

EURO-INTERLOCKING

The **GENERIS** project -
A division of the
Euro-Interlocking Project



Union Internationale des Chemins de fer
Internationaler Eisenbahnverband - International Union of Railways

Primary Project Objectives

- Significant reduction of interlocking life-cycle costs
- Standardised descriptions of requirements to meet the current and future needs of the railways
- Cross-acceptance of systems throughout Europe
- Full compliance with the European norms EN 50126 to EN 50129

Participating Railways

BS, Denmark

BV, Sweden

BLS, Switzerland

CD, Czech Republic

CFR, Romania

DB AG, Germany

JBV, Norway

MAV, Hungary

NS, Netherlands

REFER, Portugal

RFF, France

RHK, Finland

**Railtrack,
United Kingdom**

**RFI/FS SpA,
Italy**

SBB/CFF, Switzerland

SZ, Slovenian Rail

ÖBB, Austria

**SNCB/NMBS,
Belgium**

Industry Participants

AEA Technology Rail

Alcatel

Alstom Transport

Ansaldo

AZD Praha

Bombardier Transportation

I-Logix

Invensys/Westinghouse/Dimetronic

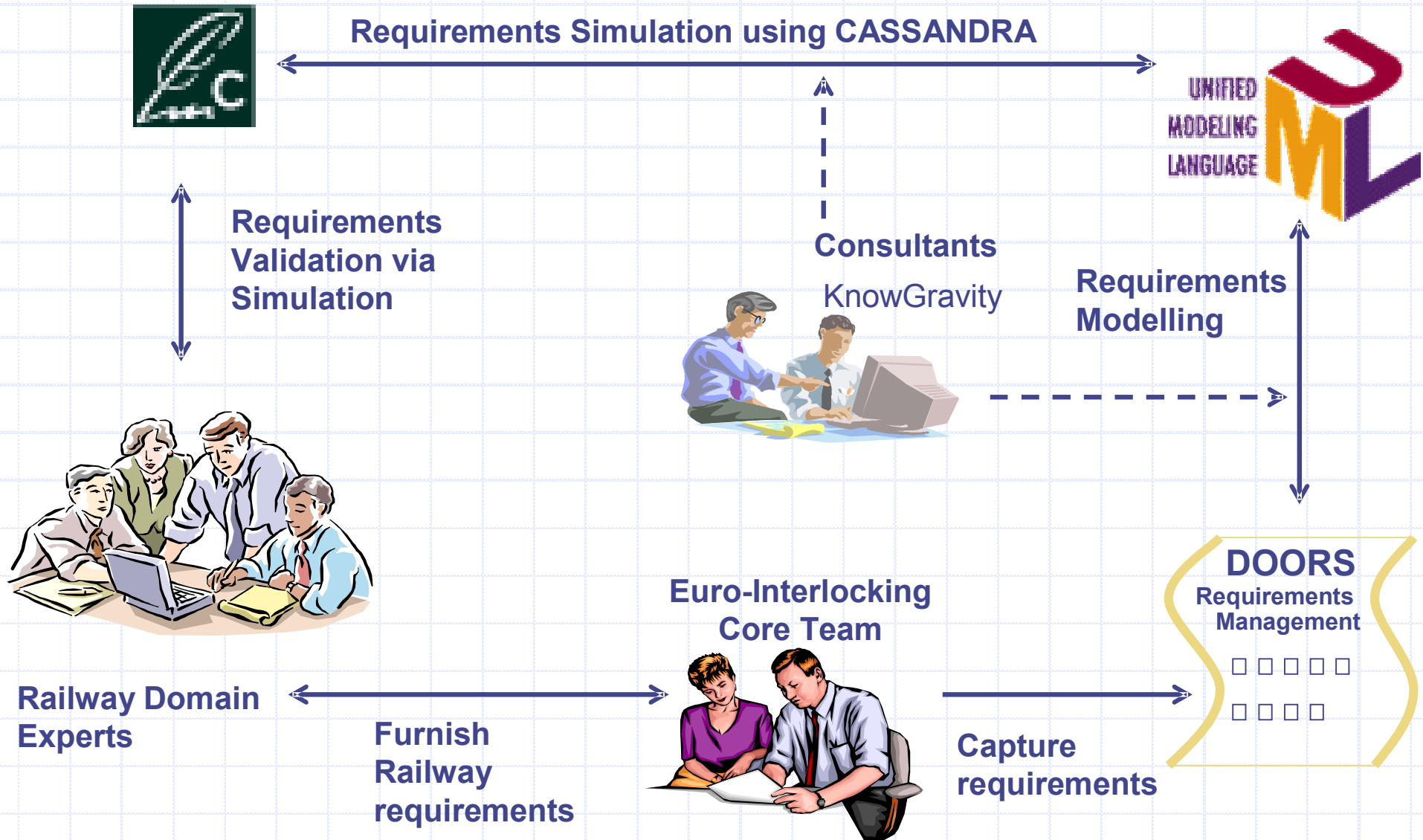
OSC-Offis

Siemens Verkehrstechnik

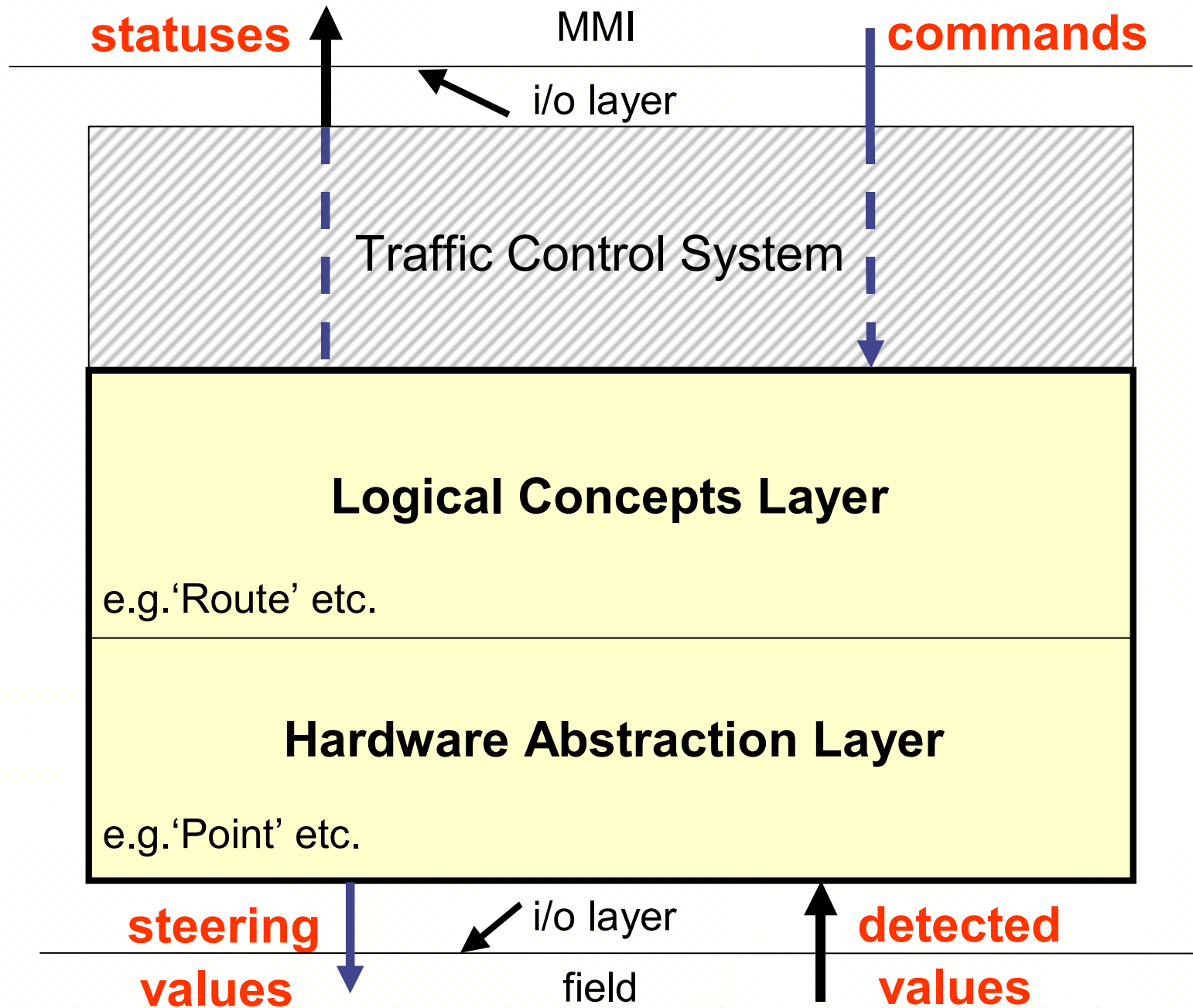
Telelogic

Vossloh System-Technik

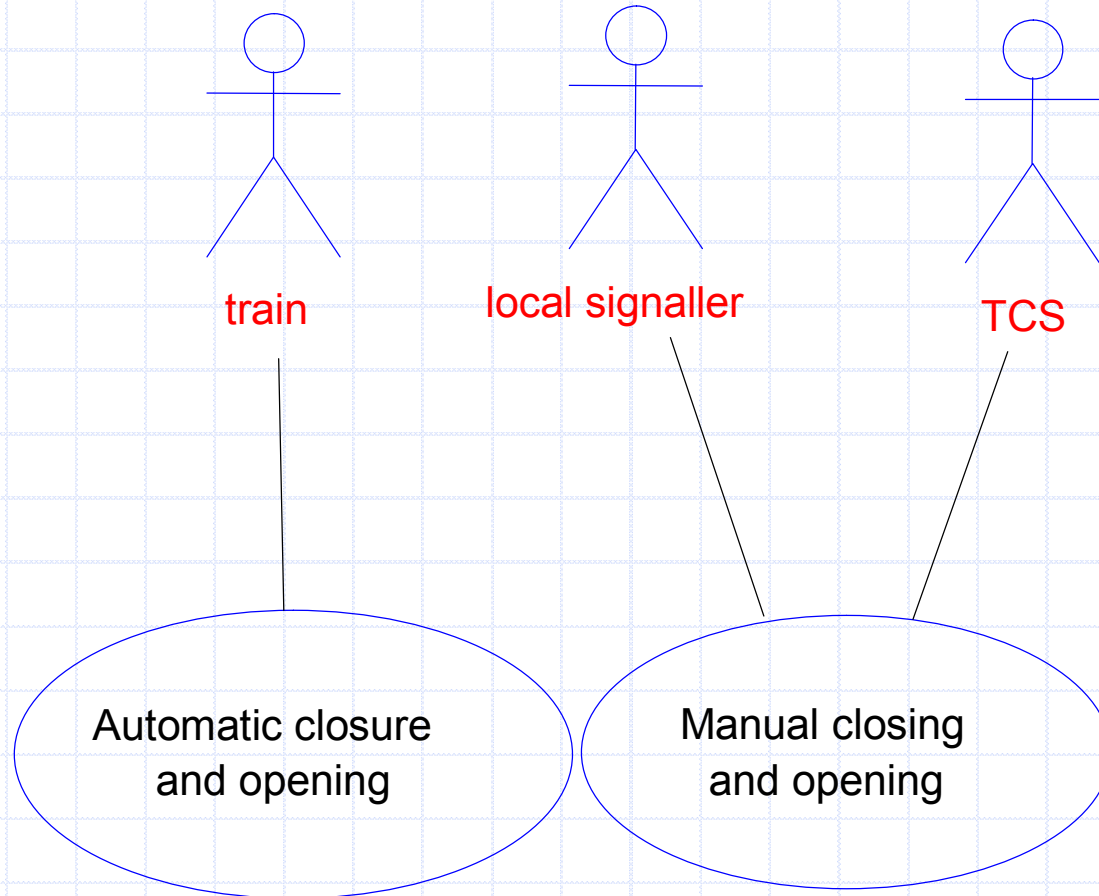
Project Development Process

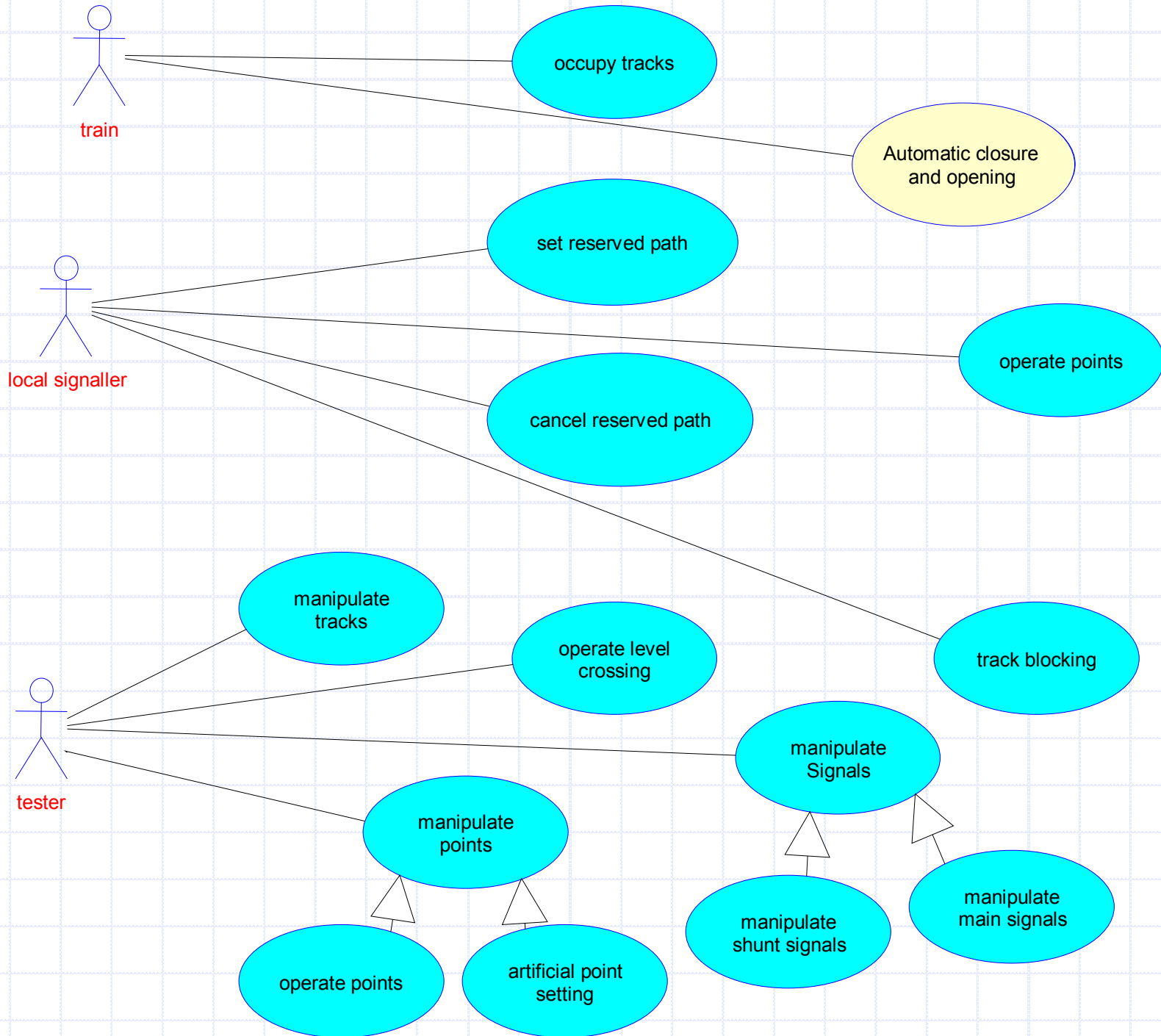


GENERIS Context Diagram

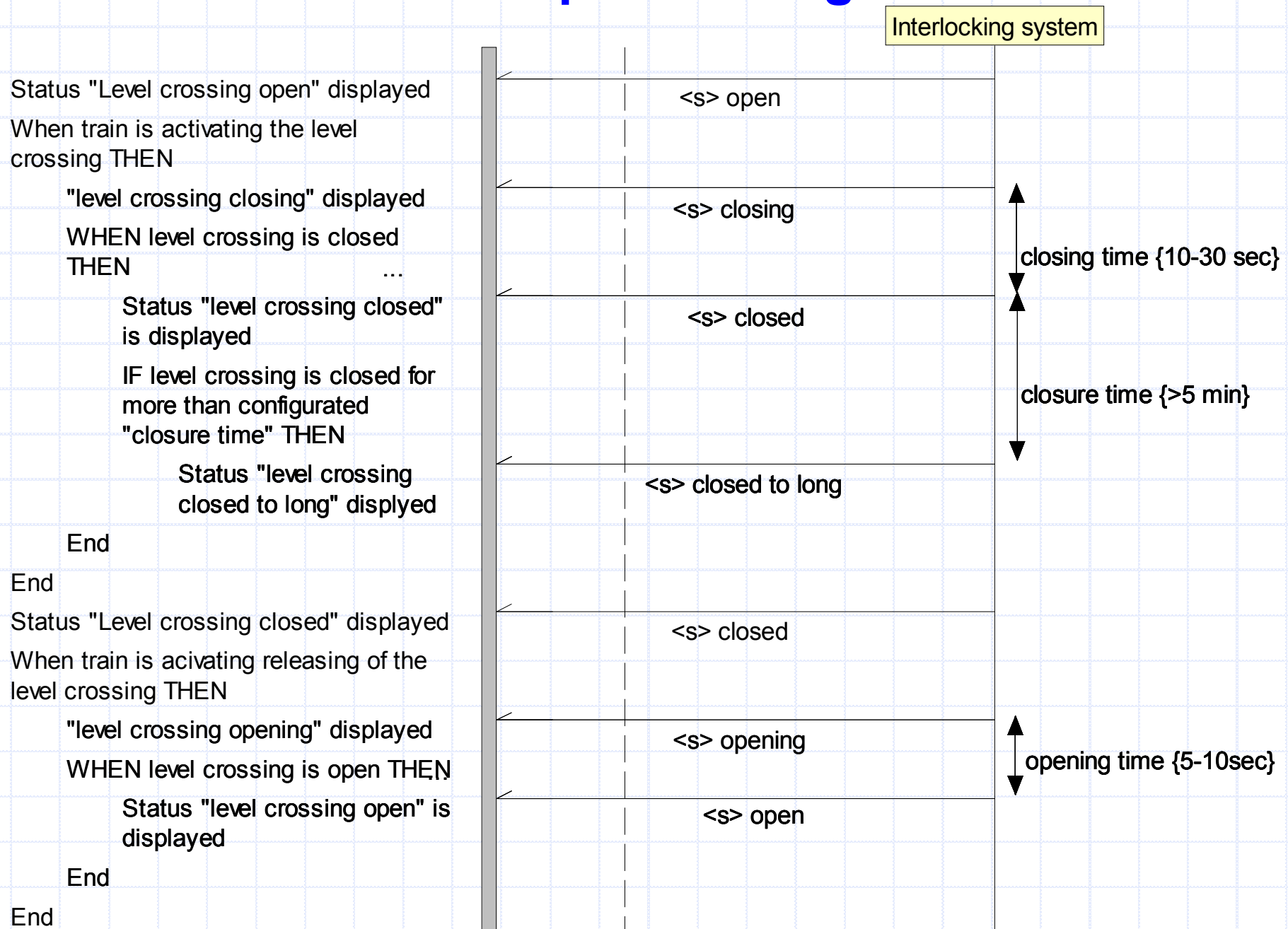


An example of a Use Case for operating a level crossing





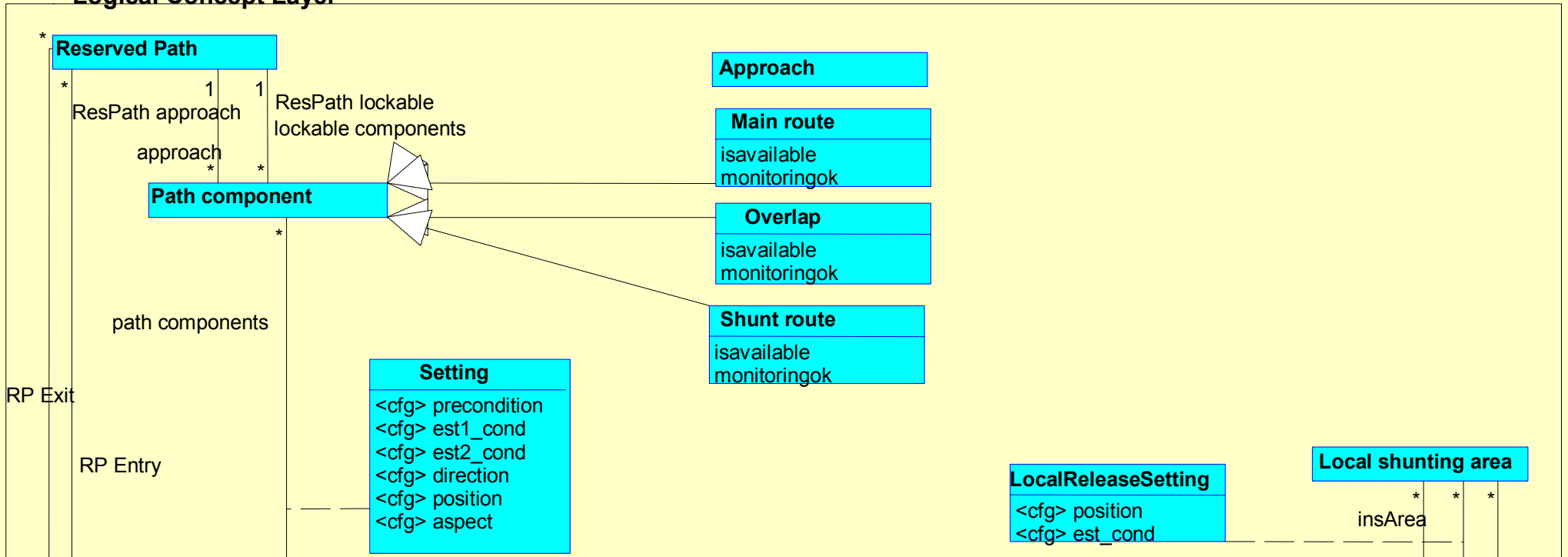
A Use Case sequence Diagram



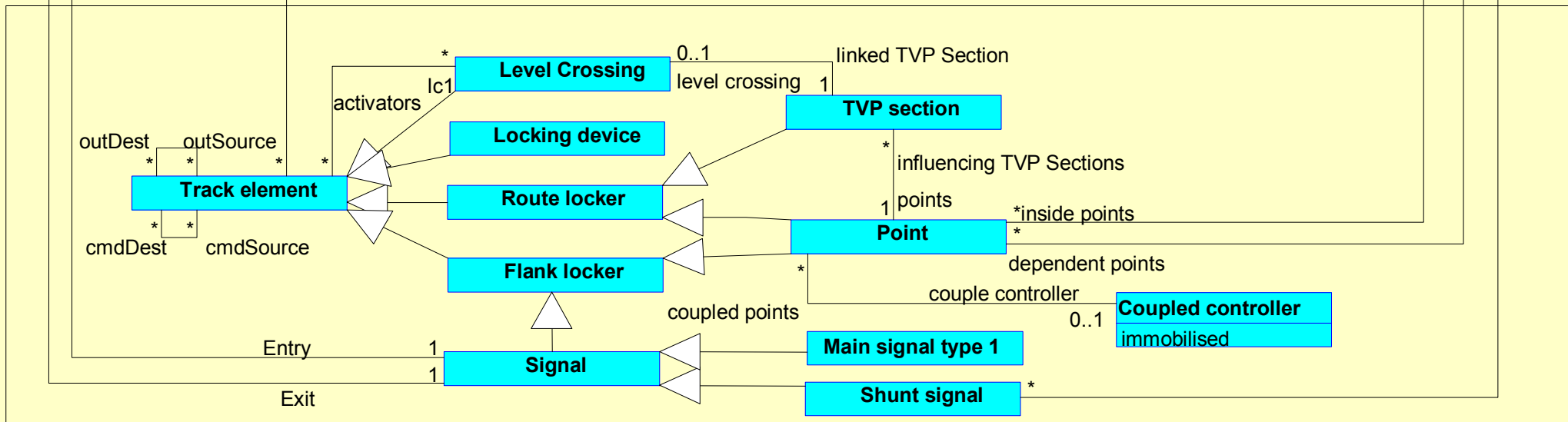
An example of action language

When in_state('#main route locked') send
'Entry'.Signal '<ic> proceed'

Logical Concept Layer

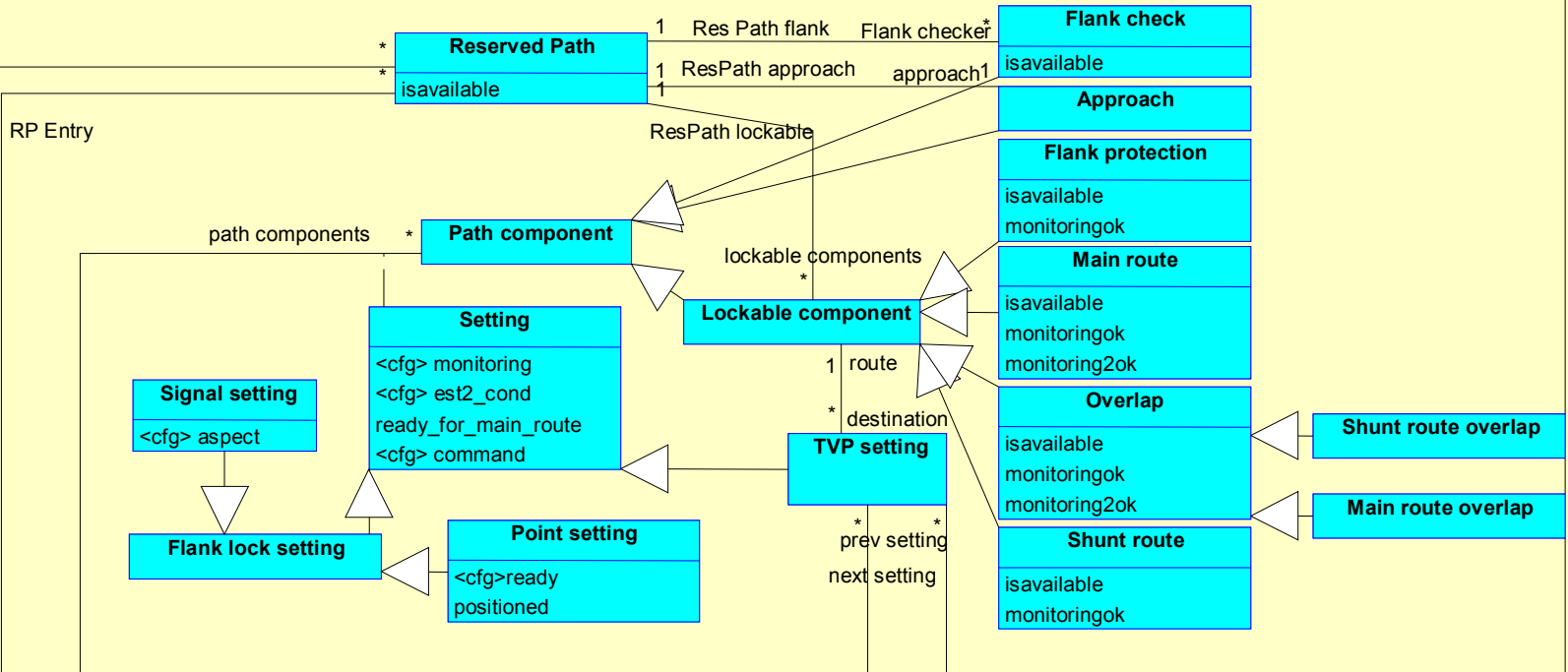


Hardware Abstraction Layer

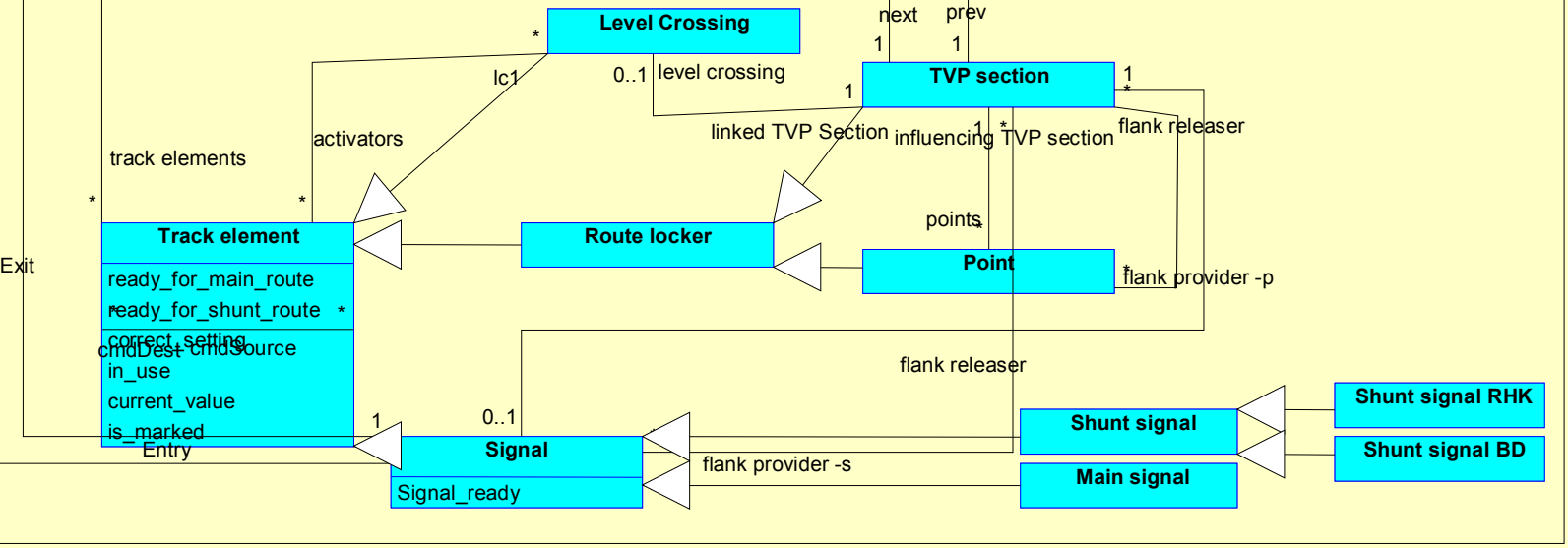


LCL

RP Exit

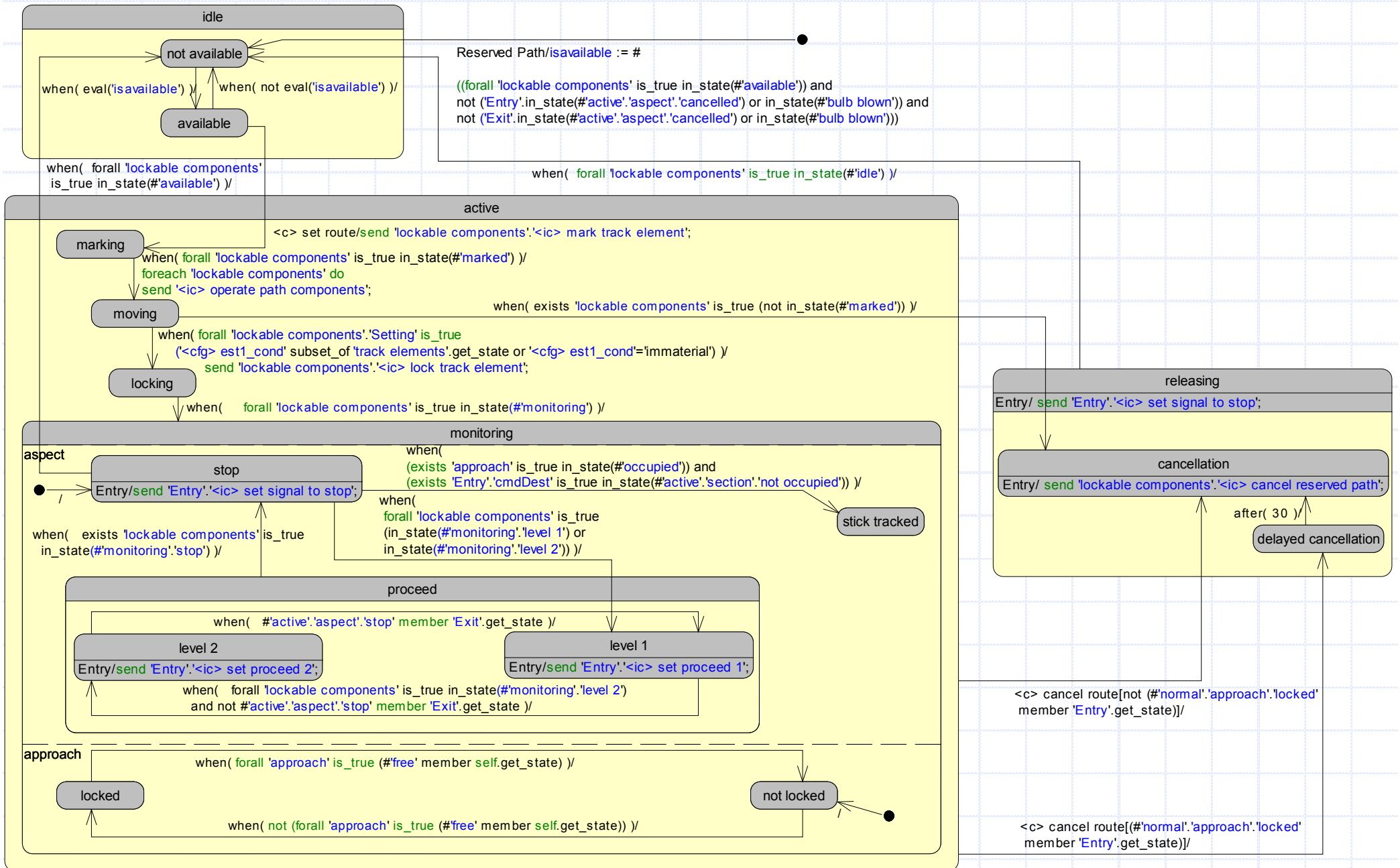


HAL



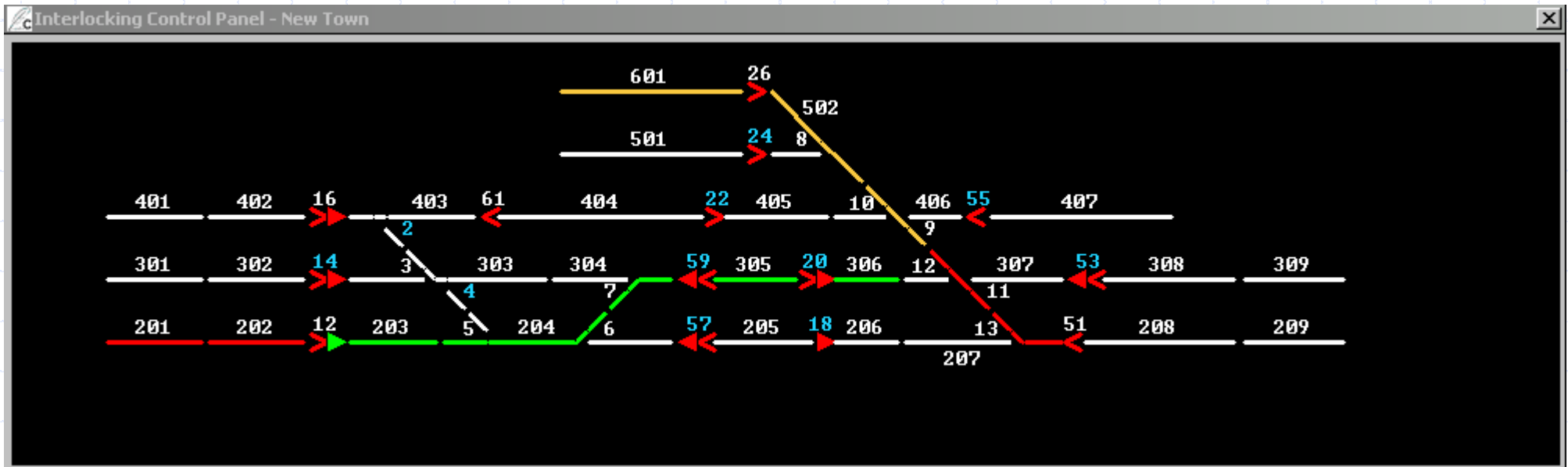
Exit

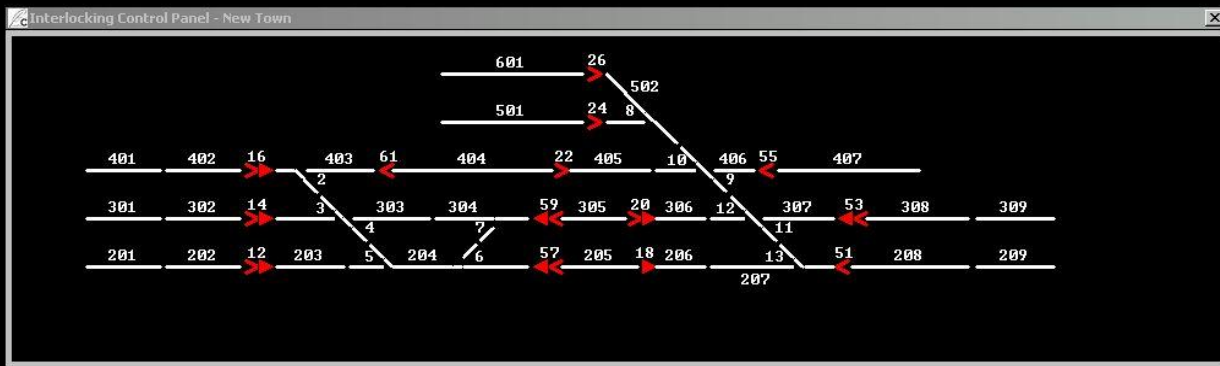
State Diagram for 'Reserved Path'



Presentation of the Requirements

A Graphical User Interface has now been completed, which will enable us to set more complicated routes and to see how multiple route settings influence one another. It will also facilitate the validation work





MR_12_20:Main route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	available		
lockable component	idle		
main route	idle.available		

SR_12_18:Shunt route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	available		
lockable component	idle		
shunt route	idle.available		

SR_FP_12_20:Flank protection

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	available		
lockable component	idle		
flank protection	idle.available		

5551:Shunt signal

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
signal	active.approach.not lock		
shunt signal	active.flank.locker.not lock		

SR_12_20:Shunt route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	available		
lockable component	idle		
shunt route	idle.available		

MainSignal18:Signal

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
signal	active.approach.not lock		
	active.flank.locker.not lock		

Set_MR_12_20_TVP204:TVP setting

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
setting	normal		
tvp setting	normal		

RP_12_18_SR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	idle.available		

RP_12_20_MR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	idle.available		

RP_12_20_SR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	idle.available		

P4:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
point	active.artificial.not set		
	active.dependency.not lc		
	active.detector.locking.ni		
	active.emergency.not rel		
	active.flank.locker.not loc		
	active.local.not released		
	active.logical.status.not ti		
	active.point.not blocked		
	active.detection.detectec		

P5:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
point	active.artificial.not set		
	active.dependency.not lc		
	active.detector.locking.ni		
	active.emergency.not rel		
	active.flank.locker.not loc		
	active.local.not released		
	active.logical.status.not ti		
	active.point.not blocked		
	active.detection.detectec		

P7:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
point	active.artificial.not set		
	active.dependency.not lc		
	active.detector.locking.ni		
	active.emergency.not rel		
	active.flank.locker.not loc		
	active.local.not released		
	active.logical.status.not ti		
	active.point.not blocked		
	active.detection.detectec		

TVP305:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		

TVP306:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		

TVP203:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		

TVP204:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		

P6:Point

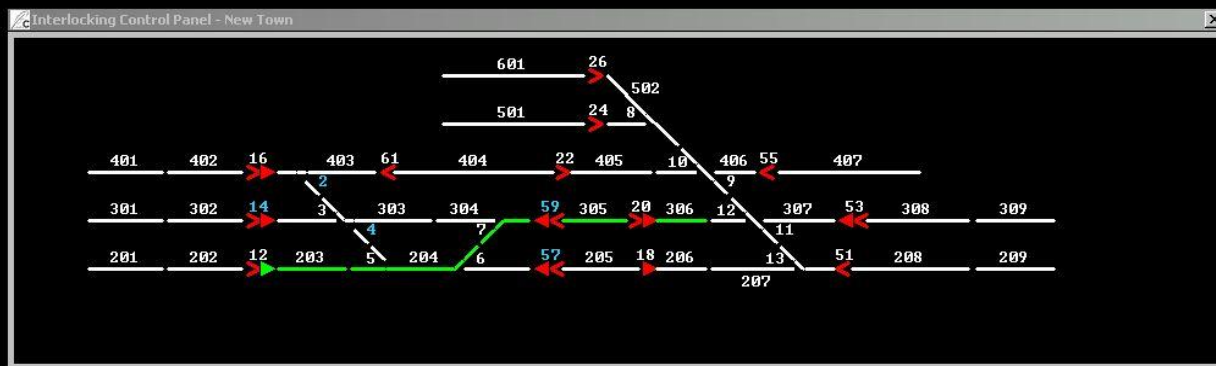
Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
point	active.artificial.not set		
	active.dependency.not lc		
	active.detector.locking.ni		
	active.emergency.not rel		
	active.flank.locker.not loc		
	active.local.not released		
	active.logical.status.not ti		
	active.point.not blocked		
	active.detection.detectec		

TVP304:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		

TVP303:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not mark		
	active.overlap.not lockec		
	active.route.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupi		
	active.track.not blocked		



MR_12_20:Main route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	not available		
lockable component	monitoring.level 1		
main route	active.monitoring.level 1		

SR_12_18:Shunt route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	not available		
lockable component	idle		
shunt route	idle.not available		

SR_FP_12_20:Flank protection

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	available		
lockable component	idle		
flank protection	idle.available		

5551:Shunt signal

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
signal	active.approach.not lock		
shunt signal	active.flank locker.not lock		

SR_12_20:Shunt route

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
path component	not available		
lockable component	idle		
shunt route	idle.not available		

MainSignal1B:Signal

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
signal	active.approach.not lock		
	active.flank locker.not lock		

Set_MR_12_20_TVP204:TVP setting

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
setting	normal		
tvp setting	normal		

RP_12_18_SR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	idle.not available		

RP_12_20_MR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	active.monitoring.approach		
	active.monitoring.aspect		

RP_12_20_SR:Reserved Path

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
reserved path	idle.not available		

P4:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.not locked		
	active.artificial.not set		
point	active.dependency.not locked		
	active.detector.locking.normal		
	active.emergency.not released		
	active.flank.locker.locked		
	active.local.not released		
	active.logical.status.not tracked		
	active.point.not blocked		
	active.detection.detected		

P5:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
	active.artificial.not set		
point	active.dependency.not locked		
	active.detector.locking.normal		
	active.emergency.not released		
	active.flank.locker.locked		
	active.local.not released		
	active.logical.status.not tracked		
	active.point.not blocked		
	active.detection.detected		

P7:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
	active.artificial.not set		
point	active.dependency.not locked		
	active.detector.locking.normal		
	active.emergency.not released		
	active.flank.locker.locked		
	active.local.not released		
	active.logical.status.not tracked		
	active.point.not blocked		
	active.detection.detected		

TVP305:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
tvp section	active.direction.odd		
	active.releaser.free		
	active.section.not occupied		
	active.track.not blocked		

TVP306:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.locked		
	active.route.not locked		
tvp section	active.direction.odd		
	active.releaser.free		
	active.section.not occupied		
	active.track.not blocked		

TVP203:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
tvp section	active.direction.odd		
	active.releaser.phase 1		
	active.section.not occupied		
	active.track.not blocked		

TVP204:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
tvp section	active.direction.odd		
	active.releaser.free		
	active.section.not occupied		
	active.track.not blocked		

P6:Point

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
flank locker	normal		
route locker	active.marking.not marked		
	active.overlap.not locked		
	active.route.main route locked		
point	active.artificial.not set		
	active.dependency.not locked		
	active.detector.locking.normal		
	active.route.main route locked		
	active.emergency.not released		
	active.flank.locker.locked		
	active.local.not released		
	active.section.not occupied		
	active.logical.status.not tracked		
	active.point.not blocked		
	active.detection.detected		

TVP304:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.not locked		
tvp section	active.direction.odd		
	active.releaser.free		
	active.section.not occupied		
	active.track.not blocked		

TVP303:TVP section

Change...	Focus	Assoc...	Attributes...
State			
xumpart	active		
track element	ready		
route locker	active.marking.not marked		
	active.overlap.not locked		
tvp section	active.direction.even		
	active.releaser.free		
	active.section.not occupied		
	active.track.not blocked		