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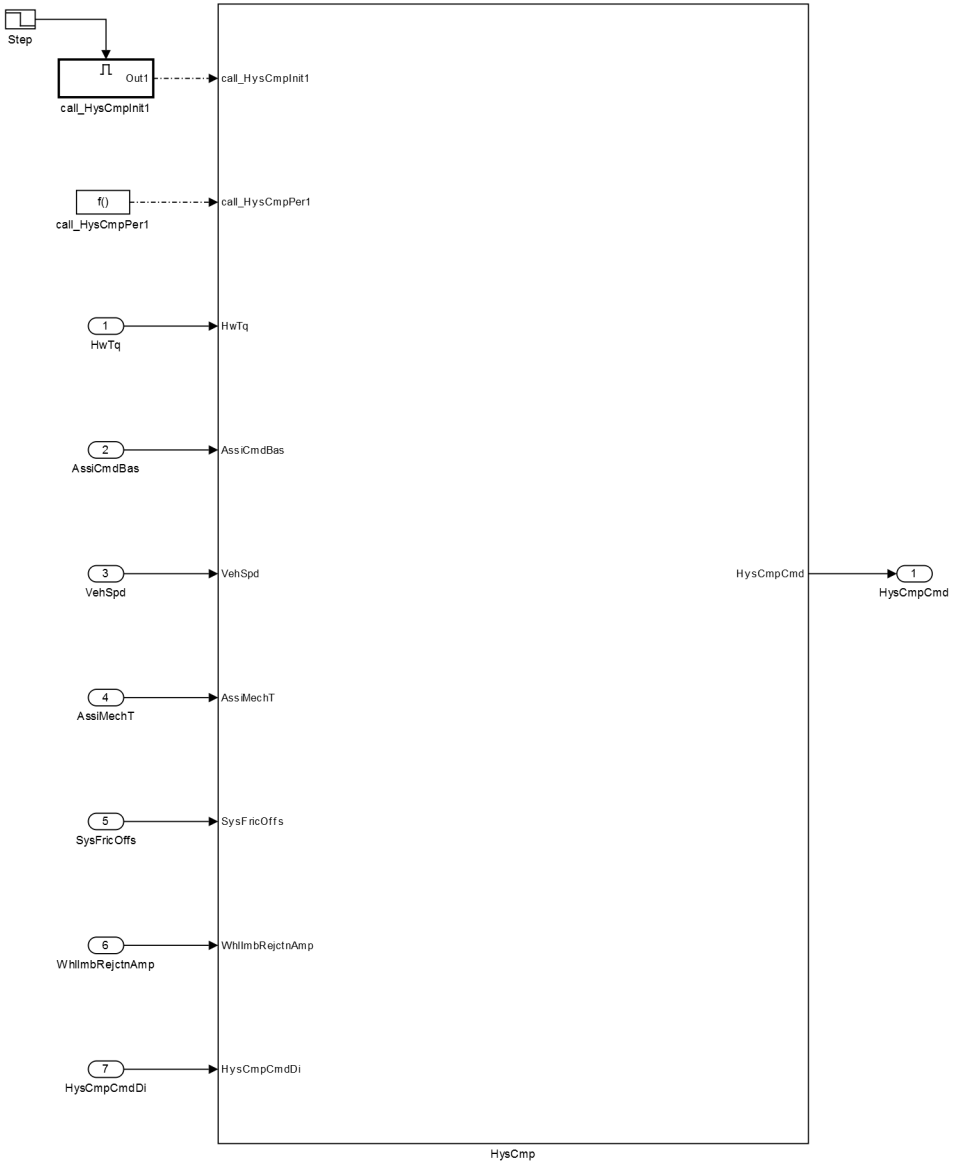

File Dependencies:

Model_Config v1.2.0
Nexteer_Utilities v4.3.1
Data_Management v2.14.0

Requirements Baseline: NA

Change Log:
v1.0.0
Date: 08-Jul-2015
Change Control #: EA4#943
Author: Sudeep Shankar
Description:
- Initial Release based off of EA3 Version 008

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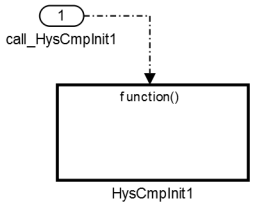
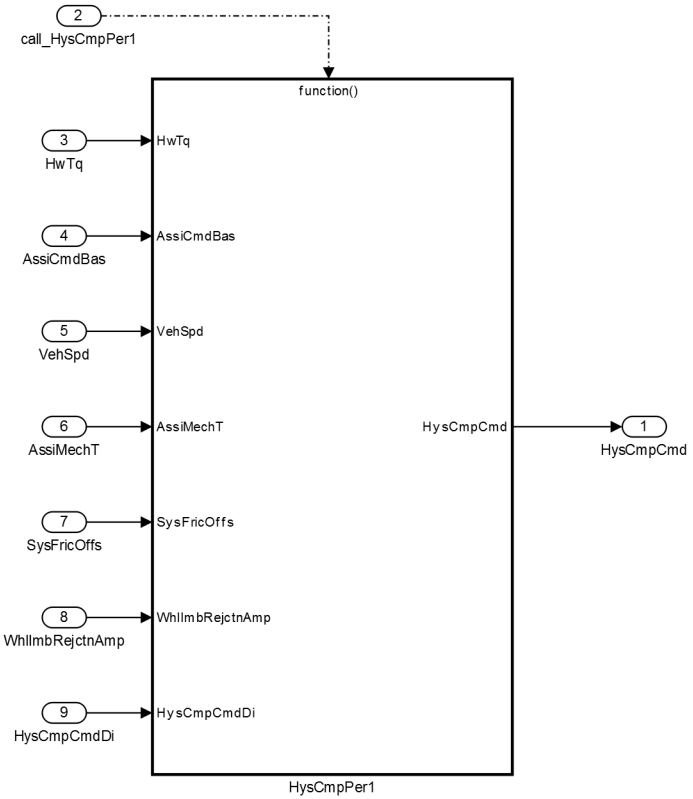
SF012A Hysterisis Compensation Version: 1.0.0 Date: Jul 8, 2015

This function improves steering precision and feel by compensating for physical friction and efficiency losses. Due to the vibratory nature of a vehicle, the calibrations associated with these physical attributes are allowed to vary according to vehicle speed and the magnitude of Wheel Imbalance Rejection function command. The function includes a feature to deal with changing physical system properties over temperature operating range. It also incorporates calibration tables used to modify how the compensation is applied during transitions between operating quadrants and during periods of near-zero handwheel torque. Finally the function may be disabled for purposes of bench testing





Display Variables

- dHysCmpAssiCmdFild
- dHysCmpHwTqFild
- dHysCmpAvl
- dHysCmpFric
- dHysCmpEffCmpTq
- dHysCmpPosAvl
- dHysCmpNegAvl
- dHysCmpRawVal
- dHysCmpRiseYFac

PIMs

- AssiCmdLpFil
- HwTqLpFil
- FinalOutpLpFil
- PrevHwTqFildVal
- PrevAssiCmdFildVal
- PrevRiseX
- PrevRiseY

f()
function

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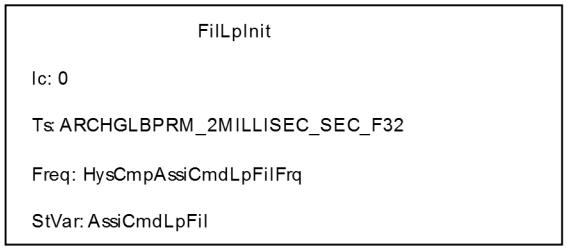
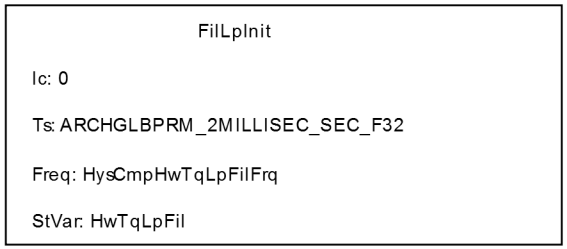
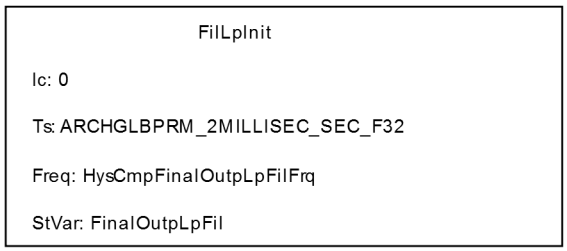


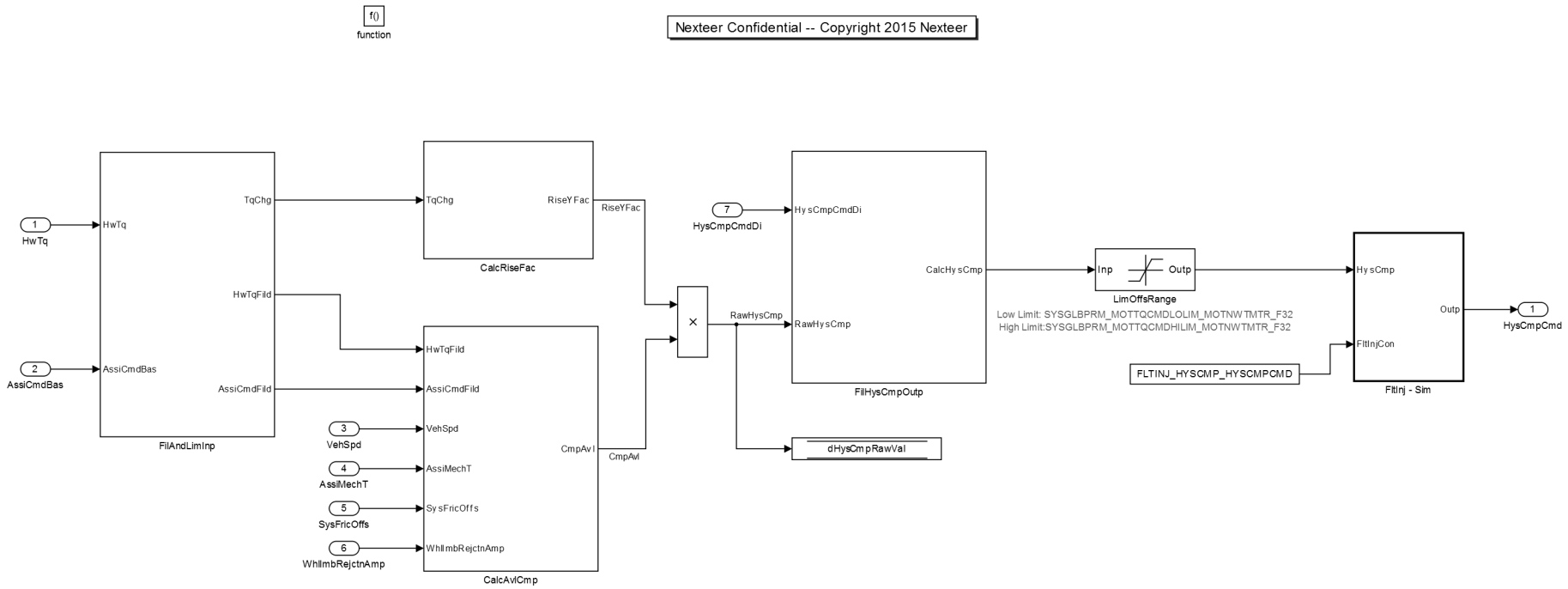
HysCmpAssiCmdLpFilInit



HysCmpHwTqLpFilInit



HysCmpFinalOutpLpFil


f()
function
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1
HwTq
2
AssiCmdBas
HwTq
AssiCmdBas
TqChg
HwTqFild
AssiCmdFild
FilAndLimInp
TqChg
RiseYFac
CalcRiseFac
RiseYFac
HwTqFild
AssiCmdFild
VehSpd
AssiMechT
SysFricOffs
WhlImbRejctnAmp
CmpAvl
CalcAvlCmp
3
VehSpd
4
AssiMechT
5
SysFricOffs
6
WhlImbRejctnAmp
CmpAvl
×
RawHysCmp
7
HysCmpCmdDi
HysCmpCmdDi
RawHysCmp
CalcHysCmp
FilHysCmpOutp
dHysCmpRawVal
Inp
Outp
LimOffsRange
Low Limit: SYSGLBPRM_MOTTQCMDLOLIM_MOTNWTMTR_F32
High Limit:SYSGLBPRM_MOTTQCMDHILIM_MOTNWTMTR_F32
FLTINJ_HYSCMP_HYSCMPCMD
HysCmp
FltInjCon
Outp
FltInj - Sim
1
HysCmpCmd

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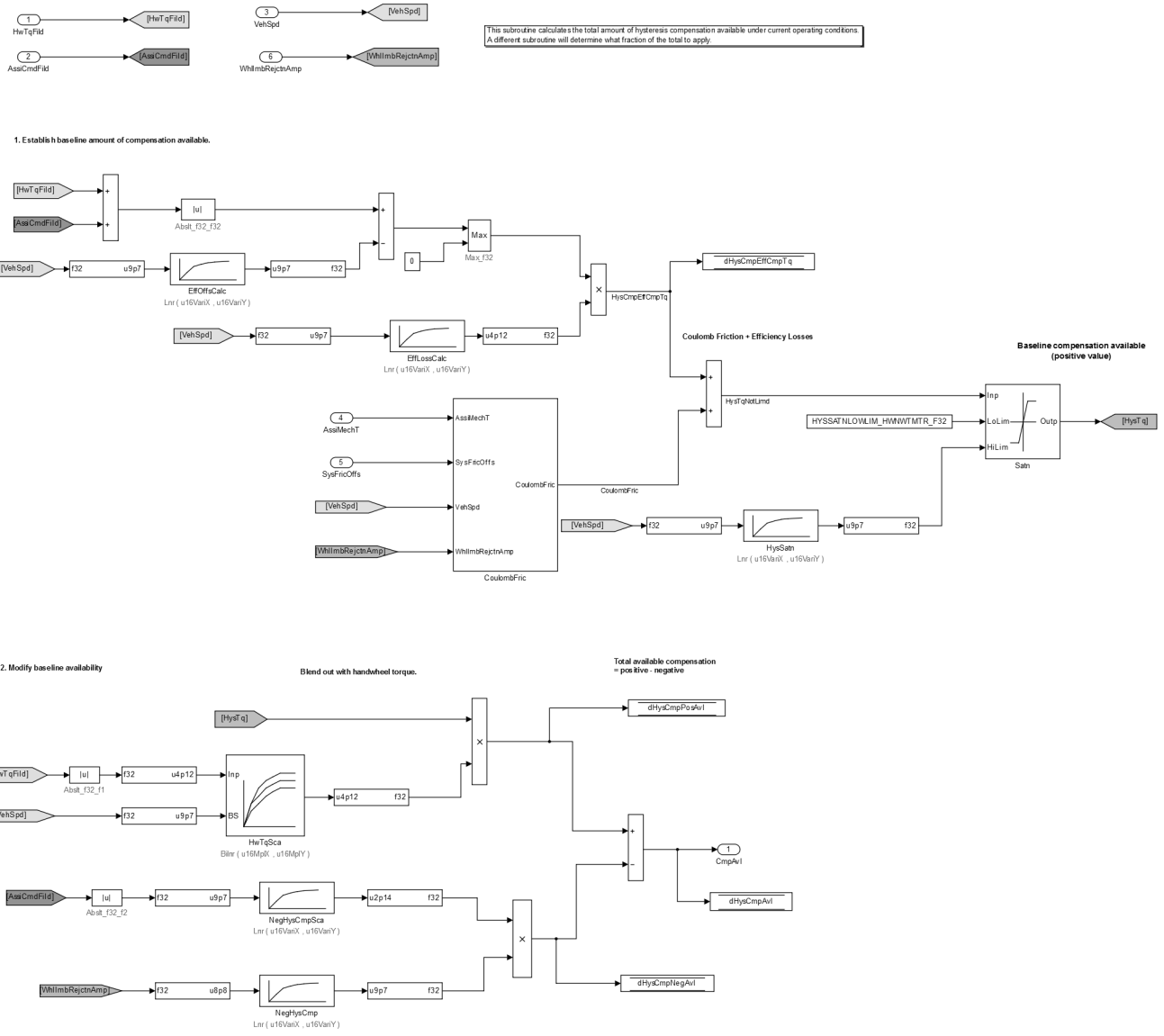

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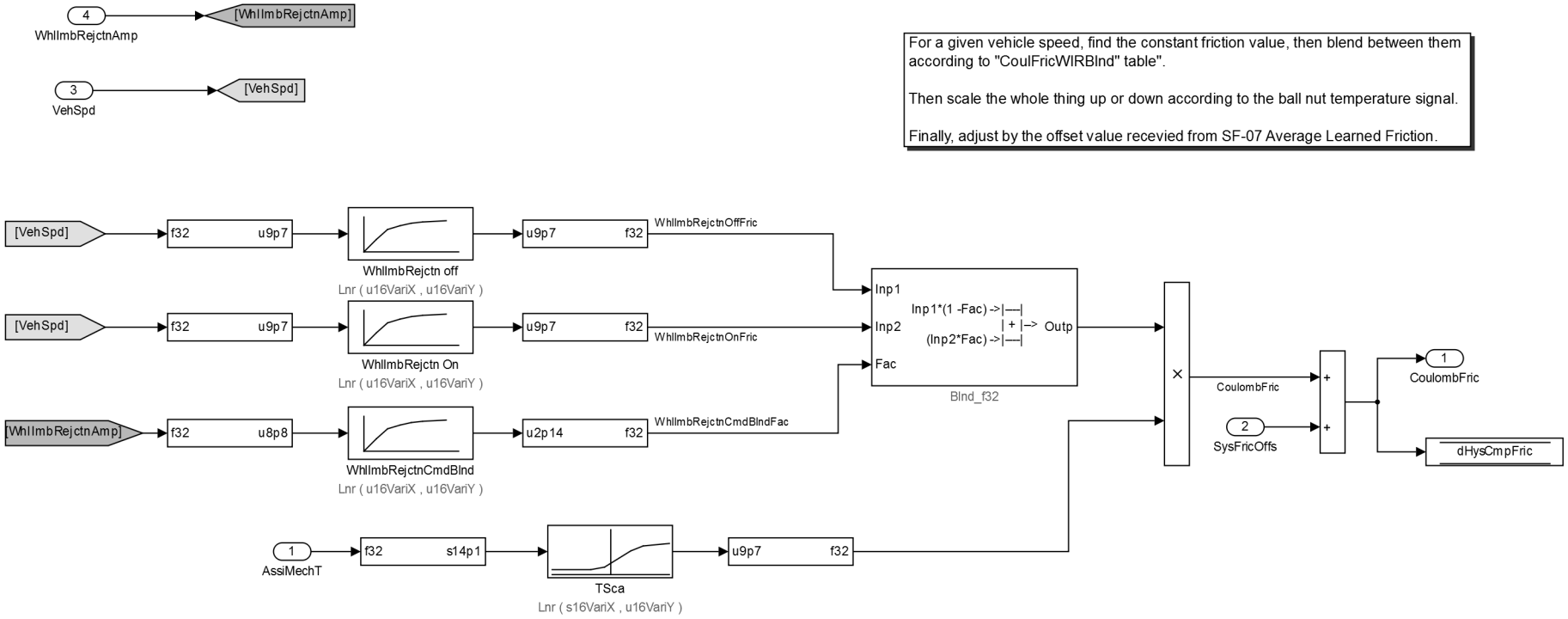

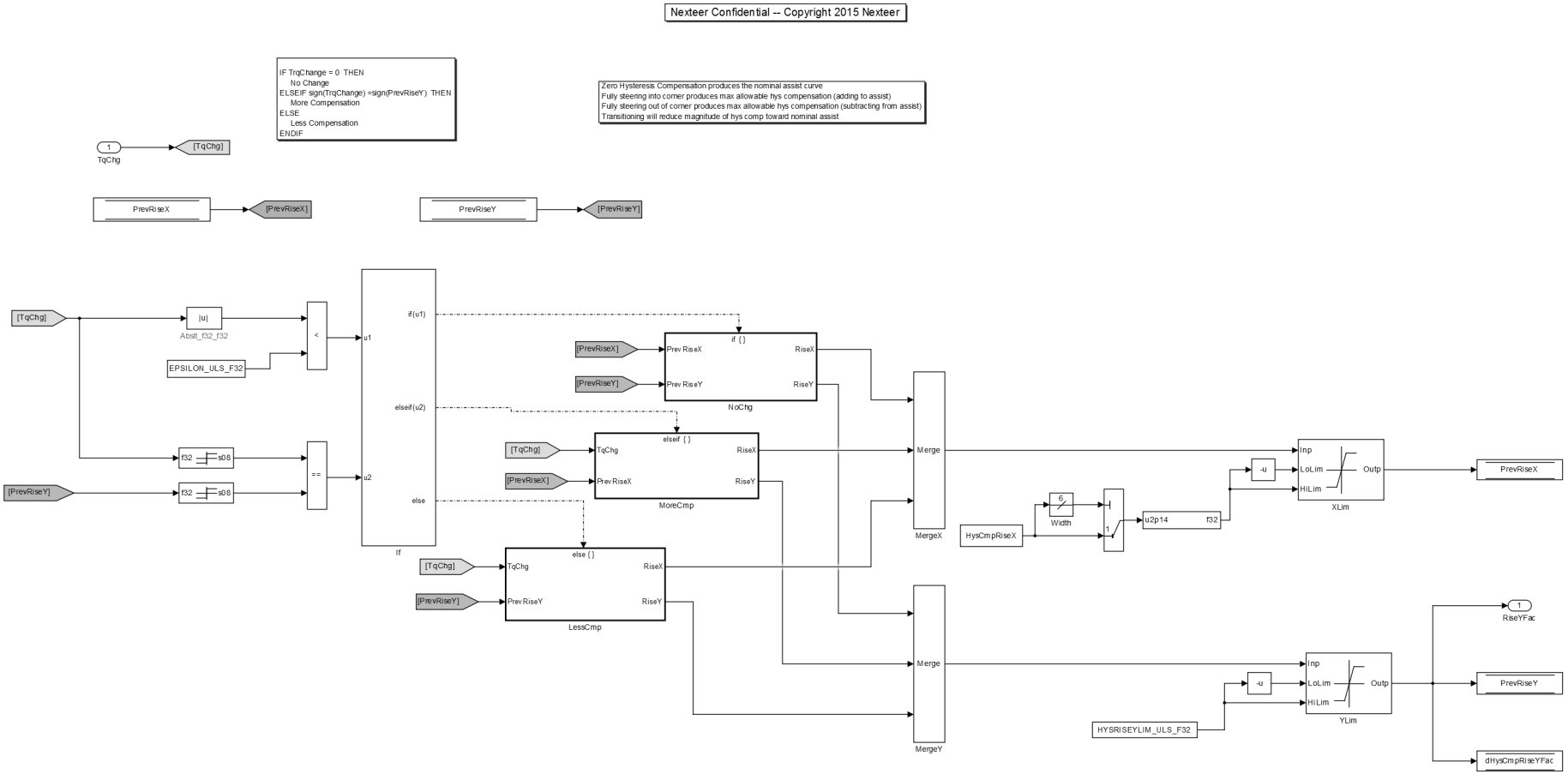
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IF TrqChange = 0 THEN
No Change
ELSEIF sign(TrqChange) =sign(PrevRiseY) THEN
More Compensation
ELSE
Less Compensation
ENDIF
Zero Hysteresis Compensation produces the nominal assist curve
Fully steering into corner produces max allowable hys compensation (adding to assist)
Fully steering out of corner produces max allowable hys compensation (subtracting from assist)
Transitioning will reduce magnitude of hys comp toward nominal assist
1
TqChg
[TqChg]
PrevRiseX
[PrevRiseX]
PrevRiseY
[PrevRiseY]
|u|
Abslt_f32_f32
EPSILON_ULS_F32
<
f32
s08
==
if(u1)
elseif(u2)
else
u1
u2
If
if { }
elseif { }
else { }
Prev RiseX
Prev RiseY
RiseX
RiseY
NoChg
MoreCmp
LessCmp
TqChg
Merge
MergeX
MergeY
HysCmpRiseX
6
Width
1
u2p14
f32
-u
Inp
LoLim
HiLim
Outp
XLim
YLim
HYSRISEYLIM_ULS_F32
RiseYFac
dHysCmpRiseYFac

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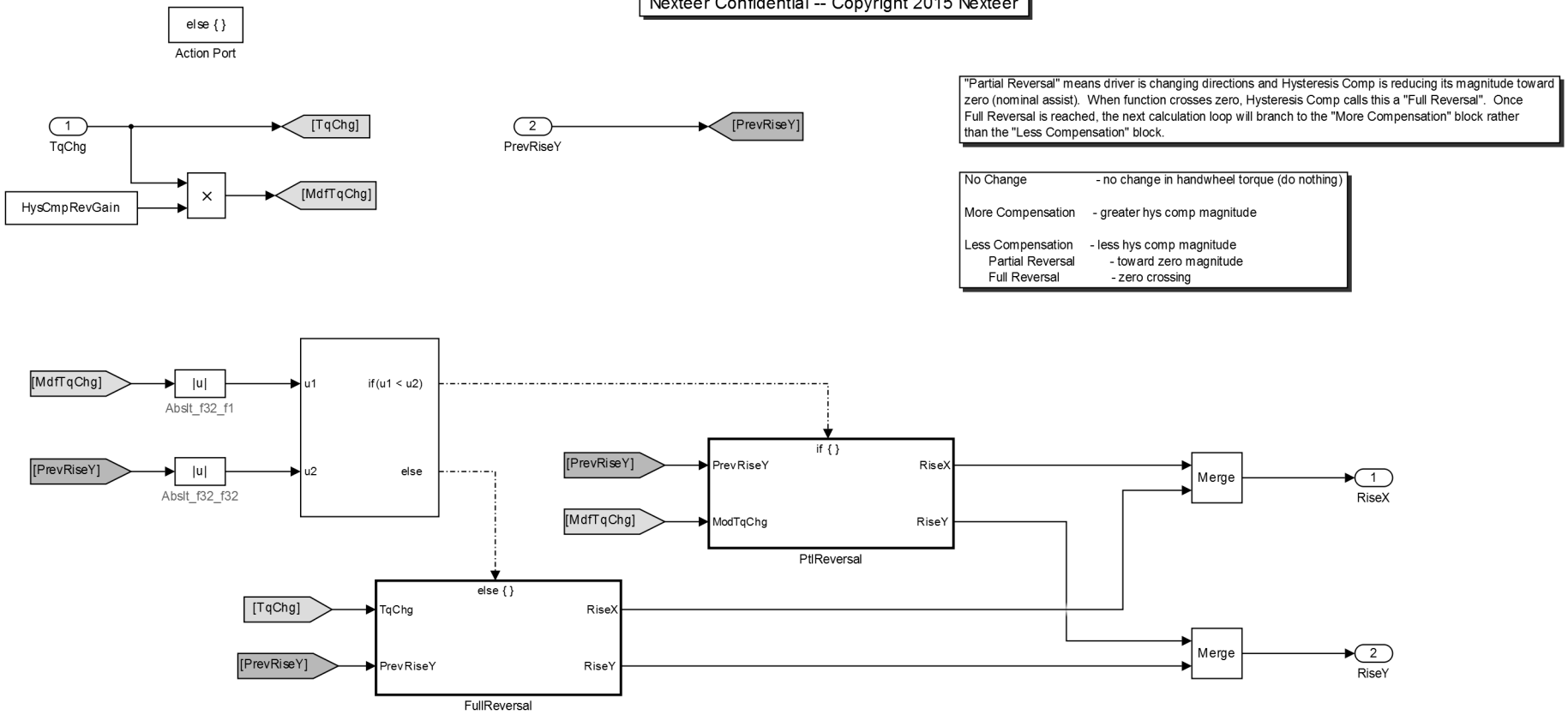
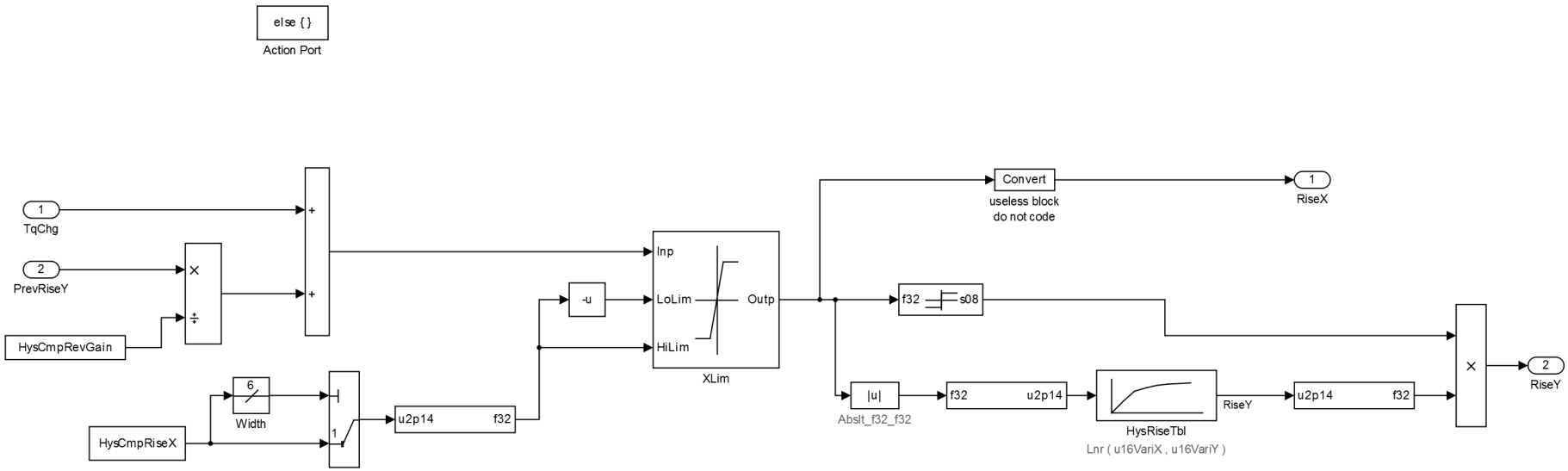
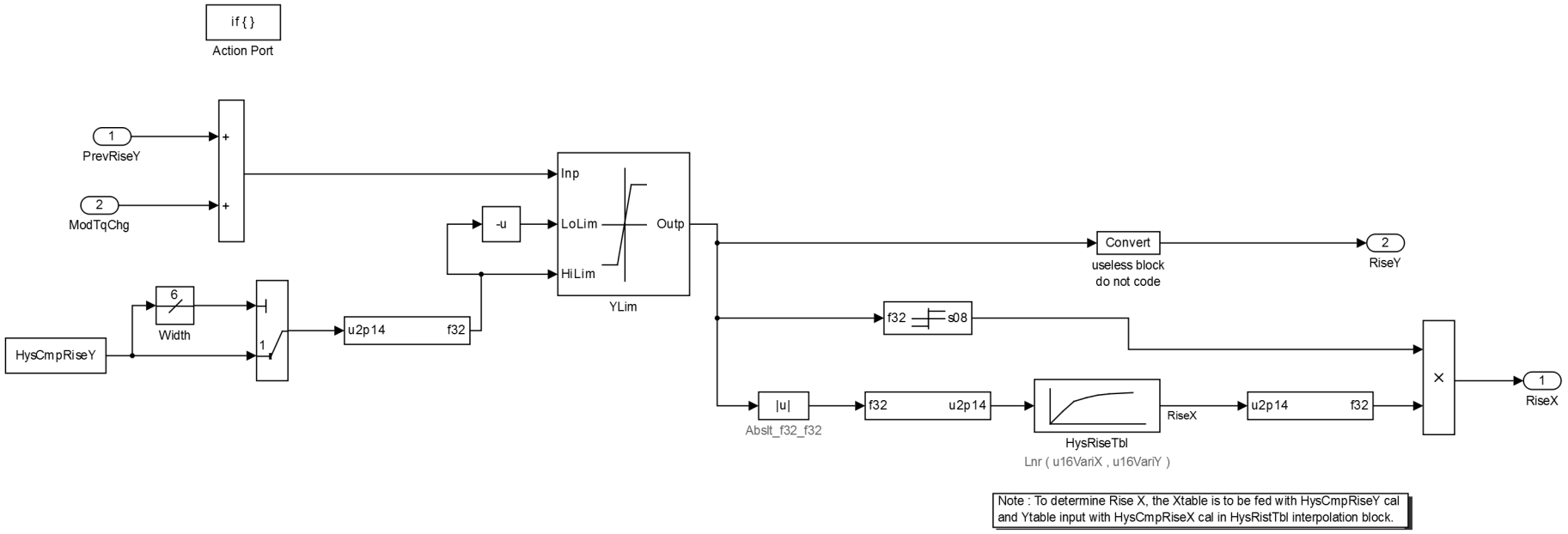
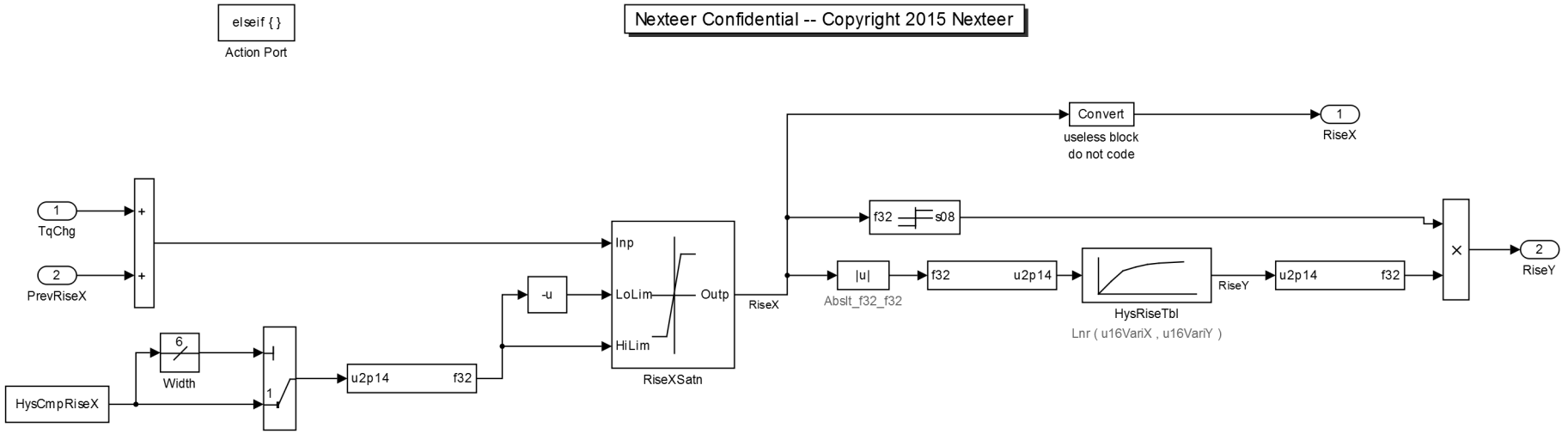



else { }
Action Port
1
TqChg
2
PrevRiseY
HysCmpRevGain
HysCmpRiseX
6
Width
1
u2p14 f32
-u
Inp
LoLim
HiLim
Outp
XLim
Convert
useless block
do not code
1
RiseX
f32 s08
|u|
Abslt_f32_f32
f32 u2p14
HysRiseTbl
Lnr (u16VariX , u16VariY)
RiseY
u2p14 f32
2
RiseY


if { }
Action Port
1
PrevRiseY
2
ModTqChg
+
+
Inp
LoLim
HiLim
Outp
YLim
-u
6
Width
HysCmpRiseY
1
u2p14 f32
Convert
useless block
do not code
2
RiseY
f32 s08
|u|
Abslt_f32_f32
f32 u2p14
HysRiseTbl
Lnr (u16VariX , u16VariY)
RiseX
u2p14 f32
×
1
RiseX
Note : To determine Rise X, the Xtable is to be fed with HysCmpRiseY cal and Ytable input with HysCmpRiseX cal in HysRistTbl interpolation block.


elseif { }
Action Port
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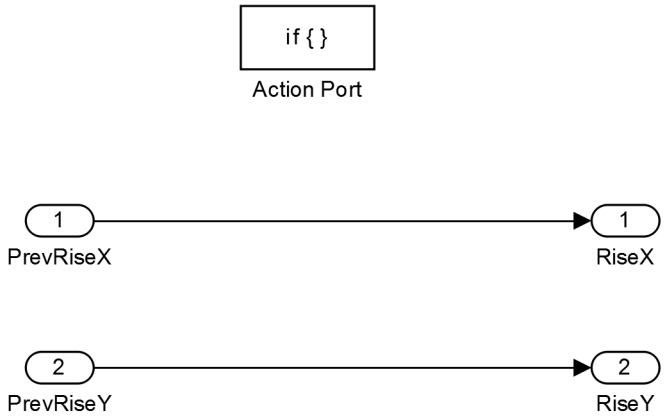
Convert
useless block
do not code
1
RiseX
1
TqChg
2
PrevRiseX
+
+
Inp
LoLim
HiLim
Outp
RiseXSatn
-u
RiseX
f32
s08
|u|
Abslt_f32_f32
f32
u2p14
HysRiseTbl
Lnr (u16VariX , u16VariY)
RiseY
u2p14
f32
×
2
RiseY
6
Width
1
HysCmpRiseX
u2p14
f32



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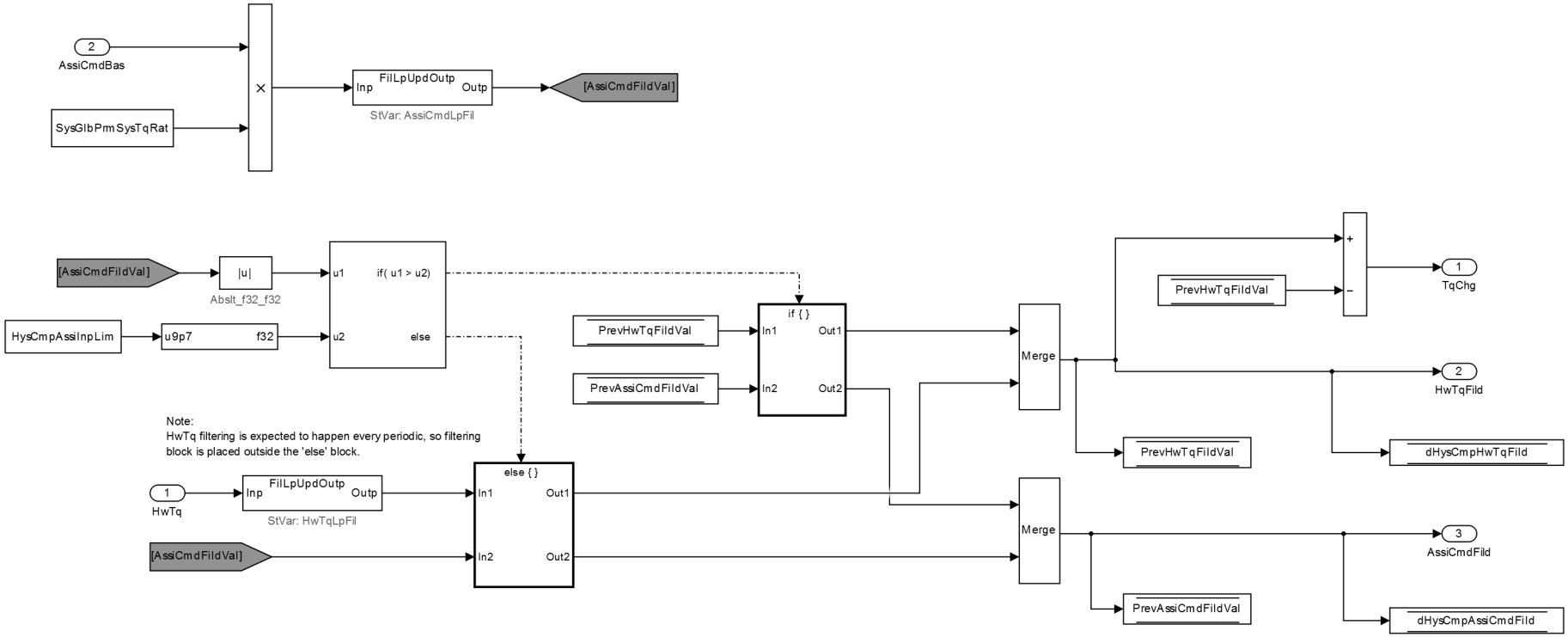

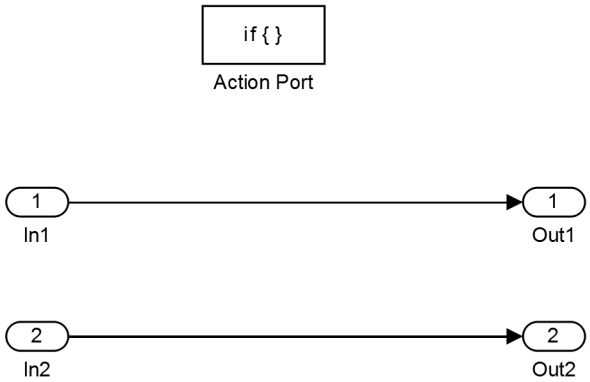

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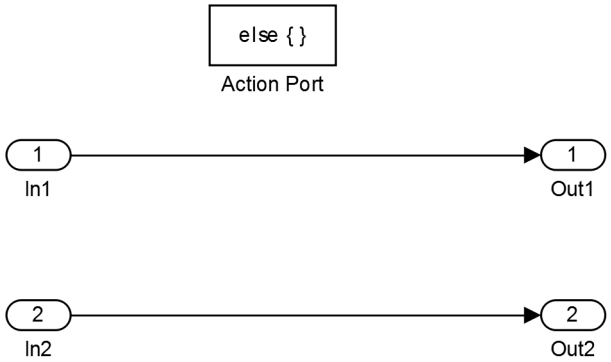

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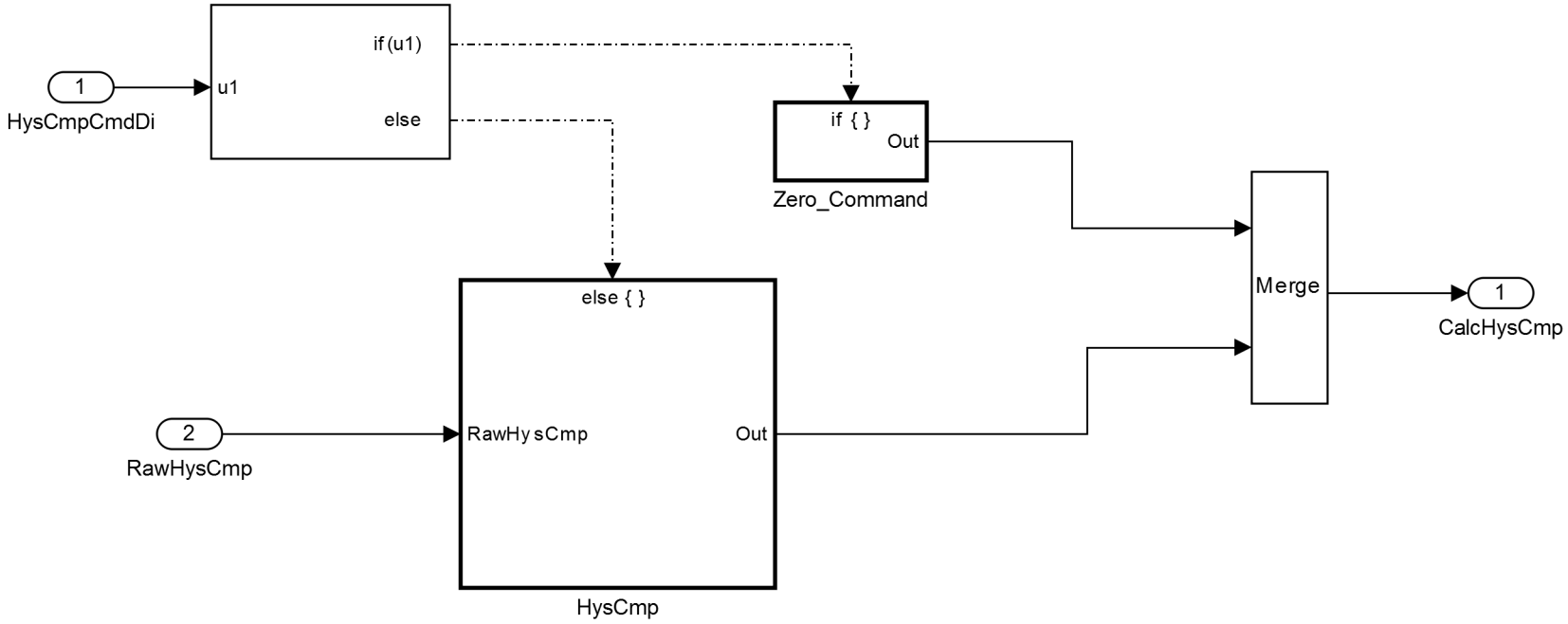

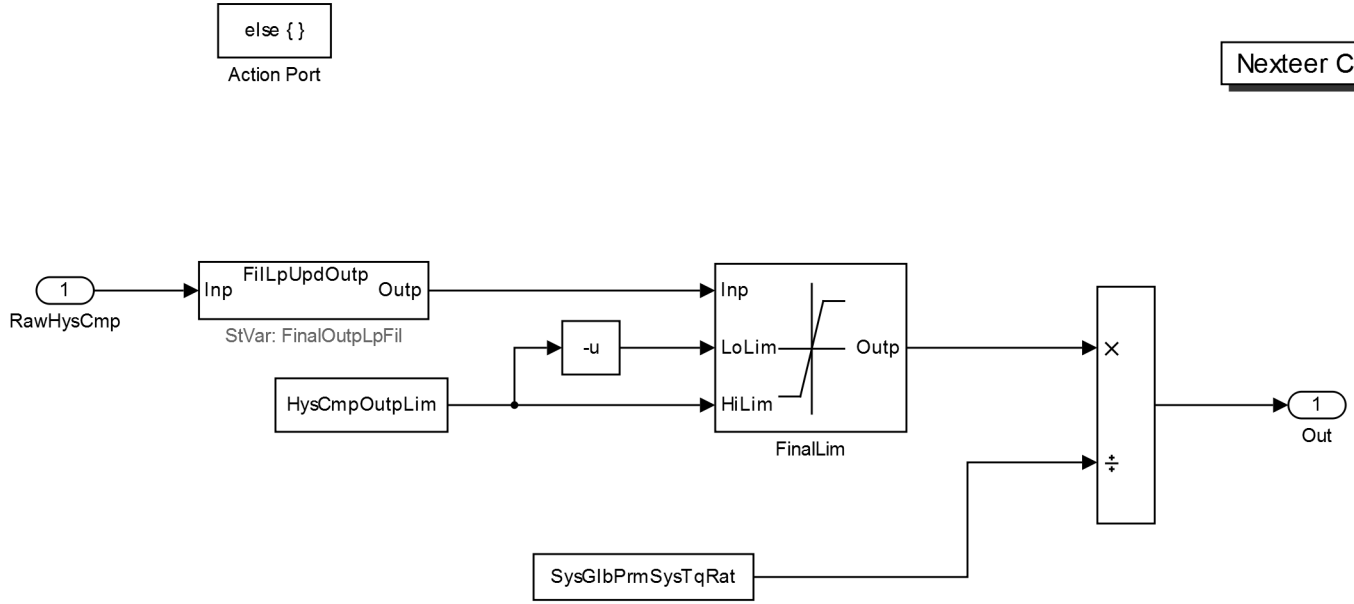
else { }
Action Port
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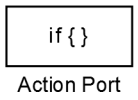
1
RawHysCmp
FilLpUpdOutp
Inp
Outp
StVar: FinalOutpLpFil
-u
HysCmpOutpLim
Inp
LoLim
HiLim
Outp
FinalLim
1
Out
SysGIbPrmSysTqRat



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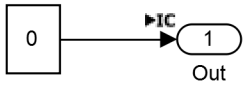

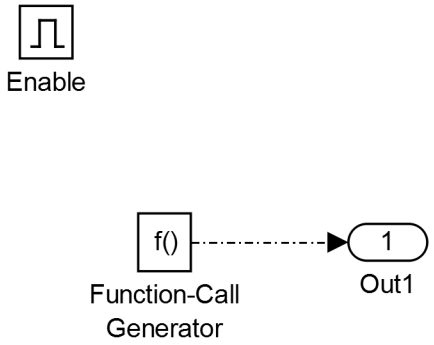
Enable
f()
Function-Call
Generator
1
Out1