInFuelInd	—	0–3	Water In Fuel Indicator. 0: Indicators inactive. 1: Upshift indicator active. 2: Downshift indicator active. 3: Do not care/take no action.	97
OperaShiftPrompt	—	0–3	Operator Shift Prompt.	5675

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
DrivWarnSysIndicator	—	0—7	Driver Warning System Indicator Status Range. 0: Off - Used when driver warning system is non-active - which, by requirement, means the low-level and severe inducement systems are also non-active 1: On – solid - Used when driver warning system is activated for any relevant malfunction. 2: Reserved for SAE assignment. 3: Reserved for SAE assignment. 4: On – fast blink (1 Hz) - Used for the second driver warning system detection threshold for diesel exhaust fluid level, where the visual alarm of the driver warning system is required to "escalate in intensity". 5: Reserved for SAE assignment. 6: Reserved for SAE assignment. 7: Not available.	5825
ECSOInducedSeverity	—	0—7	Emission Control System Operator Inducement Severity. 0: Driver warning, low-level inducement, and severe inducement non-active. 1: Inducement level 1. 2: Inducement level 2. 3: Inducement level 3. 4: Inducement level 4. 5: Inducement level 5. 6: Temporary override of inducement. 7: Not available / not supported.	5826

Outputs

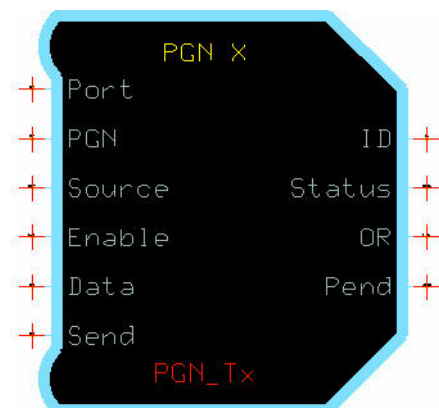
The outputs of the **OI_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Transmitters

PGN_Tx—Parameter Group Number Transmitter

The **PGN_Tx** function block transmits a PGN from a device.



This function block supports Page 1, Page 2, PDU1, and PDU2 PGNs.

Inputs

The inputs to the **PGN_Tx** function block are described.

Name	Type	Range	Description
Port	Port		Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
DataPage	U8	0-3	The data page property of the message, used to set the data page and extended data page of the ID. Normally set to 0.
PGN	U16	0-65535	The J1939 Parameter Group Number.
Source	U8	0-255	J1939 address of the transmitting device.
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.
Data	ARRAY[8]U8		Array of data to be sent for the PGN. The length of the message is always 8.

PGN Transmitters

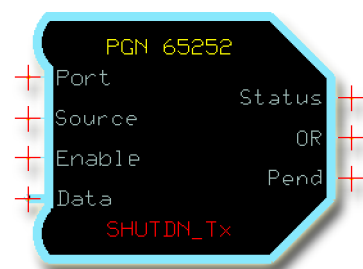
Outputs

The outputs of the **PGN Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

SHUTDN_Tx—Shutdown Transmitter

The **SHUTDN_Tx** function block transmits the SHUTDN message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 65252 (0xFEE4)

Inputs

The inputs to the **SHUTDN_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.	---
Source	---	0–253	J1939 address of the transmitting device.	---
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	---
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	---
Tx Rate	---	0–65535	Time between consecutive SHUTDN message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	---

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
EISHasShutDwnEng	---	0-3	Engine Idle Shutdown has Shutdown Engine. 0: No. 1: Yes. 2: Error. 3: Unavailable.	593
EISDrvrAlertMode	---	0-3	Engine Idle Shutdown Driver Alert Mode. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	594
EISTimerOverride	---	0-3	Engine Idle Shutdown Timer Override. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	592
EISTimerState	---	0-3	Engine Idle Shutdown Timer State. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	590
EISTimerFunc	---	0-3	Engine Idle Shutdown Timer Function. 0: Disabled in calibration. 1: Enabled in calibration. 2: Error. 3: Unavailable.	591
ACHighPressFanSW	---	0-3	A/C High Pressure Fan Switch. 0: Pressure normal. 1: Pressure high, fan may be engaged. 2: Error. 3: Unavailable.	985
RefrigLowPressSW	---	0-3	Refrigerant Low Pressure Switch: 0: Pressure normal. 1: Pressure too low, compressor clutch may be disengaged. 2: Error. 3: Unavailable.	875
RefrigHiPressSW	---	0-3	Refrigerant High Pressure Switch: 0: Pressure normal. 1: Pressure too high, compressor clutch may be disengaged. 2: Error. 3: Unavailable.	605
EngWaitToStartLmp	---	0-3	Engine Wait to Start Lamp: 0: Off. 1: On. 2: Error. 3: Unavailable.	1081
PrtctSysShutDwnEng	---	0-3	Engine Protection System has Shutdown Engine: 0: No. 1: Yes. 2: Error. 3: Unavailable.	1110
PrtctSysApprchShutDwn	---	0-3	Engine Protection System Approaching Shutdown. 0: Not approaching. 1: Approaching. 2: Error. 3: Unavailable.	1109

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
PrtctSysTmrOverride	---	0-3	Engine Protection System Timer Override. 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	1108
PrtctSysTmrState	---	0-3	Engine Protection System Timer State 0: Inactive. 1: Active. 2: Error. 3: Unavailable.	1107
PrtctSysConfig	---	0-3	Engine Protection System Configuration: 0: Disabled in calibration. 1: Enabled in calibration. 2: Error. 3: Unavailable.	1111
EngAlarmAck	---	0-3	Engine Alarm Acknowledge. 0: Engine alarm acknowledge not active. 1: Engine alarm acknowledge active. 2: Error. 3: Unavailable.	2815
EngAlarmOutCmdStat	---	0-3	Engine Alarm Output Command Status. 0: Engine alarm output command not active. 1: Engine alarm output command active. 2: Reserved. 3: Unavailable.	2814
EngAirShutoffCmdStat	---	0-3	Engine Air Shutoff Command Status. 0: Air shutoff disabled, not attempting to shutoff engine air supply. 1: Air shutoff enabled, attempting to shutoff engine air supply. 2: Reserved. 3: Unavailable.	2813
EngOverspeedTest	---	0-3	Engine Overspeed Test. 0: Engine overspeed test not active. 1: Engine overspeed test active. 2: Reserved. 3: Unavailable.	2812
EngAirShutoffStat	---	0-3	Engine Air Shutoff Status: 0: Air flow allowed to engine. 1: Air flow restricted. 2: Error. 3: Unavailable.	3667
PTOShutDwnEng	---	0-3	PTO Shutdown has Shutdown Engine. 0: No. 1: Yes. 2: Error. 3: Unavailable.	5404
CoolantLevEngProtShut	---	0-3	Coolant Level Engine Protection Shutdown Status. 0: Disabled. Calibration does not allow engine production due to low coolant level or the override is currently active. 1: Enabled. Calibration allows engine protection due to low coolant level and the override is not currently active. 2: Reserved. 3: Unavailable.	5566

PGN Transmitters

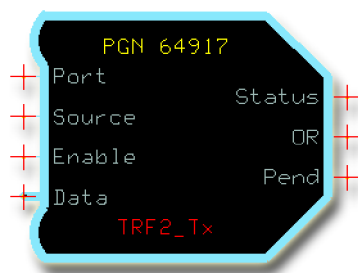
Outputs

The outputs of the **SHUTDN_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

TRF2_Tx—Transmission Fluids 2 Transmitter

The **TRF2_Tx** function block transmits the TRF2 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 64917 (0x FD95)

Inputs

The inputs to the **TRF2_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	—	0–65535	Time between consecutive TRF2 message transmissions. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	—

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
TrnsOilFiltResSw	—	0–3	Transmission Oil Filter Restriction Switch: 0: No restriction. 1: Restriction exists on oil filter. 2: Error. 3: Unavailable.	3359
TrnsOilLevelSw	—	0–3	Transmission Oil Level Switch. 0: Empty. 1: Full or not empty. 2: Error. 3: Unavailable.	3533
TrnsOvrHeatInd	—	0–3	Transmission Overheat Indicator. 0: Transmission overheat indicator is off. 1: Transmission overheat indicator is on continuously. 2: Transmission overheat indicator is flashing. 3: Unavailable.	5345
TrnsTorqConvOilOutT	—	-27300000–173496875	Transmission Torque Converter Oil Outlet Temperature. Resolution: 0.03125° C [0.00001° C]	3823
TrnsOilLifeRemain	—	0–10000	Transmission Oil Life Remaining. Resolution: 0.4% [0.01%]	4177
TrnsOilTemp2	—	-27300000–173496875	Transmission Oil Temperature 2 Resolution: 0.03125° C [0.00001° C]	5913
TrnsOilLevel2HiLow	—	-625–625	Transmission Oil Level 2 High/Low. Resolution: 0.5 L [0.1 L]	5914
TrnsOilLevel2CountT	—	0–15	Transmission Oil Level 2 Countdown Timer	5915
TrnsOilLevelMeasStat	—	0–15	Transmission Oil Level 2 Measurement Status	5916

Outputs

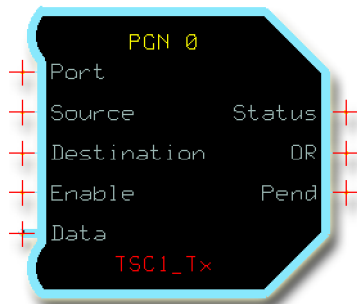
The outputs of the **TRF2_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Transmitters

TSC1_Tx—Torque/Speed Control 1 Transmitter

The **TSC1_Tx** function block transmits the TSC1 message defined by J1939-DA.



It encodes data provided from the application and broadcasts it on the CAN bus.

PGN: 0 (0x 0000)

Inputs

The inputs to the **TSC1_Tx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.	—
Source	—	0–253	J1939 address of the transmitting device.	—
Destination	U8	0–255	Destination address of the receiving device.e.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Data	BUS	—		
EngOvrRdCtrlMode	—	0–3	Engine Override Control Mode. 0: Override disabled - Disable any existing control commanded by the source of this command. 1: Speed control - Govern speed to the included “desired speed” value. 2: Torque control - Control torque to the included “desired torque” value. 3: Speed/torque limit control - Limit speed and/or torque based on the included limit values. The speed limit governor is a droop governor where the speed limit value defines the speed at the maximum torque available during this operation.	695
EngReqSpdCtrlCnd	—	0–3	Engine Requested Speed Control Conditions. 0: Transient optimized for driveline disengaged and non-lockup conditions. 1: Stability optimized for driveline disengaged and non-lockup conditions. 2: Stability optimized for driveline engaged and/or in lockup condition 1 (for example, vehicle driveline). 3: Stability optimized for driveline engaged and/or in lockup condition 2 (for example, PTO driveline).	696
OvrRdCntlModePri	—	0–3	Override Control Mode Priority. 0: Highest priority. 1: High priority. 2: Medium priority. 3: Low priority.	897

PGN Transmitters

Name	Type	Range	Description [Unit]	SPN
EngReqSpeedLimit	---	0-8031	Engine Requested Speed/Speed Limit. [RPM]	898
EngReqTorqLimit	---	-125-125	Engine Requested Torque/Torque Limit. [%]	518
TSC1CtrlPurpose	U8	0-31	TSC1 Control Purpose. 0: P1 - Accelerator pedal/operator selection. 1: P2 - Cruise control. 2: P3 - PTO governor. 3: P4 - Road speed governor. 4: P5 - Engine protection. 5: P6 - Transient optimized torque limit. 6: P7 - Automated driving system input. 7-30: P8-P31 are reserved. 31: P32 - Temporary power train control. Original use of TSC1 command.	3350
EngReqTorq_HiRes	U16	0-875	Engine Requested Torque - High Resolution. Provides increased granularity of torque request. Used with SPN 518 Engine Requested Torque/Torque Limit. The resulting torque/torque limit is calculated by adding these two values. Values greater than 875 are not available. Resolution: 0.125% [0.001%]	4191
EnMsgCounter	BOOL	T/F	T: Message counter enabled. F: Message counter and Checksum disabled.	4206
EnMsgChkSum	BOOL	T/F	T: Message Checksum enabled. F: Message Checksum disabled.	4207
DisVal_EngReqSpeedLimit	U16	0-65535	While speed control is disabled, this value gets transmitted for SPN 898.	---
DisVal_EngReqTorqLimit	U8	0-255	While torque control is disabled, this value gets transmitted for SPN 518.	---
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 3	---
Tx Rate	U16	0-65535	Time between TSC1 messages. If Tx Rate ≤ OS.ExecTime , then the message is sent every application loop while Enable = true. [ms]	---

Outputs

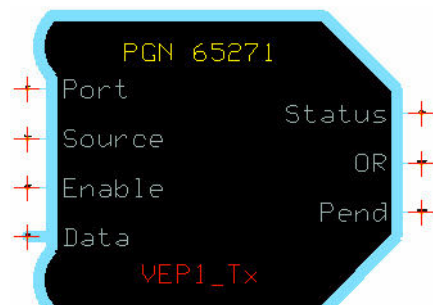
The outputs of the **TSC1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0-65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Transmitters

VEP1_Tx—Vehicle Electrical Power 1 Transmitter

The **VEP1_Tx** function block transmits the VEP1 (vehicle electrical power) message.



PGN: 65271 (0xFE7)

Inputs

The inputs to the **VEP1_Tx** function block are described.

Name	Type	Range	Description	SPN
Port	U16	—	Determines which CAN port to transmit data to.	—
Source	U8	0-253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Data	BUS	—	—	—
NetBattCurrent	S8	-125-125	Net Battery Current. [amps]	114
AltCurrent	U8	0-250	Alternator Current. [amps]	115
AltVoltage	U32	0-321275	Alternator Potential (Voltage). [0.01 V]	167
ELVoltage	U32	0-321275	Electrical Potential (Voltage). [0.01 V]	168
BattVoltage	U32	0-321275	Battery Potential (Voltage), Switched. [0.01 V]	158
Priority	U8	0-7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.	—
Tx Rate	U16	0-65535	Transmission Rate. Time between messages. Default: 1000. [ms]	—

PGN Transmitters

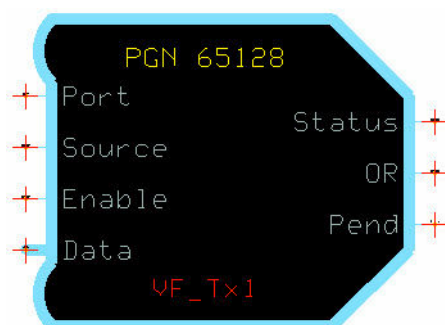
Outputs

The outputs of the **VEP1_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK. 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

VF_Tx—Vehicle Fluids Transmitter

The **VF_Tx** function block transmits information about vehicle fluids.



PGN: 65128 (0xFE68)

Inputs

The inputs to the **VF_Tx** function block are described.

Name	Type	Range	Description	SPN
Port	Port	—	Determines which CAN port to transmit data to. This variable can be found in the CAN sub-bus if using the Main template.	—
Source	U8	0-253	J1939 address of the transmitting device.	—
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.	—
Data	BUS	—	—	—
HydraulicTemp	S16	-40-210	Hydraulic temperature. [° C]	1638
HydrOilFiltResSw	U16	0-3	Hydraulic oil filter restriction switch. 0: No restriction. 1: Restriction exists. 2: Error. 3: Not available.	1713

PGN Transmitters

Name	Type	Range	Description	SPN
WinchOilPressSw	U8	0-3	Winch oil pressure switch. 0: Not OK. 1: OK. 2: Error. 3: Not available.	1857
HydraulicOilLev	U16	0-10000	Hydraulic Oil Level. [0.01%]	2602
Priority	U8	0-7	J1939 message priority for transmitting messages: • 0: Highest priority. • 7: Lowest priority. Default: 6.	—
Tx Rate	U16	0-65535	Transmission rate. Time between messages. Default: 1000. [ms]	—

Outputs

The outputs of the **VF_Tx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate that PLUS+1® standard status codes are used. This block implements the following: • 0x0000: Block is OK. • 0x8008: Invalid parameter. CAN transmission is disabled.
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

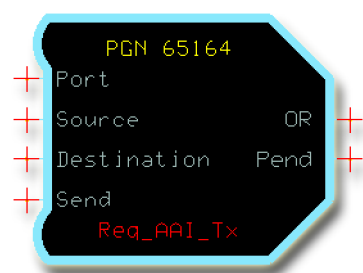
PGN Requesters

PGN requesters transmit requests for J1939 application data.

Reference information can be found in SAE J1939-21.

Req_AAI_Tx—Request Auxiliary Analog Information Transmitter

The **Req_AAI_Tx** function block transmits requests to other devices to send the AAI message.



It can be used to send requests to all devices at once or to a specific device.

PGN: 65164 (0xFE8C)

This function block does not receive the AAI message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_AAI_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	—	0-253	J1939 address of the transmitting device.
Destination	—	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

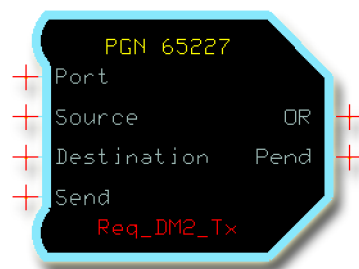
The outputs of the **Req_AAI_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_DM2_Tx—Request Diagnostic Message 2 Transmitter

The **Req_DM2_Tx** function block transmits requests to other devices to send the DM2 message.



It can be used to send requests to all devices at once or to a specific device.

PGN: 65227 (0xFECB)

This function block does not receive the DM2 message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_DM2_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	---	0-253	J1939 address of the transmitting device.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

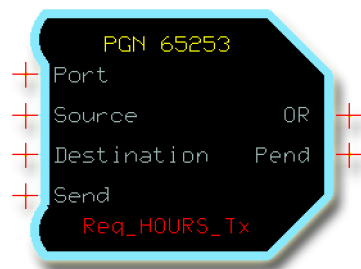
The outputs of the **Req_DM2_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_HOURS_Tx—Request Engine Hours, Revolutions Transmitter

The **Req_HOURS_Tx** function block transmits requests to other devices to send the HOURS message.



PGN: 65253 (0xFEE5)

It can be used to send requests to all devices at once or to a specific device.

This function block does not receive the HOURS message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_HOURS_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	---	0-253	J1939 address of the transmitting device.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

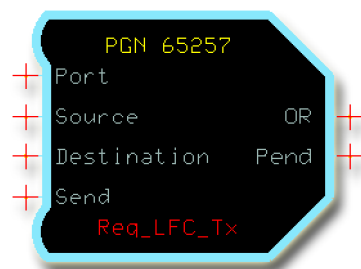
The outputs of the **Req_HOURS_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_LFC_Tx—Request Fuel Consumption (Liquid) Transmitter

The **Req_LFC_Tx** function block transmits requests to other devices to send the LFC message.



PGN: 65257 (0xFEE9)

It can be used to send requests to all devices at once or to a specific device.

This function block does not receive the LFC message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_LFC_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	—	0-253	J1939 address of the transmitting device.
Destination	—	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

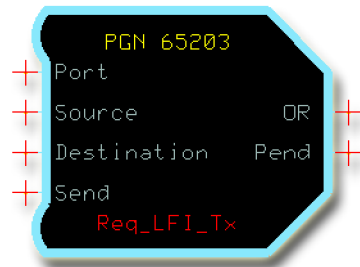
The outputs of the **Req_LFC_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_LFI_Tx—Request Fuel Information (Liquid) Transmitter

The **Req_LFI_Tx** function block transmits requests to other devices to send the LFI message.



It can be used to send requests to all devices at once or to a specific device.

PGN: 65203 (0xFEB3)

This function block does not receive the LFI message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_LFI_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	---	0-253	J1939 address of the transmitting device.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

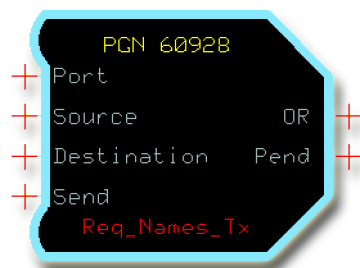
The outputs of the **Req_LFI_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_NAMES_Tx—Request NAMES Transmitter

The **Req_NAMES_Tx** function block transmits requests to other devices to send their claimed address with NAME information.



It can be used to send requests to all devices at once or to a specific device.

PGN: 60928 (0xEE00)

This function block does not receive the NAMES message or acknowledgment messages from responders.

J1939 requires all capable devices respond to this request, including the device sending the message. The **Addr_Claim_Tx_Rx** function block in this library does not automatically see this request is sent on the same CAN port. Therefore the application must internally trigger the **Force** input on the **Addr_Claim_Tx_Rx** function block when sending out the request to fulfill this requirement.

Inputs

The inputs to the **Req_NAMES_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	—	0-253	J1939 address of the transmitting device.
Destination	—	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

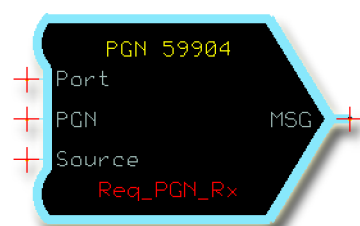
The outputs of the **Req_NAMES_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_PGN_Rx—Request PGN Receiver

The **Req_PGN_Rx** is a generic function block that receives requests from other devices for the specified PGN.



It can be used to trigger J1939 transmitters. It supports requests explicitly sent to this address as well as global requests.

PGN: 59904 (0xEA00)

No special configurations are required to receive global requests. The proper **Source** value must be set in order to receive requests intended for the device.

Inputs

The inputs to the **Req_PGN_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
PGN	—	0-0x3FFFF	Parameter Group Number. J1939 identifier for a specific set of data contained in a message. This indicates what PGN request to monitor for.
Source	—	0-255	J1939 address of this node. Sets the message filter to look for requests sent to the device. Messages sent to the global address are also received without additional configuration.

Outputs

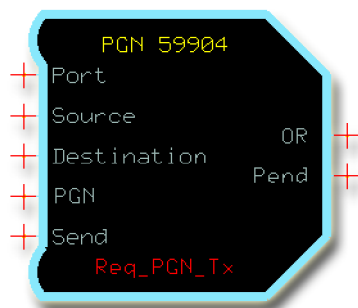
The outputs of the **Req_PGN_Rx** function block are described.

Name	Type	Range	Description
GlobalRequest	BOOL	T/F	Global Request. T: Indicates the last received PGN request was sent to a global address. F: Indicates the last received PGN request was sent to a destination specific address.
RequesterSA	U8	0-255	Requester Source Address. Address of the device sending the request.
Rx_Req	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.

PGN Requesters

Req_PGN_Tx—Request PGN Transmitter

The **Req_PGN_Tx** function block transmits requests to other devices to send the specified PGN.



It can be used to send requests to all devices at once or to a specific device.

It can be used with the **Req_PGN_Rx** function block, custom CAN receivers, or other non- PLUS+1® devices.

PGN: 59904 (0xEA00)

This function block does not receive the PGN or acknowledgment messages from responders.

Inputs

The inputs to the **Req_PGN_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port		---	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	0: Highest priority. 7: Lowest priority. Default: 6.
Source	---	0-253	J1939 address of the transmitting device.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
PGN	---	0-0x3FFFF	Parameter Group Number J1939 identifier for a specific set of data contained in a message. This indicates what PGN to request.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

The outputs of the **Req_PGN_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_VDS_Tx—Request Vehicle Direction/Speed Transmitter

The **Req_VDS_Tx** function block transmits requests to other devices to send the VDS message.



It can be used to send requests to all devices at once or to a specific device.

This function block transmits requests to other devices to send the VDS message.

PGN: 65256 (0xFEE8)

This function block does not receive the VDS message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_VDS_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	---	0-253	J1939 address of the transmitting device.
Destination	---	0-255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition. T: Trigger request message. F: No transmission.

Outputs

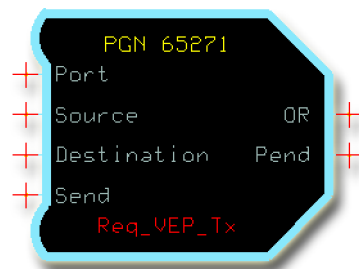
The outputs of the **Req_VDS_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

PGN Requesters

Req_VEP_Tx—Request Vehicle Electrical Power Transmitter

The **Req_VEP_Tx** function block transmits requests to other devices to send the VEP message.



It can be used to send requests to all devices at once or to a specific device.

This function block transmits requests to other devices to send the VEP message.

PGN: 65271 (0xFE7)

This function block does not receive the VEP message or acknowledgment messages from responders.

Inputs

The inputs to the **Req_VEP_Tx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Priority	U8		J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
Source	—	0–255	Address of the transmitting device. Only applies if Use Source is True.
Destination	—	0–255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	Used to trigger message transmission. T: Send message. F: Do not send message.

Outputs

The outputs of the **Req_VEP_Tx** function block are described.

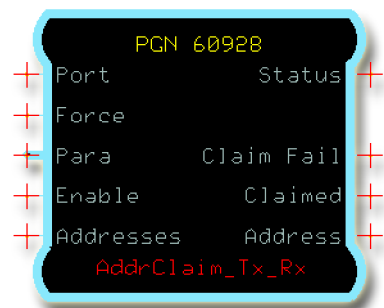
Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

Bi-Directional Transmitters and Receivers

The bi-directional function blocks can transmit and receive J1939 data broadcast on the CAN bus.

Addr_Claim_Tx_Rx—Address Claim Transmitter and Receiver

The **Addr_Claim_Tx_Rx** function block sends an address claimed message to claim an address.



It also responds to a request for address claimed.

PGN: 60928 (0xEE00)

Inputs

The inputs to the **Addr_Claim_Tx_Rx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Force	BOOL	T/F	On a False to True transition the function block transmits the currently claimed address. J1939 requires all devices to respond to a request for claimed addresses, even the device sending the request. The function block does not automatically respond to requests from its own application, therefore this input is available for the application to force a response when the request is sent.
Enable	BOOL	T/F	Enables CAN transmissions, start of address claim. T: Enable transmission. F: Disable transmission.
Addresses	Array[]U8	0–253	Array containing the desired addresses to claim. The value in the first element in the array is attempted first. If a failure occurs then the value in the next element is attempted. If only one address is defined, or the last address in the list is being claimed, then the Arbitrary Address Capable field is cleared indicating that the device cannot claim an alternative address.
Priority	U8	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.
IndustryGroup	---	0–7	Industry Group Field. Part of the J1939 name identification.
VehclSysInstance	---	0–15	Vehicle System Instance Field. Part of the J1939 name identification.
VehicleSystem	---	0–127	Vehicle System Field. Part of the J1939 name identification.
Function	---	0–255	Function Field. Part of the J1939 name identification.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]
FunctionInstance	—	0–31	Function Instance Field. Part of the J1939 name identification.
ECUInstance	—	0–7	ECU Instance Field. Part of the J1939 name identification.
ManufactureCode	—	0–2047	Manufacturer Code Field. Part of the J1939 name identification.
IdentityNumber	—	0–2097151	Identity Number Field. Part of the J1939 name identification.

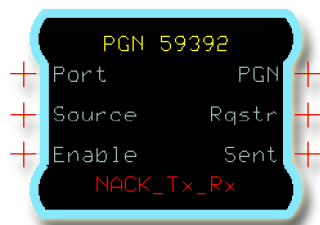
Outputs

The outputs of the **Addr_Claim_Tx_Rx** function block are described.

Name	Type	Range	Description
Status	U16	0–65535	Provides status information in a bitwise encoded format. The most significant bit is set with any other status bit to indicate PLUS+1® standard status codes are used. This block implements the following: 0x0000: Block is OK 0x8008: Invalid parameters. Name fields are truncated.
Claim Fail	BOOL	T/F	No address claimed. J1939 message transmissions disabled.
Claimed	BOOL	T/F	The current address successfully claimed. All other J1939 message transmissions can use the claimed address.
Address	U8	0-255	Current address in use for the address claim. Once Claimed is true, this value may be used as a source address.

NACK_Tx_Rx—Negative Acknowledge Transmitter

The **NACK_Tx_Rx** function block is used to receive J1939 requests not supported by the application and respond with a Negative Acknowledgment.



PGN: 59392 (0xE800)

Place this function block so it is executed after all other blocks and CAN receivers for J1939 PGN requests. Failure to do so may result in inadvertent negative responses for supported messages.

Inputs

The inputs to the **NACK_Tx_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive and transmit messages.
Priority	—	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
Source	---	0-253	J1939 address of this device, used to filter incoming request.
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.

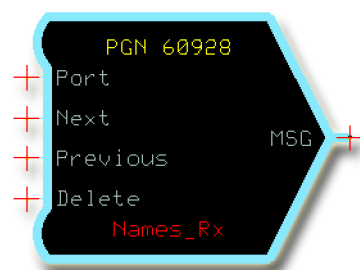
Outputs

The outputs of the **NACK_Tx_Rx** function block are described.

Name	Type	Range	Description
PGN	U32	0-262143	Requested Parameter Group Number. The unsupported PGN being requested. A negative acknowledgment is automatically sent to the requester.
Rqstr	U8	0-255	Source address of requester. Address requesting the PGN data. The negative acknowledgment is automatically sent to this address when a request is received.
Sent	BOOL	T/F	Signals when a NACK message has been transmitted. T: Message sent. F: Message not sent.

Names_Rx—Names Receiver

The **Names_Rx** function block receives address claim messages sent from other devices on the J1939 data bus.



PGN: 60928 (0xEE00)

The received information can be used to ensure all expected devices are present and keep track of what addresses they have claimed. Another use is to present the list of online devices using a display.

The data is stored within the block, and is reported to the application two ways:

- one at a time using the **NAME signals** and **Valid** outputs. The NAME reported is indicated with the **CurrentName** output. This can be manipulated via the **Next** and **Previous** inputs.
- all at once using **_Buffer** outputs. Each of these signals is an array where the elements of the same index from each array together represent information for a single NAME.

Inputs

The inputs to the **NAMES_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Next	BOOL	T/F	Increments the CurrentName and reports the next Name recorded in the list of address claims. T: Increment buffer. F: No action.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
Previous	BOOL	T/F	Decrement the CurrentName and reports the previous Name recorded in the list of address claims. T: Decrement buffer. F: No action.
Delete	BOOL	T/F	Deletes the current Name recorded in the list of address claims, thus reducing the total number of stored names by one. Delete data at current buffer index. F: No action.

Outputs

The outputs of the **NAMES_Rx** function block are described.

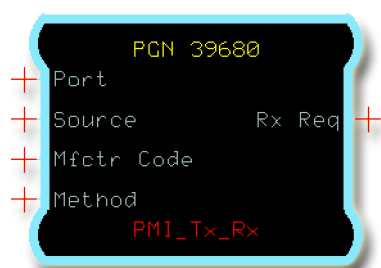
Name	Type	Range	Description
Total	U8	0–20	Total number of addresses stored in the list.
CurrentName	U8	0–20	List index of the address currently being reported.
OverFlow	BOOL	T/F	Pulses true when the buffers are full and another NAME is received. T: Buffer overflowed. F: Buffer did not overflow.
Address	U8	0–255	Address of the Name currently reported from the list.
ArbtryAddrCpbl	BOOL	T/F	Arbitrary Address Capability Field of the Name currently reported from the list.
ECUInstance	U8	0–7	ECU Instance Field of the Name currently reported from the list.
Function	U8	0–255	Function Field of the Name currently reported from the list.
FunctionInstance	U8	0–31	Function Instance Field of the Name currently reported from the list.
IdentityNumber	U32	0–2097151	Identity Number Field of the Name currently reported from the list.
IndustryGroup	U8	0–7	Industry Group Field of the Name currently reported from the list.
ManufactureCode	U16	0–2047	Manufacturer Code Field of the Name currently reported from the list.
VehclSysInstance	U8	0–15	Vehicle System Instance Field of the Name currently reported from the list.
VehicleSystem	U8	0–127	Vehicle System Field of the Name currently reported from the list.
Address_Buffer	Array[20]U8	0–255	List of received address. All corresponding Name information is stored at the same index in their respective lists.
Arbtry_Buffer	Array[20]BOOL	—	List of received Arbitrary Address Capable Fields. All corresponding Name information is stored at the same index in their respective lists.
ECUInst_Buffer	Array[20]U8	0–7	List of received ECU Instance Field. All corresponding Name information is stored at the same index in their respective lists.
Function_Buffer	Array[20]U8	0–255	List of received Function Field. All corresponding Name information is stored at the same index in their respective lists.
FuncInst_Buffer	Array[20]U8	0–31	List of received Function Instance Field. All corresponding Name information is stored at the same index in their respective lists.
Identity_Buffer	Array[20]U32	0–2097151	List of received Identity Number Field. All corresponding Name information is stored at the same index in their respective lists.
Industry_Buffer	Array[20]U8	0–7	List of received Industry Group Field. All corresponding Name information is stored at the same index in their respective lists.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
Manufact_Buffer	Array[20]U16	0–2047	List of received Manufacturer Code Field. All corresponding Name information is stored at the same index in their respective lists.
VSysInst_Buffer	Array[20]U8	0–15	List of received Vehicle System Instance Field. All corresponding Name information is stored at the same index in their respective lists.
VehicleSys_Buffer	Array[20]U8	0–127	List of received Vehicle System Field. All corresponding Name information is stored at the same index in their respective lists.
Valid_Buffer	Array[20]BOOL	—	List indicating whether data stored at the same index in the Address and Field lists is valid.

PMI_Tx_Rx—Proprietary Method Transmitter and Receiver

The **PMI_Tx_Rx** function block receives requests and responds by transmitting the PMI message.



It supports requests to both the designated address and those sent to the global address.

PGN: 39680 (0x9B00)

Inputs

The inputs to the **PMI_Tx_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive and transmit messages.
Source	—	0–255	J1939 address of this device, used to filter incoming request.
Mfctr Code	—	0–2047	Manufacturer Code. Identifier of the device manufacturer, same value as found in the address claim message.
Method	—	0–2097151	Method. Manufacturer assigned proprietary method. Refer to manufacture information for more details.

Outputs

The outputs of the **PMI_Tx_Rx** function block are described.

Name	Type	Range	Description
Rx_Req	BOOL	T/F	Received Request for PMI. T: Received request. F: Did not receive a request.

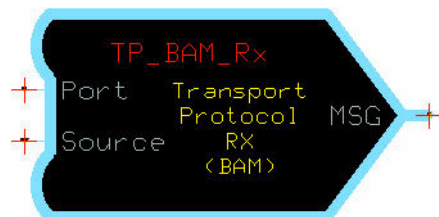
Bi-Directional Transmitters and Receivers

TransProtocol_Rx

The function blocks receive PGN data using the various J1939 transport protocol methods.

TP_BAM_Rx—Transport Protocol BAM Receiver

The **TP_BAM_Rx** function block receives globally addressed multipacket messages.



Inputs

The inputs to the **TP_BAM_Rx** function block are described.

Name	Type	Range	Description
ArraySize	U16	0-32767	Size memory allocated for storage.
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message. This variable can be found in the CAN sub-bus if using the Main template.
Source	U8	0-253	J1939 address of the transmitting device.

Outputs

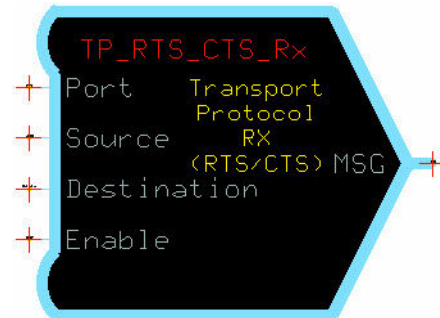
The outputs of the **TP_BAM_Rx** function block are described.

Name	Type	Range	Description [Unit]
ArraySize	U16	0-1785	Amount of memory available for storage. If a message is too large for the amount of data being stored, then no data transfer occurs.
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination. Array size is configured in StoreData.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
Faulted	BOOL	T/F	Pulses TRUE for one loop when a fault condition is detected. Either a sequence violation or timeout condition. T: Fault condition detected. F: No fault detected.

Bi-Directional Transmitters and Receivers

TP_RTS_CTS_Rx—Transport Protocol RTS CTS Receiver

The **TP_RTS_CTS_Rx** function block receives RTS (request to send) and CTS (clear to send) messages.



Inputs

The inputs to the **TP_RTS_CTS_Rx** function block are described.

Name	Type	Range	Description
ArraySize	U16	9-1785	Size of how much memory is allocated for storage.
PGNs	ARRAY[X]32	---	List of PGNs to support communication with. A connection abort message is used to reject PGNs if they are not in the array. Use a value of 0xFFFFFFFF in index 0 of the array to disable PGN filtering, which allows the function block to receive any PGN.
Port	Port	-	Determines which physical CAN port of the hardware is used to receive the message. This variable can be found in the CAN sub-bus if using the Main template.
Source	U8	0-253	J1939 address of the transmitting device.
Destination	U8	0-253	Address of the local receiving device.
Priority	U8	0-7	0: Highest priority. 7: Lowest priority.
InhibitTm	U8	0-50	The delay before a CTS message is sent. Increase this value to reduce BUS load.
Enable	BOOL	T/F	Enables message transmission. Device communicates using transport protocol messages. F: CAN messages are not sent.

Outputs

The outputs of the **TP_RTS_CTS_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
RTS_Msg	BUS	---	Request to Send message.	---
Rx	BOOL	T/F	True for one loop when a valid RTS message is received. T: Valid message received. F: Valid message not received.	---
PGN	U32	0-0x01FFFF	PGN from the RTS message.	2560
TotalMsgSize	U16	0-1785	Total Message Size from the RTS message.	2557
TotalNumOfPckts	U8	0-255	Total Number of Packets.	2558
MaxNumofPcktsSendableRTS	U8	0-255	Maximum number of packets that can be sent in response to one clear to send (CTS).	2559
DT_Msg	BUS	---	Data Transfer Message.	---

Bi-Directional Transmitters and Receivers

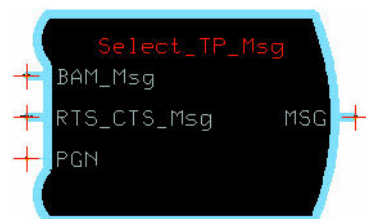
Name	Type	Range	Description [Unit]	SPN
Rx	BOOL	T/F	True for one loop when a valid DT message is received. T: Valid message received. F: Valid message not received.	—
Seq_Num	U8	0-255	Sequence Number from DT message.	2572
Data	ARRAY[7]	0-255	Packetized data from the DT message.	2573
ABORT_Msg	BUS	—	Abort Message	—
Rx	BOOL	T/F	True for one loop when a valid abort is received. T: Valid message received. F: Valid message not received.	—
PGN	U32	0-0x01FFFF	PGN indicated in the abort message.	2571
AbortReason	U8		Connection abort reason form the abort message.	2570
ABORT_Tx	BUS	—	Contains information about conditions that result in an Abort message being transmitted.	—
Abort_Reason_1	BOOL	T/F	True when the function block aborts a connection management RTS message while in a session. The active session continues. T: Transmitted about reason 1. F: No transmission.	
Abort_Reason_1_PGN	U32		PGN from the RTS message being aborted.	2560
Abort_Reason_2	BOOL	T/F	True when the function block aborts a connection management RTS message with a message size larger than the ArraySize. T: Transmitted about reason 2. F: No transmission.	
Abort_Reason_3	BOOL	T/F	True when the function block does not receive a DT message after transmitting a CM message. T: Transmitted about reason 3. F: No transmission.	
Abort_Reason_6	BOOL	T/F	True if a DT message is received when not expected. T: Transmitted about reason 6. F: No transmission.	
Abort_Reason_7	BOOL	T/F	True when the received DT message has an invalid sequence number. T: Transmitted about reason 7. F: No transmission.	
Abort_Reason_8	BOOL	T/F	True when the received DT message has a duplicate sequence error. T: Transmitted about reason 8. F: No transmission.	
Abort_Reason_9	BOOL	T/F	True when the function block aborts a connection management RTS message with a message size greater than 1785 bytes. T: Transmitted about reason 9. F: No transmission.	
Abort_Reason_250_RTS	BOOL	T/F	True when the function block aborts a connection management RTS message for any of the following reasons: TotalMsgSize less than 9. TotalNumOfPckts less than 2. MaxNumOfPcktsSendableRTS equals 0. PGN greater than 0x1FFFF. PGN not in list of supported PGNs. T: Transmitted abort reason 250 RTS. F: No transmission.	
Abort_Reason_250_DT	BOOL	T/F	True when the function block aborts a connection management RTS message for any of the following reasons. T: Transmitted abort reason 250 DT. F: No transmission.	

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]	SPN
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.	---
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.	---
Address	U8	0-253	The address from which the most recent data is received.	---
Status	U16	---	Bitwise code where multiple items can be reported at a time. 0x0000: Status OK. 0x8008: At least one parameter is out of range	---
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.	---
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination. Array size is configured in StoreData.	---

Select_TP_Msg—Select Transport Protocol Message

The **Select_TP_Msg** function block allows Transport Protocol BAM or a RTS CTS message to be received.



The function block switches between the latest received data. Store the message data with memory components before processing the message data.

Inputs

The inputs to the **Select_TP_Msg** function block are described.

Name	Type	Range	Description
RTS_CTS_Msg/BAM_MSG	BUS	---	Multipacket message output.
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785 bytes	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
PGN	U32	---	PGN to look for from the multipacket message.
Address	U8	---	Address to look for from the multipacket message.

Store_TP_Msg—Store Transport Protocol Message

The **Store_TP_Msg** function block stores a received, transport protocol message.



Bi-Directional Transmitters and Receivers

This function block is not required for a PGN if a parser function block is used because the parser function block stores the latest received message.

Inputs

The inputs to the **Store_TP_Msg** function block are described.

Name	Type	Range	Description
MSG_In/MSG	BUS	—	Multipacket message output.
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785 bytes	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
PGN	U32	—	PGN to look for from the multipacket message.
Address	U8	—	Address to look for from the multipacket message.

Parsers

The parser function blocks deconstruct, transfer and re-assemble message information.

CA_Parser—Command Address Parser

The **CA_Parser** function block deconstructs, transfers and re-assembles message information about the commanded address for an ECU.



PGN: 65240 (0xFED8)

Inputs

The inputs to the **CA_Parser** function block are described.

Name	Type	Range	Description
Para	BUS	—	
IndustryGroup	U8	0-7	Industry group.
VehclSysInstance	U8	0-15	Vehicle system instance.
VehicleSystem	U8	0-127	Vehicle system.
Function	U8	0-255	Function.
FunctionInstance	U8	0-31	Function instance.
ECUInstance	U8	0-7	ECU instance.
ManufactureCode	U16	0-2047	Manufacturer code.
IdentityNumber	U32	0-2097151	Identity number
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.

Outputs

The outputs of the **CA_Parser** unction block are described.

Name	Type	Range	Description [Unit]	SPN
ReclaimAddress	BOOL	T/F	T: Name in message matches device name. F: Name in message does not match device name.	2849
NewSrcAddr	U8	0-253	Address that this device attempts to claim.	2847
Address	U8	0-255	Source address of the device that transmitted the message.	—
Updated	BOOL	T/F	Pulses true for one loop when new data is available. T: Processed new data. F: Did not process new data.	—

CI_Parser—Component Identification Parser

The **CI_Parser** function block deconstructs, transfers and re-assembles message information about component information such as the model, make, and size.



PGN: 65259 (0xFEED)

Inputs

The inputs to the **CI_Parser** function block are described.

Name	Type	Range	Description
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.

Outputs

The outputs of the **CI_Parser** function block are described

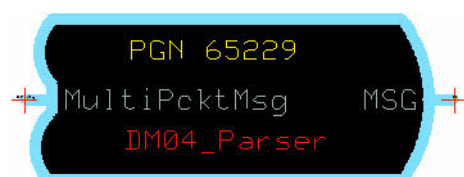
Name	Type	Range	Description [Unit]	SPN
Make	ARRAY[5]U8	—	Make of the component. [ASCII]	586
Make_Size	S16	-1-5	Bytes in Make that are used. If no message is received, -1 is reported.	—
Model	ARRAY[40]U8	—	Model of the component. [ASCII]	587
Model_Size	S16	-1-40	Bytes in Model that are used. If no message is received, -1 is reported.	—

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]	SPN
SerialNumber	Array		The component's serial number. [ASCII]	588
SerialNumber_Size	S16	-1–40	Bytes in the serial number that are used. If no message is received, -1 is reported.	—
UnitNumber	Array		Unit number or power unit. [ASCII]	233
UnitNumber_Size	S16	-1–40	Bytes in the unit number that are used. If no message is received, -1 is reported.	—
Address	U8	0-255	Source address of the device that transmitted the message.	—
Updated	BOOL	T/F	Pulses true for one loop when new data is available. T: Processed new data. F: Did not process new data.	—

DM04_Parser—Diagnostic Message 4 Parser

The **DM04_Parser** function block deconstructs, transfers and re-assembles message information about faults that use method 4.



PGN: 65229 (0xFECD)

Inputs

The inputs to the **DM04_Parser** function block are described.

Name	Type	Range	Description
Conv Meth	U8	1-3	Specifies which conversion method to use to decode faults when a fault is received that does not use method 4.
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.

Outputs

The outputs of the **DM04_Parser** function block are described.

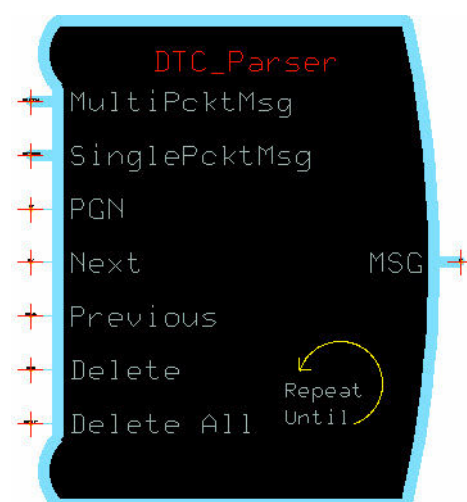
Name	Type	Range	Description [Unit]	SPN
Status	BUS	—	The Status bus contains information for each input that is transmitted in the message.	
Fault	BUS	—	The Fault bus contains information for each input that is transmitted in the message.	
FreezeFrameLength	U8	0-255	Freeze Frame Length. Required parameters plus the number of bytes in the manufacturer specific parameters.	1217
SPN	U32		Suspect Parameter Number of the current fault.	1214

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]	SPN
SPN_ConvMeth	BOOL	T/F	SPN Conversion Method. T: Uses Conv_Meth to determine SPN conversion method. F: Method 4 used.	1706
FMI	U8	—	Failure Mode Identifier of the current fault.	1215
Occurrence_Count	U8	—	Occurrence Count of the current fault.	1216
EngineTorqueMode	U8	0-15	Engine Torque Mode.	899
EngineIntakeMan1Prs	U16	0-500	Engine Intake Manifold #1 Pressure. [kPa]	102
EngineSpeed	U32	0-8031875	Engine Speed. [0.001 RPM]	190
EnginePctLoad	U8	0-125	Engine Percent Load at current speed. [%]	92
EngineCoolantTemp	S16	-40-210	Engine Coolant Temperature. [° C]	110
VehicleSpeed	U32	0-250996	Vehicle Speed. [0.001 km/h]	84
MSI_Data	(ARRAY[x]U8)	—	Manufacturer Specific Information. Depending on the application, the developer might need to adjust the size of the array.	4263
Address	U8	0-255	Source address of the device that transmitted the message.	—
Updated	BOOL	T/F	Pulses true for one loop when new data is available. T: Processed new data. F: Did not process new data.	—

DTC_Parser—Diagnostic Trouble Code Parser

The **DTC Parser** function block deconstructs, transfers and re-assembles message information about diagnostic trouble codes.



Inputs

The inputs to the **DTC_Parser** function block are described.

Name	Type	Range	Description
MultiPcktMsg	BUS	—	Multiple packets of data for a DTC.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
Address	U8	0-255	The most recent data is received from this address.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
SinglePcktMsg	BUS	—	Single packet of data for a DTC.
Address	U8	0-255	The most recent data is received from this address.
Data	(ARRAY[x]U8)	1-8	Array of data received from destination.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.
Next	BOOL	T/F	Increments the SPN, FMI, OC, and Address to the next fault in the buffers. T: Increment buffer. F: No action.
Previous	BOOL	T/F	Decrements the SPN, FMI, OC, and Address to the previous fault in the buffers. T: Decrement buffer. F: No action.
Delete	BOOL	T/F	Delete the current SPN, FMI, OC, and Address from the buffers. T: Delete SPN, FMI, OC, and Address. F: Do not delete.
Delete_All	BOOL	T/F	Delete all buffered data. T: Delete all data. F: Do not delete.
Conv Meth	U8	1-3	Specifies the conversion method used to decode the faults when a fault is received that does not use method 4.

Outputs

The outputs of the **DTC_Parser** function block are described.

Name	Type	Range	Description [Unit]
Gen_Updated	BOOL	T/F	True for one loop when a message is processed, T: A message was processed. F: A message was not processed.
Red_Lmp_State	U8	Range: 0-3	State of red lamp. 0: Off 1: Solid on 2: Blink at slow rate (1Hz) 3: Blink at fast rate (2Hz or faster)
Amber_Lmp_State	U8	Range: 0-3	State of amber lamp. 0: Off 1: Solid on 2: Blink at slow rate (1Hz) 3: Blink at fast rate (2Hz or faster)
Malfctn_Lmp_State	U8	Range: 0-3	State of malfunction lamp. 0: Off 1: Solid on 2: Blink at slow rate (1Hz) 3: Blink at fast rate (2Hz or faster)
Protect_Lmp_State	U8	Range: 0-3	State of protect lamp. 0: Off 1: Solid on 2: Blink at slow rate (1Hz) 3: Blink at fast rate (2Hz or faster)

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]
Total	U16	0-20	Number of faults in the buffer.
CurrentFaultNum	U8	0-20	Index of fault that is currently on the SPN, FMI, OC and Address output signals.
BufferOverflow	BOOL	T/F	True when the buffer is full and another DTC is received and decoded. T: Buffer overflowed. F: Buffer did not overflow.
SPN	U32	0-524287	Suspect parameter number of the fault.
FMI	U8	0-31	Failure mode identifier of the current fault.
OC	U8	0-127	Array containing Occurrence Counts that have been received.
Address	U8	0-255	Source address of the device that transmitted the fault.
Updated	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.
Valid	BOOL	T/F	True if the current index contains valid fault information. T: Current index contains fault information. F: Current index does not contain fault information.
SPN_FMI_Addr_Buf	(ARRAY[20]U32)	---	Array containing the concatenation of the SPNs, FMIs, and addresses that have been received. Addresses are the lowest 8 bits. FMIs are the next 5 bits. SPNs are the highest 19 bits.
OC_Buffer	(ARRAY[20]U8)	---	Array containing the Occurrence Counts that have been received.
Updated_Buffer	(ARRAY[20]BOOL)	---	Array whose elements report true for one loop when the corresponding faults are received.
Valid_Buffer	(ARRAY[20]BOOL)	---	Array whose elements report true if valid fault information is stored at that index.
RawData	BUS	---	More signals contained within this sub-bus.

EC1_Parser—Engine Configuration 1 Parser

The **EC1_Parser** function block deconstructs, transfers and re-assembles message information about engine configuration information.



PGN 65251 (0xFEE3)

Inputs

The inputs to the **EC1_Parser** function block are described.

Name	Type	Range	Description
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.

Bi-Directional Transmitters and Receivers

Outputs

The outputs of the **EC1_Parse** function block are described.

Name	Type	Range	Description [Unit]	SPN
Msg	BUS		Message containing information about the engine.	
Status			The Status bus contains information for each input that is transmitted in the message.	
Fault			The Fault bus contains information for each input that is transmitted in the message.	
HiRes	BUS		High resolution outputs.	
EngSpdIdle_p1_HR	U32	0-8031875	Engine Speed at Idle, point 1. [RPM]	188
EngSpd_p2_HR	U32	0-8031875	Engine Speed at Idle, point 2. [RPM]	528
EngSpd_p3_HR	U32	0-8031875	Engine Speed at Idle, point 3. [RPM]	529
EngSpd_p4_HR	U32	0-8031875	Engine Speed at Idle, point 4. [RPM]	530
EngSpd_p5_HR	U32	0-8031875	Engine Speed at Idle, point 5. [RPM]	531
EngSpdHighIdle_p6_HR	U32	0-8031875	Engine Speed at High Idle, point 6. [0.001 RPM]	532
EngGain_Kp_EndSpdGov_HR	U32	0-502	Engine gain (Kp) of the endspeed governor. [0.1%/RPM]	545
EngMaxMomOvrSpd_p7_HR	U32	0-8031875	Engine Maximum Momentary Override Speed, point 7. [0.001 RPM]	533
EngMaxMomOvertimeLmt_HR	U16	0-250	Engine Maximum Momentary Override Time Limit. [0.1 sec]	534
EngRqstSpdCtrlRngUpLmt_1712_HR	U32	0-8031875	Engine Requested Speed Control Range Upper Limit. [0.001 RPM]	1712
EngMomentOfInertia_HR	U32	0-25702	Engine Moment of Inertia. [0.01 kg*m ²]	1794
Resolution			Outputs of a Regular Resolution.	
EngSpdIdle_p1	U16	0-8032	Engine Speed at Idle, point 1. [RPM]	188
EngPctTorqIdle_p1	S8	-125-125	Engine Percent Torque at Idle, point 1. [%]	539
EngSpd_p2	U16	0-8032	Engine Speed at Idle, point 2. [RPM]	528
EngPctTorq_p2	S8	-125-125	Engine Percent Torque at Idle, point 2. [%]	540
EngSpd_p3	U16	0-8032	Engine Speed at Idle, point 3. [RPM]	529
EngPctTorq_p3	S8	-125-125	Engine Percent Torque at Idle, point 3. [%]	541
EngSpd_p4	U16	0-8032	Engine Speed at Idle, point 4. [RPM]	530
EngPctTorq_p4	S8	-125-125	Engine percent torque at idle, point 4. [%]	542
EngSpd_p5	U16	0-8032	Engine speed at idle, point 5. [RPM]	531

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description [Unit]	SPN
EngPctTorq_p5	S8	-125-125	Engine percent torque at idle, point 5. [%]	543
EngSpdHighIdle_p6	U16	0-8032	Engine Speed at High Idle, point 6. [RPM]	532
EngGain_Kp_EndspdGov	U16	0-50	Engine Gain (Kp) of the End Speed Governor. [%/RPM]	545
EngRefTorq	U16	0-64255	Engine Reference Torque. [Nm]	544
EngMaxMomOvrSpd_p7	U16	0-8032	Engine Maximum Momentary Override Speed, point 7. [RPM]	533
EndMaxMomOvrtimeLmt	U8	0-25	Engine Maximum Momentary Override Time Limit. [second]	534
EngRqstSpdCtrlRngLowLmt	U8	0-2500	Engine Requested Speed Control Range Lower Limit. [10 RPM]	535
EngRqstSpdCtrlRngUpLmt	U8	0-2500	Engine Requested Speed Control Range Upper Limit. [10 RPM]	536
EngRqstTorqCtrlRngLowLmt	U8	-125-125	Engine Requested Torque Control Range Lower Limit. [%]	537
EngRqstTorqCtrlRngUpLmt	U8	-125-125	Engine Requested Torque Control Range Upper Limit. [%]	538
EngRqstSpdCtrlRngUpLmt_1712	U16	0-8032	Engine Requested Speed Control Range Upper Limit. [RPM]	1712
EngMomentOfInertia	U16	0-257	Engine Moment of Inertia. [kg*m^2]	1794
EngDefTorqLimit	U16	0-64225	Engine Default Torque Limit. [Nm]	1846
SupportVarRateTSC1Msg	U8	0-255	Support Variable Rate Torque Speed Control 1 Message. [1 state]	3344
Support_TSC1_CtrlPurposeGroup1	U8	0-255	Support Torque Speed Control 1 (TSC1) Control Purpose Group1. [1 state]	3345
Support_TSC1_CtrlPurposeGroup2	U8	0-255	Support Torque Speed Control 1 (TSC1) Control Purpose Group2. [1 state]	3346
Support_TSC1_CtrlPurposeGroup3	U8	0-255	Support Torque Speed Control 1 (TSC1) Control Purpose Group3. [1 state]	3347
Support_TSC1_CtrlPurposeGroup4	U8	0-255	Support torque speed control 1 (TSC1) Control Purpose Group4. [1 state]	3348
Address	U8	0-255	Source address of the device that transmitted the message.	—
Updated	BOOL	T/F	Pulses true for one loop when new data is available. T: Processed new data. F: Did not process new data.	—

Bi-Directional Transmitters and Receivers

VIN_Parser—Vehicle Identification Number Parser

The **VIN_Parser** function block deconstructs, transfers and re-assembles message information about the vehicle identification number of the machine.



PGN: 65260 (0xFEEC)

Inputs

The inputs to the **VIN_Parser** function block are described.

Name	Type	Range	Description
Address	U8	0-255	The address from which the most recent data is received.
Data	(ARRAY[x]U8)	9-1785	Array of data received from destination.
PGN	U32	0-0x01FFFF	Associated PGN of the most recent message received.
TotalMsgSize	U16	0-1785	Message size of the most recent data is available.
Updated	BOOL	T/F	Pulses TRUE for one loop when new data is available. T: Received new data. F: Did not receive new data.

Outputs

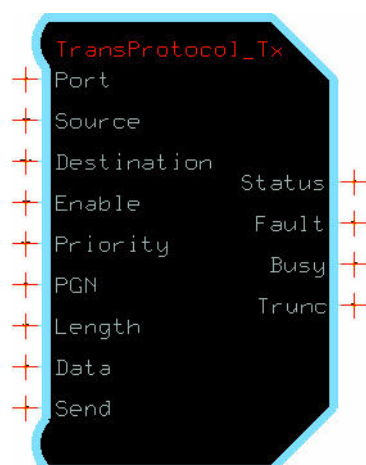
The outputs of the **VIN_Parser** function block are described.

Name	Type	Range	Description [Unit]	SPN
Msg	BUS		The output message containing information about the VIN.	—
VIN_Data	U8[200]	—	Current vehicle identification number.	237
VIN_Len	U8	0-200	Length of the vehicle identification number.	—
VIN_Valid	BOOL	T/F	Validity of the current received VIN. T: Valid VIN. F: Invalid VIN.	—
Address	U8	0-255	Source address of the device that transmitted the message.	—
Updated	BOOL	T/F	Pulses true for one loop when new data is available. T: Processed new data. F: Did not process new data.	—

Bi-Directional Transmitters and Receivers

TransProtocol_Tx—Transportation Protocol Transmitter

The **TransProtocol_Tx** function block transmits PGN data using the various J1939 transport protocol methods.



It supports messages from 8 to 1785 bytes in length with support for single packet, Transport Protocol – BAM, and Transport Protocol – RTS/CTS. The function block automatically selects the correct protocol based on the **Destination** and **Length** inputs.

While messages are being transmitted, the data is temporarily saved with the MEM components. This allows the application to freely change the input values without corrupting data during transmission.

Only the transport protocol layer messages are implemented within the block. Application layer requests for PGN data must be received somewhere else in the application and then the **Send** input notifies the block when to respond.

The **Data** input array uses the MEM component inside the block. This component has a defined array length. Adjust the length to match the length of the array connected to the input. If this value is bigger than it needs to be, the application uses excess RAM. If it is too small, transmitted data is likely to be corrupted.

Inputs

The inputs to the **TransProtocol_Tx** function block are described.

Name	Type	Range	Description
Port	Port	—	CAN port to receive data from.
Source	—	0–253	J1939 address of the transmitting device (this device).
Destination	—	0–255	Destination address for the data. If the destination is 255 and the data length is more than 8 bytes, the BAM transport protocol is used.
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.
Priority	—	0–7	J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority.
PGN	—	0–0x1FFFF	Parameter Group Number. J1939 identifier for the data being transmitted.
Length	—	0–1785	Number of bytes in the Data array to transmit. If the length is greater than 8, the BAM or RTS/CTS transport protocol methods are used.

Bi-Directional Transmitters and Receivers

Name	Type	Range	Description
Data	(ARRAY[x]U8)	0–255	The data to be transmitted in an array of U8 values. The length of the array should be from 0 to 1785. Modify the data type of the MEM component inside the block to match the maximum length required by the application.
Send	BOOL	T/F	T: Start transmission of the new data to the indicated DA. F: Disabling starting a new transmission.

Outputs

The outputs of the **TransProtocol_Tx** function block are described.

Name	Type	Range	Description
Status	BUS	——	Bitwise code where multiple items can be reported at a time. 0: OK. 8008: A parameter value is set out of range. Block does not send CAN messages.
Fault	BUS	——	Bitwise code where multiple items can be reported at a time. 0: OK. 1: Transmitting device aborted. 2: Local device aborted.
Busy	BOOL	T/F	True whenever a transport protocol message transmission is in progress. T: Currently in a communication session. F: Not in a communication session.
Trunc	BOOL	T/F	Data is truncated. Some data is lost during transmission. True if: • Length is greater than the Data array size: • Length is greater than 1785 or length is greater than actual array data size: The values applied to the Mem component inside this function block determines the Data array size. If the Mem component value is set: • Too low, the function block truncates data. • Too high, the function block wastes controller memory.

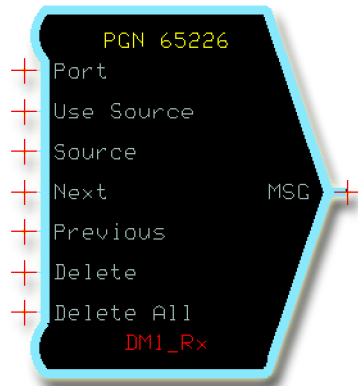
Diagnostic Function Blocks

The diagnostic function blocks support the various diagnostic needs of the system.

Reference information can be found in SAE J1939-73.

DM1_Rx—Diagnostic Message 1 Receiver

For trouble codes to be received properly, use the **DM1_Rx** function block in applications where the OS.ExecTime (Loop_Time) is less than 50 ms.



These fault codes can be used by the application for various tasks such as fault handling or providing indications to the user.

The codes are stored within the function block and reported to the application two ways:

- One at a time, using the **SPN**, **FMI**, **OC**, **Address**, **Updated** and **Valid** outputs. The code reported is indicated with the **CurrentFaultNum** output. Use the **Next** and **Previous** inputs to manipulate this.
- All at once, using the **SPN_FMI_Addr_Buf**, **OC_Buffer**, **Updated_Buffer** and **Valid_Buffer** outputs. Each of these signals is an array where the elements of the same index from each array together represent information for a single code.

Codes are temporarily stored in the function block. They are cleared when power is cycled. Using the **Delete** or **Delete All** inputs deletes the code from the function block. If the code is still being reported by its source, it is added back to the block.

PGN: 65226 (0xFECA)

For trouble codes to be received properly, use this block in applications where the OS.ExecTime (Loop_Time) is less than 50 ms.

Inputs

The inputs to the **DM1_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.
Use Source	BOOL	T/F	Determines if messages are received from any source or just from the one specified in Source . T: Only receive this message transmitted from the address specified by Source . F: Receive this message from any address.
Source	—	0–255	J1939 address of the transmitting device. Only applies if Use Source is True.
Next	BOOL	T/F	Increments the CurrentFaultNum and reports the next DTC recorded in the list of faults.
Previous	BOOL	T/F	Decrements the CurrentFaultNum and reports the previous DTC recorded in the list of faults.

Diagnostic Function Blocks

Name	Type	Range	Description
Delete	BOOL	T/F	Deletes the current DTC recorded in the list of faults, thus reducing the total number of stored DTCs by one. Note that this does not clear any faults from the reporting devices.
Delete All	BOOL	T/F	Deletes all DTCs recorded within the function block. Note that this does not clear all faults from the reporting devices.
Conv Meth	---	1–3	Conversion Method. Specifies which conversion method to use for decoding non-standard diagnostic trouble codes. If this is not properly set, faults reported with methods 1, 2, or 3 are incorrectly interpreted, resulting in incorrect SPN , FMI and OC values.

Outputs

The outputs of the **DM1_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Red_Lmp_State	U8	0–3	Red Stop Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	623, 3039
Amber_Lmp_State	U8	0–3	Amber Warning Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	624, 3040
Malfcn_Lmp_State	U8	0–3	Malfunction Indicator Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	1213, 3038
Protect_Lmp_State	U8	0–3	Protect Lamp: 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	987, 3041
Total	U16	0–20	Total number of faults reported.	---
CurrentFaultNum	U8	0–20	Currently Reported Fault Number Equals zero when no faults are reported, otherwise reports faults 1 through 20.	---
BufferOverflow	BOOL	T/F	True during a program cycle that a new unique fault is received when there are already 20 locally stored faults. When this happens, the newest received fault is lost.	---
SPN	U32	0–524287	Suspect Parameter Number Currently reported SPN from the list of faults. This interface of SPN , FMI , OC , Address , Updated and Valid allow the application to access one fault at a time using the Previous and Next signals.	1214
FMI	U8	0–31	Failure Mode Identifier Currently reported FMI from the list of faults. See SPN for more information.	1215
OC	U8	0–127	Occurrence Count Currently reported OC from the list of faults. See SPN for more information.	1216
Address	U8	0–253	Address of the device reporting the current fault. See SPN for more information.	---

Diagnostic Function Blocks

Name	Type	Range	Description [Unit]	SPN
Updated	BOOL	T/F	True only on the program cycle that the fault is received. This is also true on program cycles that the fault is again received. See SPN for more information.	---
Valid	BOOL	T/F	Status indicating the current fault reported is valid. See SPN for more information.	---
SPN_FMI_Addr_Buf	Array[20]U32	0–4294967295	An array of combined data for each trouble code. The data encoding is as follows: - Address is the lowest 8 bits. - FMI is the next 5 bits. - SPN is the highest 19 bits. Information stored at any given index is only valid if the value of the same index of the Valid_Buffer is true.	1214 1215
OC_Buffer	Array[20]U8	0–255	Occurrence Count Buffer An array of Occurrence Counts where the value given at a specific index is the Occurrence Count for the trouble code stored at the same index of the SPN_FMI_Addr_Buf . A value of 255 typically indicates that the count is not available.	1216
Updated_Buffer	Array[20] BOOL	---	An array of Updated status signals to indicate that the trouble code stored at the same index of the SPN_FMI_Addr_Buf has been received during the program cycle.	---
Valid_Buffer	Array[20]BOOL	---	An array of Valid status signals to indicate that there is a valid trouble code stored at the same index of the SPN_FMI_Addr_Buf .	---
RawData	Bus	---	Several additional signals are reported in the RawData bus. These are provided for backward compatibility and not recommended for new applications.	---

DM2_Rx—Diagnostic Message 2 Receiver

The **DM2_Rx** function block receives, decodes, and temporarily stores previously active diagnostic trouble codes from a J1939 device.



The application uses these fault codes to report previously active diagnostic trouble codes to the user.

The codes are stored within the function block and reported to the application two ways:

Diagnostic Function Blocks

- One at a time, using the **SPN**, **FMI**, **OC**, **Address**, **Updated** and **Valid** outputs. The code reported is indicated with the **CurrentFaultNum** output. Use the **Next** and **Previous** inputs to manipulate this.
- All at once, using the **SPN_FMI_Addr_Buf**, **OC_Buffer**, **Updated_Buffer** and **Valid_Buffer** outputs. Each of these signals is an array where the elements of the same index from each array together represent information for a single code.

Codes are temporarily stored in the function block. They are cleared when power is cycled. Using the **Delete** or **Delete All** inputs only deletes the code from the function block. Subsequent requests for DM2 data result in these codes reported by the block. Consult the device's user manual to possibly clear previously active faults at the source.

PGN: 65227 (0xFECB)

For trouble codes to be received properly, use this function block in applications where the OS.ExecTime (Loop_Time) is less than 50 ms.

Inputs

The inputs to the **DM2_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to transmit the message.
Priority	U8	0-7	Priority used for the Transport Protocol and PGN Request messages.
Source	—	0-255	J1939 address of the transmitting device. Only applies if Use Source is True.
Destination	—	0-255	J1939 address of this device. This value should be determined via a J1939 address claim. It is used as the source address when sending a request for DM2 and is used as the destination address when filtering for transport protocol CAN messages.
Next	BOOL	T/F	Increments the CurrentFaultNum and reports the next DTC recorded in the list of faults.
Previous	BOOL	T/F	Decrements the CurrentFaultNum and reports the previous DTC recorded in the list of faults.
Delete	BOOL	T/F	Deletes the current DTC recorded in the list of faults, thus reducing the total number of stored DTCs by one. Note that this does not clear any faults from the reporting devices.
Delete All	BOOL	T/F	Deletes all DTCs recorded within the function block. Note that this does not clear all faults from the reporting devices.
Conv Meth	—	1-3	Conversion Method. Specifies which conversion method to use for decoding non-standard diagnostic trouble codes. If this is not properly set, faults reported with methods 1, 2, or 3 are incorrectly interpreted, resulting in incorrect SPN , FMI and OC values.

Diagnostic Function Blocks

Outputs

The outputs of the **DM2_Rx** function block are described.

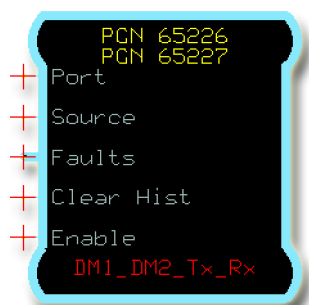
Name	Type	Range	Description [Unit]	SPN
Red_Lmp_State	U8	0–3	Red Stop Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	623, 3039
Amber_Lmp_State	U8	0–3	Amber Warning Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	624, 3040
Malfctn_Lmp_State	U8	0–3	Malfunction Indicator Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	1213, 3038
Protect_Lmp_State	U8	0–3	Protect Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).	987, 3041
Total	U16	0–20	Total number of faults reported.	—
CurrentFaultNum	U8	0–20	Currently Reported Fault Number Equals zero when no faults are reported, otherwise reports faults 1 through 20.	—
BufferOverflow	BOOL	T/F	True during a program cycle that a new unique fault is received when there are already 20 locally stored faults. When this happens, the newest received fault is lost.	—
Updated	BOOL	T/F	True only on the program cycle that the fault is received. This will also be true on program cycles that the fault is again received. See SPN for more information.	—
Valid	BOOL	T/F	Status indicating the current fault reported is valid. See SPN for more information.	—
SPN	U32	0–524287	Suspect Parameter Number Currently reported SPN from the list of faults. This interface of SPN , FMI , OC , Address , Updated and Valid allow the application to access one fault at a time using the Previous and Next signals.	1214
FMI	U8	0–31	Failure Mode Identifier Currently reported FMI from the list of faults. See SPN for more information.	1215
OC	U8	0–127	Occurrence Count Currently reported OC from the list of faults. See SPN for more information.	1216
Address	U8	0–253	Address of the device reporting the current fault. See SPN for more information.	—
SPN_FMI_Addr_Buf	Array[20]U32	0–4294967295	An array of combined data for each trouble code. The data encoding is as follows: - Address is the lowest 8 bits. - FMI is the next 5 bits. - SPN is the highest 19 bits. Information stored at any given index is only valid if the value of the same index of the Valid_Buffer is true.	1214 1215

Diagnostic Function Blocks

Name	Type	Range	Description [Unit]	SPN
OC_Buffer	Array[20]U8	0–255	Occurrence Count Buffer An array of Occurrence Counts where the value given at a specific index is the Occurrence Count for the trouble code stored at the same index of the SPN_FMI_Addr_Buf . A value of 255 typically indicates that the count is not available.	1216
Updated_Buffer	Array[20] BOOL	—	An array of Updated status signals to indicate that the trouble code stored at the same index of the SPN_FMI_Addr_Buf has been received during the program cycle.	—
Valid_Buffer	Array[20]BOOL	—	An array of Valid status signals to indicate that there is a valid trouble code stored at the same index of the SPN_FMI_Addr_Buf .	—
RawData	Bus	—	Several additional signals are reported in the RawData bus. These are provided for backward compatibility and not recommended for new applications.	—

DM1_DM2_Tx_Rx—Diagnostic Message 1 and 2 Transmitter

The **DM1_DM2_Tx_Rx** function block transmits active and previously active J1939 diagnostic trouble codes.



Up to 16 codes of SPN and FMI combinations can be defined in the function block and are reported as active when their corresponding Fault input is true.

The function block also records how many times a fault has transitioned from inactive to active. This information, also known as the Occurrence Count, is stored using internal EEPROM symbols. All previously active faults are automatically sent out in response to CAN requests for DM2 data.

Diagnostic trouble codes are transmitted using conversion method 4. This type of message encodes the conversion method within the DTC and therefore receivers should be able to decode the faults correctly without special settings.

Occurrence Counts can be cleared two ways:

- When true is applied to the **Clear Hist** input.
- When the function block receives a CAN request for DM3.

PGN: 65226 (0xFECA)

PGN: 65227 (0xFECB)

This function block can only transmit 16 distinct trouble codes. It is recommended to use constants for defining SPN and FMI inputs as these values should not be changing during transmission. Also, changing SPN and FMI definitions may result in unreliable Occurrence Counts. For applications with more codes, see the **DM1_Tx** and **DM2_Tx** function blocks.

Diagnostic Function Blocks

Inputs

The inputs to the **DM1_DM2_Tx_Rx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Source	—	0–253	J1939 address of the transmitting device (this device).
Faults	Bus	—	Empty bus intended for the user to connect external signals to drive each Fault_X input.
Clear Hist	BOOL	T/F	Sets the internally EEPROM stored occurrence counter for each fault to zero.
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.
TP_Priority	U8	0–7	Transport Protocol Priority. 0: Highest priority. 7: Lowest priority. Default: 7.
Priority	—	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority.
DM2wAct	BOOL	T/F	T: Include active faults when transmitting DM2. F: Only transmit non-active faults with DM2.
Protect	—	0–3	Protect Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
Amber	—	0–3	Amber Warning Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
RedStop	—	0–3	Red Stop Lamp: 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
MIL	—	0–3	Malfunction Indicator Lamp: 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
Fault_X (1-16)	BOOL	—	Each of the 16 Fault_X inputs corresponds to the 16 SPN , FMI , and Lmp diagnostic trouble code signals. When a signal is true, the trouble code is automatically transmitted with the DM1 message. Each time Fault_X transitions from false to true, the Occurrence Count is incremented by one.
SPN_X (1-16)	—	0–524287	Suspect Parameter Number of a diagnostic trouble code. It is transmitted periodically when the corresponding Fault_X is true as part of the active trouble codes and it is transmitted on request as part of the previously active trouble codes.

Diagnostic Function Blocks

Name	Type	Range	Description
FMI_X (1-16)	---	0-31	Failure Mode Indicator of a diagnostic trouble code. It is transmitted periodically when the corresponding Fault_X is true as part of the active trouble codes and it is transmitted on request as part of the previously active trouble codes.
OC_X (1-16)	---	0-127	Occurrence Count of a diagnostic trouble code. It is transmitted periodically when the corresponding Fault_X is true as part of the active trouble codes and it is transmitted on request as part of the previously active trouble codes.

Outputs

The outputs of the **DM1_DM2_Tx_Rx** function block are described.

Name	Type	Range	Description
Rx_DM3	BOOL	T/F	True on any application program cycle that a request for DM3 is received. This indicates to the application that the occurrence counters should be set to zero.

DM3_Rx—Diagnostic Message 3 Receiver

The **DM3_Rx** function block uses the Request PGN message to receive a command to clear the diagnostic message.



PGN: 65228 (0xFECC)

Inputs

The inputs to the **DM3_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Source	---	0-255	J1939 address of the transmitting device. Only applies if Use Source is True.

Outputs

The outputs of the **DM3_Rx** function block are described.

Name	Type	Range	Description [Unit]
GlobalRequest	BOOL	T/F	True if the received request was sent to the global address. T: Global. F: Destination specific.
RequesterSA	U8	0-255	Source address of the node that transmitted the message.
Rx_DM3	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.

Diagnostic Function Blocks

DM1_Tx—Diagnostic Message 1 Transmitter

The **DM1_Tx** function block transmits active J1939 diagnostic trouble codes. Up to 256 combinations of SPN and FMIs can be transmitted at any time.



When using this block it is possible to use one of the two following interfaces:

- Define all SPNs and FMIs as constant value arrays and potentially reduce RAM usage in applications with many defined code combinations.
- Dynamically create an array of faults and pass into the function block. This is convenient for applications already creating such an array.

In either case, active faults are only transmitted if the corresponding **Active** flag is true.

While messages are being transmitted, the data is temporarily saved with the MEM components. This allows the application to freely change the input values without corrupting data during transmission.

The 'SPNs FMIs and OCs' input arrays use MEM components inside the block. These components have a defined array length. These lengths should be adjusted to match the length of the array connected to the input. If this value is bigger than necessary, the application uses excess RAM; if too small, then faults may go unreported.

This implementation does not support intermittently changing faults. It is possible for an Active flag to be true and then false before the DM1 message is transmitted. It is suggested for the application to ensure reported faults are active for at least one second.

PGN: 65226 (0xFECA)

Inputs

The inputs to the **DM1_Tx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Source	—	0–254	J1939 address of the transmitting device (this device).
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.
Lamps	BUS	—	Bus containing the J1939 lamp inputs.
Protect	—	0–3	Protect Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).

Diagnostic Function Blocks

Name	Type	Range	Description
Amber	---	0–3	Amber Warning Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
RedStop	---	0–3	Red Stop Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
MIL	---	0–3	Malfunction Indicator Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
SPNs	Array[n]U32	0–524287	Suspect Parameter Number of a diagnostic trouble code. It is transmitted periodically when the corresponding Active flag is true as part of the active trouble codes.
FMI s	Array[n]U8	0–31	Failure Mode Indicator of a diagnostic trouble code. It is transmitted periodically when the corresponding Active flag is true as part of the active trouble codes.
OC s	Array[n]U8	0–127	Occurrence Count of a diagnostic trouble code. It is transmitted periodically when the corresponding Active flag is true as part of the active trouble codes.
Active	BUS	---	Bus containing the active status inputs
Active X (1-8)	U32		Bit field indicating that fault with the corresponding SPN , FMI and OC is currently active and should be transmitted as part of the DM1 message. Active1 contains 32 bits. The least significant bit is used to report data at index 0 of the arrays as active. The most significant bit is used to report data at index 31 of the arrays as active. Active8 contains 32 bits. The least significant bit is used to report data at index 224 of the arrays as active. The most significant bit is used to report data at index 255 of the arrays as active.
TP_Priority	U8	0–7	Transport Protocol Priority. 0: Highest priority. 7: Lowest priority. Default: 7.
Priority	---	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.

Outputs

The outputs of the **DM1_Tx** function block are described.

Name	Type	Range	Description
Busy	BOOL	T/F	True when a DM1_Tx transmission is in progress.

Diagnostic Function Blocks

DM2_Tx—Diagnostic Message 2 Transmitter

The **DM2_Tx** function block transmits previously active J1939 diagnostic trouble codes. Up to 256 combinations of SPN and FMIs can be transmitted at any time.



When using this block it is possible to use one of the two following interfaces:

- Define all SPNs and FMIs as constant value arrays and potentially reduce RAM usage in applications with many defined code combinations.
- Dynamically create an array of faults and pass into the function block. This is convenient for applications already creating such an array.

In either case, active faults are only transmitted if the corresponding **PrevActive** flag is true.

While messages are being transmitted, the data is temporarily saved with the MEM components. This allows the application to freely change the input values without corrupting data during transmission.

This block is capable of handling broadcast and destination specific requests for DM2. When more than one DTC needs to be transmitted one of two transport protocol methods are employed. In the case of a broadcast request it uses the J1939 BAM protocol, for destination specific requests it uses the RTS/CTS protocol.

The 'SPNs FMIs and OCs' input arrays use MEM components inside the block. These components have a defined array length. These lengths should be adjusted to match the length of the array connected to the input. If this value is bigger than necessary, the application uses excess RAM; if too small, then faults may go unreported.

Unlike the DM1_DM2_Tx_Rx function block, the DM2_Tx block does not internally store the occurrence count or state of being previously active. The application must determine and provide this information using the **OCs** and **PrevActive X** inputs.

PGN: 65227 (0xFECEB)

Inputs

The inputs to the **DM2_Tx** function block are described.

Name	Type	Range	Description
Port	Port	—	Determines which physical CAN port of the hardware is used to receive the message.
Source	—	0–254	J1939 address of the transmitting device (this device).
Enable	BOOL	T/F	Enables message transmission. T: Enable transmission. F: Disable transmission.
Lamps	Bus	—	Bus containing the J1939 lamp inputs.

Diagnostic Function Blocks

Name	Type	Range	Description
Protect	---	0–3	Protect Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
Amber	---	0–3	Amber Warning Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
RedStop	---	0–3	Red Stop Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
MIL	---	0–3	Malfunction Indicator Lamp. 0: Off. 1: Solid on. 2: Blink at slow rate (1Hz). 3: Blink at fast rate (2Hz or faster).
SPNs	Array[n]U32	0–524287	Suspect Parameter Number of a diagnostic trouble code. It is transmitted on request when the corresponding PrevActive flag is true as part of the previously active trouble codes.
FMIs	Array[n]U8	0–31	Failure Mode Indicator of a diagnostic trouble code. It is transmitted on request when the corresponding PrevActive flag is true as part of the previously active trouble codes.
OCs	Array[n]U8	0–127	Occurrence Count of a diagnostic trouble code. It is transmitted on request when the corresponding PrevActive flag is true as part of the previously active trouble codes.
PrevActive	Bus	---	Bus containing the previously active status inputs.
PrevActive X (1-8)	U32		Bit field indicating that fault with the corresponding SPN , FMI and OC was previously active and should be transmitted as part of the DM2 message. PrevActive1 contains 32 bits. The least significant bit is used to report data at index 0 of the arrays as previously active. The most significant bit is used to report data at index 31 of the arrays as previously active. PrevActive8 contains 32 bits. The least significant bit is used to report data at index 224 of the arrays as previously active. The most significant bit is used to report data at index 255 of the arrays as previously active.
TP_Priority	U8	0–7	Transport Protocol Priority. 0: Highest priority. 7: Lowest priority. Default: 7.
Priority	---	0–7	J1939 message priority for transmitting messages: 0: Highest priority. 7: Lowest priority. Default: 6.

Outputs

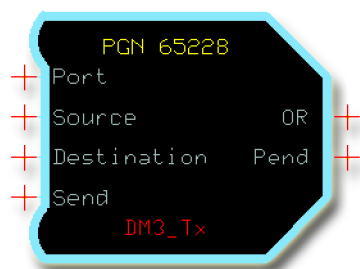
The outputs of the **DM2_Tx** function block are described.

Name	Type	Range	Description
Busy	BOOL	T/F	True when a DM2 transmission is in progress.

Diagnostic Function Blocks

DM3_Tx—Diagnostic Message 3 Transmitter

The **DM3_Tx** function block transmits a request to clear previously active diagnostic trouble codes.



PGN: 65228 (0xFECC)

The **DM1_DM2_Tx_Rx** function block supports and responds to this message.

Inputs

The inputs to the **DM3_Tx** function block are described.

Name	Type	Range	Description [Unit]
Port	Port	---	Determines which physical CAN port of the hardware is used to transmit the message.
Source	---	0–253	J1939 address of the transmitting device.
Destination	---	0–255	Address to which the message is sent. If the destination address is 255, all nodes that support this message respond.
Send	BOOL	T/F	The message is sent on a false to true transition.
Priority	U8		J1939 message priority for transmitting messages. 0: Highest priority. 7: Lowest priority. Default: 6.

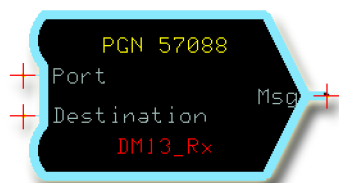
Outputs

The outputs of the **DM3_Tx** function block are described.

Name	Type	Range	Description
OR	BOOL	T/F	Overrun. T: A new request to send a message is made before the last message is sent. F: No overrun condition.
Pend	BOOL	T/F	Pending. T: The last message requested is waiting to be transmitted on the bus. F: No message waiting to be sent.

DM13_Rx—Diagnostic Message 13 Receiver

The **DM13_Rx** function block receives the J1939 Stop Broadcast commands, maintains the current state and provides this information as its output.



Diagnostic Function Blocks

The application can implement functions to limit or stop select CAN transmissions as necessary. Receivers of this message suspend or adjust communication timeouts accordingly.

A DM13 message can be transmitted by one node to command other nodes to stop noncritical communications and it can also be used to inform other nodes that it is not transmitting its normal messages. This block receives those hold commands and suspension statuses and keeps track of their current state.

The DM13 message can be sent to a single node (point-to-point) or all nodes on the CAN bus (broadcast). If more than one **DM13_Rx** function block is used in a single PLUS+1® GUIDApplication, only the first block receives and processes the broadcast message.

PGN: 57088 (0xDF00)

Inputs

The inputs to the **DM13_Rx** function block are described.

Name	Type	Range	Description
Port	Port	---	Determines which physical CAN port of the hardware is used to receive the message.
Destination	---	0–254	J1939 address of the receiver (this device). It is the destination address of the incoming message.

Outputs

The outputs of the **DM13_Rx** function block are described.

Name	Type	Range	Description [Unit]	SPN
Hold_CurrLink	BOOL	T/F	Hold Current Link. T: Communications on this network	1230
Hold_ISO9141	BOOL	T/F	Hold ISO9141.	1232
Hold_J1587	BOOL	T/F	Hold J1587.	608
Hold_J1850	BOOL	T/F	Hold J1850.	1233
Hold_J1922	BOOL	T/F	Hold J1922.	622
Hold_J1939_1	BOOL	T/F	Hold J1939 Network 1 (Primary J1939 Network).	639
Hold_J1939_2	BOOL	T/F	Hold J1939 Network 2.	1231
Hold_J1939_3	BOOL	T/F	Hold J1939 Network 3.	1235
Hold_J1939_4	BOOL	T/F	Hold J1939 Network 4.	1668
Hold_Prop1	BOOL	T/F	Hold Proprietary Network 1.	625
Hold_Prop2	BOOL	T/F	Hold Proprietary Network 2.	5588
Hold_Other	BOOL	T/F	Hold Other	1234
Indet_Susp_All	BOOL	T/F	Indefinite Suspension for All Networks.	2618
Indet_Susp_Some	BOOL	T/F	Indefinite Suspension for Some Networks. The specific networks are indicated by the individual Hold signals.	2618
Temp_Susp_All	BOOL	T/F	Temporary Suspension for All Networks. The time is indicated by Susp_Duration .	2618
Temp_Susp_Some	BOOL	T/F	Temporary suspension for some networks, time indicated by Susp_Duration . The specific networks are indicated by the individual Hold signals.	2618
Susp_Duration	U16	0–64255	Suspension Duration. How long the suspension lasts. Valid only when a temporary suspension is active. [seconds]	2619

Diagnostic Function Blocks

Name	Type	Range	Description [Unit]	SPN
DM13_Source	U8	0–255	Address of the requesting device.	---
Rx_DM13	BOOL	T/F	True for the first cycle that new data is received. T: Received new data. F: Did not receive new data.	---

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