6.7.9.9 Example case of damage

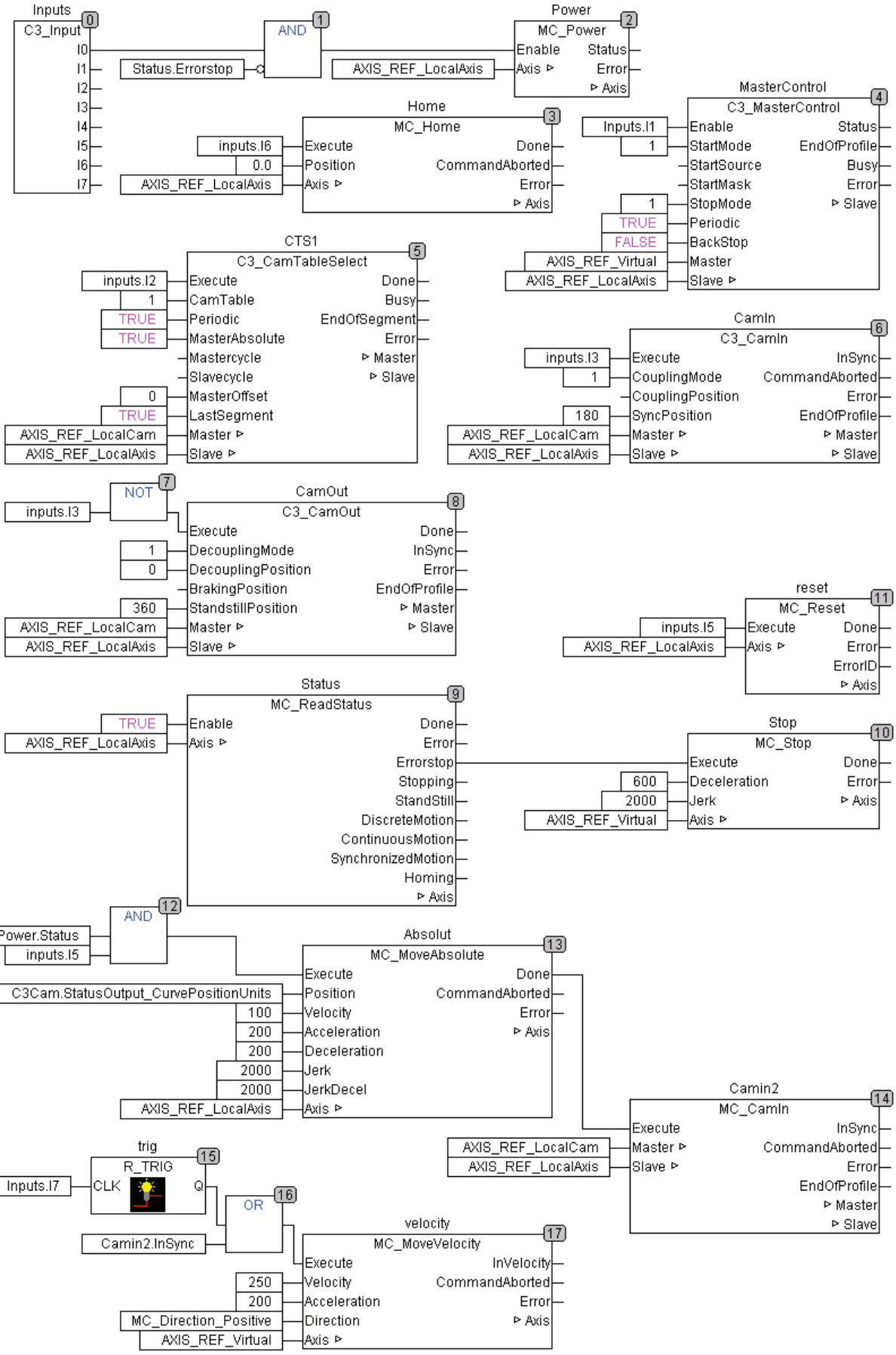
The axis should work in curve mode.
The master should be stopped in the case of an axis error. After the elimination and acknowledgement of the error, the axis shall synchronize and normal operation shall be resumed.

Corresponding files: CamExampleHav.C3P (Compax3 Project on the Compax3 CD:\Examples\Examples_Haverie)
CamExampleHav.pro (CoDeSys Project on the Compax3 CD:\Examples\Examples_Haverie)

Control interface:

Input	Function
I0	Energize axis
I1	Enable and start of the master position detection
I2	Start of the curve cycle
I3	Coupling / Decoupling
I4	Free
I5	Clear Error
I6	Homing
I7	Start of the virtual master

Solution:

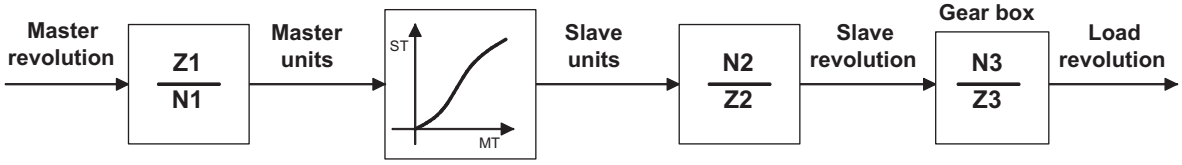

Inputs
C3_Input
0
I0
I1
I2
I3
I4
I5
I6
I7
AND
1
Status.Errorstop
AXIS_REF_LocalAxis
Power
MC_Power
2
Enable
Axis
Status
Error
Axis
Home
MC_Home
3
inputs.I6
0.0
AXIS_REF_LocalAxis
Execute
Position
Axis
Done
CommandAborted
Error
Axis
MasterControl
C3_MasterControl
4
Inputs.I1
1
1
TRUE
FALSE
AXIS_REF_Virtual
AXIS_REF_LocalAxis
Enable
StartMode
StartSource
StartMask
StopMode
Periodic
BackStop
Master
Slave
Status
EndOfProfile
Busy
Error
Slave
CTS1
C3_CamTableSelect
5
inputs.I2
1
TRUE
TRUE
0
TRUE
AXIS_REF_LocalCam
AXIS_REF_LocalAxis
Execute
CamTable
Periodic
MasterAbsolute
Mastercycle
Slavecycle
MasterOffset
LastSegment
Master
Slave
Done
Busy
EndOfSegment
Error
Master
Slave
CamIn
C3_CamIn
6
inputs.I3
1
180
AXIS_REF_LocalCam
AXIS_REF_LocalAxis
Execute
CouplingMode
CouplingPosition
SyncPosition
Master
Slave
InSync
CommandAborted
Error
EndOfProfile
Master
Slave
NOT
7
inputs.I3
CamOut
C3_CamOut
8
1
0
360
AXIS_REF_LocalCam
AXIS_REF_LocalAxis
Execute
DecouplingMode
DecouplingPosition
BrakingPosition
StandstillPosition
Master
Slave
Done
InSync
Error
EndOfProfile
Master
Slave
reset
MC_Reset
11
inputs.I5
AXIS_REF_LocalAxis
Execute
Axis
Done
Error
ErrorID
Axis
Status
MC_ReadStatus
9
TRUE
AXIS_REF_LocalAxis
Enable
Axis
Done
Error
Errorstop
Stopping
StandStill
DiscreteMotion
ContinuousMotion
SynchronizedMotion
Homing
Axis
Stop
MC_Stop
10
600
2000
AXIS_REF_Virtual
Execute
Deceleration
Jerk
Axis
Done
Error
Axis
AND
12
Power.Status
inputs.I5
Absolut
MC_MoveAbsolute
13
C3Cam.StatusOutput_CurvePositionUnits
100
200
200
2000
2000
AXIS_REF_LocalAxis
Execute
Position
Velocity
Acceleration
Deceleration
Jerk
JerkDecel
Axis
Done
CommandAborted
Error
Axis
Camin2
MC_CamIn
14
AXIS_REF_LocalCam
AXIS_REF_LocalAxis
Execute
Master
Slave
InSync
CommandAborted
Error
EndOfProfile
Master
Slave
trig
R_TRIG
15
Inputs.I7
CLK
Q
OR
16
Camin2.InSync
velocity
MC_MoveVelocity
17
250
200
MC_Direction_Positive
AXIS_REF_Virtual
Execute
Velocity
Acceleration
Direction
Axis
InVelocity
CommandAborted
Error
Axis

Boundary conditions:

- The ReadStatus module helps detect, if the axis is in the error state.
  An error will trigger the stop of the virtual axis, the curve cycle will stop, the curve generator (C3_CamTableSelect) will continue.
- After the stop of the master, the axis will also be at a standstill.
- The error is acknowledged via input I5; the axis will be energized again (see also the "AND" module at the input of MC_Power).
- If the axis is energized again and input I5 is present, the axis is moved to the current position of the curve output (MC_moveAbsolute) and at the end of the movement it is coupled again with MC_CamIn.
- The output "InSync" of the MC_CamIn (camin2) will re-start the virtual master and the cycle is continued.

6.7.9.10 Application note: Drift

Correct scaling of the reference values helps prevent drift.
For this, it is necessary to consider the conversions of the position signal:



Master / Slave / Load revolution: Master / Slave / Load revolutions:
Master / Slave units: Master / Slave - revolutions
Gear box: Gearbox
The rule for this is:

$$\frac{Z1}{N1} = \frac{\text{Travel distance per revolution master axis numerator}}{\text{Travel distance per motor revolution master axis denominator}}$$

(configured in the Compax3 ServoManager under "signal source")

$$\frac{Z2}{N2} = \frac{\text{Travel distance per revolution slave axis numerator}}{\text{Travel distance per revolution – Slave axis Denominator}}$$

(configured in the Compax3 ServoManager under "configuration")

$$\frac{Z3}{N3} = \text{transmission ratio} \quad \frac{\text{Motor}}{\text{Load}}$$

MT: Master clock distance

$$\frac{\text{"Position Reset" Distance - Master Axis (M_Units)}}{\text{"Position Reset" Distance - Master Axis (Denominator)}}$$

MT is rounded to 3 decimal places.
ST: Slave clock distance