Power Distribution Gauge – Integration Guide

Files to include:

1. Files

|  |
| --- |
| PDG\_CGEA\_1\_3\_V\_4\_2.C |
| PDG\_CGEA\_1\_3\_V\_4\_data\_2.C |
| PDG\_CGEA\_1\_3\_V\_4\_2.H |
| rtwtypes.h |

Data table 1.

1. Data types

|  |  |  |  |
| --- | --- | --- | --- |
| Input/Output | Signal Name/Variable Name | Data type | Fixed point position |
| Input | PG\_MAX\_POWER\_VALUE | Int32 | 9 |
| Input | PG\_WHL\_TRQ\_FILTER | Int32 | 9 |
| Input | PG\_PERCENT\_FILL\_CONV\_CONSTANT | Int32 | 9 |
| Input | PG\_POWER\_CONV\_CONSTANT | Int32 | 9 |
| Input | PG\_POWER\_MULTIPLIER | Int32 | 9 |
| Input | PG\_REAR\_AXLE\_RATIO | Int32 | 9 |
| Input | PG\_WHEEL\_RPM\_CONV\_CONSTANT | Int32 | 9 |
| Input | PG\_DECAY\_RISING | Int32 | 9 |
| Input | PG\_DECAY\_FALLING\_HI\_TORQ | Int32 | 9 |
| Input | PG\_PT\_TORQUE\_MAX | Int32 | 9 |
| Input | PG\_DECAY\_FALLING\_LO\_TORQ | Int32 | 9 |
| Input | PG\_PRPLWHL\_TQ\_LOW\_LIMIT | Int32 | 9 |
| Input | PG\_DECAY\_FALLING\_SWITCHPOINT | Int32 | 9 |
| Input | AwdLck\_Tq\_Rq | Int32 | 9 |
| Input | AwdRnge\_D\_Actl | Int32 | 9 |
| ~~Input~~ | ~~GearLvrPos\_D\_Actl~~ | ~~Int32~~ | ~~9~~ |
| Input | AwdSrvcRqd\_B\_Rq | Int32 | 9 |
| Input | PrplWhlTot2\_Tq\_Actl | Int32 | 9 |
| Input | Veh\_V\_ActlEng | Int32 | 9 |
| Output | Front\_Percent\_Fill | Int32 | 9 |
| Output | Rear\_Percent\_Fill | Int32 | 9 |

Data table 2.

1. Setting up DID Configuration value

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Structure. Variable |  | Assigning value |  |  |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_MAX\_POWER\_VALUE | = | FLOAT2FIXED( FD72\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_WHL\_TRQ\_FILTER | = | FLOAT2FIXED( FD79\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_PERCENT\_FILL\_CONV\_CONSTANT | = | FLOAT2FIXED( FD73\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_POWER\_CONV\_CONSTANT | = | FLOAT2FIXED( FD74\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_POWER\_MULTIPLIER | = | FLOAT2FIXED( FD75\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_REAR\_AXLE\_RATIO | = | FLOAT2FIXED( FD76\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_WHEEL\_RPM\_CONV\_CONSTANT | = | FLOAT2FIXED( FD77\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_DECAY\_RISING | = | FLOAT2FIXED( FD80\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_DECAY\_FALLING\_HI\_TORQ | = | FLOAT2FIXED( FD81\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_PT\_TORQUE\_MAX | = | FLOAT2FIXED( FD84\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_DECAY\_FALLING\_LO\_TORQ | = | FLOAT2FIXED( FD82\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_PRPLWHL\_TQ\_LOW\_LIMIT | = | FLOAT2FIXED( FD78\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_DECAY\_FALLING\_SWITCHPOINT | = | FLOAT2FIXED( FD83\* Resolution | , | 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.PG\_LIN\_FACTOR | = | FLOAT2FIXED( FD83\* Resolution | , | 9); |

Data table 3.

1. Setting up variable values

|  |  |  |  |
| --- | --- | --- | --- |
| PDG\_CGEA\_1\_3\_V\_4\_U.AwdLck\_Tq\_Rq | = | FLOAT2FIXED(AwdLck\_Tq\_Actl \* Resolution | , 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.AwdSrvcRqd\_B\_Rq | = | FLOAT2FIXED(AwdSrvcRqd\_B\_Rq \* Resolution | , 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.AwdRng\_D\_Actl | = | FLOAT2FIXED(AwdRnge\_D\_Actl \* Resolution | , 9); |
| ~~PDG\_CGEA\_1\_3\_V\_4\_U.GearLvrPos\_D\_Actl~~ | ~~=~~ | ~~FLOAT2FIXED(GearLvrPos\_D\_Actl \* Resolution~~ | ~~, 9);~~ |
| PDG\_CGEA\_1\_3\_V\_4\_U.PrplWhlTot2\_Tq\_Actl | = | FLOAT2FIXED(PrplWhlTot2\_Tq\_Actl \* Resolution | , 9); |
| PDG\_CGEA\_1\_3\_V\_4\_U.Veh\_V\_ActlEng | = | FLOAT2FIXED(Veh\_V\_ActlEng \* Resolution | , 9); |

Data table 4.

1. Step the model

|  |
| --- |
| Function name |
| PDG\_CGEA\_1\_3\_V\_4\_step() |

Data table 5.

1. Instructions

|  |  |  |
| --- | --- | --- |
| # | Instruction | Type / Frequency |
| 1 | Include all files mentioned in *Data table 1.* | Set up |
| 2 | Set up DID configuration values to model using *Data table 3 and PDG\_CGEA\_1\_3\_V\_4\_2.m*. | Initialization |
| 3 | Get CAN values | Every 100ms |
| 4 | Set up variable values using *Data table 4 & CAN Values.* | Every 100ms |
| 5 | Step the model using *Data table 5.* | Every 100ms |
| 6 | Get model results & interpolate/lookup | Every 100ms |
| 7 | Go to instruction 3. | Every 100ms |

Data table 6

1. Revision History.

| **Revision Level** | **Name** | **Change Description** | **Date** |
| --- | --- | --- | --- |
| 1.0 | Power distribution gauge - integration guide | Initial release (arodr313)  Author: Arturo Rodriguez (arodr313) | 20140818 |
| 2.0 | Power distribution gauge – integration guide | Modified version 1.0 to support CGEA 1.3 programs.  Author: Jim Miloser (jmiloser) | 20150320 |
| 3.0 | Power distribution gauge – integration guide | Updated version 2.0 to support CGEA 1.3 programs. GearLvrPos Signal removed from reference.  Authors: Jim Miloser (jmiloser)/ Ravi Chalanti (rchalant) | 20150706 |
| 4.0 | Power distribution gauge – integration guide | No Major changes from 3.0 other than Constants file update and other file name changes  Authors: Ravi Chalanti (rchalant) | 20150924 |

Data table 7