Cell_Name	Short_Description	NumberElements	ID_Array	Type	Units_Cell	Long_Description	CollectionFreq	CollectionFreqUnits	Single_Val_Min	Single_Val_Max
Experiment	Name of Experiment			chars		Experiment Name. Set in ExperimentConfig.txt. Default is TestExp.				
Subject	Sibject ID			chars		Subjject ID. Set in ExperimentConfig.txt. Default is TesSubj.				
Frames	simulation frame number	1	0	int		Frame counter starts from miniSim launch. Frame numbers are recorded from scenario start to end. Frames are incremented 60 times/sec (60 Hz).				
Time	Elapsed Simulation time	1	0	float		Each frame is 1/60 th of a second (0.0166666667 sec)				
CFS_Accelerator_Pedal_Position	Accelerator pedal position	1	0	float	1	Normalized value between 1 and 0	60	Hz	0	1
CFS_Auto_Transmission_Mode	Auto Transmission Mode	1	0	short	1	-2 = Park -1 = Reverse 0 = Neutral 1 = First 2 = Second 3 = Drive 4 = Overdrive	1	CSSDC	-2	4
CFS_Brake_Pedal_Force	Brake pedal force	1	0	float	lbf	lbf: pound force	60	Hz	0	180
CFS_Brake_Pedal_Position	Brake pedal position	1	0	float	rad	Radians of actuator movement **(not supported on miniSim)**	60	Hz	0	100
CIS_Entertainment_Status	Radio status					See Table 3, at the end of this section, for details on this variable **(not supported on miniSim).**	1	CSSDC		
CFS_Steering_Wheel_Angle	Steering wheel angle	1	0	float	Deg	Units=Degrees	60	Hz		
CFS_Steering_Wheel_Angle_Rate	Steering wheel angle rate	1	0	float	Deg/sec	Units=Degrees/sec	60	Hz		
CFS_Steering_Wheel_Torque	Steering wheel torque (if equipped)	1	0	float	ft-lb	Foot-pounds	60	Hz		
CFS_Transfer_Case_Mode	Transfer case mode				1	1 = 2H 2 = 4H 3 = Neutral 4 = 4L Generally defaults to 3 but hardcoded to 1 for CTB (Heavy Truck Only)	1	CSSDC		
CIS_Auxiliary_Buttons	Auxiliary buttons	20	1	float	1	0 = button is not pressed, 1 = button is pressed. Mapping of physical buttons to this variable are accomplished via the system configuration (hardware.xml). Button 1 is the left wheel button, and button 2 is the right wheel button for driver response (eg Divided Attention scenarios). Buttons 3 and 4 are often used for the up/down paddles on gaming wheels Buttons 5-10 are reserved for automation. Buttons 11-20 are available for other uses.	60	Hz		
CIS_Joystick_Type	Joystick type	1	0	short	1	0 = ECCI hybrid with analog shifter stalk, 1 = MicroSoft Generic, 2 = Logitech gamepad, 3 = Logitech G25 wheel, 4 = HAPP board hybrid wheel with analog shifter stalk, 5 = Logitech Wingman Formula GP, 6 = Logitech G27 wheel, 7 = ECCI original wheel with paddle shifter	1	CSSDC	0	7
CIS_Joystick_Buttons	Joystick Buttons	1	0	integer	1	Combined joystick button press values in bitmap form. Paddle shifter paddles are buttons so their values are reflected here as well.	1	CSSDC		
CIS_Cruise_Control	Cruise Control state	1	0	short	1	0 – Not available 1 – off 2 – On 3 – Set/Accel 4 – Resume 5 - Coast	1	CSSDC		
CIS_Horn	Car horn	1	0	integer	1	0=off, 1=on	1	CSSDC	1	2
CIS_Turn_Signal	Turn signals	1	0	short	1	1 – no turn signal on 2 – left turn signal on 3 – right turn signal on 4 – hazard signals on	1	CSSDC	1	4
SCC_Audio_Trigger	Present each time the Audio trigger fires	1	0	integer	1	Contains the Audio File ID from the **instructions.txt** file triggered by scenario. values: 0 (clear), 50 (Please take the next exit), 51 (Please take this Exit), 55 (Please follow the signs for Interstate 80 West), 57 (This is the end of your drive..), 350 (alert chime),1008 (speeding warning)	1	CSSDC	0	
SCC_Custom1	User Defined	1	0	float	1	Generic utility variable. Typical uses are to store caclulations made in scenario for debugging or data reduction purposes. Can also write to these with RouteTable as inputs to scenario.		Hz		
SCC_Custom2	User Defined	1	0	float	1	Generic utility variable. Typical uses are to store caclulations made in scenario for debugging or data reduction purposes. Can also write to these with RouteTable as inputs to scenario.		Hz		
SCC_Custom3	User Defined	1	0	float	1	Generic utility variable. Typical uses are to store caclulations made in scenario for debugging or data reduction purposes. Can also write to these with RouteTable as inputs to scenario.				
SCC_Custom4	User Defined	1	0	float	1	Generic utility variable. Typical uses are to store caclulations made in scenario for debugging or data reduction purposes. Can also write to these with RouteTable as inputs to scenario.				
SCC_Collision_Count	total collisions	1	0	integer	1	Total number of collisions in drive.				
SCC_Collision_List_Size	Number of objects collided with	1	0	integer		Number of objects collided with				
SCC_DataRed_Params	Parameters for Data Reduction Segments	1	0	chars		is 10884 chars. ASCII Number	60	Hz		
SCC_Collision_Det_Object		10	0	short		Collision object CVED IDs in order of collision				

SCC_Collision_Det_Ob_Type		10	0	short		Collision object CVED IDs in order of collision;Array of 10 shorts If the value of SCC_Collision_List_Size is n, only the first n values in this array are valid 1 – trajectory follower (DDOs) 2 – vehicle (can be ADOs or static objs) 7 – traffic signs 9 – obstacle 13 – walker				
SCC_Collision_Det_Ob_SolId		10	0	short		SOL ID of object collided with; array lists objects in order of collisiion.				
SCC_DataRed_Segments	Data Reduction Segment Type	6	2	integer		Integer ≥ 0	60	Hz	0	
SCC_DynObj_AudioVisualState	Bit mask Audio and Visual states	20	3	integer		20 unsigned integers	60	Hz		
SCC_DynObj_ColorIndex	Scenario object's color index	20	4	short		Scenario object's color index as specified in the sol2.txt file	60	Hz		
SCC_DynObj_CvedId	Cved IDs of Scenario Objects	20	5	integer		Integer ≥ 0	60	Hz	0	
SCC_DynObj_DataSize	Indicates how many valid objects in SCC_DynObj Arra	1	0	integer			60	Hz		
SCC_DynObj_HcsmType	Scenario object's HCSM Type	20	6	integer			60	Hz		
SCC_DynObj_Heading	Headings of Scenario Objects	20	7	float	Deg	Units=degrees	60	Hz		
SCC_DynObj_Name	Name of scenario object	640	8	chars		array of char (reversed, chunked in 4ths)	60	Hz		
SCC_DynObj_Pos	Global Position of scenario object, X, Y, Z	60	9	float	feet	Cartesian coordinate system; As viewed in ISAT, X positive to the East (Right), Y positive to the North (top of screen), Z positive up elevation (out of screen)	60	Hz		
SCC_DynObj_RollPitch	Roll and Pitches of Scenario Objects	40	10	float	Deg	Units=degrees	60	Hz		
SCC_DynObj_SolId	Sol IDs of Scenario Objects	20	11	integer		Integer ≥ 0; model objects are assigned unique IDs within the sol2 or sol2_aux file.	60	Hz		
SCC_DynObj_Vel	Velocities of Scenario Objects	20	12	float	ft/sec	Units=ft/s for DDOs (HcsmType = 1), Units= m/s for ADOs (HcsmType = 10)	60	Hz		
SCC_DRT_ReactionTime	Reaction time as calculated by the DRT device for the DRT task	1	0	float	sec	Units=seconds. If the response does not take place within the detection period (part of the configuration for the DRT device), the value will be -9999.0. Note that the value will be updated to reflect the response time for the current task only after a response is recorded or the duration of the response window has passed.	60	Hz		
SCC_HighRes_Time	High resolution timestamp with sub-	2	13	integer		Array of two integers (4 bytes×2) that represent a 64-bit unsigned integer timestamp. The first integer represents the lower 4 bytes and the second the upper 4 bytes.	60	Hz		
SCC_EventStatus	Status of an event	1	0	short		0|1; 0 means no event is active. 1 means there is an active event. Needs to be set to 1 at least once to indicate the drive has started and run time data reduction, including those overall evaluations and sliding window based evaluations, should be started. *NOTE: atypical use in Platoon scenarios; attempt to use this mechanism to capture collisions when SOL collision IDs are -1; this does not work; this mechanism DOES NOT determine event status for platoon scenarios (see logstreams)	1	CSSDC		
SCC_EventNumber	Index of an event	1	0	short		{1..20}; A maximum of 20 events can be defined within a scenario.	1	CSSDC		

SCC_Eval_Exec_Time	Time since drive started.	1	0	float	sec	Seconds. The clock starts the first time SCC_EventStatus is set to 1.	1	CSSDC		
SCC_Eval_Collisions	Total number of collisions	1	0	integer	1	Total number of collisions so far in the drive (i.e. from when the event status is set to 1 for the first time).	1	CSSDC	0	
SCC_Eval_Max_Speed	Maximum own vehicle speed	1	0	float	MPH	Maximum own vehicle speed so far. MPH:Miles per hour	1	CSSDC	0	
SCC_Eval_Avg_Speed	Average OV speed	1	0	double	MPH	MPH:Miles per hour	1	CSSDC	0	
SCC_Eval_SpeedSD	Standard deviation of OV speed	1	0	double	MPH	MPH:Miles per hour	1	CSSDC	0	
SCC_Eval_Overall_SDLP	Standard deviation of OV lane position	1	0	double	ft	Standard deviation of OV lane position	1	CSSDC		
SCC_Eval_Lane_Departures	Total number of OV lane departures	1	0	integer		Lane departures as the LDW system indicates.	1	CSSDC		
SCC_Eval_Lane_Departure_Pct	Percentage of time when the OV is considered departed from the lane	1	0	float	1	Values from 0% to 100%	1	CSSDC	0	100
SCC_Eval_Speedings	Total number of occasions when the OV is 5MPH or more above the speed limit	1	0	short		There is a debounce time of 30 seconds. So within 30 seconds of activation the count won't increase even if the OV violates the speed limit multiple times during that time span.	1	CSSDC		
SCC_Eval_Speeding_Pct	Percentage of time when the OV is 5MPH or more above the speed limit	1	0	float	1	0% -- 100%. Debounce time is not used here. It's the actual frame count when the OV violates the speed limit measured against the total frame count of the drive so far.	1	CSSDC	0	100
SCC_Eval_Avg_Hdwy	Average distance between OV and a lead vehicle	1	0	float	ft	The distance is only averaged among the frames when there is a lead vehicle as reported by the scenario controller.	1	CSSDC		
SCC_Eval_Event_Collisions	Number of collisions during an event.	20	14	integer		An event is defined by SCC_Event_Status and SCC_Event_Number. The status needs to be 1 and the number needs to be between 1 and 20. (i.e. within a defined event). *Note: This is NOT TRUE for Platoon scenarios (see logstreams for event definition)	1	CSSDC		
SCC_Eval_Event_Max_Speed	Maximum OV speed during an event.	20	15	float	MPH	MPH:Miles per hour	1	CSSDC		
SCC_Eval_Event_Min_Speed	Minimum OV speed during an event	20	16	float	MPH	MPH:Miles per hour	1	CSSDC		
SCC_Eval_Event_Avg_Speed	Average OV speed during an event	20	17	double	MPH	MPH:Miles per hour	1	CSSDC		

SCC_Eval_Event_SDLP	Standard deviation of OV lane position during an event	20	18	double	ft	ft:feet	1	CSSDC		
SCC_Eval_Event_Lane_Departures	Number of OV lane departures during an event	20	19	integer			1	CSSDC		
SCC_Eval_Event_Lane_Departure_Pct	Percentage of time when the OV is 5MPH or more above the speed limit during an event	20	20		1		1	CSSDC	0	100
SCC_Eval_Event_Avg_Hdwy	Average distance between the OV and a lead vehicle during an event	20	21	float	ft	See remarks for SCC_Eval_Avg_Hdwy	1	CSSDC		
SCC_Eval_Window_Duration	Lengths of windows preceding the current frame, to be used for run time data reduction	10	22	float	sec	A total of 10 windows of different duration can be defined. There is a build up time for the window at the start of the drive as data are being filled in the windows. The length of the build up time is the same as the length of the window. The values during the build up time should be discarded.	1	CSSDC		
SCC_Eval_Window_Collisions	Number of collisions in a window of predefined duration preceding the current frame	10	23	integer	1		1	CSSDC		
SCC_Eval_Window_Avg_Speed	Average OV speed in a predefined window	10	24	double	MPH	MPH:Miles per hour	1	CSSDC		
SCC_Eval_Window_SDLP	Standard deviation of OV speed in a predefined window preceding the current frame	10	25	double	MPH	MPH:Miles per hour	1	CSSDC		
SCC_Eval_Window_Lane_Departures	Number of OV lane departures in a predefined window preceding the current frame	10	26	integer			1	CSSDC		

SCC_Eval_Window_Lane_Departure_Pct	Percentage of time when the OV is considered departed from the lane in a predefined window preceding the current frame	10	27	float	1		1	CSSDC	0	100
SCC_Eval_Window_Speedings	Number of occasions when the OV is 5MPH or more above the speed limit in a predefined window preceding the current frame	10	28	short	1	See remarks for SCC_Eval_Speedings.	1	CSSDC		
SCC_Eval_Window_Speeding_Pct	Percentage of time when the OV is 5MPH or more above the speed limit in a predefined window preceding the current frame	10	29	float	1	See remarks for SCC_Eval_Speeding_Pct	1	CSSDC	0	100
SCC_Eval_Window_Avg_Hdwy	Average distance between the OV and a lead vehicle preceding the current frame	10	30	float	ft	See remarks for SCC_Eval_Avg_Hdwy.	1	CSSDC		
SCC_Follow_Info	Lead vehicle follow data	9	31	float		An array of 9 floats 1st - identifier (CVED ID) of object -1 if none or error 0 if no ownvehicle 2nd - distance to lead vehicle CG (in feet, Cartesian global coordinates) 3rd - bumper-to-bumper time to lead vehicle (in seconds) 4th - bumper-to-bumper distance to lead vehicle (in feet) 5th - time-to-collision (in seconds) 6th - lead vehicle velocity (ft/s) 7th – x coordinate of lead vehicle 8th – y coordinate of lead vehicle 9th – z coordinate of lead vehicle	60	Hz		
SCC_DynObj_HcsmType	Scenario object's HCSM	20	32	integer			60	Hz		

SCC_Lane_Depart_Warn	Lane departure warning based on lane definition, not lane markings. Margin is customizable through cell SCC_Lane_Markings as well as cell AUX1_LdwWarningTimedHeadway	4		float		Array of 4 floats First element is LDW status: 0=off, 1=monitoring, 2=left depart, 3=right depart Second element is distance between left side of car and left lane (ft) Third element is distance between right side of car and right lane (ft) Fourth element is local heading angle of the car in the lane (deg) There are many ways to achieve lane departure warnings. The built-in method is to look at the first element of SCC_Lane_Depart_Warn cell. It's nominal value is 1. If the outside left corner of the vehicle comes to within some distance of the left lane edge, then it will change to 2. If the outside right corner of the vehicle comes to within some distance of the right lane edge, then it will change to 3. The edge of the lane is not where the lane markings are, it's where the edge of the lane definition is. The function allows for some margin inside the lane edge. The value of this margin is customizable through the cell SCC_Lane_Markings as well as through the cell AUX1_LdwWarningTimedHeadway. If AUX1_LdwWarningTimedHeadway = 1, margin = 12 else if AUX1_LdwWarningTimedHeadway = 2, margin = 3 otherwise, margin = 6 Then the minimum distance to lane edge to trigger a warning is determined by the margin as well as where the lane marking is. I will give you the defaults since that is what will be used unless someone goes through the trouble to define lane markings throughout the drive. Min_distance_from_left_edge = (2 + margin)/12 feet Min_distance_from_right_edge = margin/12 feet As you can see, the threshold is not symmetrical. This has to do with standard lane marking locations and is intentional. If you don't want to use the built-in mechanism, you can also get a good approximation by simply setting a threshold on SCC_Lane_Deviation, 2nd element. Lane departures will occur around deviations of 3 feet, approximately.	60	Hz		
* SCC_Lane_Deviation	Deviation of OV from center of lane Units =	4	33	float	1	Array of 4 floats {1st:: -1 or -2 (on a crdr) 1 (on a lane) 0 (error)} ;{ 2nd: offset from the center of lane/corridor}; { 3rd: width of lane (corridor's width is not reported)}; { 4th:Lane/corridor CVED id}	60	Hz	0	4
SCC_Spline_Lane_Deviation	Deviation of OV from center of lane computed	4	unknown	float	1	Array of 4 floats {1st:: -1 or -2 (on a crdr) 1 (on a lane) 0 (error)} ;{ 2nd: offset from the center of lane/corridor}; { 3rd: width of lane (corridor's width is not reported)}; { 4th:Lane/corridor CVED id}	60	Hz	0	4
SCC_LogStreams	Scenario set values	10 (5 std, 5 extended)	34	float		Array of 5 floats. Logstreams are values written into the DAQ file through "write to logstream" actions within a scenario. Typical uses are to store caclulations made in scenario for debugging or data reduction purposes. Can also write to these with RouteTable as inputs to scenario.	60	Hz		
SCC_Over_Speed_Limit	Over speed limit accumulation	1	0	integer		Integer >= 0	60	Hz	0	
SCC_OwnVeh_Curvature	Road curvature at Own Vehicle's current position	1	0	float	feet	Float >= 0, Radius in feet	60	Hz	0	
SCC_Scen_Pos_Hex_Pitch	Pitch of the driver, in scenario coordinates.	1	0	float	Deg	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_Hex_Roll	Roll of the driver, in scenario coordinates.	1	0	float	Deg	***not used in miniSim***	1	CSSDC		

SCC_Scen_Pos_Hex_X	X position of the motion base hexapd, in scenario coordinates.	1	0	float	ft	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_Hex_Y	Y position of the motion base hexapod, in scenario coordinates.	1	0	float	ft	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_Hex_Yaw	Yaw of the motion base hexapod, in degrees.	1	0	float	Deg	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_Hex_Z	Z position of the driver, in scenario coordinates.	1	0	float	ft	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_TT	Turntable position of the driver, in scenario coordinates.	1	0	float	Deg	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_X_Crossbeam	X Crossbeam position of the driver, in scenario coordinates.	1	0	float	in	***not used in miniSim***	1	CSSDC		
SCC_Scen_Pos_Y_Carriage	Y Carriage position of the driver, in scenario coordinates	1	0	float	in	***not used in miniSim***	1	CSSDC		
SCC_Total_Speed_Limit	Total number of increments collected at 60 Hz (frame count)	1	0	integer		Integer >=0	60	Hz	0	
SCC_Under_Speed_Limit	Under speed limit accumulation (frame count)	1	0	integer		Integer >=0	60	Hz	0	
SCC_Within_Speed_Limit	Within speed limit accumulation (frame count)	1	0	integer		Integer >=0	60	Hz	0	
SOP_Weather_State	Type, enabled or disabled	2	0	integer		Components are type, state [1]: rain, 2: snow, 4: fog, 8: wind, 16: sun [2] 0 (off) or 1 (on)	60	Hz		
SOP_Weather_Parameters	Values depend on SOP_Weather_State	3	0	float		(Rain or Snow): intensity 0 to 1, 0 = minimum, 1 = maximum (Fog): 0 to 0.1 (0 = minimum, 0.1 maximum) (Wind): [1] = wind speed in mph (0-40), [2] = wind direction in degrees 0 to 350, West is left horizontal = 0 degrees, angle increases CCW, so N = 270 degrees	60	Hz		

SOP_Weather_Override	0 = disable, 1 = enable	1	0	short		0 = disable, 1 = enable	60	Hz		
TPR_Surface_Tire_Friction_Ind	Type of surface the tire is in contact with (up to 10 tires as on a Class 8 truck)	10	35	short		0 - intersections and drivable off-road; 14 – Road; 20 - Shoulder	1	CSSDC		
VDS_ABS_Operating_Flag	Flag to enable/disable ABS system	1	0	short		0 – ABS system disabled ; 1 – ABS system enabled	1	CSSDC		
VDS_Acc_Pedal_Pos_Backdrive	Acceleration pedal position backdrive	1	0	float		***not used in miniSim***	60	Hz		
VDS_Brake_Torque	The brake torque at each wheel	4	36	float	N-m	N-m:Newton-meter. Order of brakes as shown in Figure 1. See Figure 1 in document [R02] last page.	60	Hz		
VDS_BrkPdl_Fr_Fltrd	VDS filtered version of CFS_Brake_Pedal_Force	1	0	float	lb	lb:Pounds	60	Hz		
VDS_Chassis_CG_Accel	Chassis CG Acceleration (X, Y, Z Global) Coordinates)	3	37	float	ft/(sec*sec)	As viewed in ISAT, X positive to the East (Right), Y positive to the North (top of screen), Z positive up elevation (out of screen)	60	Hz	SA this element is not correct based on DAQ review	
VDS_Chassis_CG_Ang_Vel	Chassis CG angular velocity	3	38	float	Deg/sec	Rotational velocity about the axes of the Global Coordinate system.	60	Hz		
VDS_Chassis_CG_Orient	Chassis CG orientation	3	39	float	Deg	Rotational orientation about the axes of the Global Coordinate system.	60	Hz		
VDS_Chassis_CG_Position	Chassis CG position (SAECoordinates; see https://www.researchgate.net/figure/SAE-Vehicle-Axis-System_fig3_323573937)	3	40	double	ft	As viewed in ISAT, X positive to the East (Right), Y positive to the North (top of screen), Z positive up elevation (out of screen)	60	Hz	NOTE atypical use of Y,X,Z coordinates	
VDS_Chassis_CG_Vel	Chassis CG velocity (x,y,z)	3	41	float	fps	It's 3 components are longitudinal, lateral, and vertical, in the SAE coordinate system. X is forward, Y is right, Z is down.	60	Hz		
VDS_Coeff_Fric	Coefficient of friction currently being used by dynamics	1	0	float	1	Coefficient of friction currently being used by dynamics[R02]. Terrain type 14 – 0.50 ; Terrain type 20 – 0.65; Terrain type 0 – 0.65; Terrain type 25 – 0.50	60	Hz		
VDS_Eyepoint_Orient	Eye point orientation in global coordinate system	3	42	float	Deg	Rotational orientation about the axes of the Global Coordinate system.	60	Hz		
VDS_Eyepoint_Pos	Eye point position in global coordinate system	3	43	double	ft	As viewed in ISAT, X positive to the East (Right), Y positive to the North (top of screen), Z positive up elevation (out of screen)	60	Hz		
VDS_Head_Pt_Angular_Vel	Angular velocity of head point	3	44	float	Deg/sec	Rotational velocities around the driver's headpoint with respect to a local coordinate system at the headpoint. X is along vehilce axis (positive forward), Y is transverse (positive to left), Z is positive down. Headpoint location with respect to vehicle CG is in the SOL2 file.	60	Hz		

VDS_Head_Pt_Specific_Force	Head point specific forces	3	45	float	G	in G's. with respect to a local coordinate system at the driver's headpoint. X is along vehilce axis (positive forward), Y is transverse (positive to left), Z is positive down. Headpoint location with respect to vehicle CG is in the SOL2 file.	60	Hz		
VDS_Load_Torque	Wheel torque due to external forces	1	0	float	ft-lb	ft-lb:foot-pounds	60	Hz		
VDS_Num_Grids	Number of grids used for each contact patch	1	0	short	1	Ask NADS for details.	1	CSSDC		
VDS_Num_Tires	Number of tires on vehicle	1	0	short	1	0-10	60	Hz	0	10
VDS_Steering_torque_Backdrive	Commanded Steering Wheel Torque	1	0	float	ft-lb	ft-lb:foot-pounds **(not supported in minisim)**	60	Hz		
VDS_Tire_Ground_Contact	The tire/terrain contact location	20	46	float	ft	In feet, a vector with two elements (x,y) for each tire, representing the point where the tire contacts the ground with respect to vehicle CG. The tires are listed with front right first, front left second, rear right third, rear left fourth.	60	Hz		
VDS_Tire_Rot_Vel	Tire rotational velocity	10	47	float	Deg/sec		60	Hz		
VDS_Tire_Slip_Angle	Tire slip angle	10	48	float	Deg	with respect to vehicle longitudinal axis.	60	Hz		
VDS_Tire_Slip_Ratio	Tire slip ratio	10	49	float	1	0-1 normalized	60	Hz	0	1
VDS_Tire_Weight_On_Wheels	Tire weight on wheels	10	50	float	lbf	lbf: Pound force	60	Hz		
VDS_Veh_Eng_RPM	Engine revolutions per minute	1	0	float	rpm	rpm: revolutions per minute	60	Hz		
VDS_Veh_Eng_Torque	Engine torque	1	0	float	ft-lb	ft-lb: foot-pounds	60	Hz		
VDS_Veh_Heading	Vehicle heading	1	0	float	Deg	North is 0 deg. Positive CCW as viewed from above.	60	Hz		
VDS_Veh_Speed	Vehicle speed	1	0	float	MPH	MPH:Miles per hour	60	Hz		
VDS_Veh_Trans_RPM	Transmission revolutions per minute	1	0	float	rpm	rpm:revolutions per minute	60	Hz		
VDS_VibrForce	Commanded Vibration Forces	4	51	float	Gs	Gs:force expressed in g's **(not supported in minisim)**	60	Hz		
VDS_Wheel_Center_Heading	Heading angle of wheel	10	52	float	Deg		60	Hz		
VDS_Wheel_Center_Velocity	Translational velocity of wheel center	30	53	float	ft/sec		60	Hz		
VDS_Wheel_Spin	Wheel spin	10	54	float	rad/sec		60	Hz		
VDS_Wheel_Spin_Angle	Rotational position of tire, in radians	10	55	float	rad		60	Hz		
VDS_Wheel_Steer_Angle	Road wheel angle	10	56	float	rad		60	Hz		
VVS_Right_Warning_Light	Electronic Stability Control (ESC) on icon	1	0	integer	1	1 - off; 2 - on (**not supported on minisim**)	1	CSSDC		
VVS_Speedometer_Backdrive	Speedometer backdrive	?	?		MPH	MPH:Miles per hour	60	Hz		
VDS_DRV_Frame_No	Drive File Frame No.	1	0	integer		recorded data used in a driver input playback file - special application	60	Hz		
VDS_DRV_Joystick_Type	Drive File Joystick Type	1	0	short		recorded data used in a driver input playback file - special application	60	Hz		

VDS_DRV_Steering_Wheel_Angle	Drive File Steering Wheel Angle	1	0	float		recorded data used in a driver input playback file - special application	60	Hz		
VDS_DRV_Steering_Wheel_Angle_Rate	Drive File Steering Wheel Angle Rate	1	0	float		recorded data used in a driver input playback file - special application	60	Hz		
VDS_DRV_Transmission_Gear	Drive File Transmissi on Gear	1	0	short		recorded data used in a driver input playback file - special application	1	CSSDC		
VDS_DRV_Auto_Transmission_Mode	Drive File Auto Transmissi on Mode	1	0	short		recorded data used in a driver input playback file - special application	1	CSSDC		
VDS_DRV_Accelerator_Pedal_Position	Drive File Accelerat or Pedal Position	1	0	float		recorded data used in a driver input playback file - special application	60	Hz		
VDS_DRV_Brake_Pedal_Force	Drive File Brake Pedal Force	1	0	float		recorded data used in a driver input playback file - special application	60	Hz		
VDS_DRV_Joystick_Buttons	Drive File Joystick Buttons	1	0	integer		recorded data used in a driver input playback file - special application	1	CSSDC		
SOP_DriveMode		1	0	short		0 = regular drive, 1 = recording, 2 = playback	1	CSSDC		
SOP_PlaybackFileName	Playback File Name	256	57	chars		256 chars, name of the playback file. The file is in binary format and its name has an extension of ".drv".	1	CSSDC		
SCC_Visual_Database		256	58	chars		name of BLI file in use				
SCC_Scenario_File		128	59	chars		name of SCN file in use				
SCC_LKA_Status	Status LKA device	1	0	integer	1	0: OFF(default) or 1:ON	60	Hz	0	1
SCC_LKA_ModelID	Unique Number for the model to be utilized	1	0	integer	1	1:constant torque, 2:Exponential torque(default)	60	Hz	1	2
SCC_LDW_Status	Status of LDW	1	0	integer	1	0: OFF(default) or 1:ON	60	Hz	0	1
SCC_LDW_AlertNumber	Unique ID for an alert	1	0	integer	1	1:alert number one in database(default)	60	Hz	1	
SCC_WindGust_Status	Status Wind-gust	1	0	integer	1	0: OFF(default) or 1:ON	60	Hz	0	1
SCC_WindGust_ModelID	Unique Number for the model to be utilized	1	0	integer	1	1:constant torque, 2:Exponential torque(default)	60	Hz	1	2

NOTE: AutoDrive is not part of the standard miniSim installation, it is a licensed option

Cell_Name	Short_Description	NumberElements	ID_Array	Type	Units_Cell	Long_Description	CollectionFreq	CollectionFreqUnits	Single_Val_Min	Single_Val_Max
							60	Hz		
CFS_AutoDriver_Command	Command hotkey from outside dynamics	1	0	short						
CFS_AutoDriver_SetSpeed	Override set from outside dynamics	1	0	float	mph					
CFS_Autonomous_Control_Mode_Override	Auto-driver override mask bit 0: steering bit 1: gas bit 2: brake	1	0	integer						
SCC_External_Driver	Define external driver **0**: none **1**: external driver like keyboard or commands through ISAT Expression Triggers, **2**: external driver like sub-system(software) which controls AD	1	0	integer						
SCC_AutoDriver_Mode	Mode of autodrive 0: off 1: on	1	0	integer						
SCC_AutoDriver_Command	Command hotkey from scenario **w** Drive at the speed limit **s** Brake to a stop **j** Adjust speed down by 5 mph **k** Adjust speed up by 5 mph **a** Change lanes to the left if possible **d** Change lanes to the right if possible **W** Set the next turn direction to straight **A** Set next turn direction to left **D** Set next turn direction to right **p** Pullover to the side of the road **1** Style coefficient = 0.0 **2** Style coefficient = 0.2 **3** Style coefficient = 0.4 **4** Style coefficient = 0.6 **5** Style coefficient = 0.8 **6** Style coefficient = 1.0	1	0	short					0	1
SCC_AutoDriver_SetSpeed	Any positive real number	1	0	float	mph				-2	4
SCC_AutoDriver_ISAT_HI_Interface		1	0	integer						
SCC_AutoDriver_ONOFF_ISAT		1	0	integer						
SCC_AutoDriver_GasBrake_Status		1	0	integer						
VDS_AutoDriver_Command	Effective command hotkey output from dynamics	1	0	char					0	180
VDS_Steering_Wheel_Angle	Effective steering wheel angle output from dynamics	1	0	float	degrees				0	100
VDS_Accelerator_Pedal_Position	Effective throttle pedal output from dynamics range 0 -1	1	0	float	lbf					
VDS_Brake_Pedal_Force	Effective brake force output from dynamics	1	0	float						

Lead expression

(Xlead – X) / vel

Distance to lead is also known as headway

TTC expression

Time to collision equation is something like:

(Xlead – X) / (Vlead - vel) (I might have the sign wrong)

In words, it is range over range rate.

Date	Initials	Description	Source
7/15/2024	SA	Add Weather cell info to main list	[oh] N:\MiniSim_FAQ_Support\Weather_In_miniSim
9/29/2023	SA	Add Notes page	Info from Chris S.
9/18/2023	SA	Add AutoDrive cells from AutoDrive documentation	N:\MiniSim_FAQ_Support\AutoDrive_Docs\manAD-EXTERNAL.pdf