Demonstrating interoperability of FORTE runtime with synchronous execution environment

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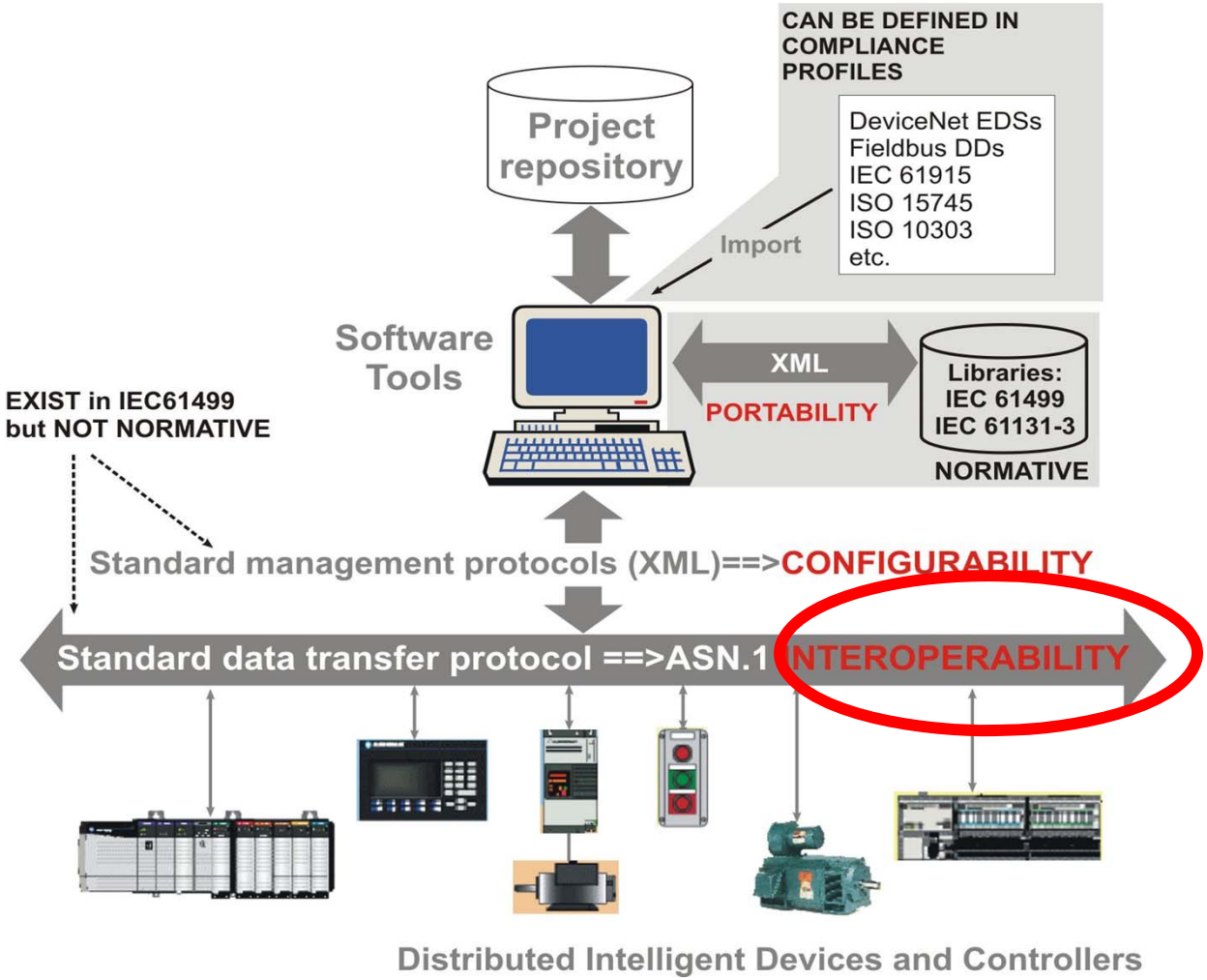
Plan

- Interoperability in IEC 61499
- Synchronous execution of function blocks
- BlokSynk – synchronous compiler
- BlokSynk plugin to NxtStudio
- Interoperability demo

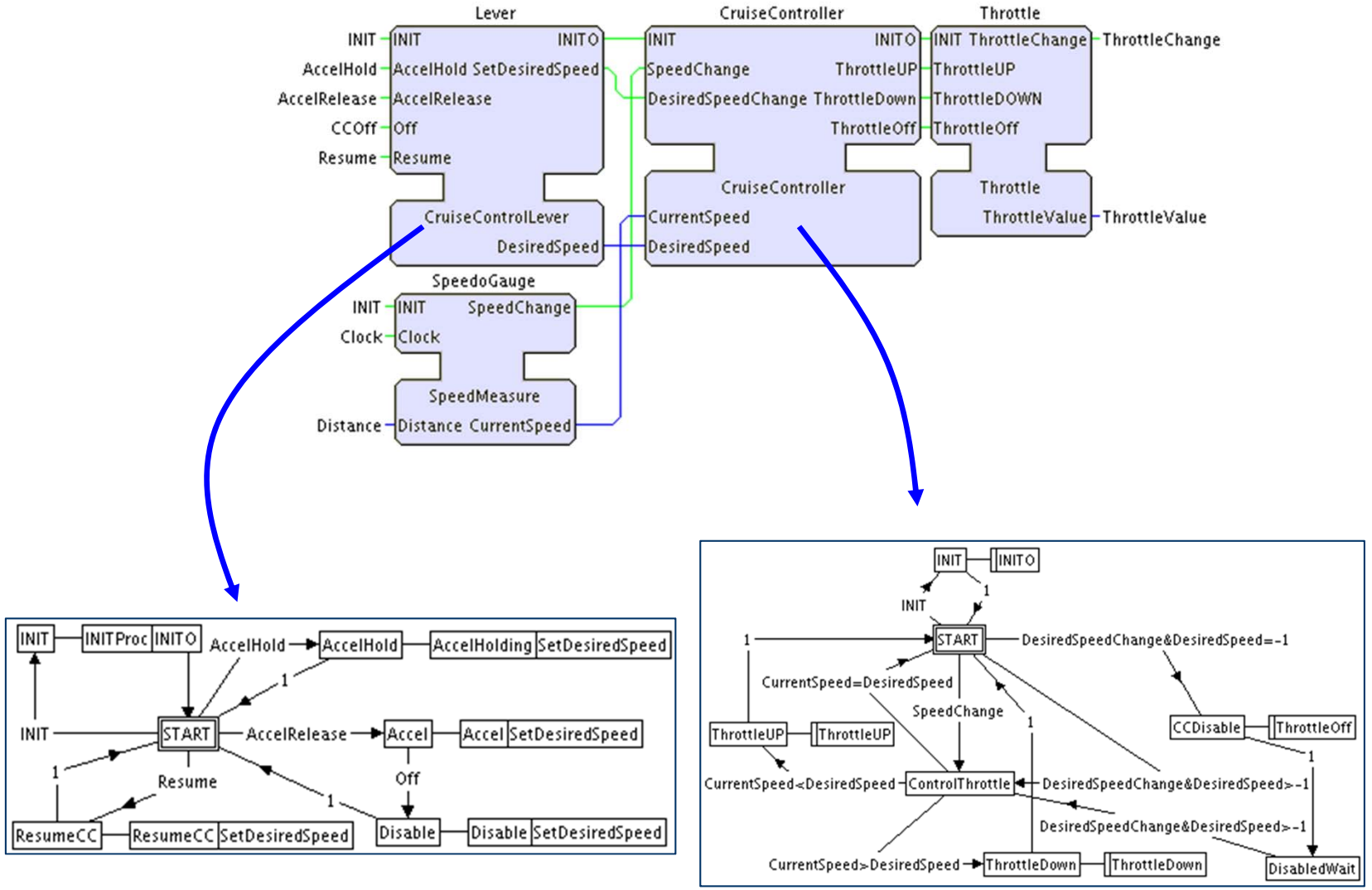
Interoperability



Other provisions of interoperability?

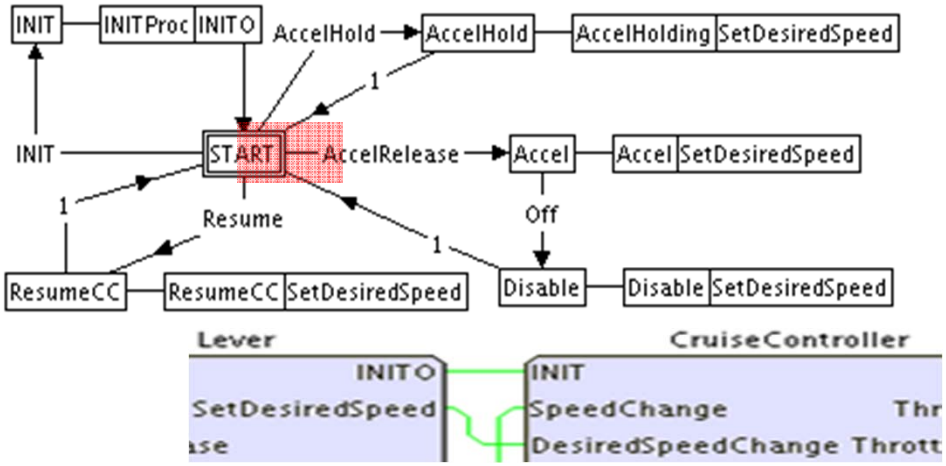
- Generic communication models, e.g.:
  - PUBLISH-SUBSCRIBE
  - CLIENT-SERVER
- Event-driven, so good chance of being tolerant to different execution models of IEC 61499

FB Synchronous Execution Semantics

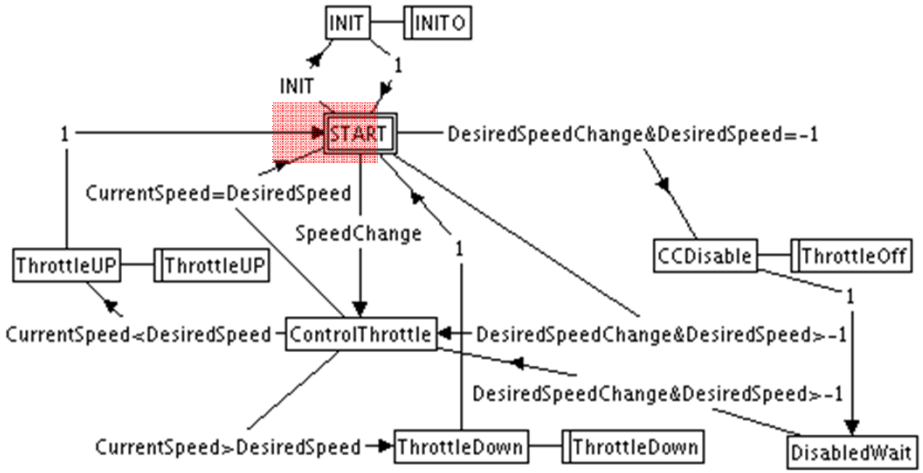


Synchronous Execution

Lever

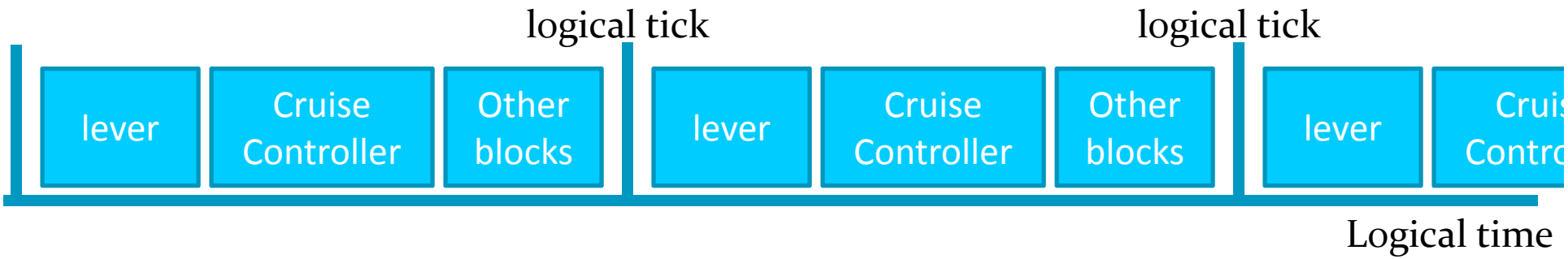


Cruise Controller



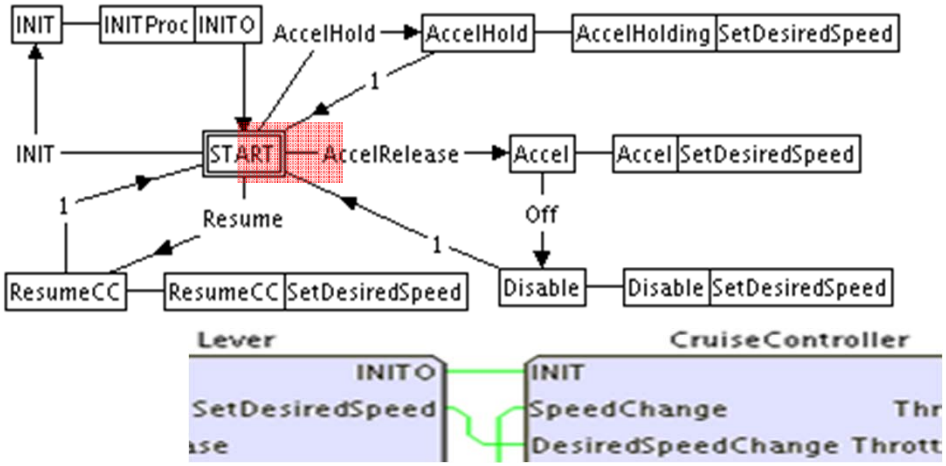
Inputs events:

Outputs events:

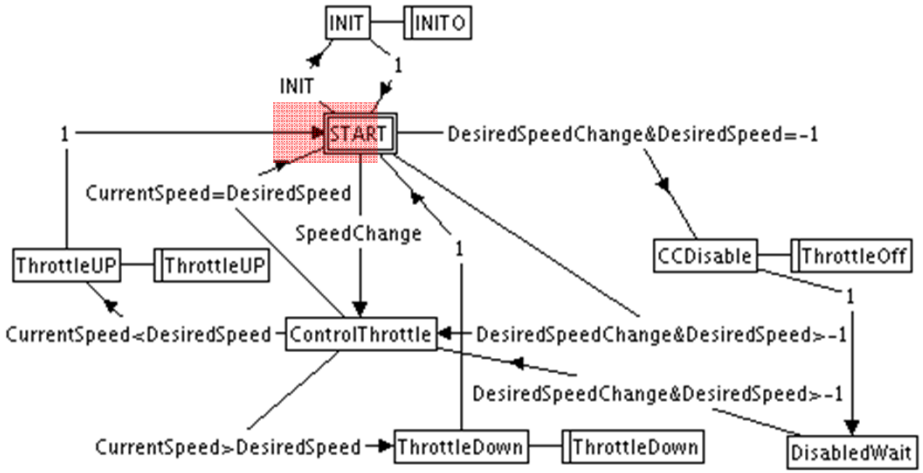


Synchronous Execution

Lever



Cruise Controller

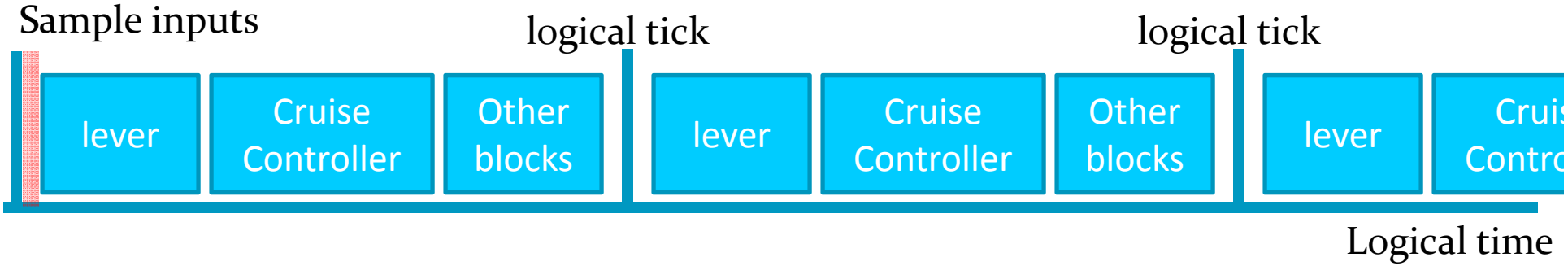


Inputs events:

AccelRelease

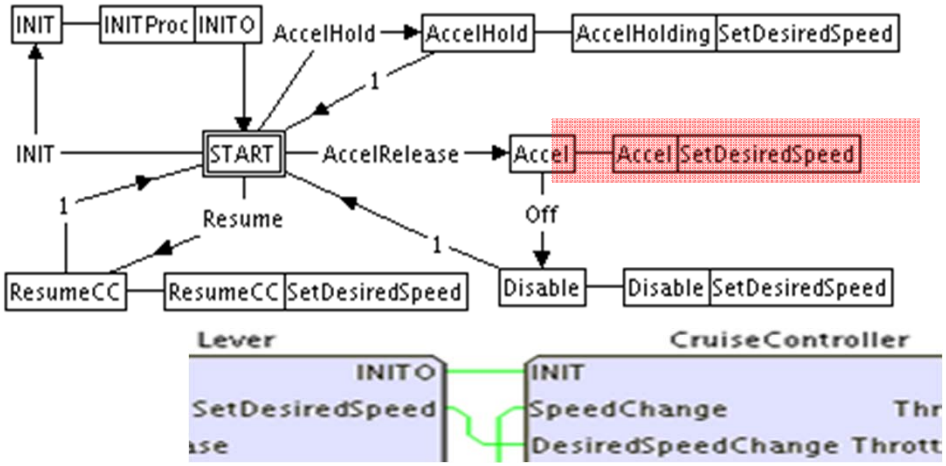
Outputs events:

Sample inputs

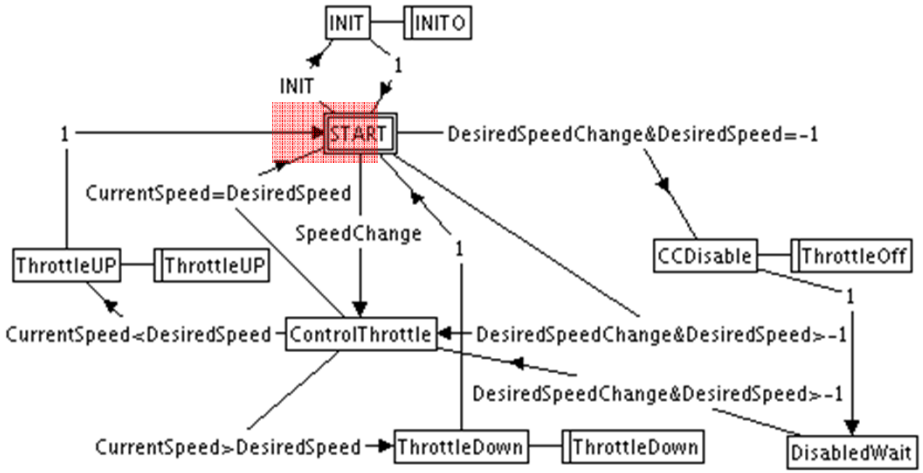


Synchronous Execution

Lever



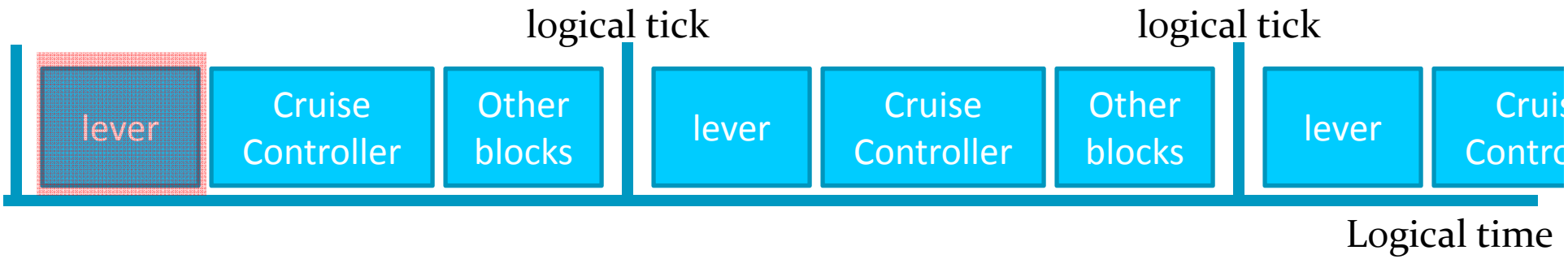
Cruise Controller



Inputs events:

AccelRelease

Outputs events:



Synchronous Execution

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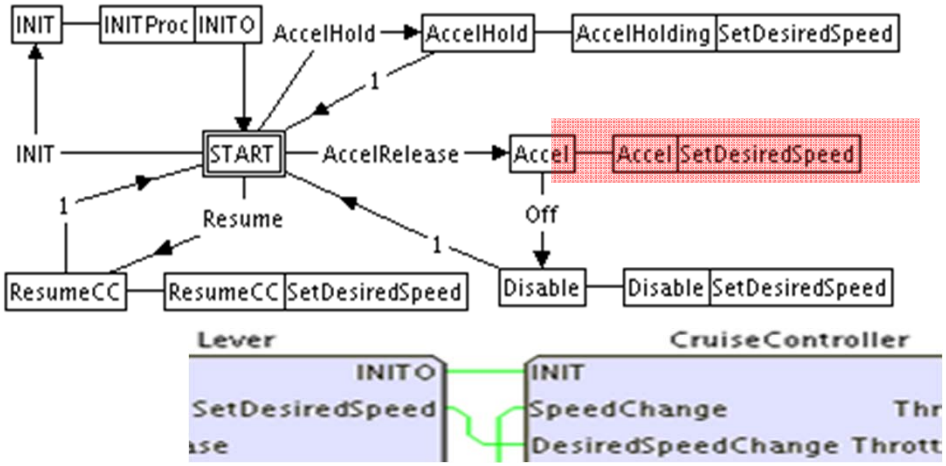
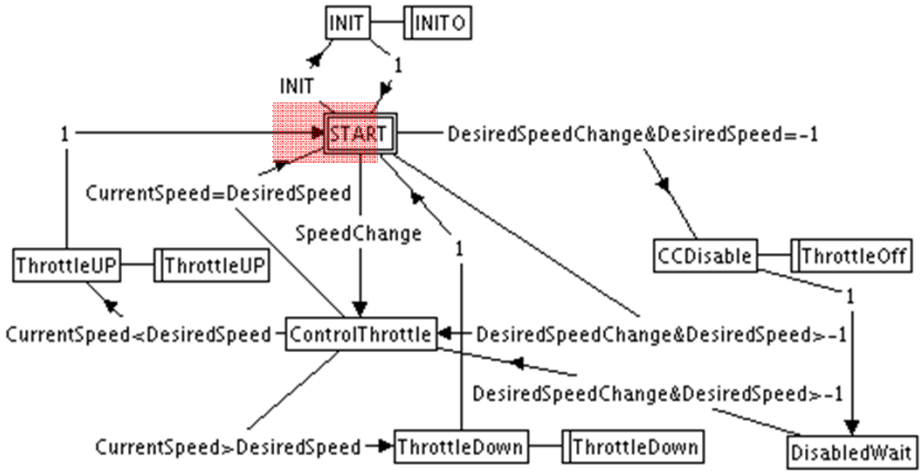


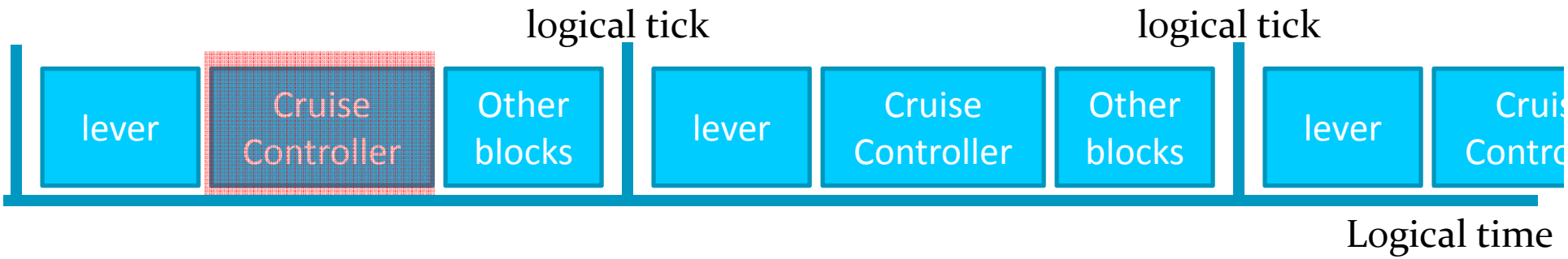
Cruise Controller



Inputs events:

AccelRelease

Outputs events:



Synchronous Execution

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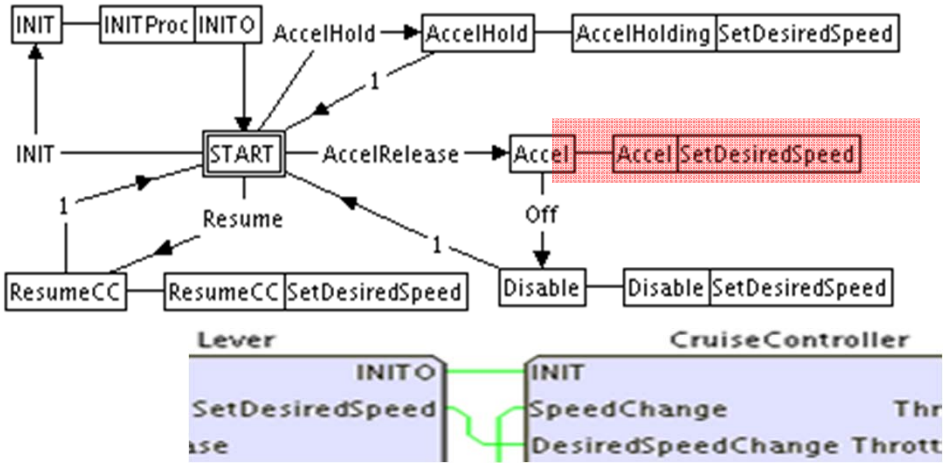
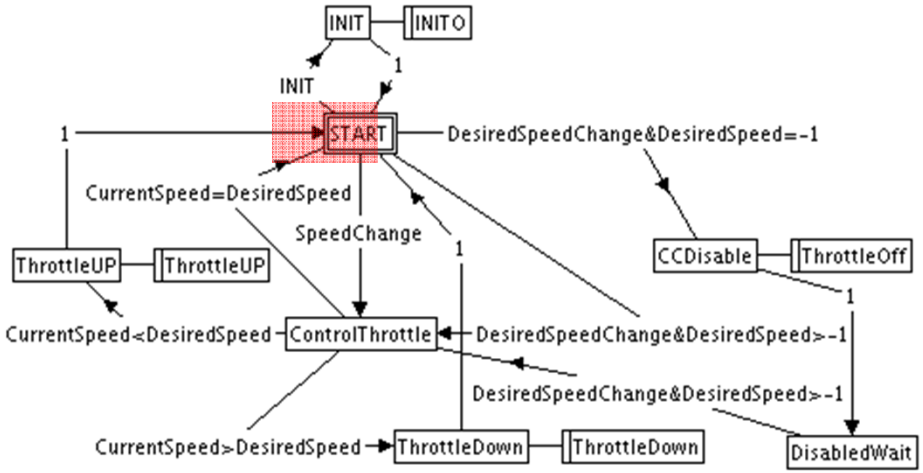


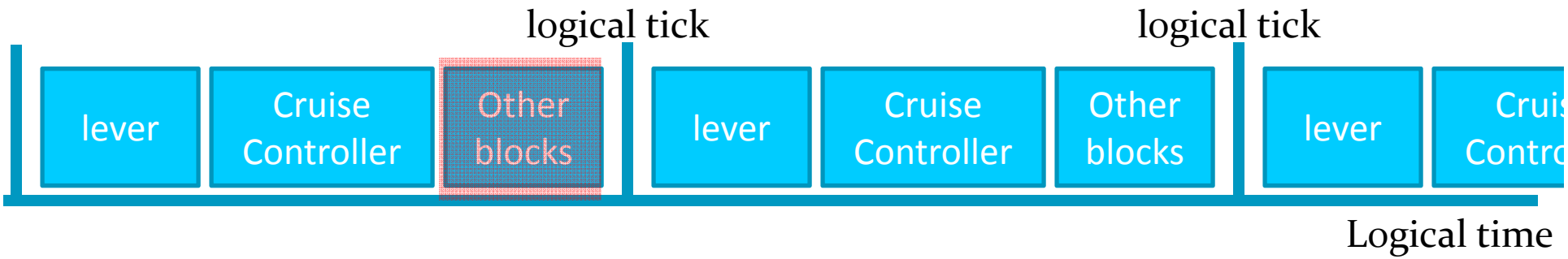
Cruise Controller



Inputs events:

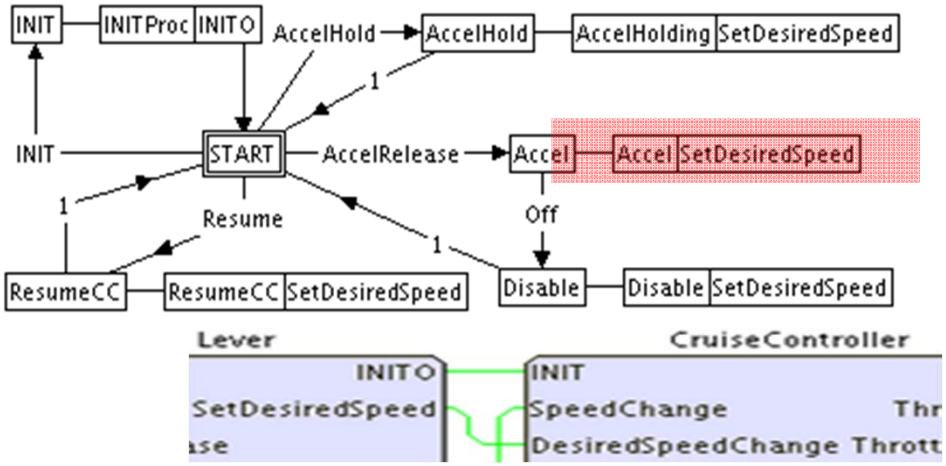
AccelRelease

Outputs events:

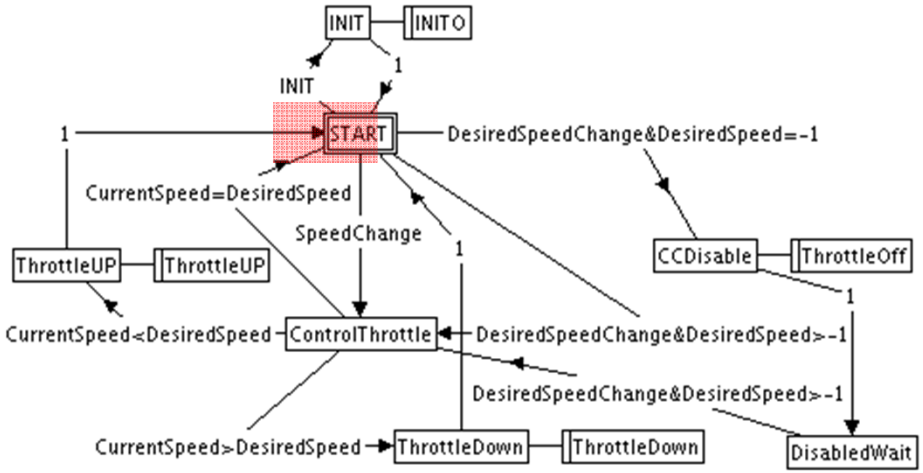


Synchronous Execution

Lever



Cruise Controller

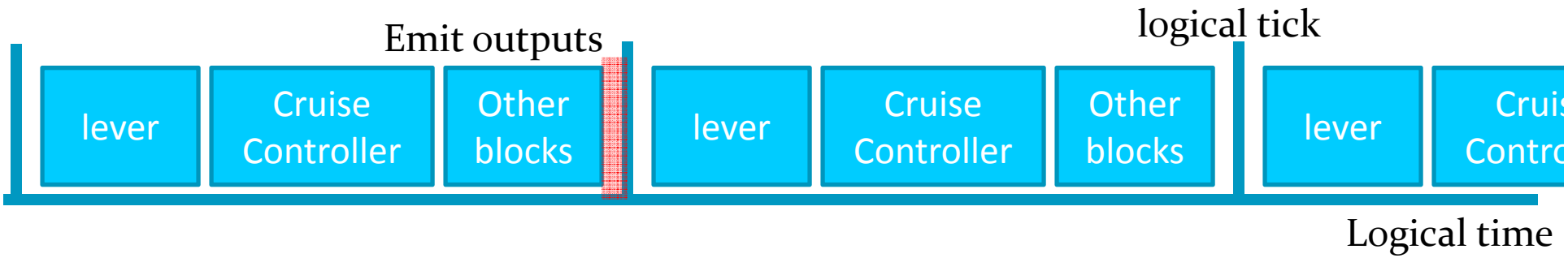


Inputs events:

AccelRelease

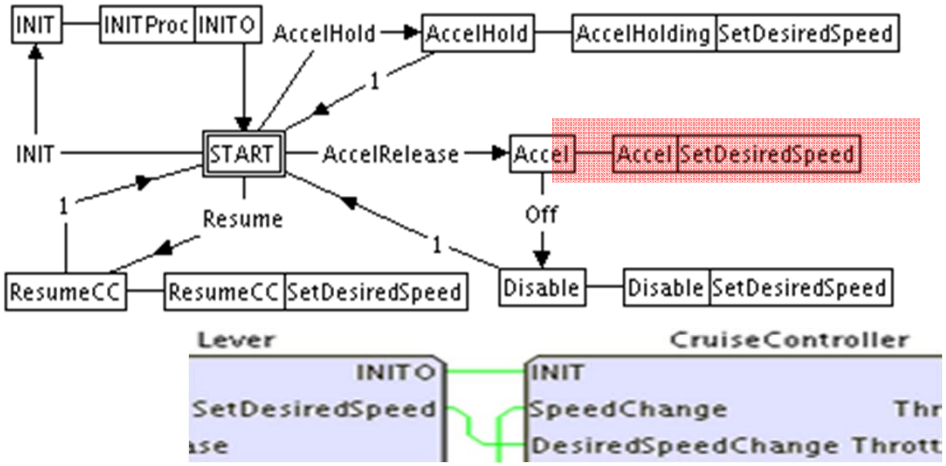
Outputs events:

SetDesiredSpeed

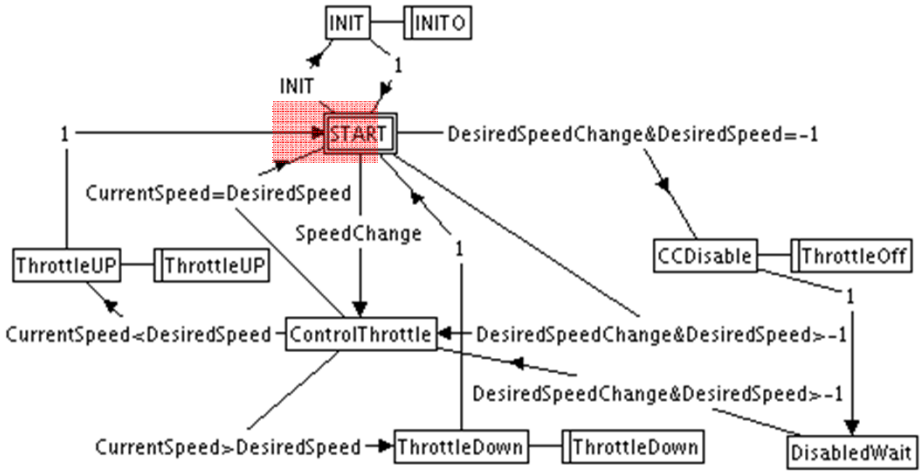


Synchronous Execution

Lever



Cruise Controller



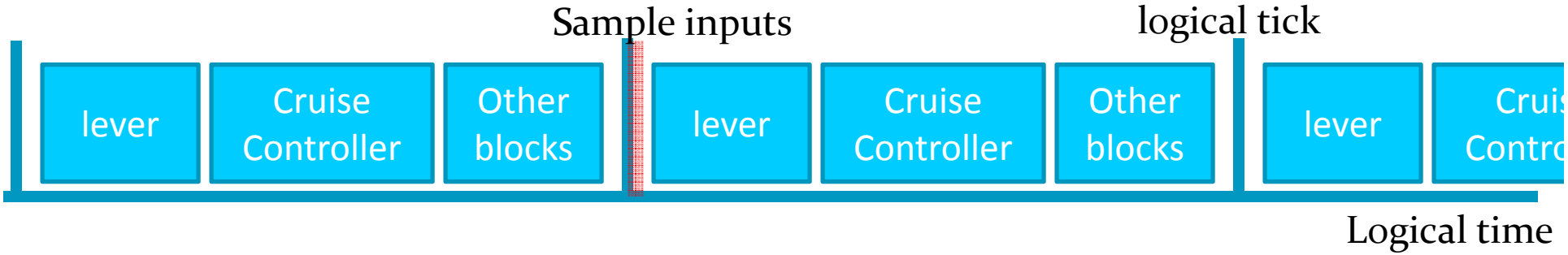
Inputs events:

AccelRelease

DesiredSpeedChange

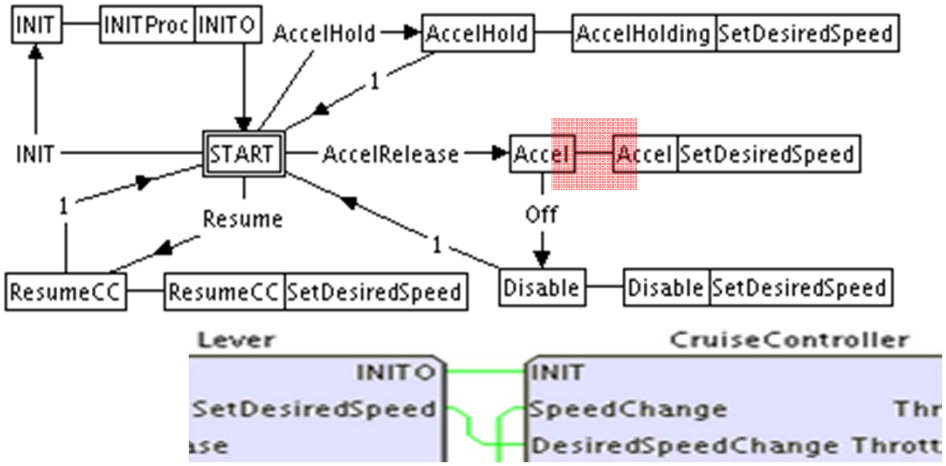
Outputs events:

SetDesiredSpeed

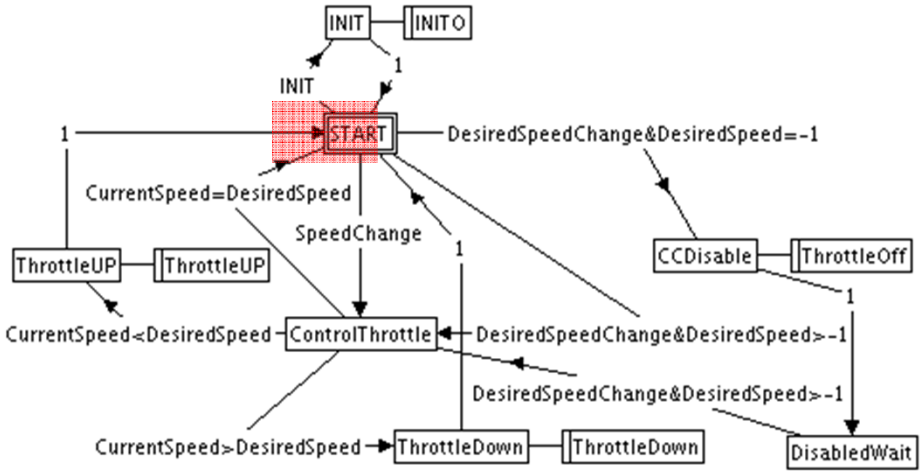


Synchronous Execution

Lever



Cruise Controller



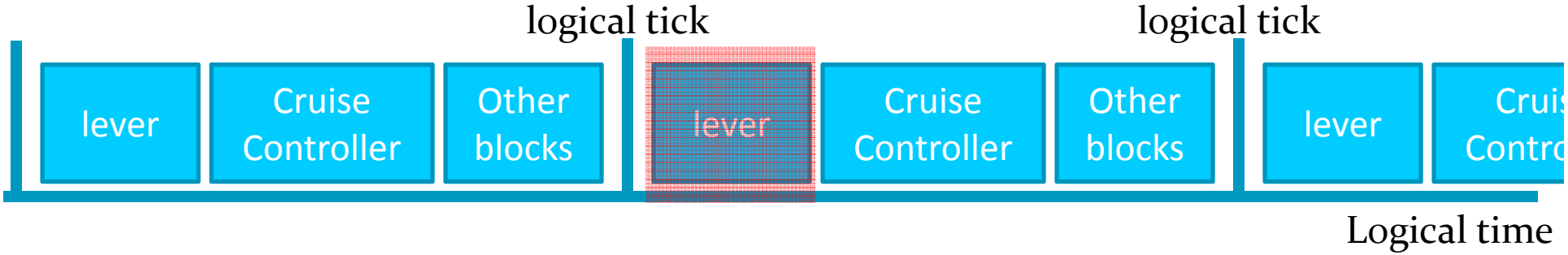
Inputs events:

AccelRelease

DesiredSpeedChange

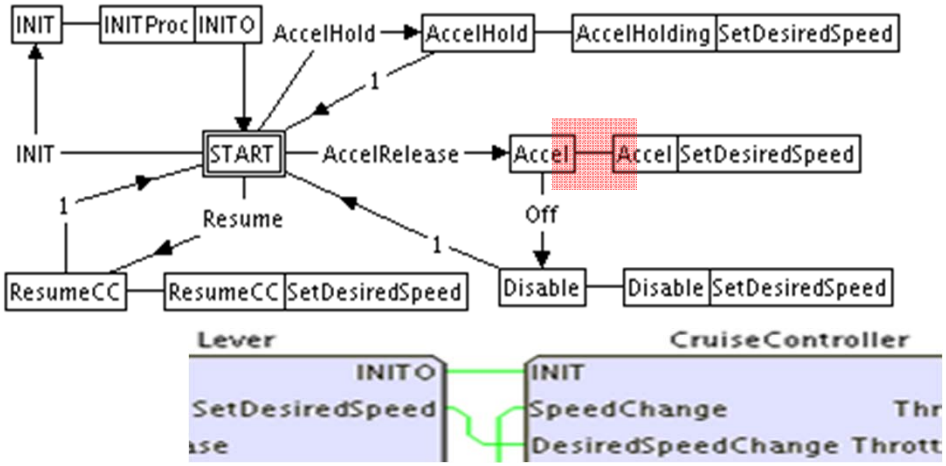
Outputs events:

SetDesiredSpeed

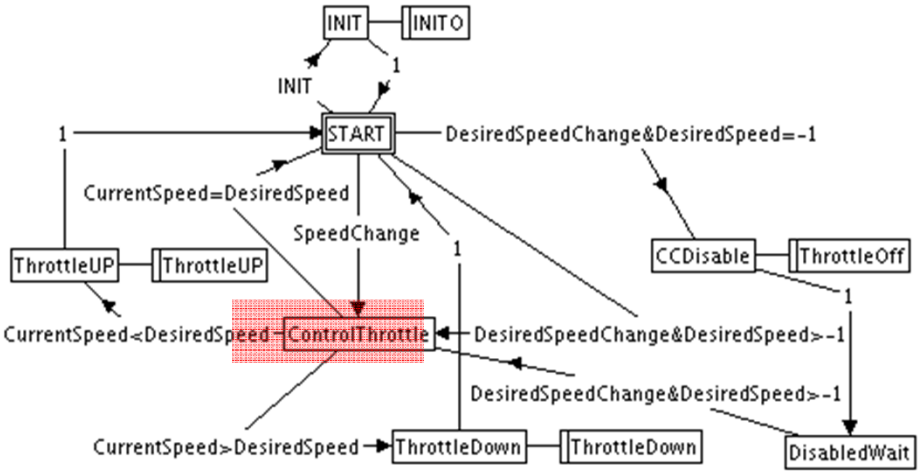


Synchronous Execution

Lever



Cruise Controller



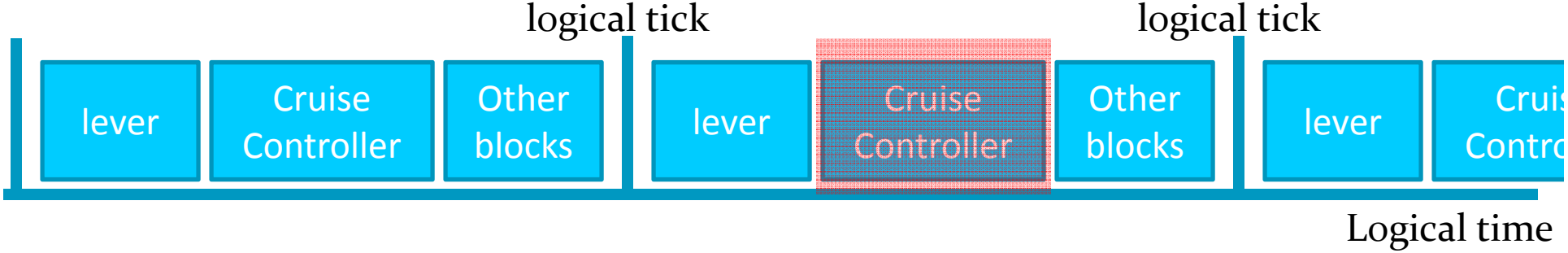
Inputs events:

AccelRelease

DesiredSpeedChange

Outputs events:

SetDesiredSpeed



Synchronous Execution

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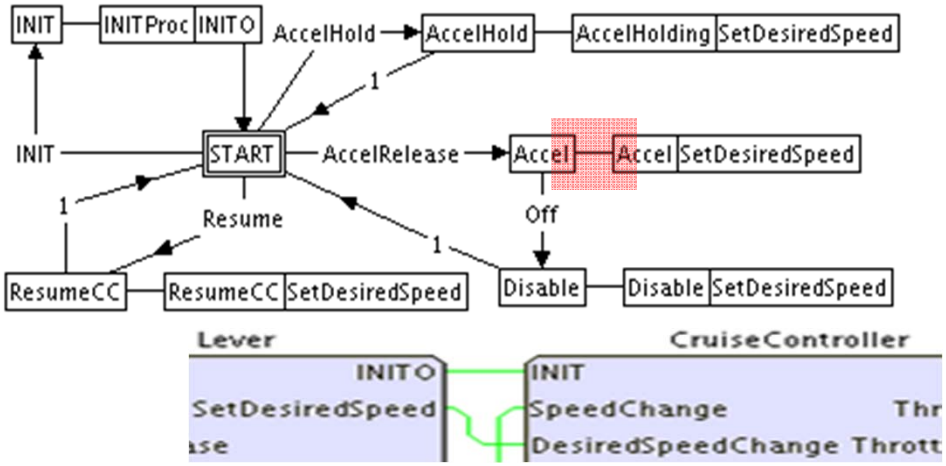
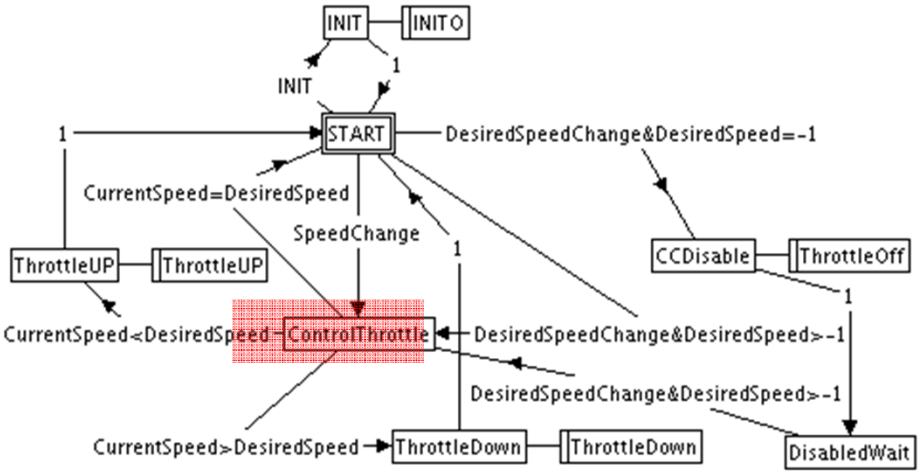


Cruise Controller



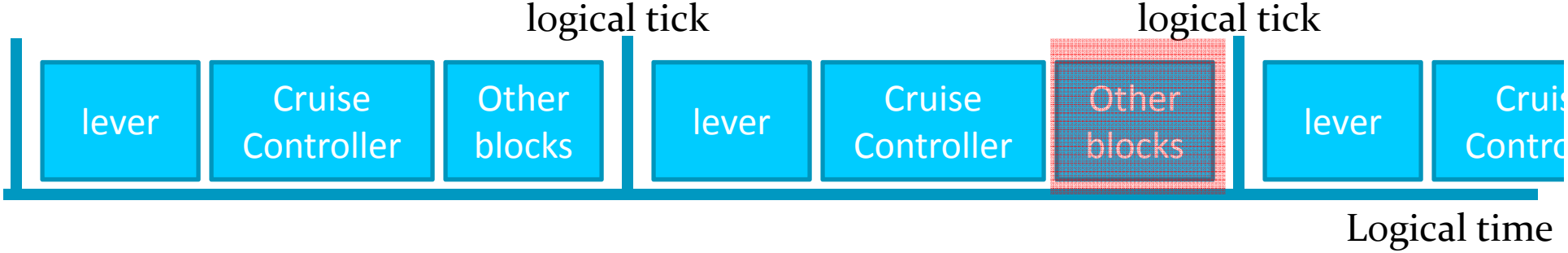
Inputs events:

AccelRelease

DesiredSpeedChange

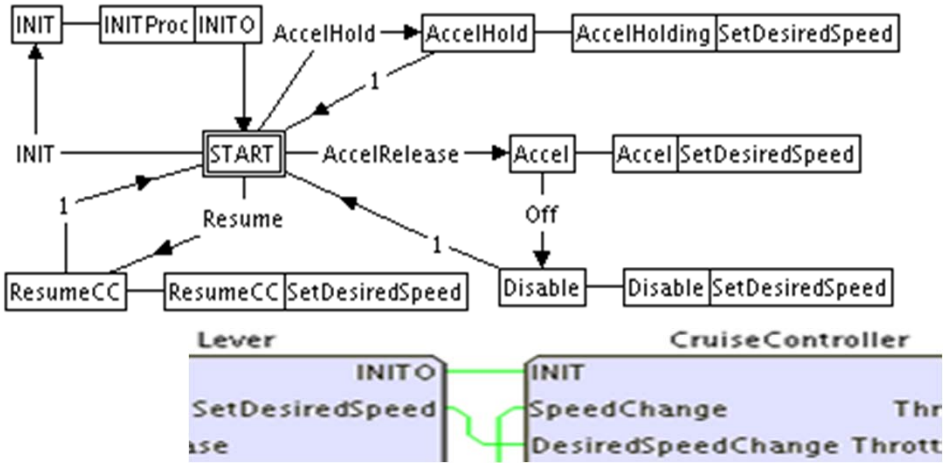
Outputs events:

SetDesiredSpeed

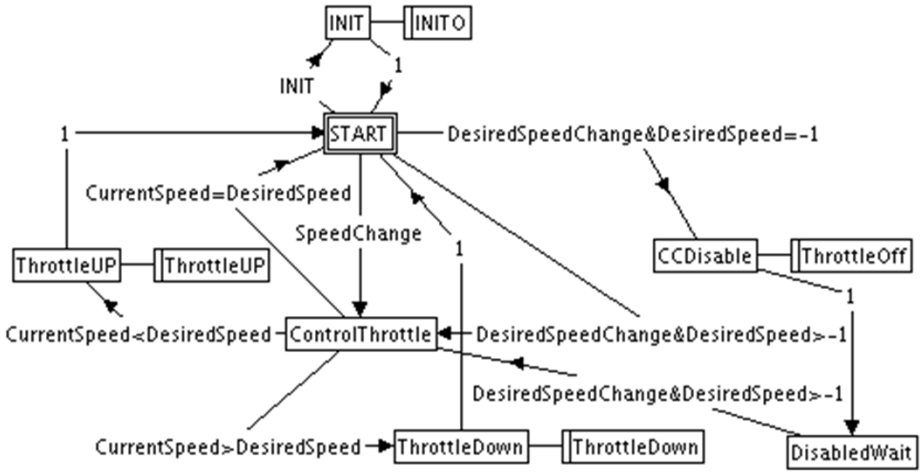


Synchronous Execution

Lever



Cruise Controller



Reaction Time

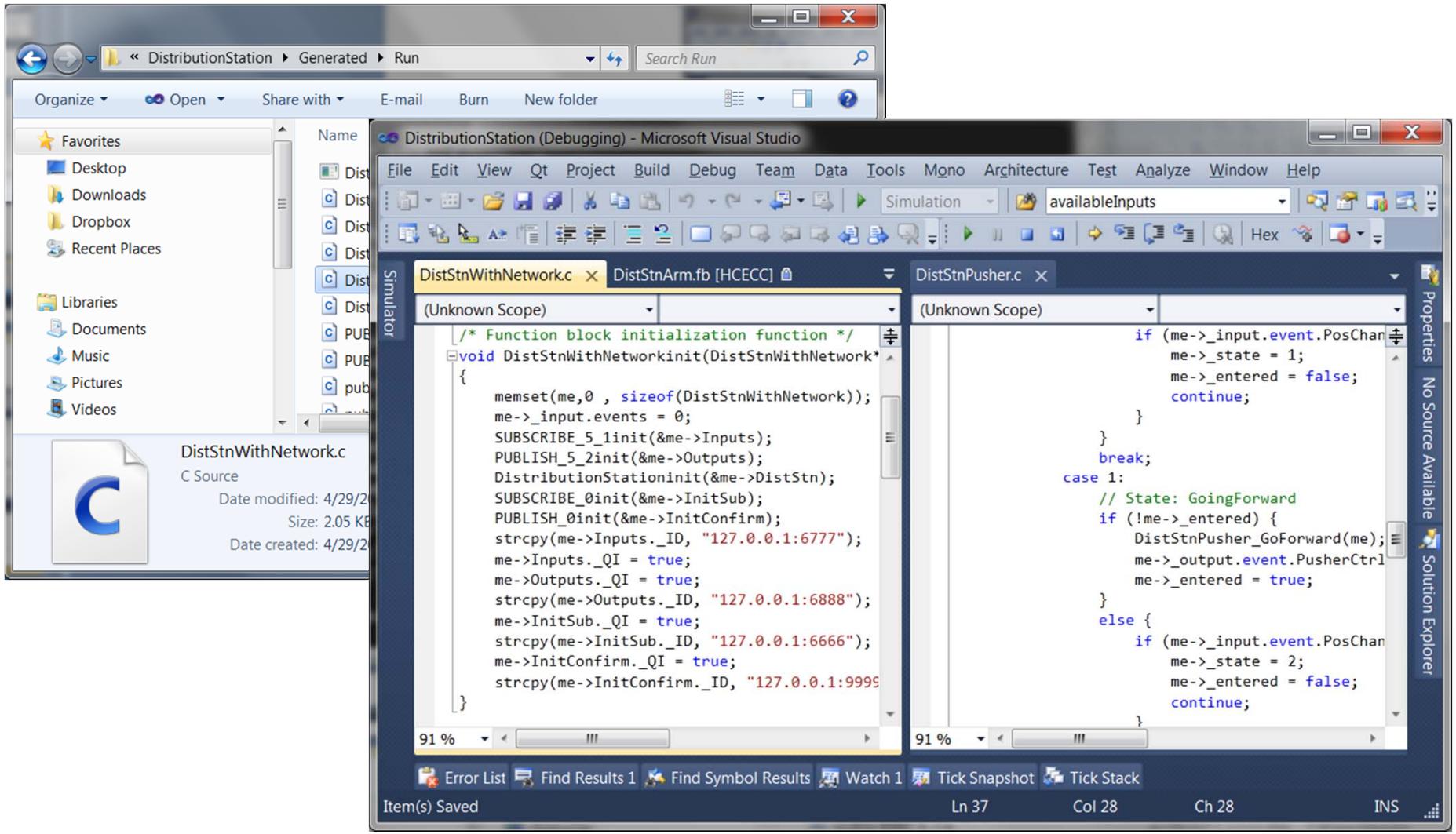
logical tick

logical tick

lever	Cruise Controller	Other blocks	lever	Cruise Controller	Other blocks	lever	Cruis Contro

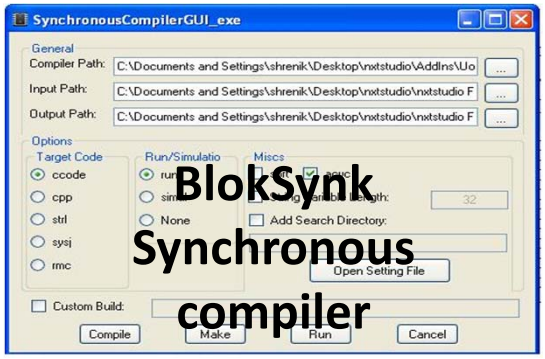
Logical time

BlokSynk: Generation of Deterministic Safe C code



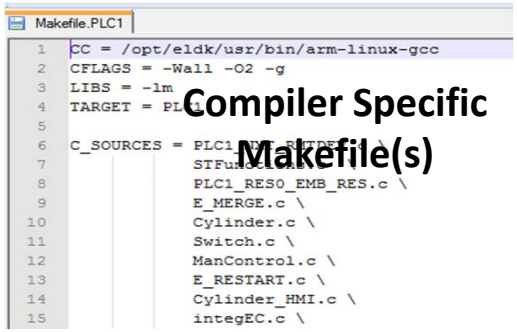
BlokSynk Plugin

FB Model in NxtStudio



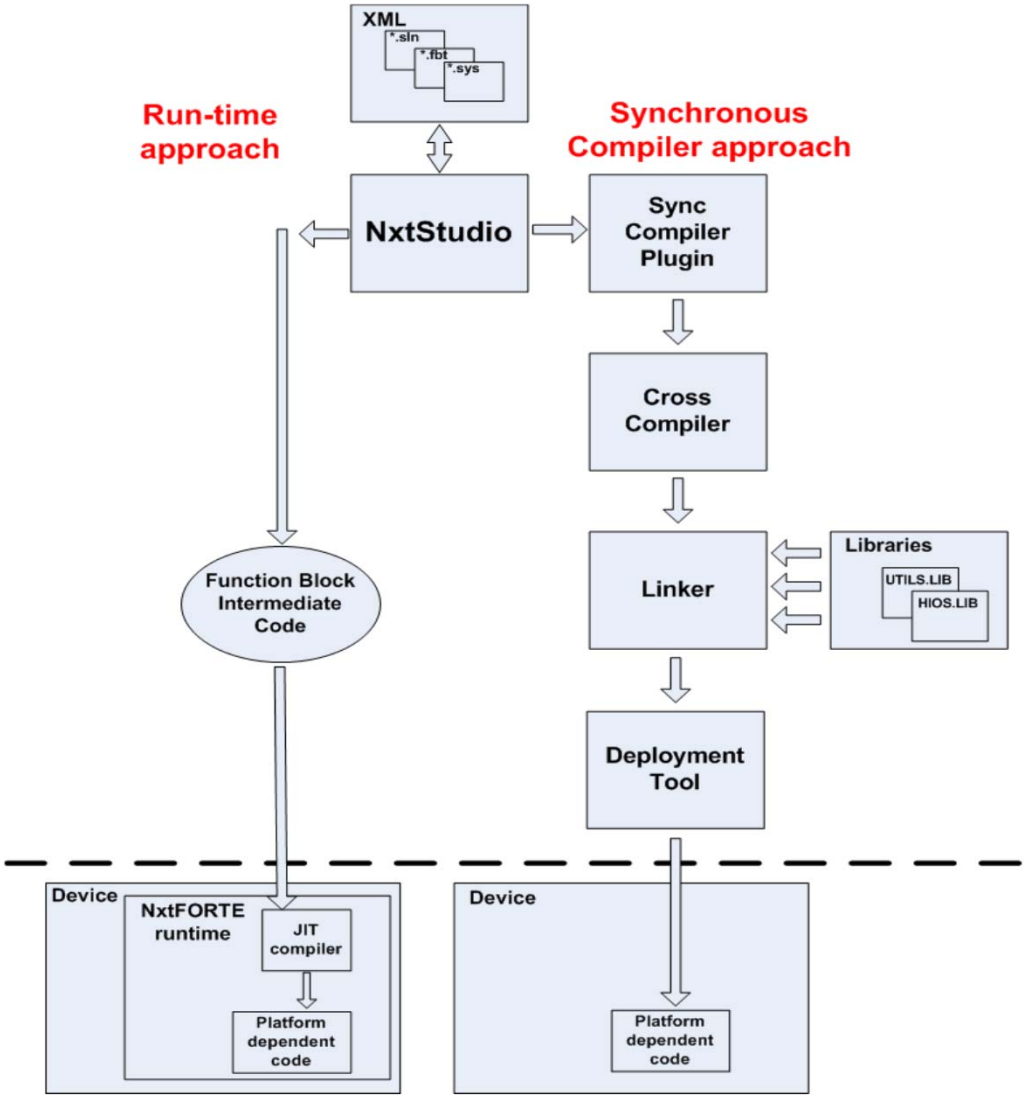
BlokSynk Synchronous compiler

Standard 'C' source Files

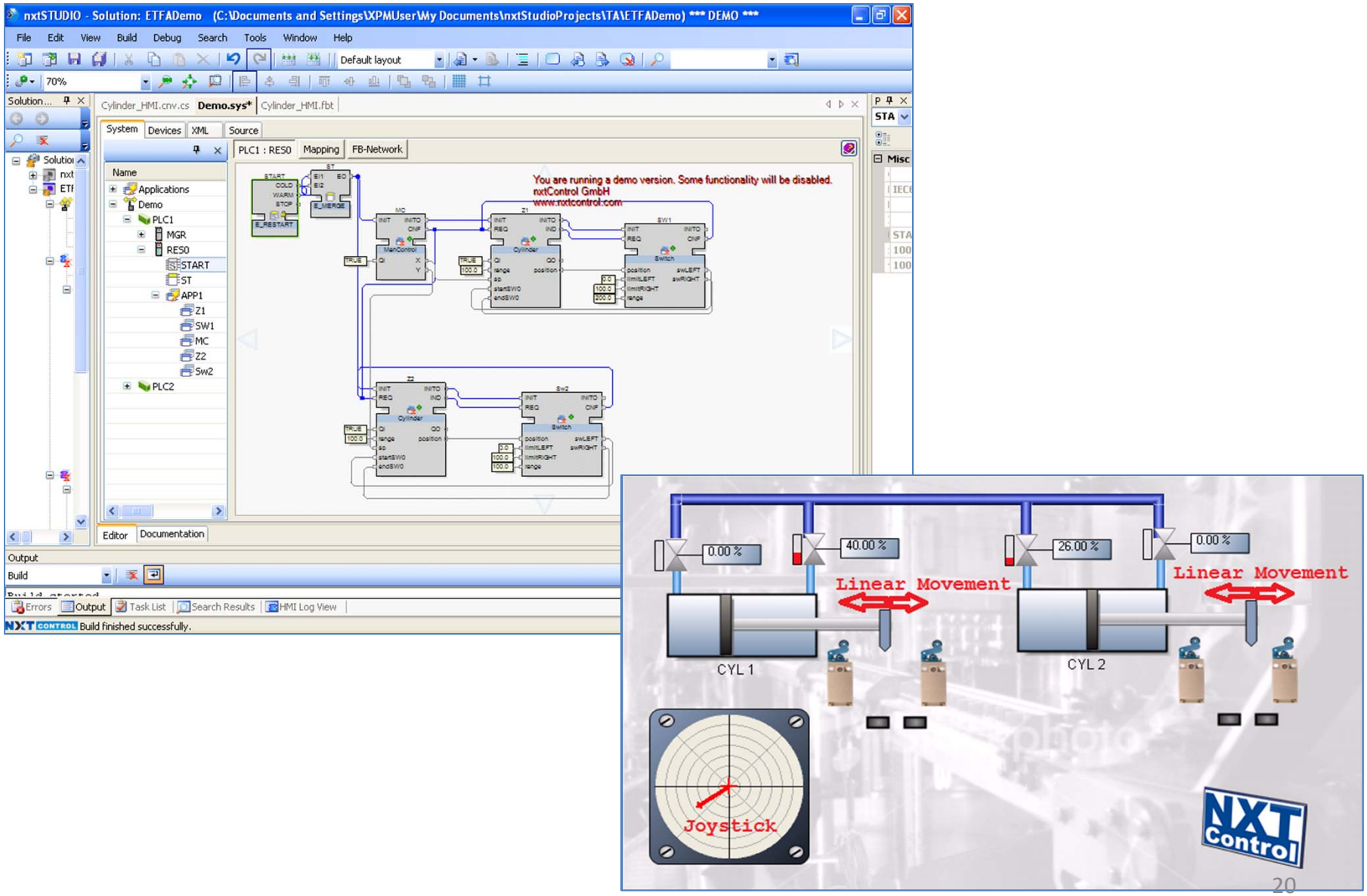


Compiler Specific Makefile(s)

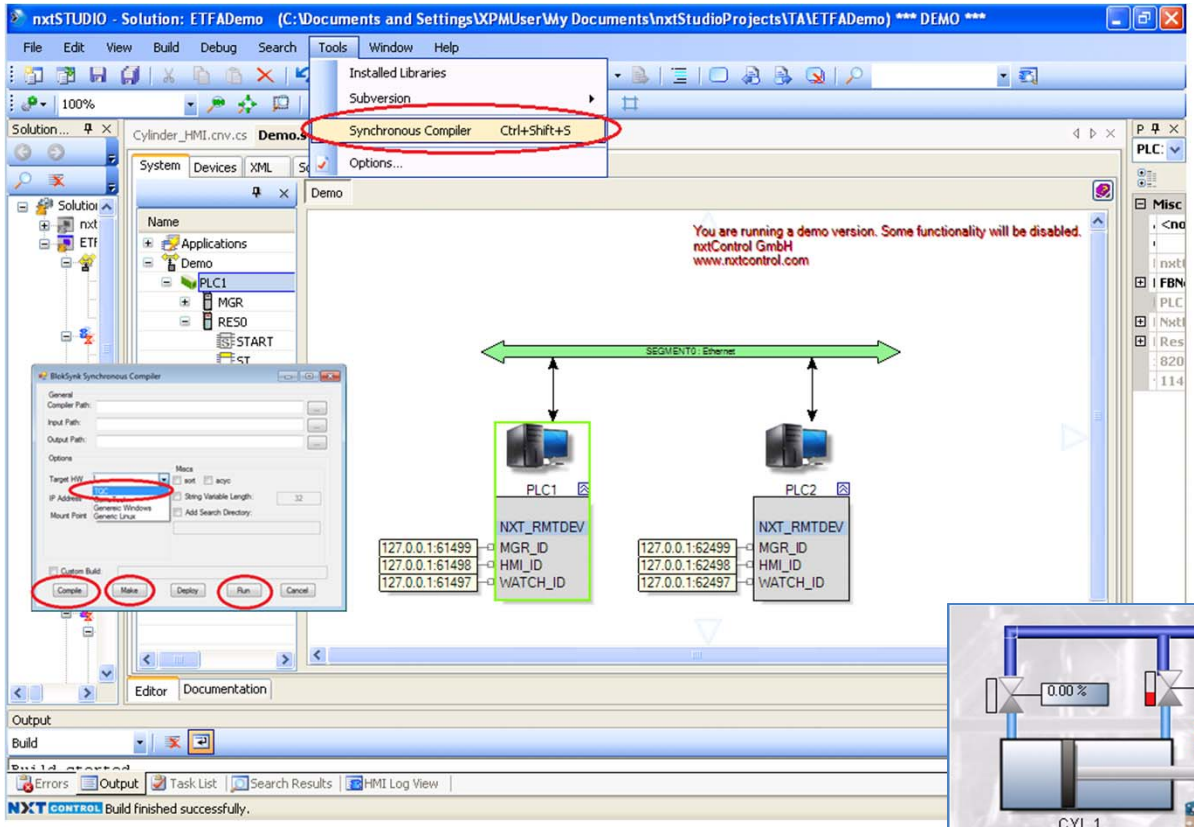
BlokSynk Deployment Model

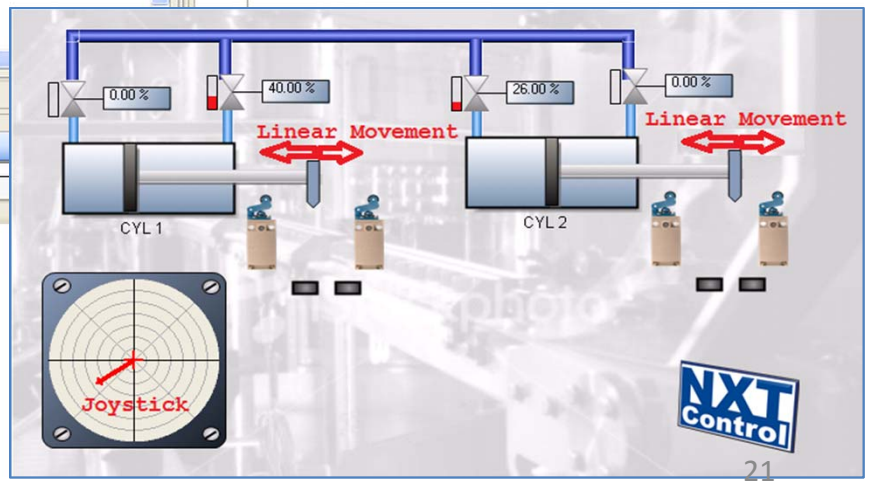


Demo

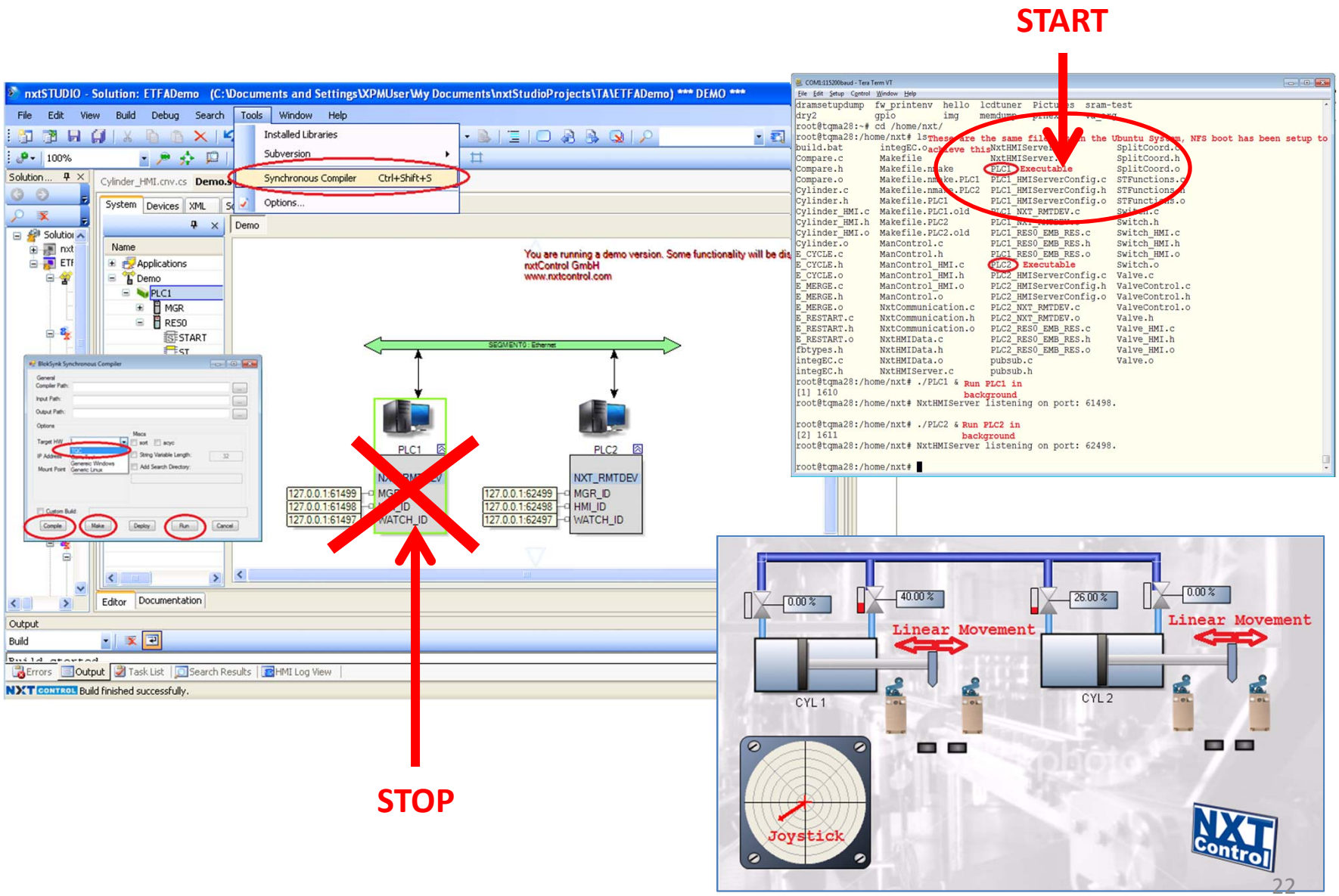

nxtSTUDIO - Solution: ETFADemo (C:\Documents and Settings\XPMUser\My Documents\nxtStudioProjects\TA\ETFADemo) *** DEMO ***
You are running a demo version. Some functionality will be disabled.
nxtControl GmbH
www.nxtcontrol.com
0.00 %
40.00 %
26.00 %
0.00 %
Linear Movement
Linear Movement
CYL 1
CYL 2
Joystick
NXT Control

Deployment view





Substituting Device On the Fly



Conclusion

- BlokSynk and Forte interoperate with each other
- BlokSynk talks to Nxt HMI
- This is yet another benefit of IEC 61499!