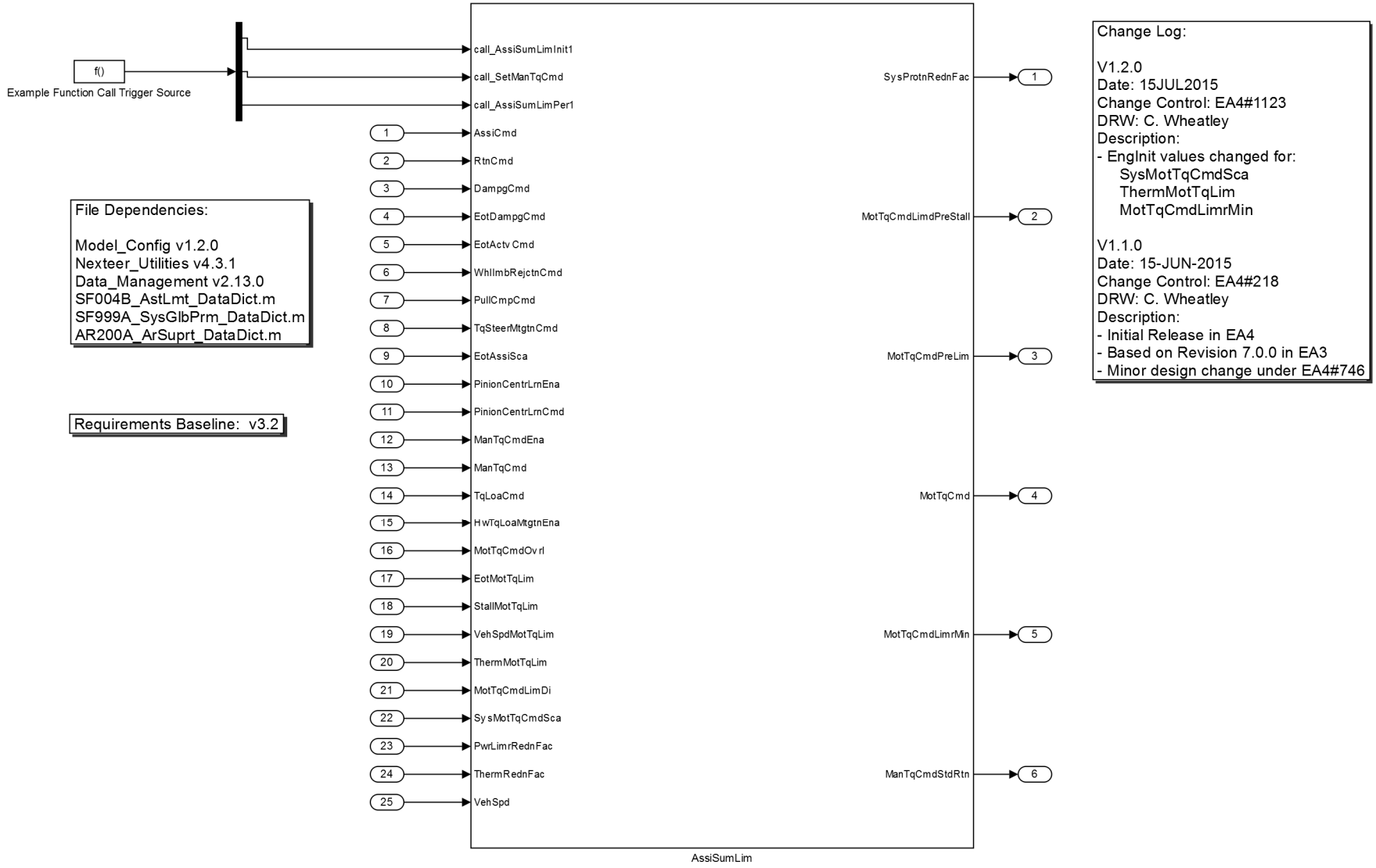


File Dependencies:

Model_Config v1.2.0
Nexteer_Utilities v4.3.1
Data_Management v2.13.0
SF004B_AstLmt_DataDict.m
SF999A_SysGlbPrm_DataDict.m
AR200A_ArSuprt_DataDict.m

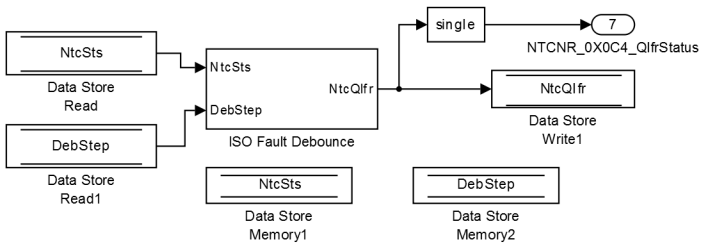
Requirements Baseline: v3.2

Change Log:

V1.2.0
Date: 15JUL2015
Change Control: EA4#1123
DRW: C. Wheatley
Description:
- EngInit values changed for:
  SysMotTqCmdSca
  ThermMotTqLim
  MotTqCmdLimrMin

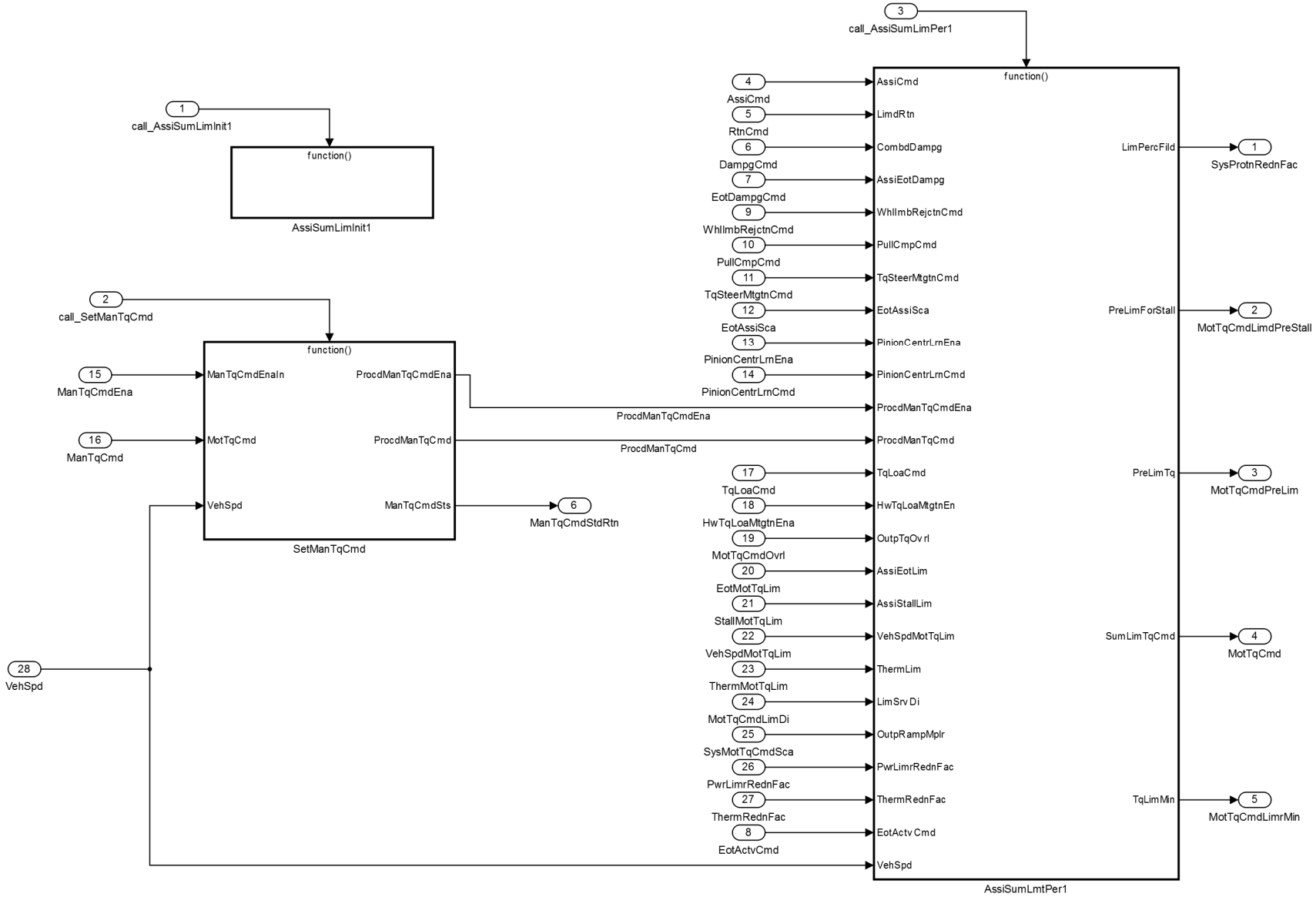
V1.1.0
Date: 15-JUN-2015
Change Control: EA4#218
DRW: C. Wheatley
Description:
- Initial Release in EA4
- Based on Revision 7.0.0 in EA3
- Minor design change under EA4#746

For Simulation Purposes



SF-04B Assist Summation and Limiting (Current)
v7.0.0 Date: 19-Feb-2015

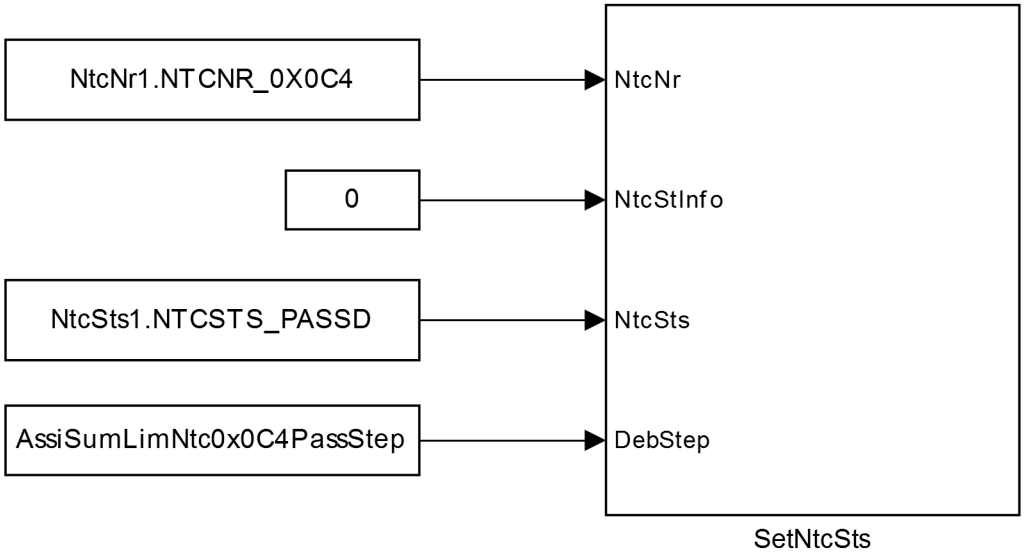
This function sums torque commands from various functions and then limits the net command.
Before summation, it allows for application of safety overwrites of incoming signal values.



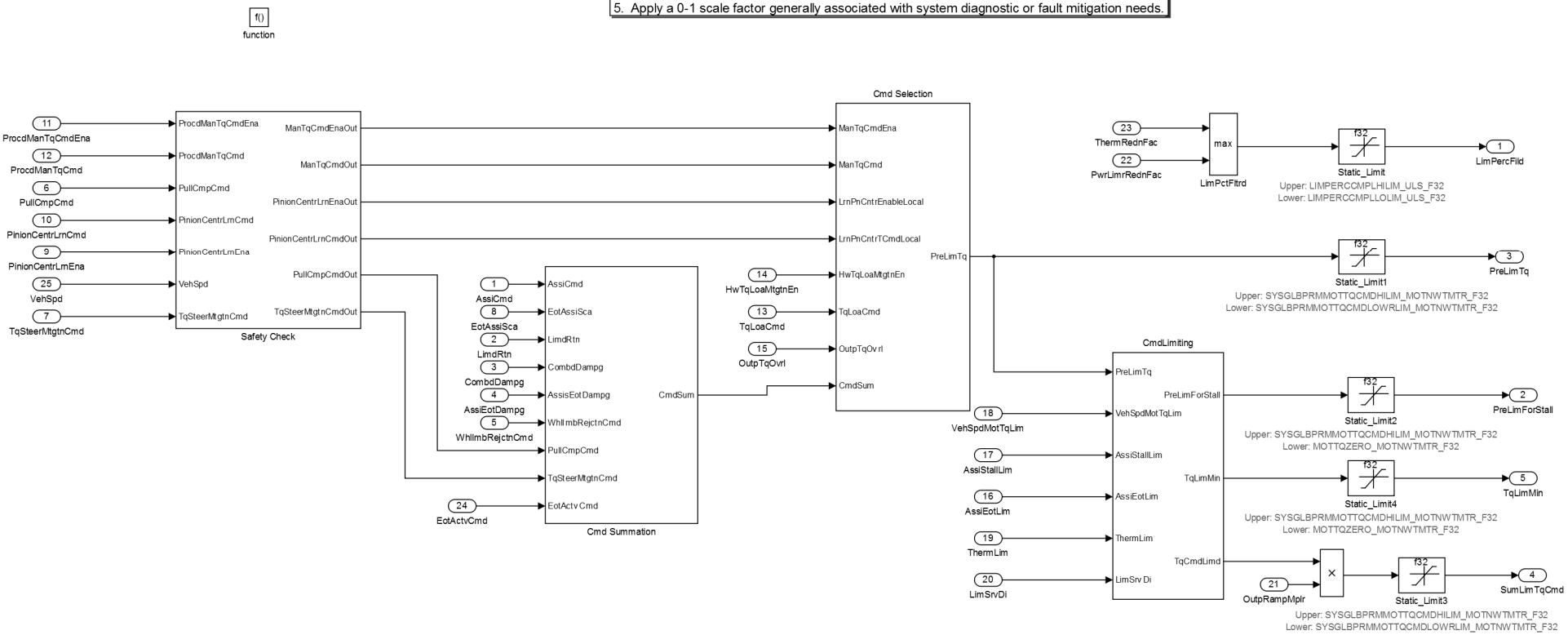
f()
function

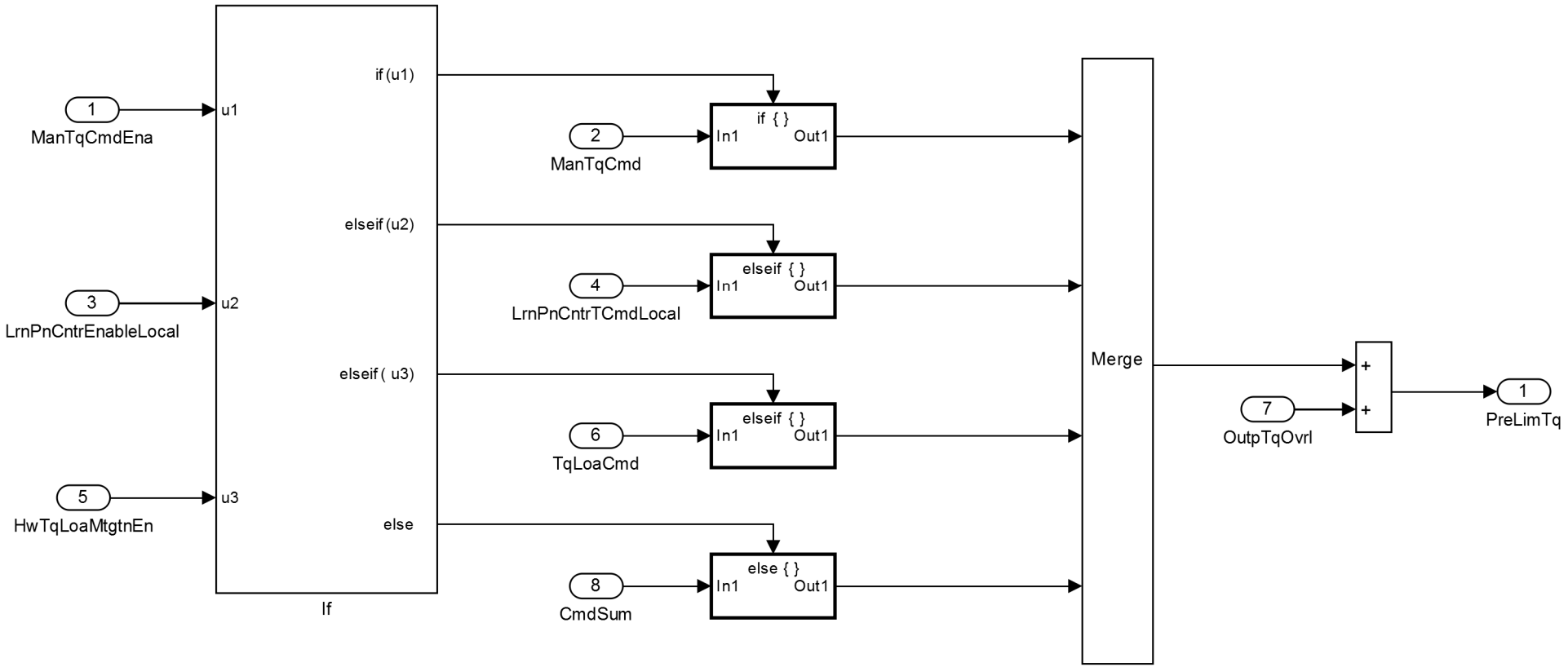
This component monitors Learn Pinion Center signals for safety violations, and sets a Nexteer Trouble Code when a violation persists.

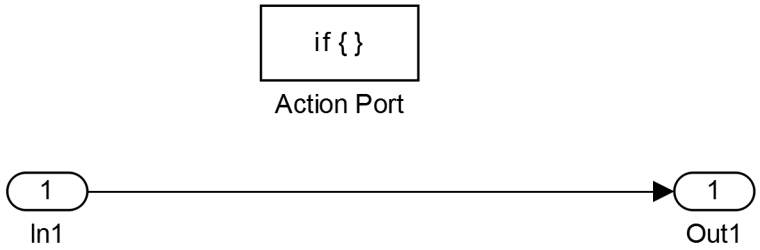
This initialization runnable calls DiagMgr to set the NTC status to Pass.

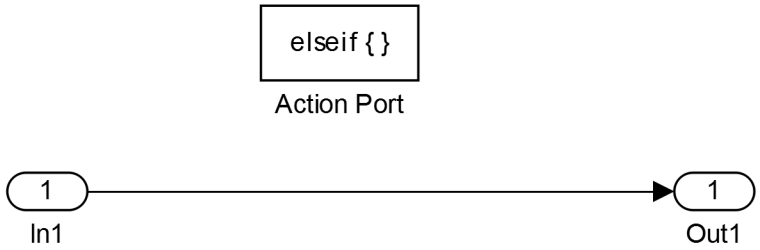


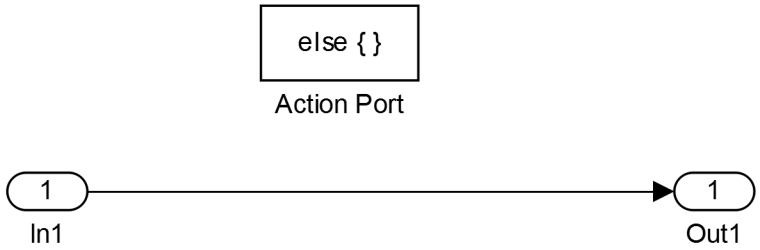
The general flow of this runnable is:
1. Apply safety-related conditioning to some incoming signals.
2. Sum all the various motor torque commands requested by upstream functions.
3. Select a source for motor torque command... normally use the summation, but not always.
4. Limit the chosen torque command to protect the system from damage (overheating).
5. Apply a 0-1 scale factor generally associated with system diagnostic or fault mitigation needs.

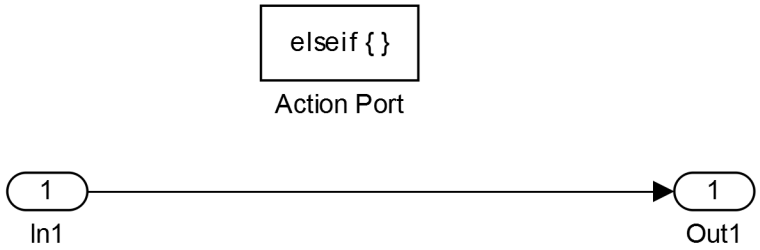


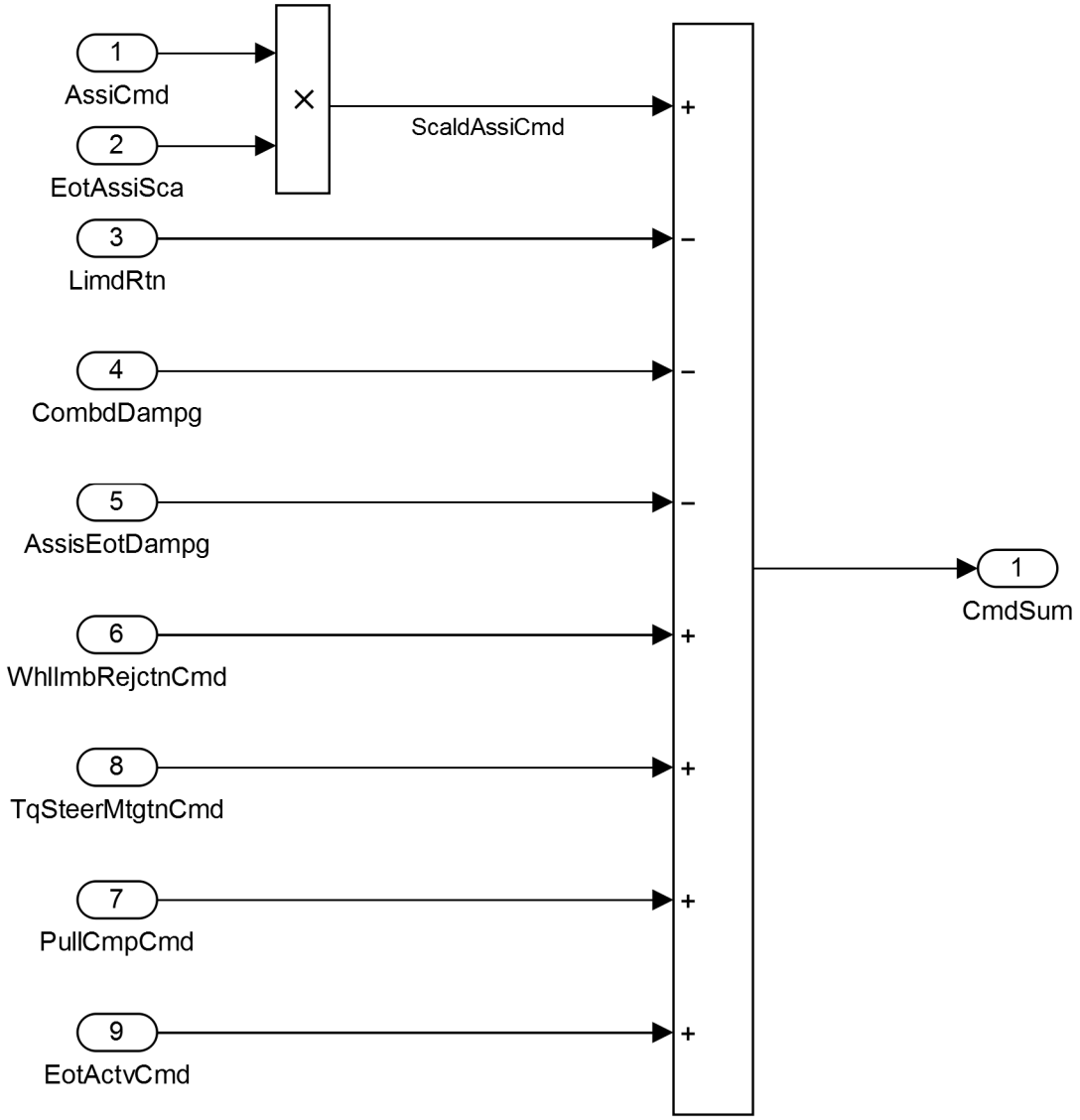



if { }
Action Port
1
In1
1
Out1

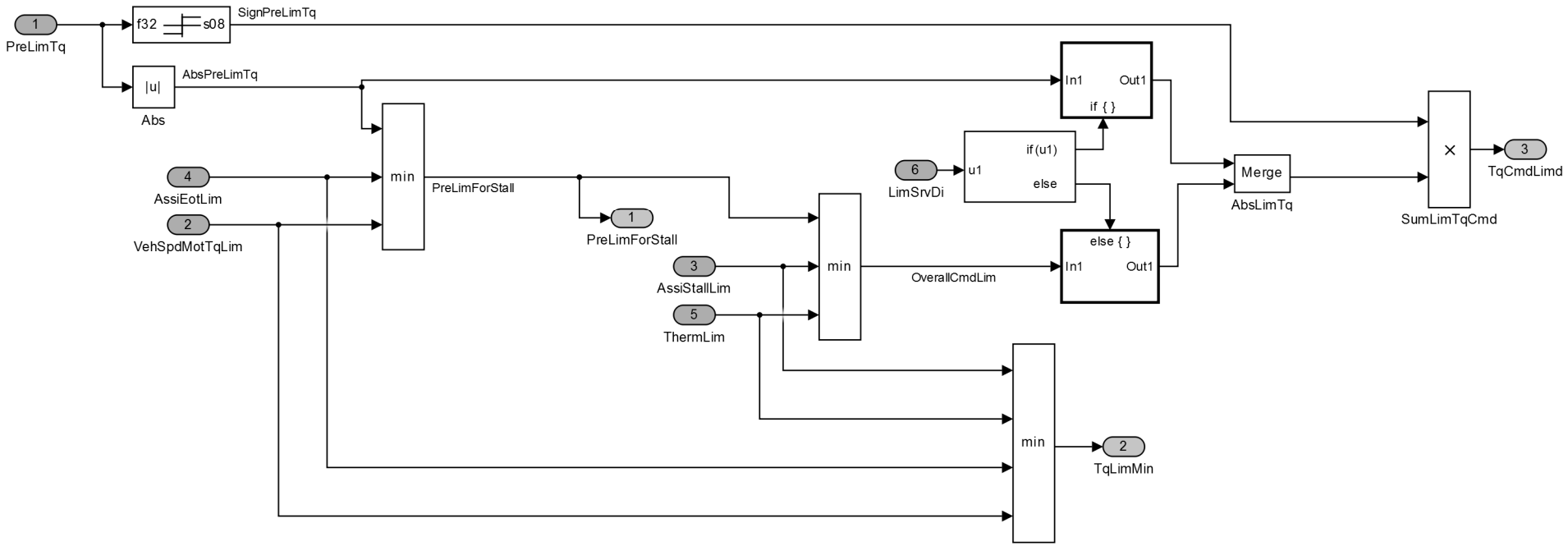

elseif { }
Action Port
1
In1
1
Out1

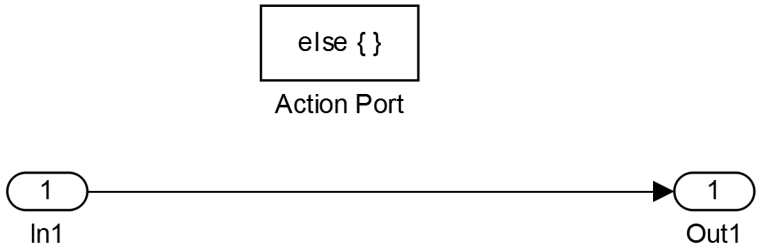

else { }
Action Port
1
In1
1
Out1

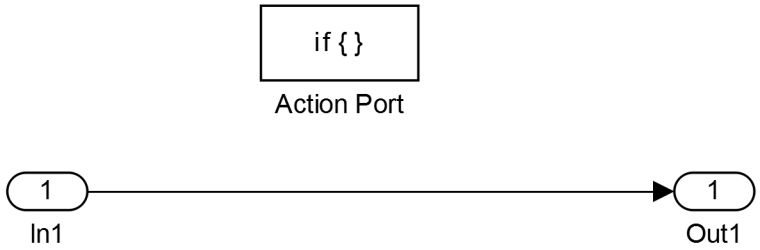

elseif { }
Action Port
1
In1
1
Out1



This block applies an overall limit to the previous summation while outputting intermediate calculations along the way.

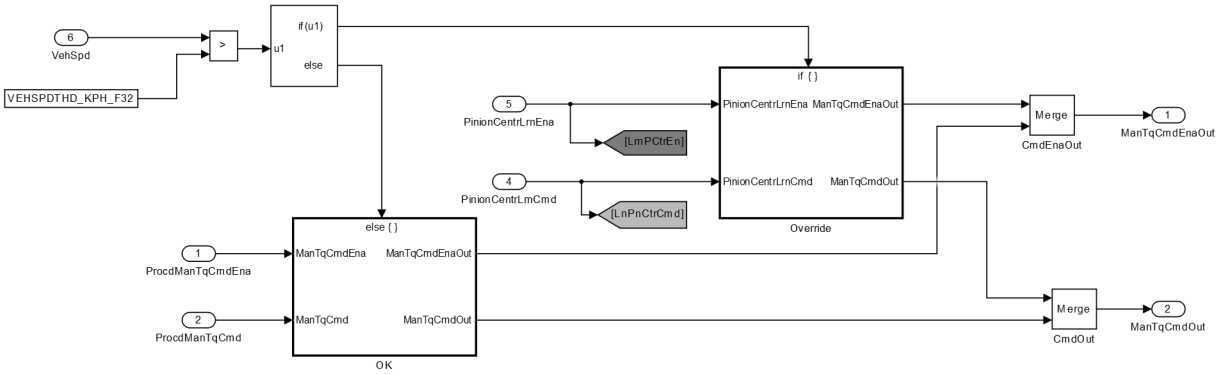



else { }
Action Port
1
In1
1
Out1

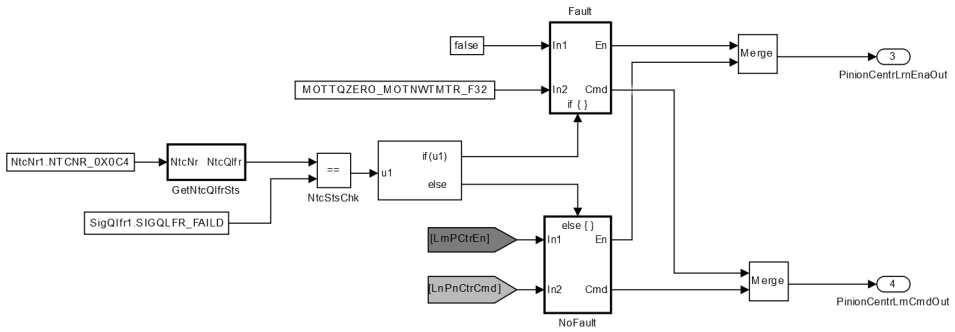

if { }
Action Port
1
In1
1
Out1

This routine applies safety-related conditioning to incoming signals. These operations are performed within this software component because it is intended to support ASIL-D. The components providing the inputs have lower ASIL ratings.

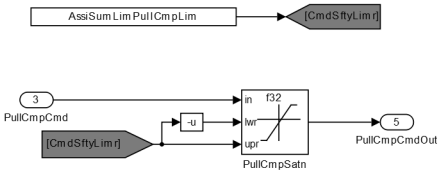
Manual Torque Command and Learn Pinion Center



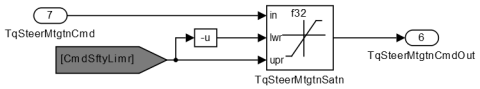
Get NTC Qualifier Status to set Pinion Center Enable Out and Pinion Center Command Out

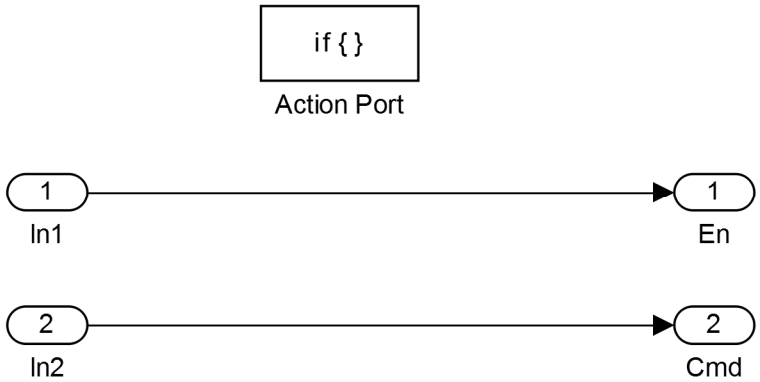


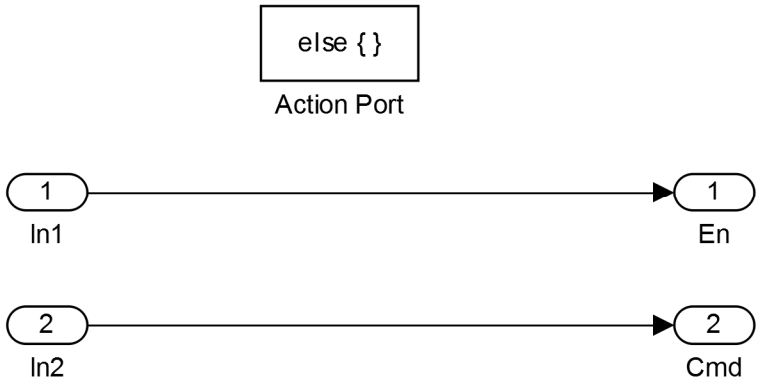
Pull Compensation

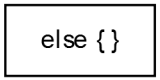


Torque Steer Mitigation

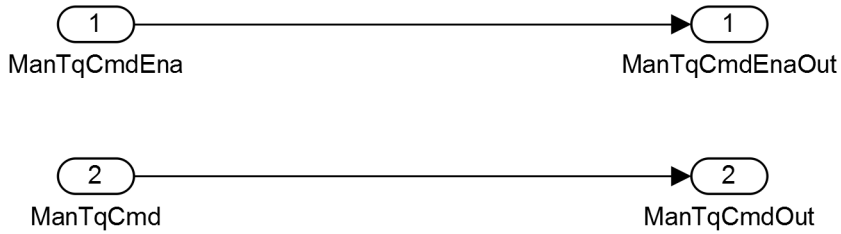



if { }
Action Port
1
In1
1
En
2
In2
2
Cmd

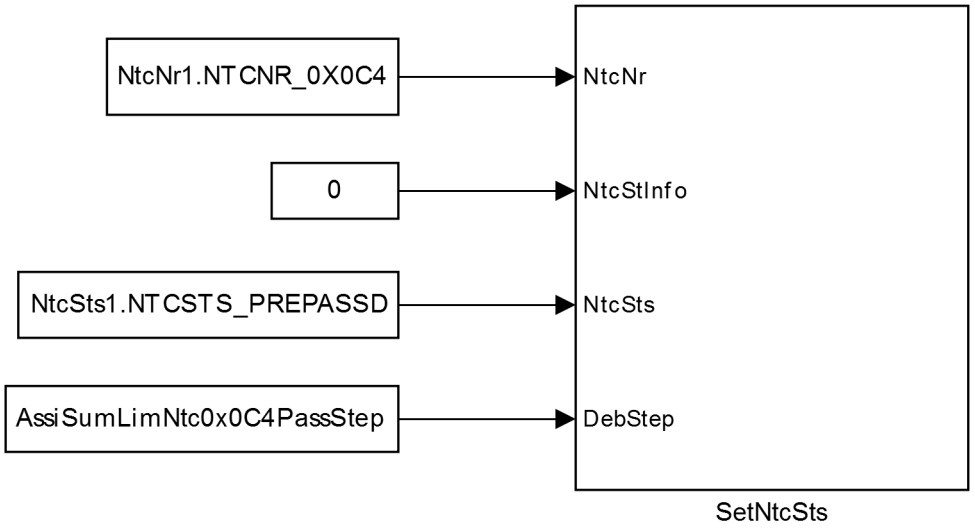

else { }
Action Port
1
In1
2
In2
1
En
2
Cmd

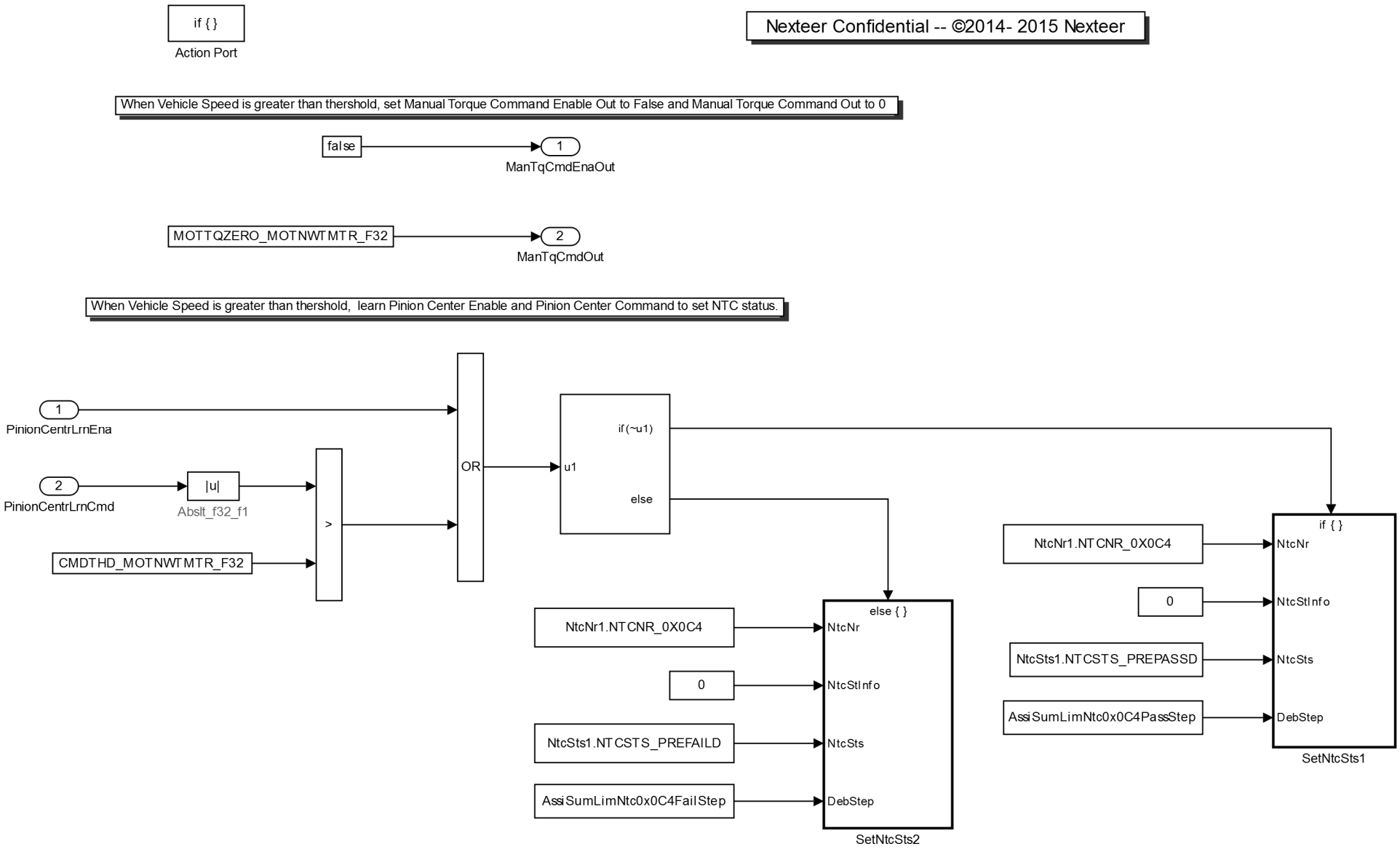


When Vehicle Speed is lesser than thershold, pass on Manual Torque Command Enable and Manual Torque Command values

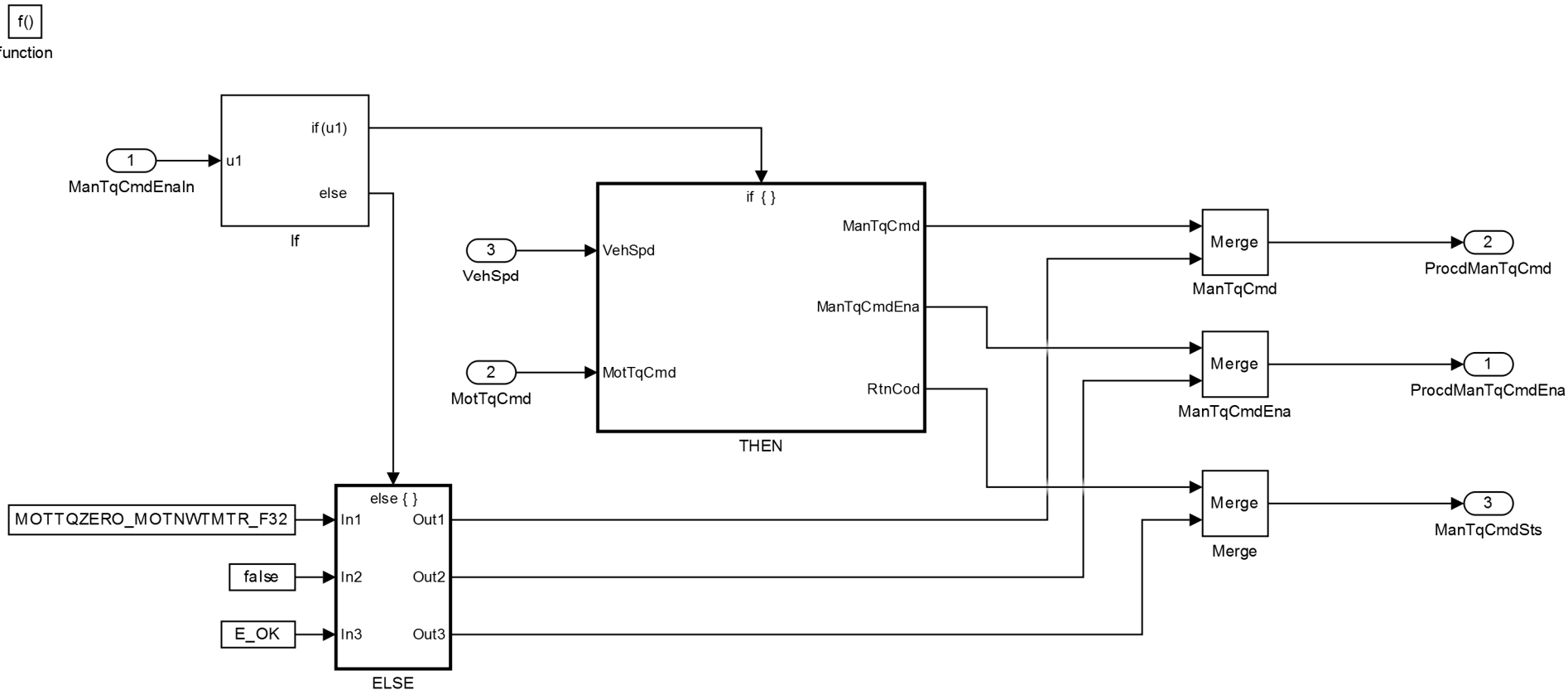


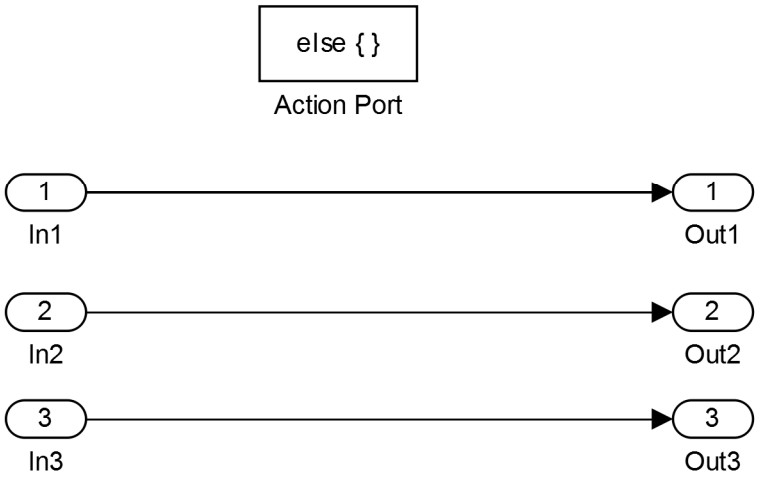
When vehicle Speed is lesser than thershold, NTC status is set to PREPASSED irrespective of PinionCentrLrnEna and PinionCentrLrnCmd values

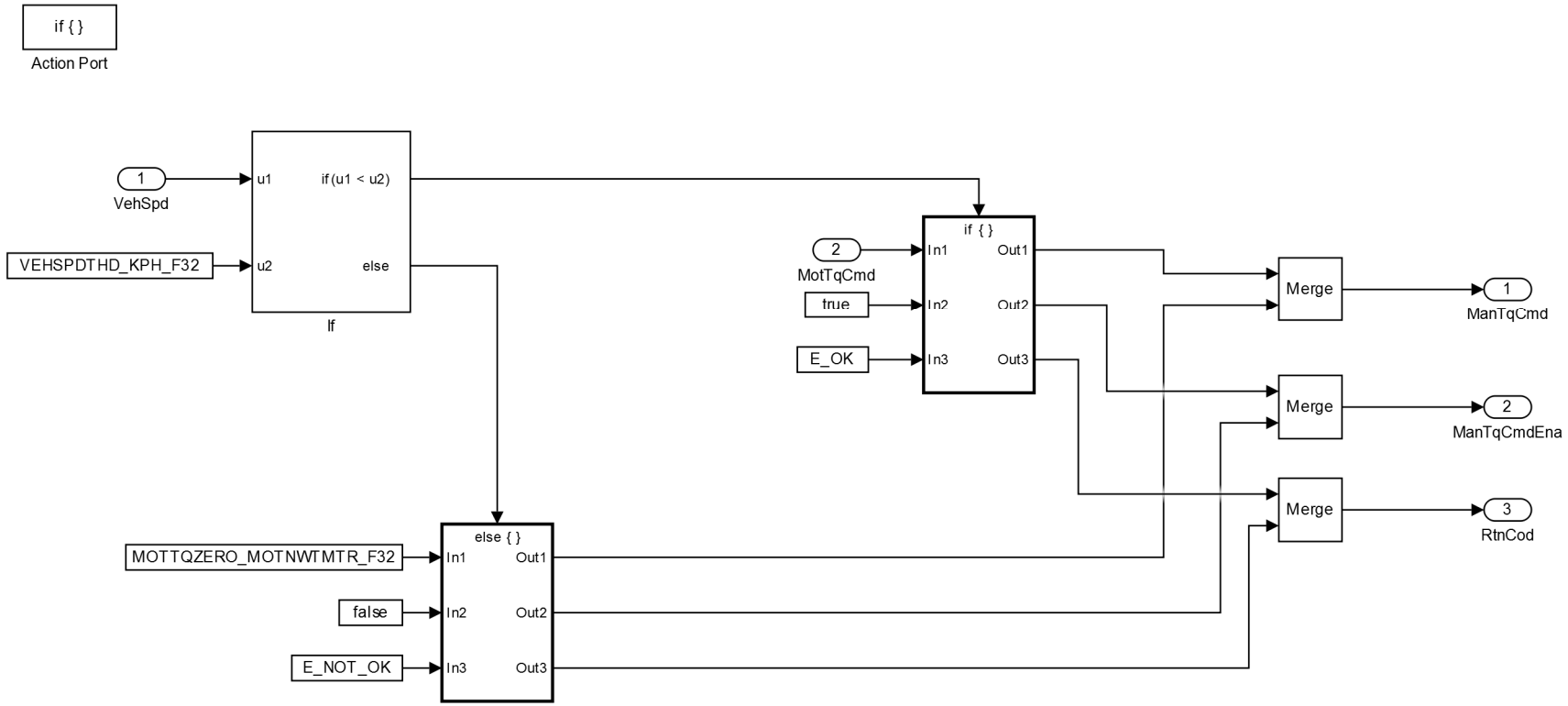


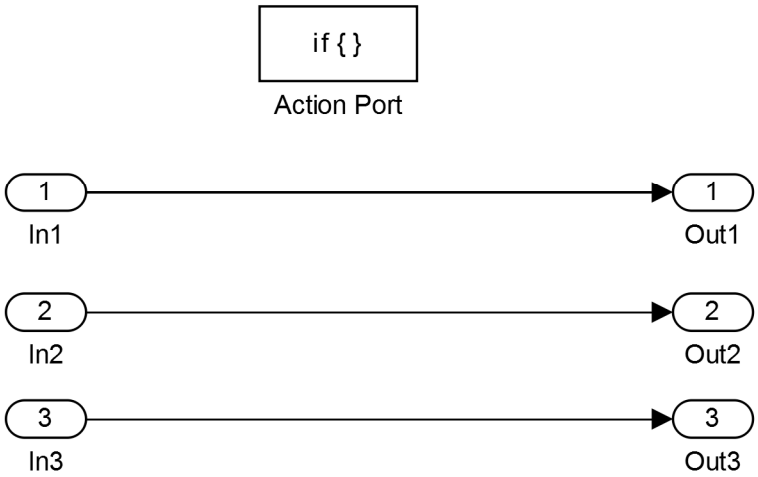

if { }
Action Port
Nexteer Confidential -- ©2014- 2015 Nexteer
When Vehicle Speed is greater than thershold, set Manual Torque Command Enable Out to False and Manual Torque Command Out to 0
false
1
ManTqCmdEnaOut
MOTTQZERO_MOTNWTMTR_F32
2
ManTqCmdOut
When Vehicle Speed is greater than thershold, learn Pinion Center Enable and Pinion Center Command to set NTC status.
1
PinionCentrLrnEna
2
PinionCentrLrnCmd
|u|
Abslt_f32_f1
CMDTHD_MOTNWTMTR_F32
>
OR
if(~u1)
u1
else
NtcNr1.NTCNR_0X0C4
0
NtcSts1.NTCSTS_PREFAILD
AssiSumLimNtc0x0C4FailStep
else { }
NtcNr
NtcStInfo
NtcSts
DebStep
SetNtcSts2
NtcNr1.NTCNR_0X0C4
0
NtcSts1.NTCSTS_PREPASSD
AssiSumLimNtc0x0C4PassStep
if { }
NtcNr
NtcStInfo
NtcSts
DebStep
SetNtcSts1

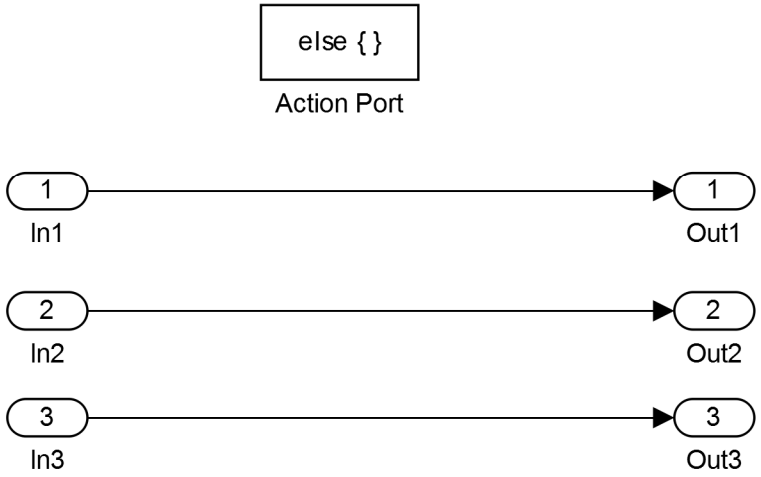
This model writes to two module-level static variables visible to Periodic1 runnable. It only takes a snapshot of vehicle conditions. It may allow a reqested enable and return an error code of "OK", but the periodic it feeds must continuously watch for the possiblity of vehicle rolling while enabled.

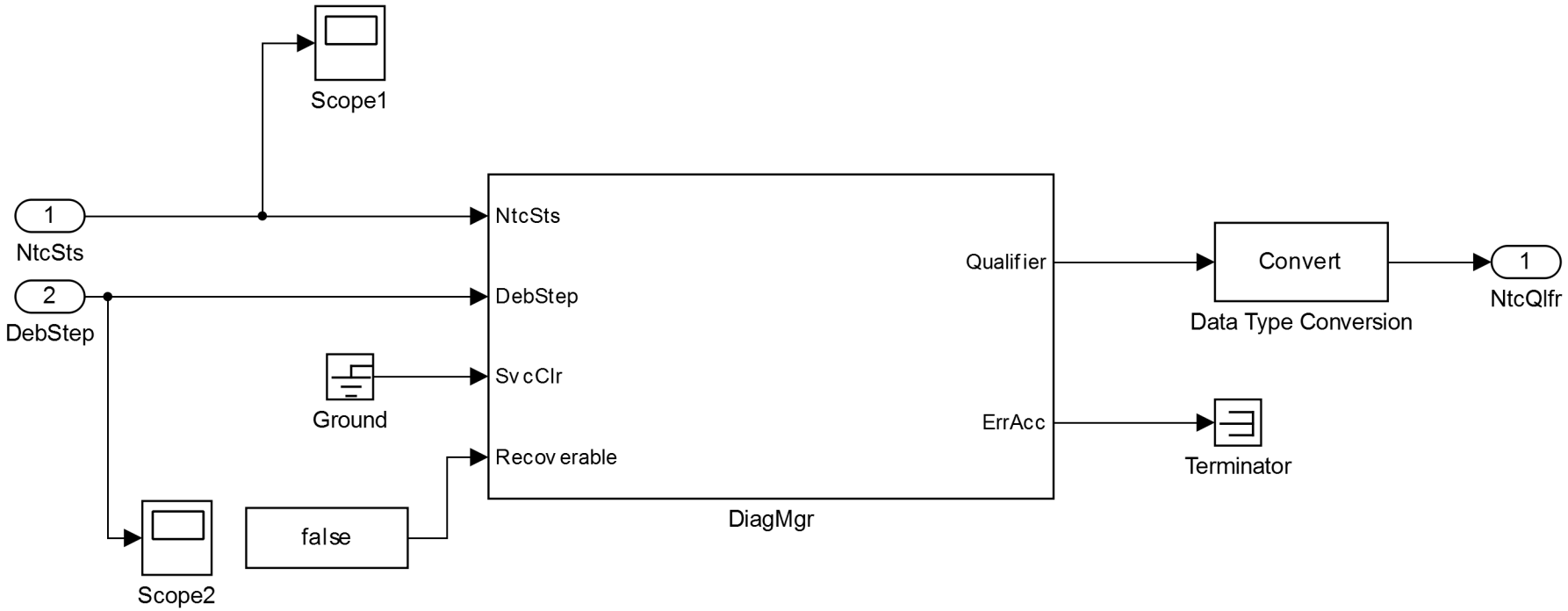






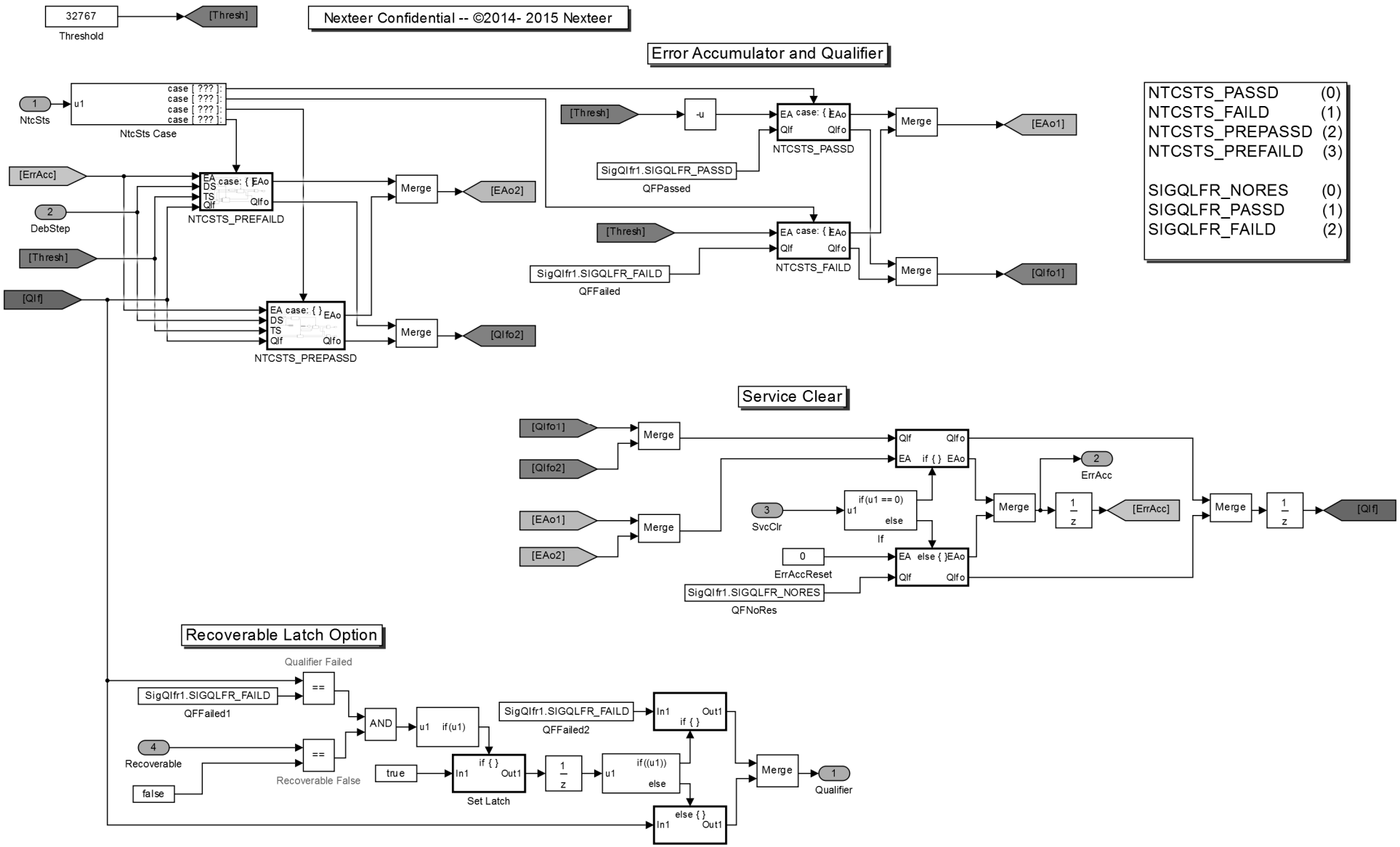


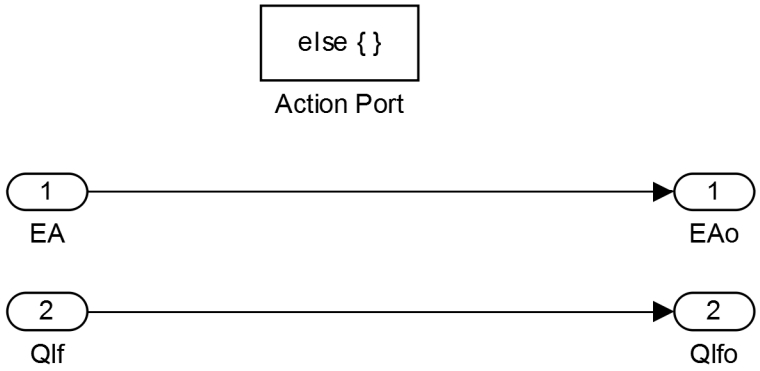


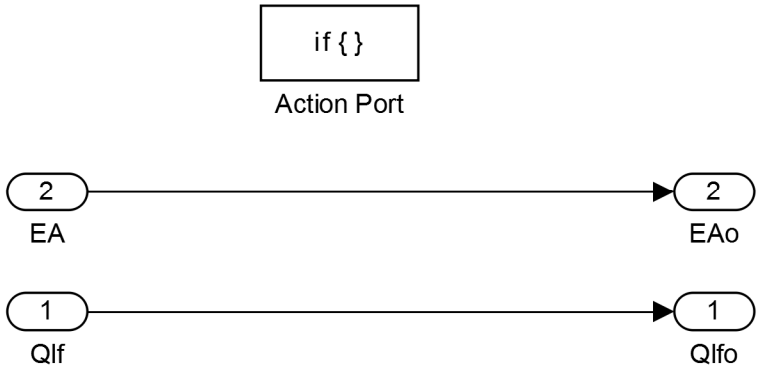


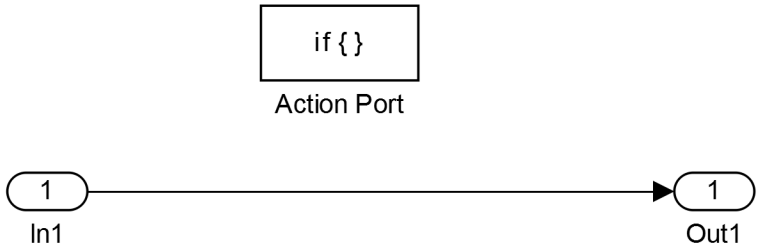
Note:

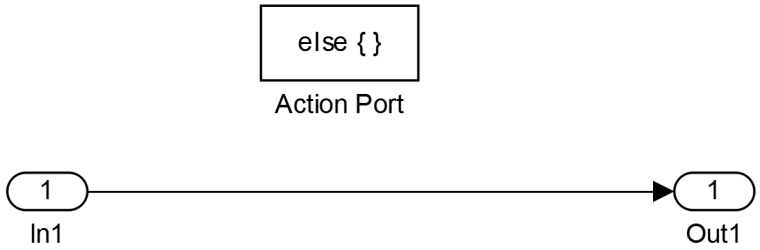
- "ISO Fault Debounce Design" Simulink block intent to use here for Simulation purpose only. Do not Code this block

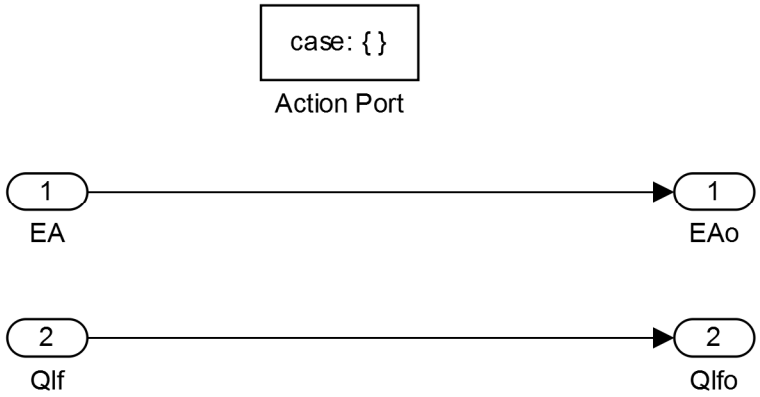

32767
Threshold
[Thresh]
Nexteer Confidential -- ©2014- 2015 Nexteer
Error Accumulator and Qualifier
NTCSTS_PASSD (0)
NTCSTS_FAILD (1)
NTCSTS_PREPASSD (2)
NTCSTS_PREFAILD (3)
SIGQLFR_NORES (0)
SIGQLFR_PASSD (1)
SIGQLFR_FAILD (2)
1
NtcSts
u1
case [???]:
NtcSts Case
[ErrAcc]
2
DebStep
[Thresh]
[Qlf]
EA case: { } EAo
DS
TS
Qlf Qlfo
NTCSTS_PREFAILD
NTCSTS_PREPASSD
Merge
[EAo2]
[Qlfo2]
-u
SigQlfr1.SIGQLFR_PASSD
QFPassed
NTCSTS_PASSD
[EAo1]
SigQlfr1.SIGQLFR_FAILD
QFFailed
NTCSTS_FAILD
[Qlfo1]
Service Clear
[Qlfo1]
[Qlfo2]
[EAo1]
[EAo2]
Qlf Qlfo
EA if { } EAo
3
SvcClr
if(u1 == 0)
else
If
0
ErrAccReset
EA else { }EAo
SigQlfr1.SIGQLFR_NORES
QFNoRes
2
ErrAcc
[ErrAcc]
[Qlf]
1
z
Recoverable Latch Option
Qualifier Failed
SigQlfr1.SIGQLFR_FAILD
QFFailed1
==
4
Recoverable
false
Recoverable False
AND
u1 if(u1)
true
if { }
In1 Out1
Set Latch
SigQlfr1.SIGQLFR_FAILD
QFFailed2
if { }
if((u1))
else
else { }
Merge
1
Qualifier

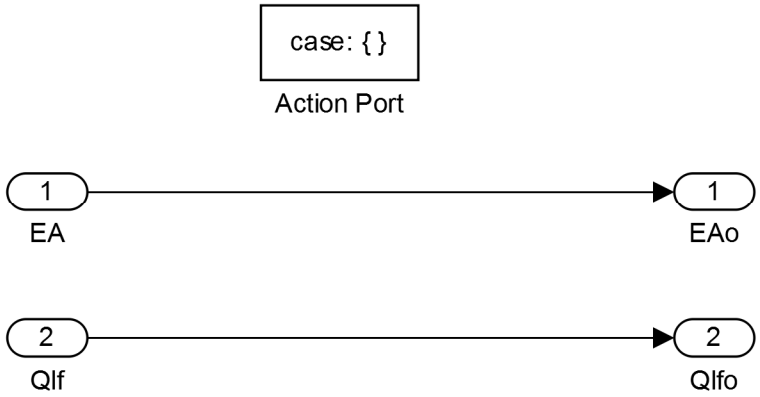

else { }
Action Port
1
EA
1
EAo
2
Qlf
2
Qlfo

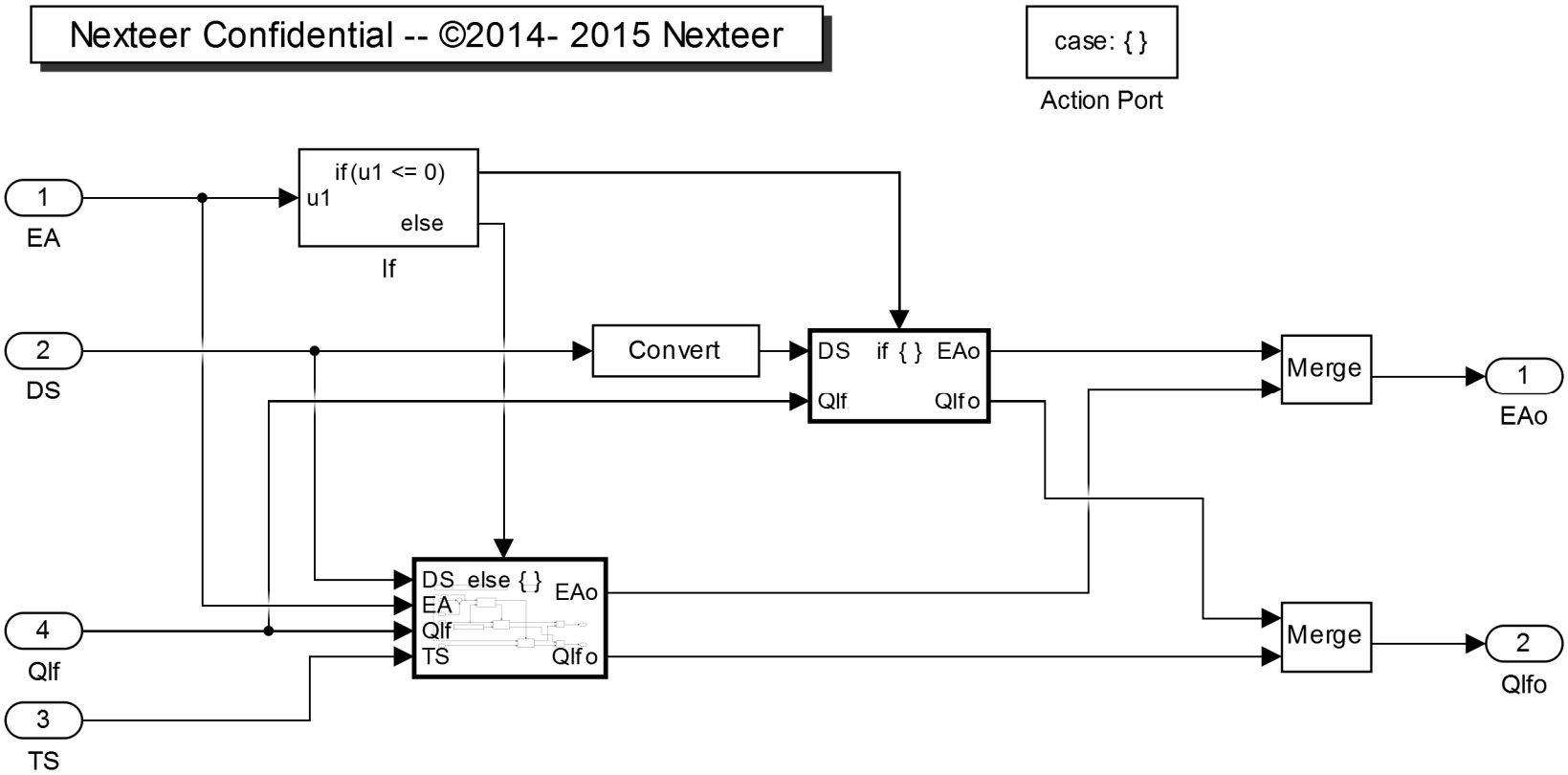

if { }
Action Port
2
EA
2
EAo
1
Qlf
1
Qlfo

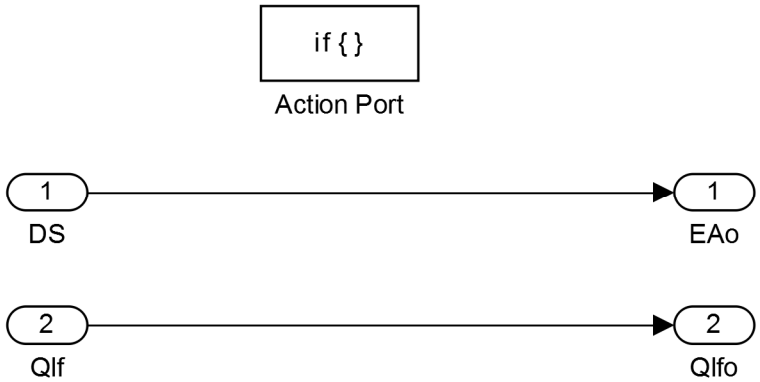

if { }
Action Port
1
In1
1
Out1

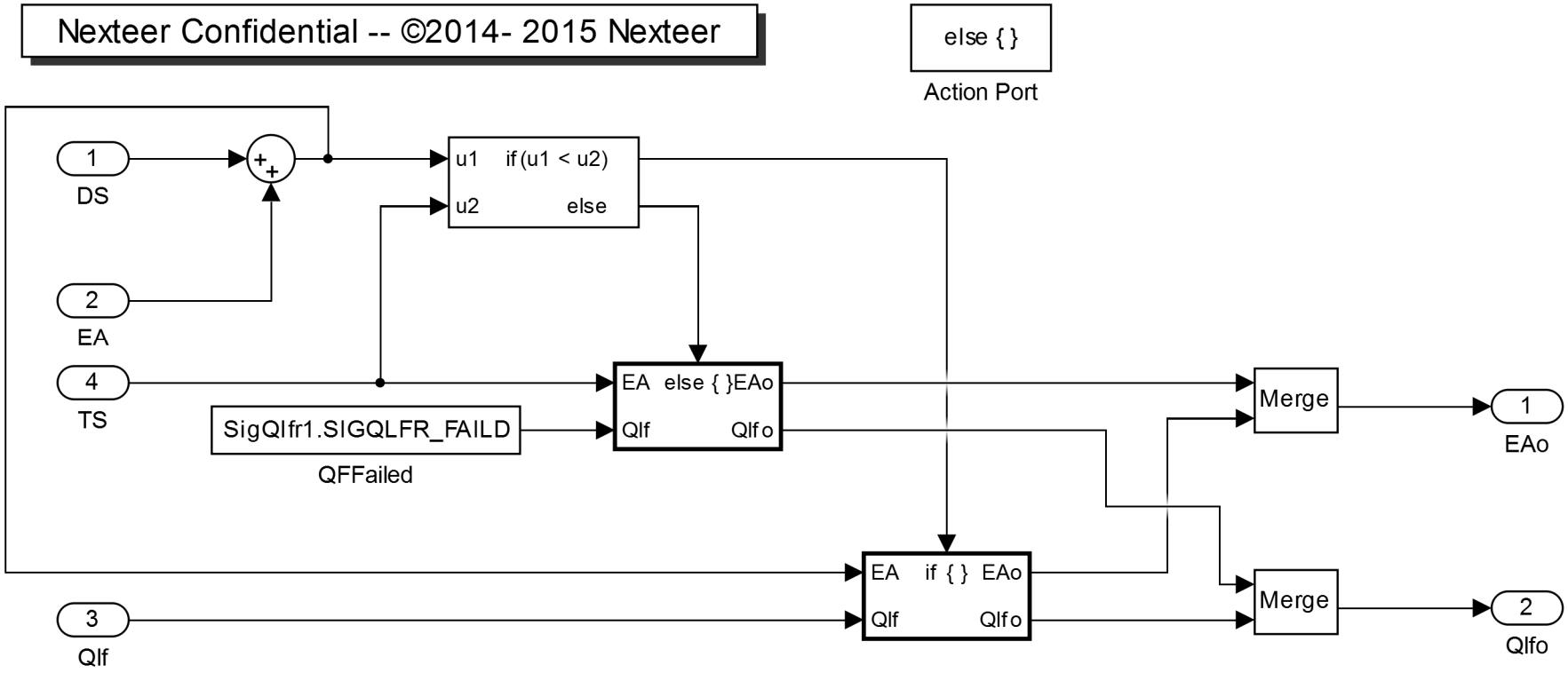

else { }
Action Port
1
In1
1
Out1

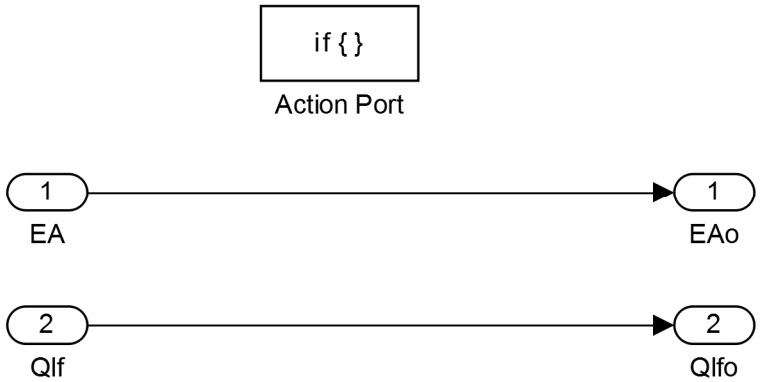

case: { }
Action Port
1
EA
1
EAo
2
Qlf
2
Qlfo

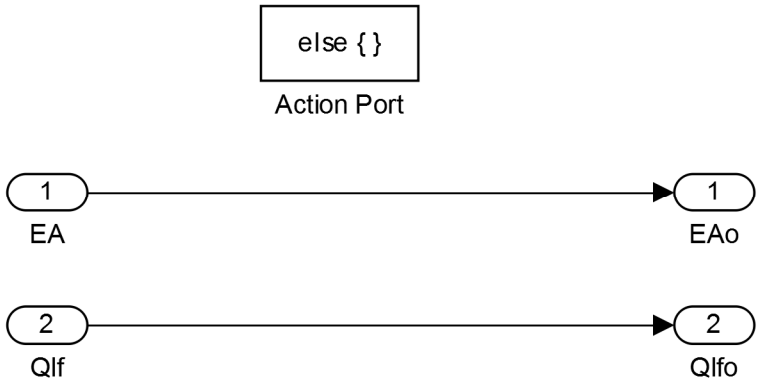

case: { }
Action Port
1
EA
1
EAo
2
Qlf
2
Qlfo

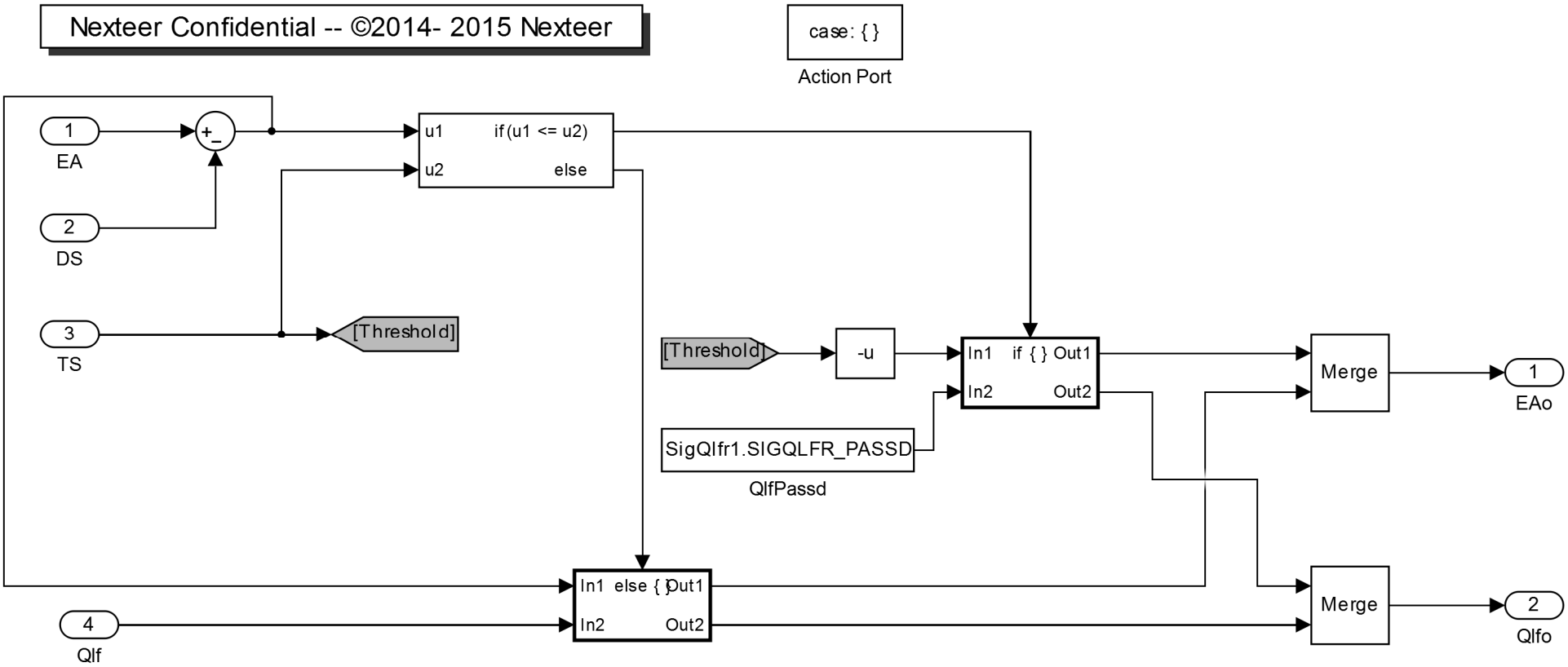


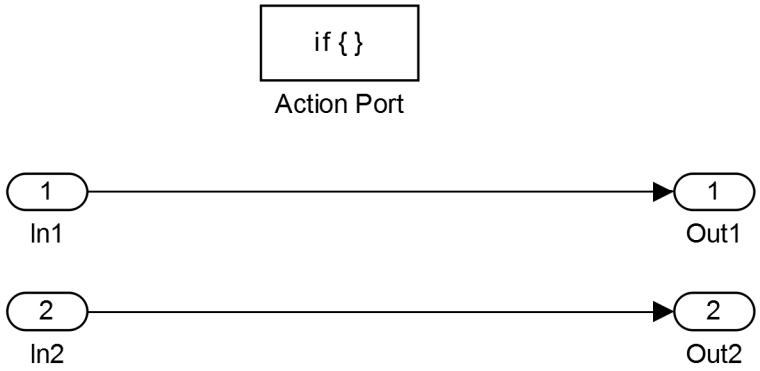

if { }
Action Port
1
DS
1
EAo
2
Qlf
2
Qlfo

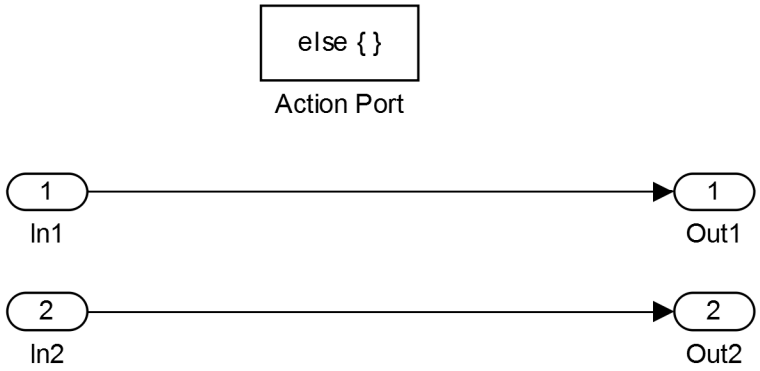


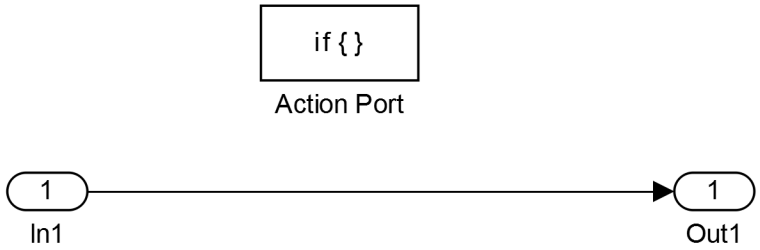

if { }
Action Port
1
EA
1
EAo
2
Qlf
2
Qlfo


else { }
Action Port
1
EA
1
EAo
2
Qlf
2
Qlfo




if { }
Action Port
1
In1
1
Out1
2
In2
2
Out2


else { }
Action Port
1
In1
1
Out1
2
In2
2
Out2


if { }
Action Port
1
In1
1
Out1