```c
/*
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 * course requirements at degree granting institutions only.  Not for
 * government, commercial, or other organizational use.
 *
 * File: Vehicle_Speedometer_Module.c
 *
 * Code generated for Simulink model 'Vehicle_Speedometer_Module'.
 *
 * Model version                  : 1.35
 * Simulink Coder version         : 9.7 (R2022a) 13-Nov-2021
 * C/C++ source code generated on : Sun Mar 19 04:03:56 2023
 *
 * Target selection: ert.tlc
 * Embedded hardware selection: Intel->x86-64 (Mac OS X)
 * Code generation objectives: Unspecified
 * Validation result: Not run
 */

#include "Vehicle_Speedometer_Module.h"
#include "rtwtypes.h"
#include "Vehicle_Speedometer_Module_private.h"

/* Block signals (default storage) */
B_Vehicle_Speedometer_Module_T Vehicle_Speedometer_Module_B;
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/* External inputs (root inport signals with default storage) */

ExtU_Vehicle_Speedometer_Modu_T Vehicle_Speedometer_Module_U;


/* External outputs (root outports fed by signals with default
storage) */

ExtY_Vehicle_Speedometer_Modu_T Vehicle_Speedometer_Module_Y;


/* Real-time model */

static RT_MODEL_Vehicle_Speedometer__T
Vehicle_Speedometer_Module_M_;

RT_MODEL_Vehicle_Speedometer__T *const Vehicle_Speedometer_Module_M
=

  &Vehicle_Speedometer_Module_M_;


/* Model step function */

void Vehicle_Speedometer_Module_step(void)

{

  int16_T rtb_Add;

  uint16_T rtb_Add_0;

  uint16_T tmp;


  /* Outputs for Atomic SubSystem: '<Root>/Speedometer_Module' */

  /* Saturate: '<S5>/Saturation' incorporates:

   *  Inport: '<Root>/Avg_VehicleSpeed'

   */

  if (Vehicle_Speedometer_Module_U.Avg_VehicleSpeed > 25000) {

    /* Saturate: '<S5>/Saturation' */

    Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display = 25000U;
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  } else if (Vehicle_Speedometer_Module_U.Avg_VehicleSpeed < 200) {

    /* Saturate: '<S5>/Saturation' */

    Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display = 200U;
  } else {

    /* Saturate: '<S5>/Saturation' */

    Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display =

      Vehicle_Speedometer_Module_U.Avg_VehicleSpeed;
  }


  /* End of Saturate: '<S5>/Saturation' */


  /* Outputs for Enabled SubSystem: '<S1>/Auxilliary_Data_Filtering'
incorporates:

   *  EnablePort: '<S2>/Enable'

   */

  /* Outputs for Enabled SubSystem: '<S1>/Main_Data_Filtering'
incorporates:

   *  EnablePort: '<S6>/Enable'

   */

  /* RelationalOperator: '<S3>/Compare' incorporates:

   *  Constant: '<S3>/Constant'

   *  Inport: '<Root>/Timer_Input'

   *  Math: '<S1>/Rem'

   */

  if ((uint16_T)(Vehicle_Speedometer_Module_U.Timer_Input % 10) ==
0) {
```

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/* Product: '<S6>/Divide' incorporates:

 *  Gain: '<S6>/Gain'

 *  Inport: '<Root>/In_MainFilt_SpeedValue'

 *  Saturate: '<S5>/Saturation'

 */

if (Vehicle_Speedometer_Module_U.In_MainFilt_SpeedValue == 0U) {

  rtb_Add_0 = MAX_uint16_T;

  /* Divide by zero handler */

} else {

  rtb_Add_0 = (uint16_T)((uint32_T)(uint16_T)((((65U *

    Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display) >> 7)
* 2684355UL)

    >> 21) /
Vehicle_Speedometer_Module_U.In_MainFilt_SpeedValue);

}
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/* Product: '<S2>/Divide' incorporates:

 *  Constant: '<S6>/Constant'

 *  Gain: '<S2>/Gain'

 *  Inport: '<Root>/In_AuxFilt_SpeedValue'

 *  Product: '<S6>/Divide'

 *  Sum: '<S6>/Add'

 */

if (Vehicle_Speedometer_Module_U.In_AuxFilt_SpeedValue == 0U) {


  rtb_Add_0 = MAX_uint16_T;



    /* Divide by zero handler */

} else {


    rtb_Add_0 = (uint16_T)((uint32_T)(uint16_T)((((((uint16_T)
(rtb_Add_0 - 5U) *


    39U) >> 6) * 2684355UL) >> 21) /


    Vehicle_Speedometer_Module_U.In_AuxFilt_SpeedValue);

}
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  /* Sum: '<S2>/Add' incorporates:

   *  Constant: '<S2>/Constant'

   *  Product: '<S2>/Divide'

   */

    Vehicle_Speedometer_Module_B.DisplaySpeed_Filter = (uint16_T)
(rtb_Add_0 - 3U);
  }


  /* End of RelationalOperator: '<S3>/Compare' */

  /* End of Outputs for SubSystem: '<S1>/Main_Data_Filtering' */

  /* End of Outputs for SubSystem: '<S1>/Auxilliary_Data_Filtering'
*/


  /* Sum: '<S4>/Add' incorporates:

   *  Saturate: '<S5>/Saturation'

   *  Sum: '<S2>/Add'

   */

  rtb_Add_0 = Vehicle_Speedometer_Module_B.DisplaySpeed_Filter;

  if (Vehicle_Speedometer_Module_B.DisplaySpeed_Filter > 32767) {

    rtb_Add_0 = 32767U;

  }


  tmp = Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display;
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  if (Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display > 32767)
{

    tmp = 32767U;

  }


  rtb_Add = (int16_T)(rtb_Add_0 - tmp);


  /* End of Sum: '<S4>/Add' */


  /* Abs: '<S4>/Abs' incorporates:
   *  Sum: '<S4>/Add'
   */
  if (rtb_Add < 0) {

    rtb_Add_0 = (uint16_T)-rtb_Add;

  } else {

    rtb_Add_0 = (uint16_T)rtb_Add;

  }


  /* End of Abs: '<S4>/Abs' */


  /* Switch: '<S4>/Switch' incorporates:
   *  RelationalOperator: '<S4>/Relational Operator'
   */
  if (rtb_Add_0 <= 150) {

    /* Saturate: '<S5>/Saturation' incorporates:
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 *  Outport: '<Root>/Out_VehicleSpeed_Display'

 *  Sum: '<S2>/Add'

 */

  Vehicle_Speedometer_Module_Y.Out_VehicleSpeed_Display =

    Vehicle_Speedometer_Module_B.DisplaySpeed_Filter;
  }


  /* End of Switch: '<S4>/Switch' */

  /* End of Outputs for SubSystem: '<Root>/Speedometer_Module' */
}


/* Model initialize function */

void Vehicle_Speedometer_Module_initialize(void)

{

  /* (no initialization code required) */

}


/* Model terminate function */

void Vehicle_Speedometer_Module_terminate(void)

{

  /* (no terminate code required) */

}


/*

 * File trailer for generated code.
```

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*
* [EOF]
*/
```