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rw /SFB_501/teams/team3/Basis−Projekt.BaX/Entwicklung/RequirementsSp

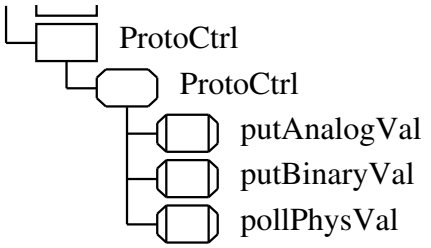
rw /SFB_501/teams/team3/Basis−Projekt.BaX/Entwicklung/RequirementsSp

Used Packages

DataTypes	r−	../Datatypes/LatestRev/DataTypes.sun
Utils	r−	../Utils/LatestRev/Utils.sun
Sensors	r−	../Sensors/Sensors.sun
ODLSens	r−	../Sensors/ODLSens.sbt
MotDet	r−	../Sensors/MotDet.sbt
Switch	r−	../Sensors/Switch.sbt
SunDet	r−	../Sensors/SunDet.sbt
Actuators	r−	../Actuators/LatestRev/Actuators.sun
TaskLight	r−	../Actuators/LatestRev/TaskLight.sbt
Dimmer	r−	../Actuators/LatestRev/Dimmer.sbt
PulsGen	r−	../Actuators/LatestRev/PulsGen.sbt
CP4	r−	../Control−sub4/LatestRev/CP4.sun
Floor	r−	../Control−sub4/LatestRev/Floor.sbt
CP1	r−	../Control−sub1/CP1.sun
Section1	r−	../Control−sub1/Section1.sbt
Section2	r−	../Control−sub1/Section2.sbt
Section3	r−	../Control−sub1/Section3.sbt
CP3	r−	../Control−sub3/LatestRev/CP3.sun
Hallway	r−	../Control−sub3/LatestRev/Hallway1.sbt
CP2	r−	../Control−sub2/CP2.sun

System

ProtoSys	rw	ProtoSys.ssy
x:y floor4 : Floor		



ProtoCtrl	rw	ProtoCtrl.sbk
ProtoCtrl	rw	ProtoCtrl.spr
putAnalogVal	rw	putAnalogVal.spd
putBinaryVal	rw	putBinaryVal.spd
pollPhysVal	rw	pollPhysVal.spd

ecification/System/ProtoSys.sdt

ecification/System/

Package Datatypes 1(2)

```
SIGNAL dummy;
SIGNAL ident (PID, CharString);
```

```
SYNTYPE Analog=Real  ENDSYNTYPE;
SYNTYPE Binary=Integer CONSTANTS 0,1 ENDSYNTYPE;
SYNTYPE Percent=Real CONSTANTS 0:100 ENDSYNTYPE;
SYNTYPE Day=Integer CONSTANTS 1:365 ENDSYNTYPE;
SYNTYPE WkDay=Integer CONSTANTS 1:7 ENDSYNTYPE;
SYNTYPE Celsius=Real CONSTANTS –60:100 ENDSYNTYPE;
SYNTYPE Lux=REAL CONSTANTS –1:120000 ENDSYNTYPE;
SYNTYPE HallwayIdType = Integer CONSTANTS 1:3 ENDSYNTYPE;
SYNTYPE DegF=Real CONSTANTS –60:200 ENDSYNTYPE; /*Fahrenheit*/
SYNTYPE GPM=Real CONSTANTS 0:200 ENDSYNTYPE; /*Gallon per minute*/
SYNTYPE Psi=Real CONSTANTS 0:200 ENDSYNTYPE; /*Pound per square inch*/
SYNTYPE Watt=Real CONSTANTS 0:10000 ENDSYNTYPE; /*Power unit*/
SYNTYPE ErrorType = INTEGER CONSTANTS 0:100 ENDSYNTYPE;
SYNTYPE Joule = REAL CONSTANTS 0:3000000 ENDSYNTYPE;
SYNTYPE DayTime = INTEGER ENDSYNTYPE;
SYNTYPE LightSourceType = INTEGER CONSTANTS 1:3 ENDSYNTYPE;
```

```
NEWTYPE RoomIdType
struct
rId CHARSTRING;
sId CHARSTRING;
ENDNEWTYPE;
```

```
NEWTYPE LightSourceListType
ARRAY (INTEGER, LightSourceType)
ENDNEWTYPE;
```

```
/* Fehlt: Die Prioritaetsliste fuer die Lichtquellen */
NEWTYPE LightScene
struct
name CharString;
rIll Lux;
dIll Lux;
ls LightSourceListType;
ENDNEWTYPE;
```

```
NEWTYPE CalTimeType
struct
year, month, day, hour, min, sec INTEGER;
operators
   toTime: CalTimeType –> Time;
   fromTime: Time–>CalTimeType;
/*#ADT (B)*/
ENDNEWTYPE;
```

Package Datatypes 2(2)

```
SIGNAL getIlluminance ;
SIGNAL newIlluminance (RoomIdType, Lux);
```

```
SIGNAL newHwEnergyConsumption (Joule, Duration);
SIGNAL newHwMalFunction( Errortype );
SIGNAL getHwPBDelay;
SIGNAL getHwOccDelay;

SIGNAL setHwEnergyDiffTime(Duration);
SIGNAL setHwLight( Boolean );
SIGNAL setHwPbDelay(Duration);
SIGNAL setHwOccDelay (Duration);

SIGNAL setRoomDelay (RoomIdType, Duration);
SIGNAL setRoomReoccDelay (RoomIdType, Duration);
SIGNAL setDefaultLightScene (RoomIdType, LightScene);
SIGNAL setAllDefaultLightScene (LightScene);
SIGNAL setDefaultAmbientLightLevel (RoomIdType, Lux);
SIGNAL setRoomLight (RoomIdType, Boolean);
SIGNAL setRoomEnergyDiffTime (Duration);
SIGNAL newRoomMalfunction (RoomIdType, ErrorType);
SIGNAL newRoomEnergyConsumption (RoomIdType, Joule, Duration);

SIGNAL newEntrance;
```

```
USE DataTypes;
```

Package Utils

```
/*setxxValue: root sets value in remote node*/
/*pollxxValue: root polls value of remote node*/
/*putxxValue: remote node puts value into root*/

REMOTE PROCEDURE setPhysVal; FPAR IN  Analog;
REMOTE PROCEDURE putAnalogVal; FPAR IN  PID, Analog;
REMOTE PROCEDURE putBinaryVal; FPAR IN  PID, Binary;
REMOTE PROCEDURE pollPhysVal; FPAR IN  PID;
```

```
procedure toJoule;
fpar IN w Watt,
IN dimV Percent,
IN timeDiff Duration;
RETURNS Joule;
EXTERNAL;
```

```
/* Proz zum Ausdruck eines beliebigen
Binaerwerts mit der aktuellen Zeit */
procedure printBi;
fpar IN c Charstring,
IN b Binary,
IN dur Time;
EXTERNAL;
```

```
/* Proz zum Ausdruck eines beliebigen
Anaolgwerts mit der aktuellen Zeit */
procedure printAn;
fpar IN c CharString,
IN a Analog,
IN dur Time;
EXTERNAL;
```

```
/* Proz zum Umformen der Kalendereit in die aktuelle Zeit*/
/*procedure calTimeToTime;
fpar IN actTime calTimeType;
RETURNS Time;
EXTERNAL;*/
```

```
/* Proz zum Umformen der aktuellen Zeit in Kalenderzeit*/
/*procedure timeToCalTime;
fpar IN actTime Time;
RETURNS CalTimeType;
EXTERNAL;*/
```

```
/* Proz zum Ausdruck eines beliebigen
Strings mit der aktuellen Zeit */
procedure printIt;
fpar IN c CharString,
IN dur Time;
EXTERNAL;
```

```
USE DataTypes;
```

Package Utils 2(2)

```
/* Proz zum Verbindungsaufbaus des Systems
mit der Umwelt (physSock)*/
procedure initSockets;
EXTERNAL;
```

```
/* Proz., die periodisch einen eventuellen Eingang an dem beiden
Socket physSock bearbeitet.*/
 procedure checkSockets;
returns INTEGER;
EXTERNAL;
```

```
/* Proz., die einen binaeren physik. Werte setzen.*/
procedure setBinOutVal;
FPAR IN actId CharString,
IN val Binary;
EXTERNAL;
```

```
/* Proz., die einen analogen physik. Werte setzen.*/
procedure setAnOutVal;
FPAR IN actId CharString,
IN val Analog;
EXTERNAL;
```

```
/* Proz., die einen physik. Werte anfordert.*/
procedure reqPhysVal;
FPAR IN actId CharString;
EXTERNAL;
```

```
USE Datatypes;
USE Utils;
```

Package Sensors 1(1)

ODLSens

```
/* Signals at object input oi */
SIGNAL getOls;  /*  Get value, independent of mode  */
SIGNAL setOlsPeriod(Duration) ; /* Send value periodically with period p  */
SIGNAL setOlsEvent (Lux); /* Send value if changed  */
SIGNAL setOlsPoll ; /* Wait for getValue signal  */
SIGNALLIST  ODLSensInp=getOls, setOlsPeriod, setOlsEvent, setOlsPoll; /*   */
/* Signals at object output oo */
SIGNAL  newOls(Lux) ; /*   */
SIGNAL newODLMal;
SIGNALLIST  ODLSensOutp=ident,  newOls, newODLMal ; /*   */
```

MotDet

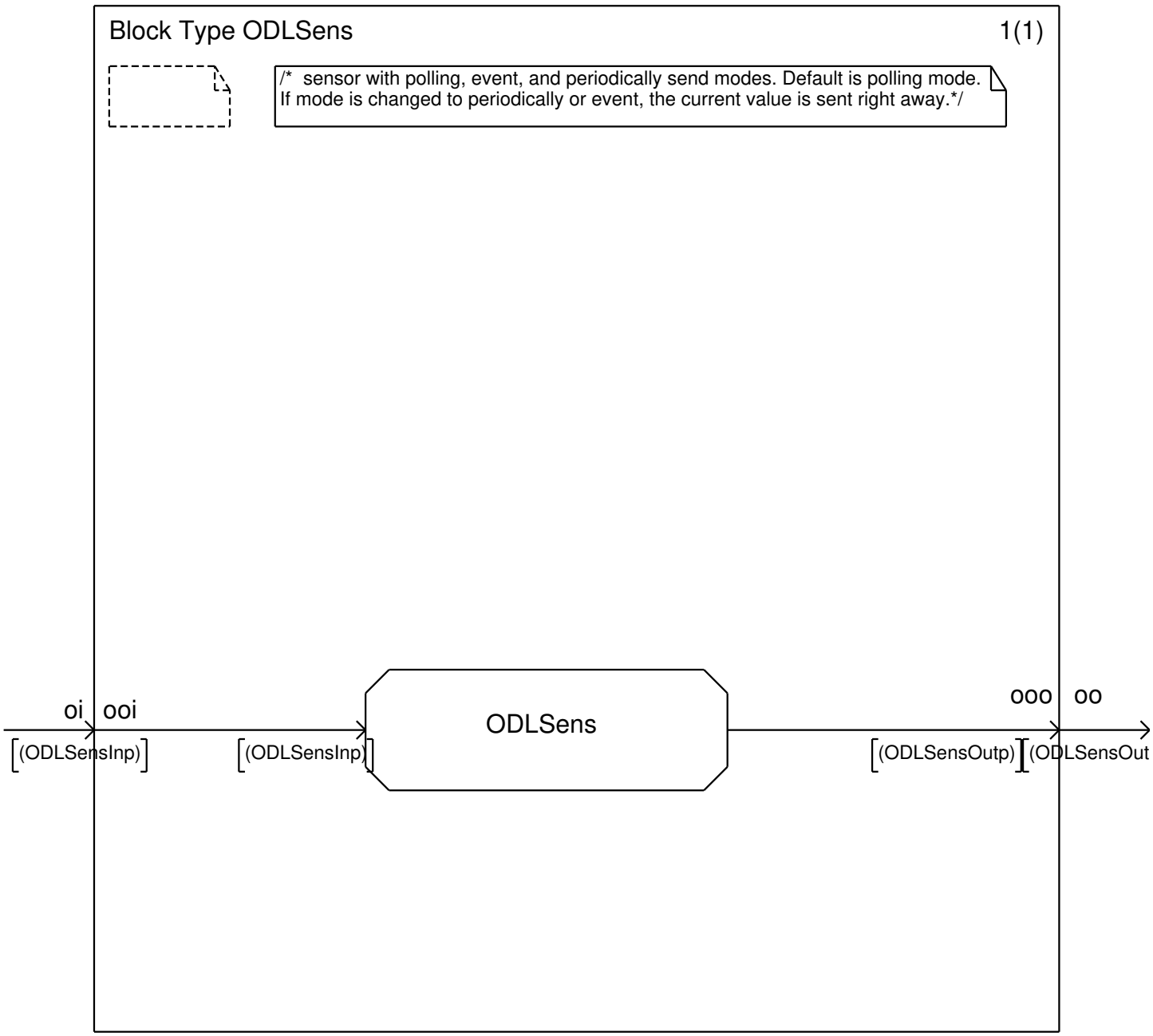
```
/* Signals at object input oi */
SIGNAL getMotDet ;  /*  Get value, independent of mode  */
SIGNAL setMDPeriod(Duration) ; /* Send value periodically with period p  */
SIGNAL setMDEvent ; /* Send value if changed  */
SIGNAL setMDPoll ; /* Wait for getValue signal  */
SIGNALLIST  MotDetInp=getMotDet, setMDPeriod, setMDEvent,  setMDPoll ; /*   */
/* Signals at object output oo */
SIGNAL  newMotDet(Binary) ; /*   */
SIGNAL newMotDetMal (ErrorType);
SIGNALLIST  MotDetOutp=ident, newMotDet, newMotDetMal; /*   */
```

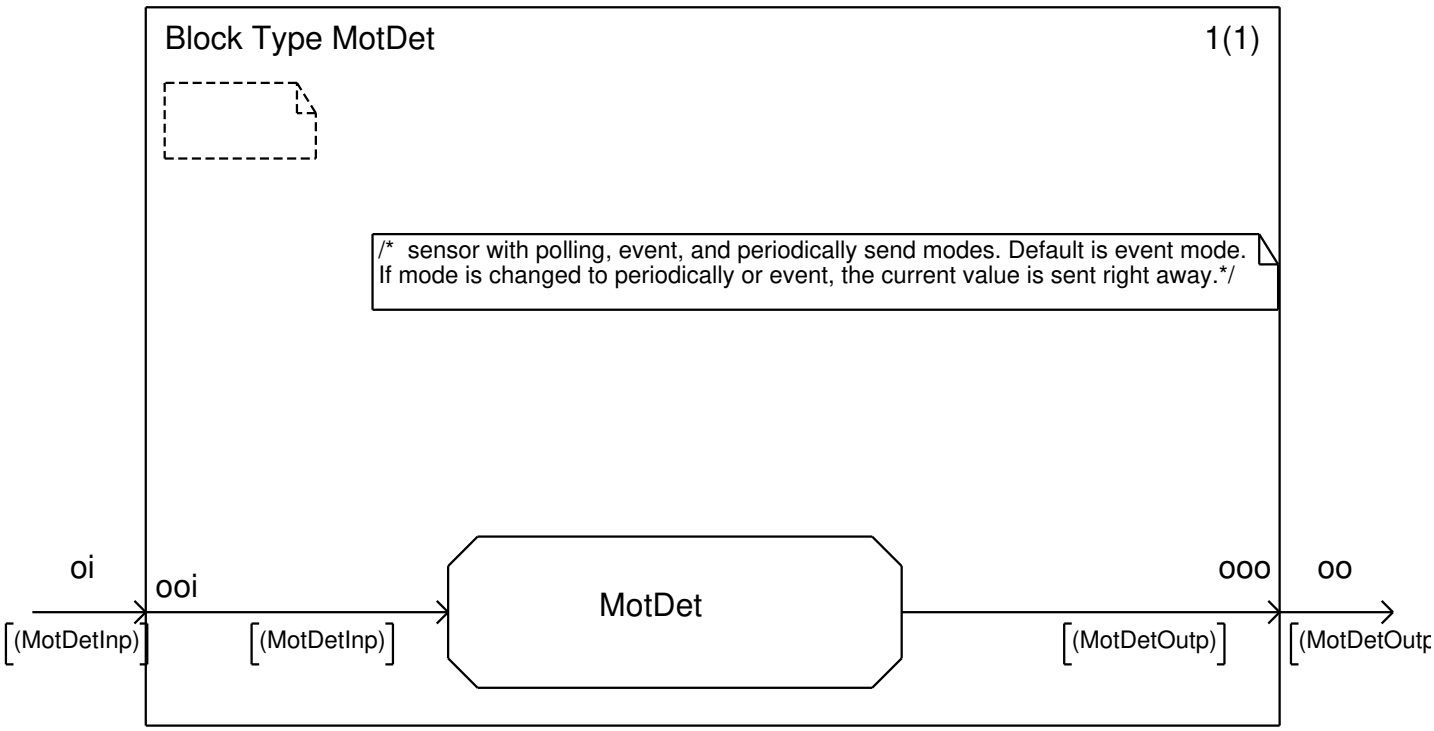
Switch

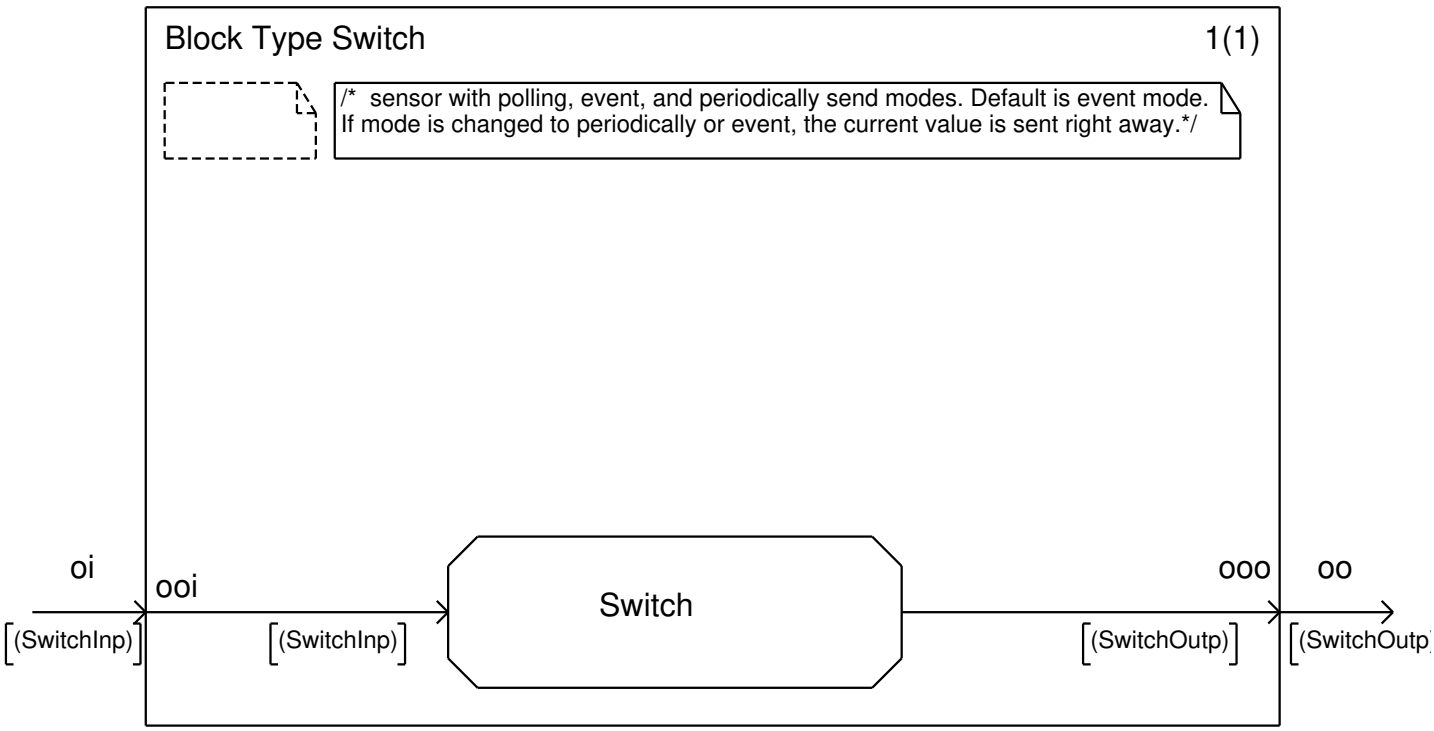
```
/* Signals at object input oi */
SIGNAL getSwitch ;  /*  Get value, independent of mode  */
SIGNAL setSwPeriod(Duration) ; /* Send value periodically with period p  */
SIGNAL setSwEvent ; /* Send value if changed  */
SIGNAL setSwPoll ; /* Wait for getValue signal  */
SIGNALLIST  SwitchInp=getSwitch, setSwPeriod, setSwEvent,  setSwPoll ; /*   */
/* Signals at object output oo */
SIGNAL  newSwitch(Binary) ; /*   */
SIGNAL newSwitchMal (ErrorType);
SIGNALLIST  SwitchOutp=ident, newSwitch, newSwitchMal; /*   */
```

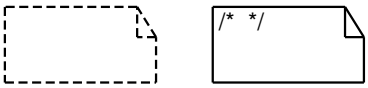
SunDet

```
SIGNAL getSun (RoomIdType);
SIGNAL newSunDetMal (ErrorType);
SIGNAL newSun (RoomIdType, Lux);
SIGNALLIST SunDetInp = getSun;
SIGNALLIST SunDetOutp = ident, newSun, newSunDetMal;
```


Block Type ODLSens
1(1)
/* sensor with polling, event, and periodically send modes. Default is polling mode.
If mode is changed to periodically or event, the current value is sent right away.*/
oi
ooi
(ODLSensInp)
(ODLSensInp)
ODLSens
ooo
oo
(ODLSensOutp)
(ODLSensOut

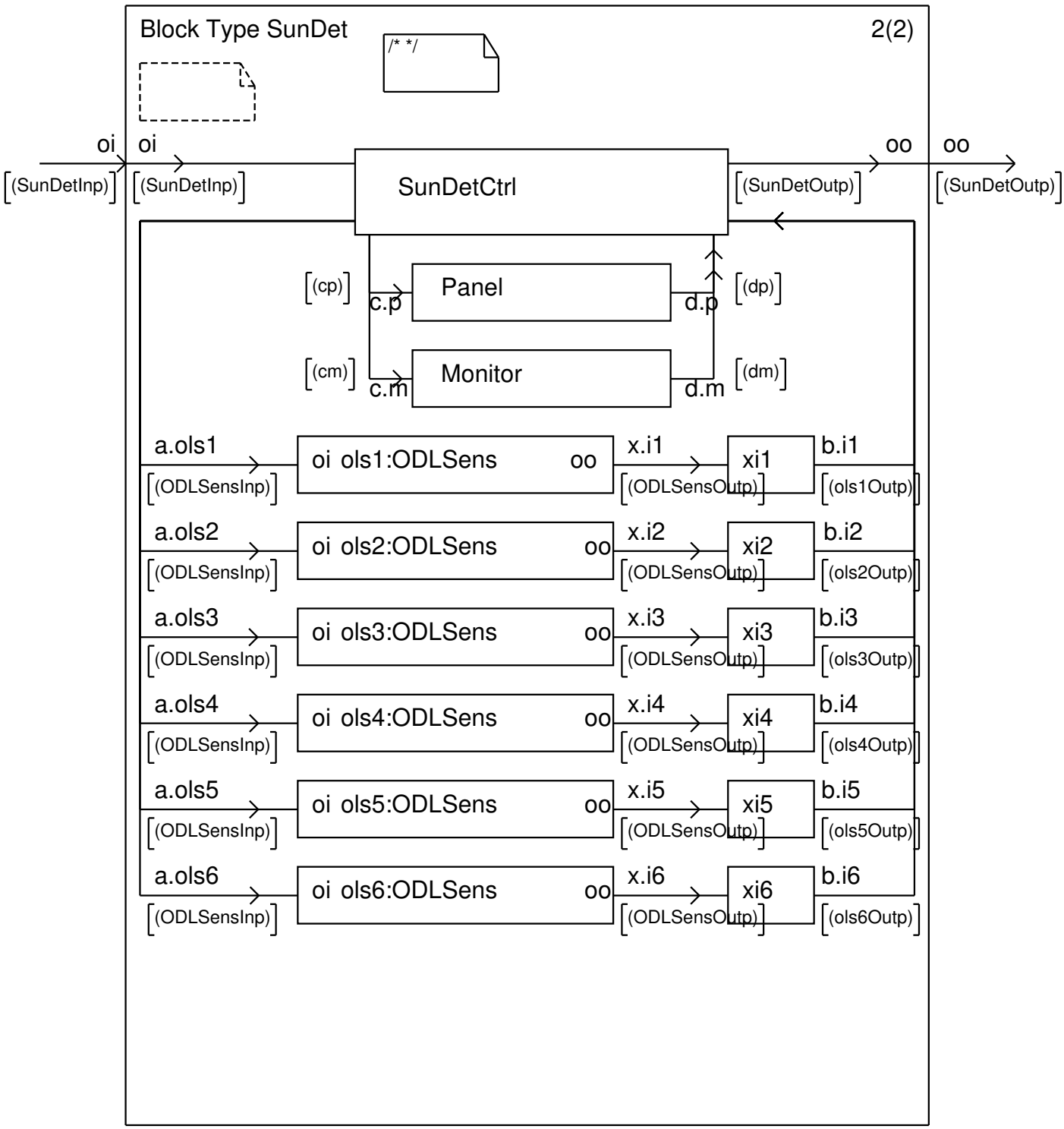

Block Type MotDet
1(1)
/* sensor with polling, event, and periodically send modes. Default is event mode.
If mode is changed to periodically or event, the current value is sent right away.*/
oi
ooi
MotDet
ooo
oo
(MotDetInp)
(MotDetInp)
(MotDetOutp)
(MotDetOutp


Block Type Switch
1(1)
/* sensor with polling, event, and periodically send modes. Default is event mode.
If mode is changed to periodically or event, the current value is sent right away.*/
oi
ooi
Switch
ooo
oo
(SwitchInp)
(SwitchInp)
(SwitchOutp)
(SwitchOutp)




```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

```
/* Signals from subobjects via b */
SIGNAL newOlsOls1 (Lux);
SIGNAL newODLMalOls1;
SIGNALLIST ols1Outp = ident, newOlsOls1, newODLMalOls1; /*   */
SIGNAL newODLMalOls2;
SIGNAL newOlsOls2 (Lux);
SIGNALLIST ols2Outp = ident, newOlsOls2, newODLMalOls2; /*   */
SIGNAL newODLMalOls3;
SIGNAL newOlsOls3 (Lux);
SIGNALLIST ols3Outp = ident, newOlsOls3, newODLMalOls3; /*   */
SIGNAL newODLMalOls4;
SIGNAL newOlsOls4 (Lux);
SIGNALLIST ols4Outp = ident, newOlsOls4, newODLMalOls4; /*   */
SIGNAL newODLMalOls5;
SIGNAL newOlsOls5 (Lux);
SIGNALLIST ols5Outp = ident, newOlsOls5, newODLMalOls5; /*   */
SIGNAL newODLMalOls6;
SIGNAL newOlsOls6 (Lux);
SIGNALLIST ols6Outp = ident, newOlsOls6, newODLMalOls6; /*   */
```


Block Type SunDet
2(2)
/* */
oi
oi
(SunDetInp)
(SunDetInp)
SunDetCtrl
oo
oo
(SunDetOutp)
(SunDetOutp)
(cp)
c.p
Panel
d.p
(dp)
(cm)
c.m
Monitor
d.m
(dm)
a.ols1
(ODLSensInp)
oi ols1:ODLSens oo
x.i1
(ODLSensOutp)
xi1
b.i1
(ols1Outp)
a.ols2
(ODLSensInp)
oi ols2:ODLSens oo
x.i2
(ODLSensOutp)
xi2
b.i2
(ols2Outp)
a.ols3
(ODLSensInp)
oi ols3:ODLSens oo
x.i3
(ODLSensOutp)
xi3
b.i3
(ols3Outp)
a.ols4
(ODLSensInp)
oi ols4:ODLSens oo
x.i4
(ODLSensOutp)
xi4
b.i4
(ols4Outp)
a.ols5
(ODLSensInp)
oi ols5:ODLSens oo
x.i5
(ODLSensOutp)
xi5
b.i5
(ols5Outp)
a.ols6
(ODLSensInp)
oi ols6:ODLSens oo
x.i6
(ODLSensOutp)
xi6
b.i6
(ols6Outp)

```
USE DataTypes;
USE Utils;
```

Package Actuators 1(1)

TaskLight

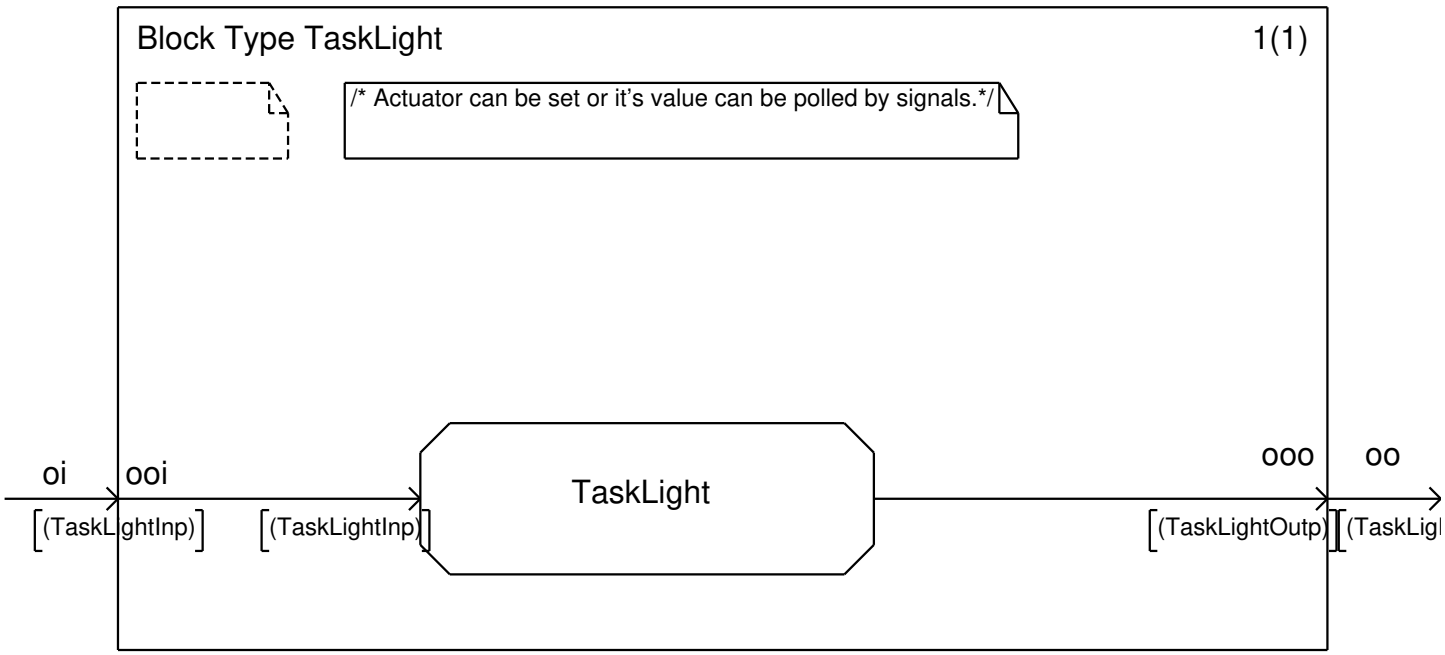
```
/* Signals at object input oi */
SIGNAL setTL(Binary);
SIGNALLIST  TaskLightInp= setTL; /*   */
SIGNALLIST TaskLightOutp=ident;
```

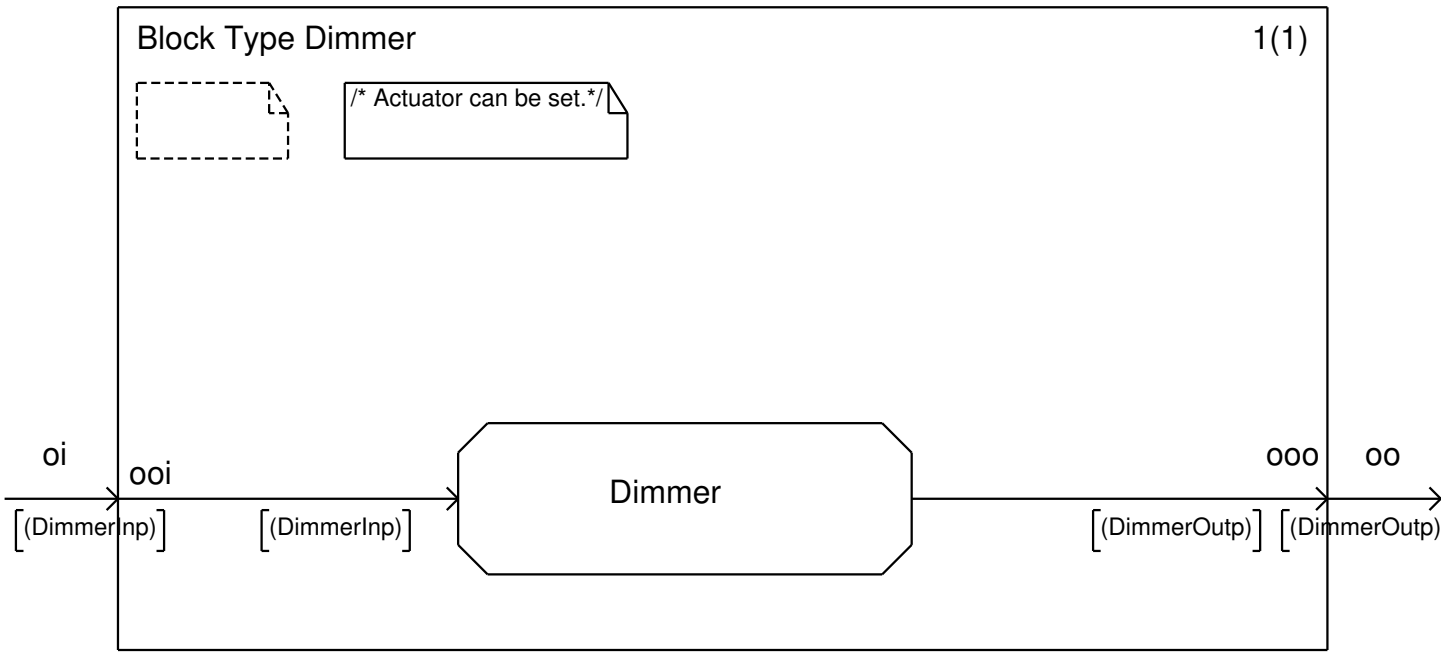
Dimmer

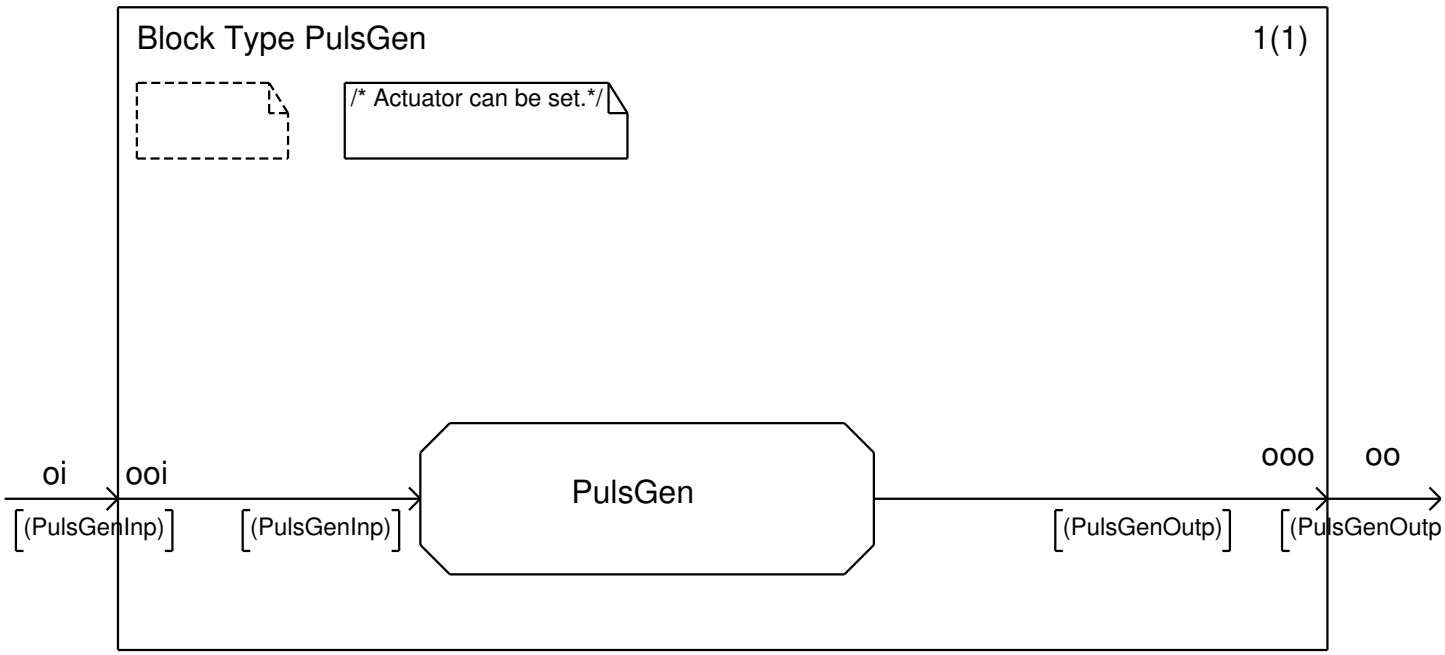
```
/* Signals at object input oi */
SIGNAL setDV(Percent);
SIGNALLIST  DimmerInp= setDV; /*   */
SIGNALLIST DimmerOutp=ident;
```

PulsGen

```
/* Signals at object input oi */
SIGNAL setPG(Binary);
SIGNALLIST  PulsGenInp= setPG; /*   */
SIGNALLIST PulsGenOutp=ident;
```


Block Type TaskLight
1(1)
/* Actuator can be set or it's value can be polled by signals.*/
oi
ooi
TaskLight
ooo
oo
(TaskLightInp)
(TaskLightInp)
(TaskLightOutp)


Block Type Dimmer
1(1)
/* Actuator can be set.*/
oi
ooi
Dimmer
ooo
oo
(DimmerInp)
(DimmerInp)
(DimmerOutp)
(DimmerOutp)


Block Type PulsGen
1(1)
/* Actuator can be set.*/
oi
ooi
PulsGen
ooo
oo
(PulsGenInp)
(PulsGenInp)
(PulsGenOutp)
(PulsGenOutp

USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators; USE CP1; USE CP2; USE CP3;

Package CP4 1(1)

Floor

SIGNALLIST FloorOutp = ident;
SIGNALLIST FloorInp = dummy;

Block Type Floor 1(3)

/* */

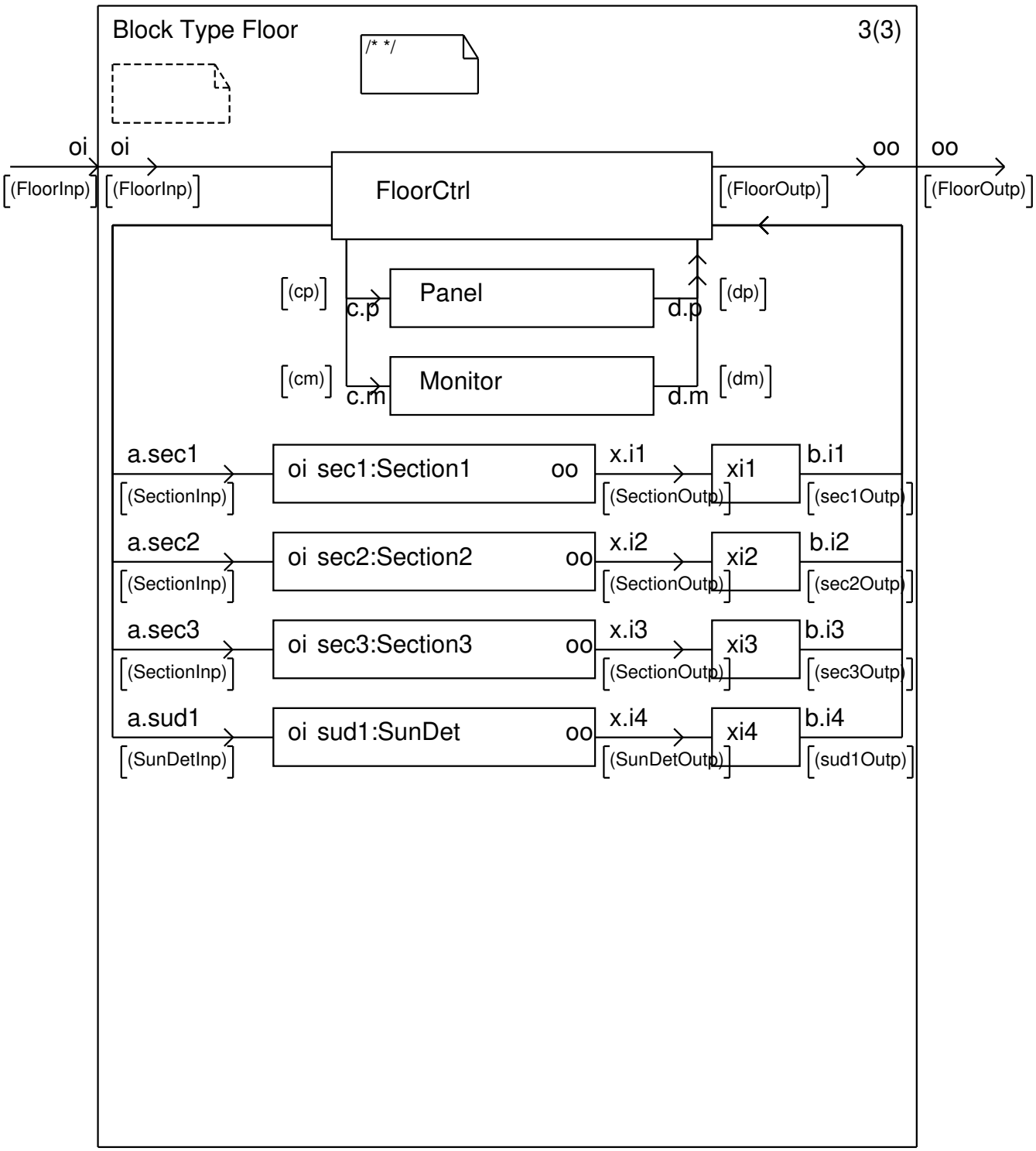
```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

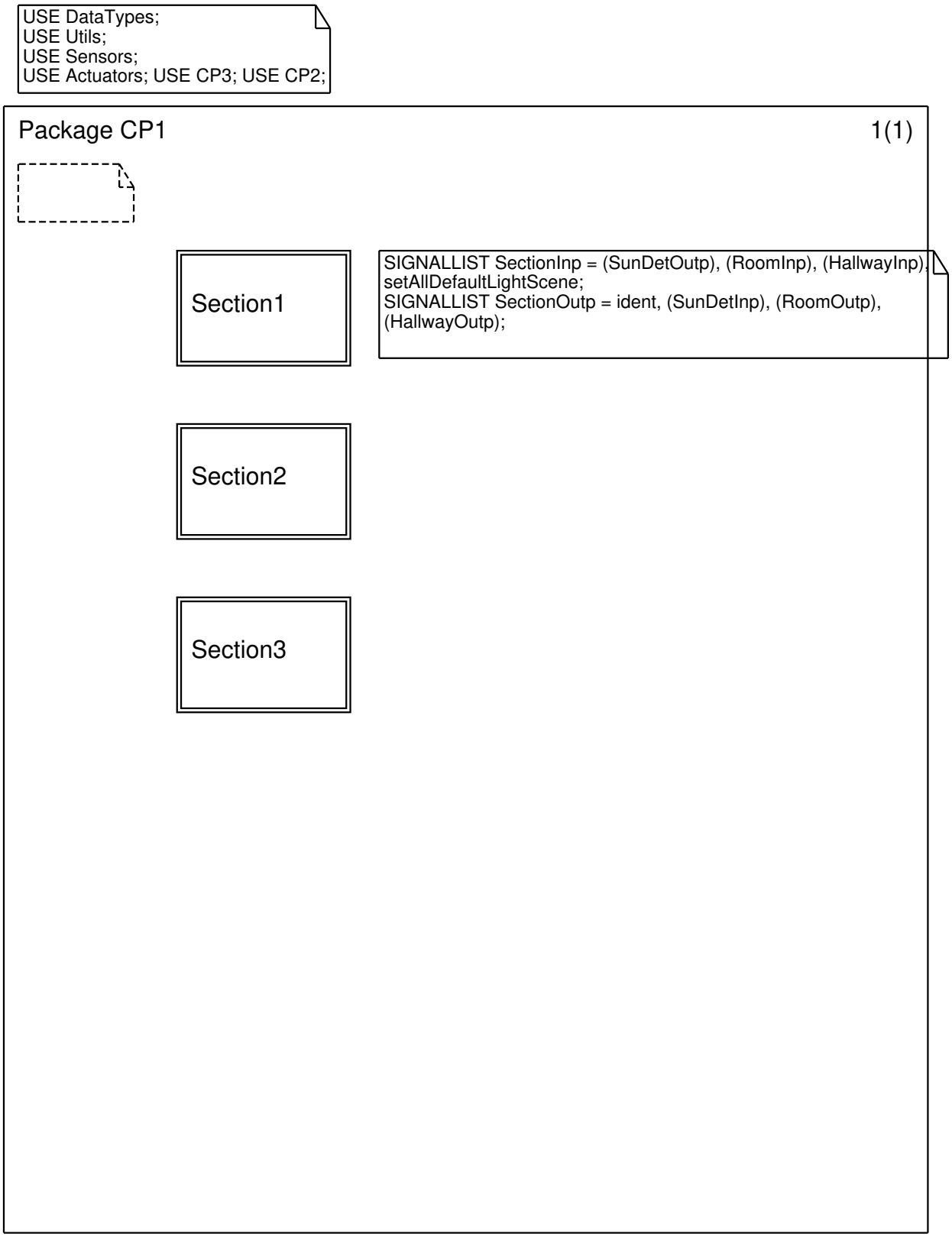
```
SIGNAL newSunDetMalSud1 (ErrorType);
SIGNAL newSunSud1 (RoomIdType, Lux);
SIGNALLIST sud1Outp = ident,
newSunDetMalSud1, newSunSud1 ; /*   */
```

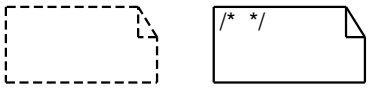
```
/* Signals from subobjects via b.sec1 */
SIGNAL newRoomMalFunctionSec1 (RoomIdType, ErrorType);
SIGNAL newRoomEnergyConsumptionSec1 (RoomIdType, Joule, Duration);
SIGNAL newHwEnergyConsumptionSec1(Joule, Duration);
SIGNAL newHwMalFunctionSec1 (ErrorType);
SIGNAL getHwPbDelaySec1;
SIGNAL getSunSec1 (RoomIdType);
SIGNALLIST sec1Outp = ident,
newRoomMalFunctionSec1, newRoomEnergyConsumptionSec1,
newHwEnergyConsumptionSec1,
newHwMalFunctionSec1, getHwPbDelaySec1, getSunSec1; /*   */
```

```
/* Signals from subobjects via b.sec2 */
SIGNAL newRoomMalFunctionSec2 (RoomIdType, ErrorType);
SIGNAL newRoomEnergyConsumptionSec2 (RoomIdType, Joule, Duration);
SIGNAL newHwEnergyConsumptionSec2(Joule, Duration);
SIGNAL newHwMalFunctionSec2 (ErrorType);
SIGNAL getHwPbDelaySec2;
SIGNAL getSunSec2 (RoomIdType);
SIGNALLIST sec2Outp = ident, getSunSec2,
newRoomMalFunctionSec2, newRoomEnergyConsumptionSec2,
newHwEnergyConsumptionSec2,
newHwMalFunctionSec2, getHwPbDelaySec2; /*   */
```

```
/* Signals from subobjects via b.sec3 */
SIGNAL newRoomMalFunctionSec3 (RoomidType, ErrorType);
SIGNAL newRoomEnergyConsumptionSec3 (RoomIdType, Joule, Duration);
SIGNAL newHwEnergyConsumptionSec3(Joule, Duration);
SIGNAL newHwMalFunctionSec3 (ErrorType);
SIGNAL getHwPbDelaySec3;
SIGNAL getSunSec3 (RoomIdType);
SIGNALLIST sec3Outp = ident, getSunSec3,
newRoomMalFunctionSec3, newRoomEnergyConsumptionSec3,
newHwEnergyConsumptionSec3,
newHwMalFunctionSec3, getHwPbDelaySec3; /*   */
```

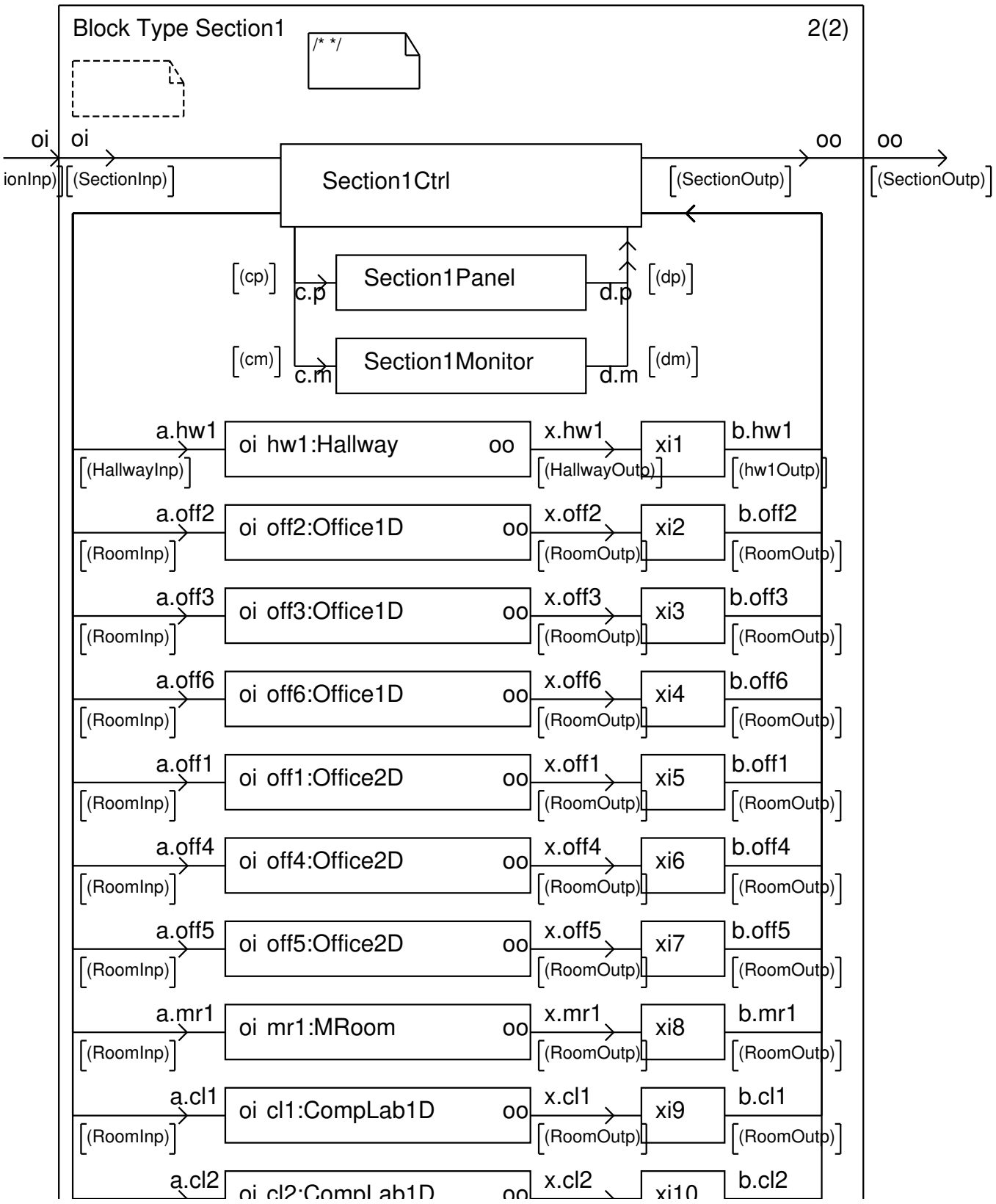

Block Type Floor
3(3)
/* */
oi
oi
(FloorInp)
(FloorInp)
FloorCtrl
oo
oo
(FloorOutp)
(FloorOutp)
(cp)
c.p
Panel
d.p
(dp)
(cm)
c.m
Monitor
d.m
(dm)
a.sec1
(SectionInp)
oi sec1:Section1 oo
x.i1
(SectionOutp)
xi1
b.i1
(sec1Outp)
a.sec2
(SectionInp)
oi sec2:Section2 oo
x.i2
(SectionOutp)
xi2
b.i2
(sec2Outp)
a.sec3
(SectionInp)
oi sec3:Section3 oo
x.i3
(SectionOutp)
xi3
b.i3
(sec3Outp)
a.sud1
(SunDetInp)
oi sud1:SunDet oo
x.i4
(SunDetOutp)
xi4
b.i4
(sud1Outp)

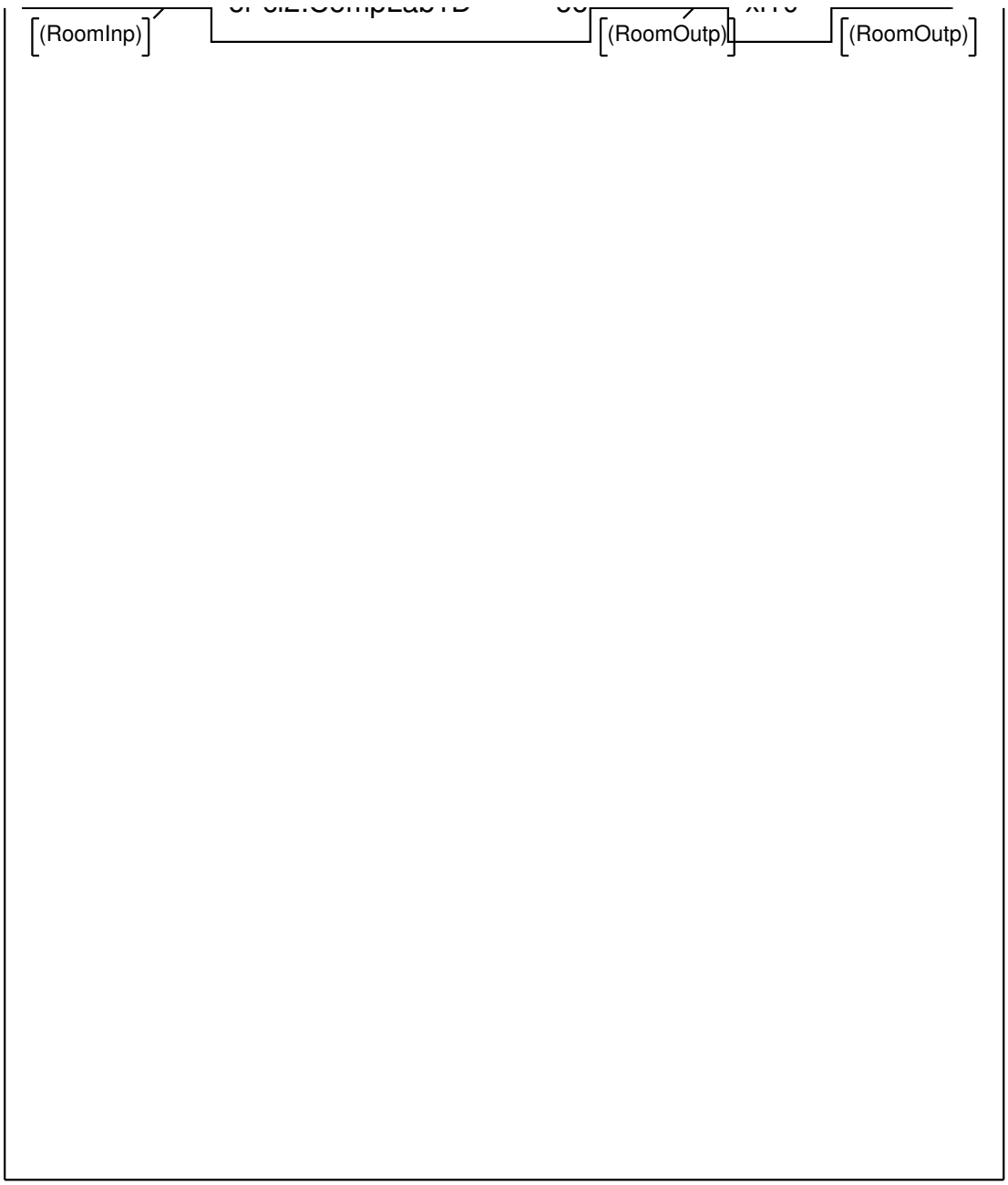

USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators; USE CP3; USE CP2;
Package CP1
1(1)
Section1
SIGNALLIST SectionInp = (SunDetOutp), (RoomInp), (HallwayInp), setAllDefaultLightScene;
SIGNALLIST SectionOutp = ident, (SunDetInp), (RoomOutp), (HallwayOutp);
Section2
Section3

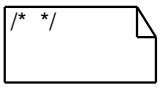



```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

```
SIGNAL getIlluminanceHw1;
SIGNAL newHwEnergyConsumptionHw1( Joule, Duration);
SIGNAL newHwMalFunctionHw1( Errortype );
SIGNAL getHwPBDelayHw1;

SIGNALLIST hw1Outp =  ident, getIlluminanceHw1,
                      newHwEnergyConsumptionHw1,
                      newHwMalFunctionHw1, getHwPBDelayHw1;
```

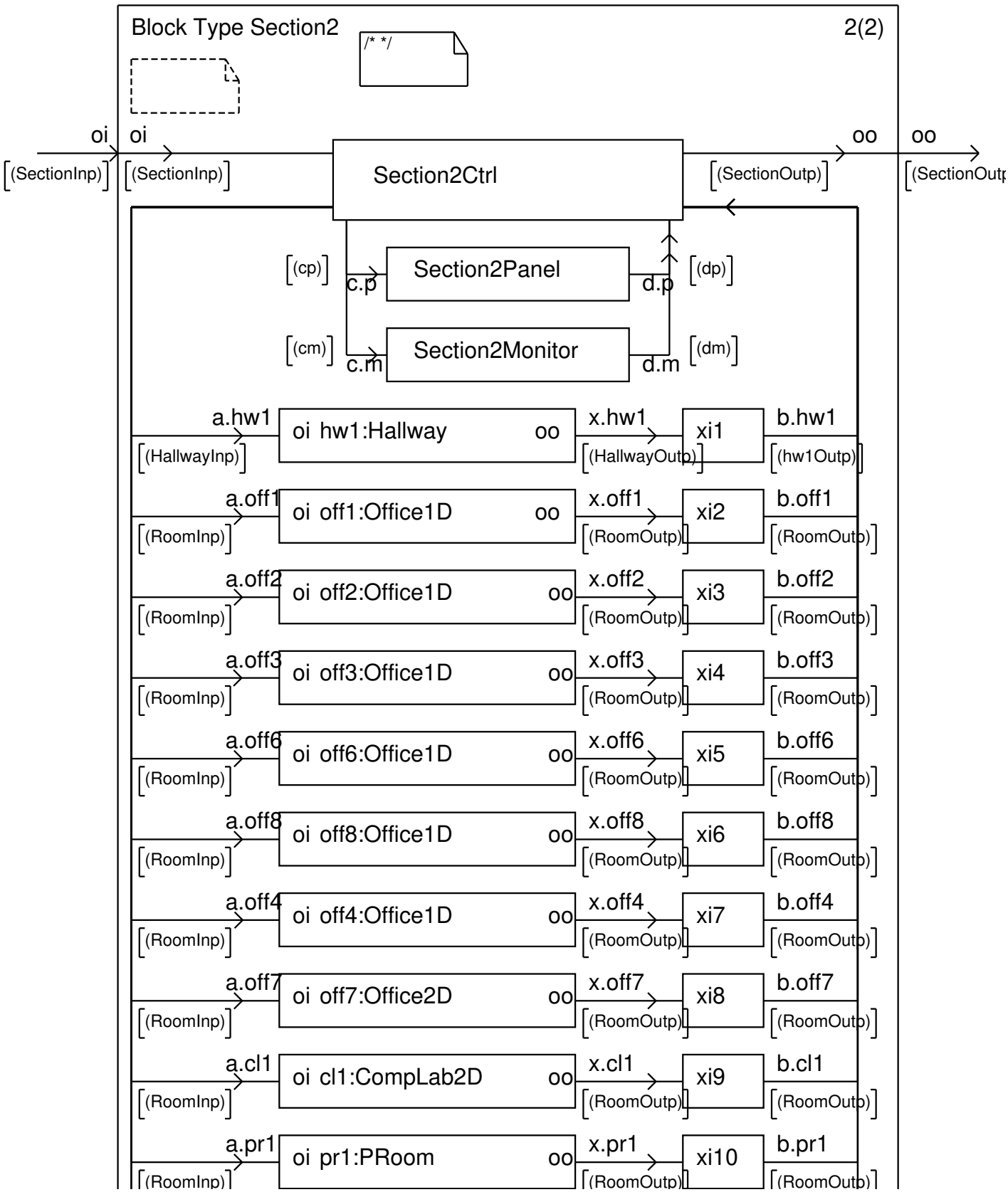

Block Type Section1
2(2)
/* */
oi
oi
oo
oo
ionInp)
(SectionInp)
Section1Ctrl
(SectionOutp)
(SectionOutp)
(cp)
c.p
Section1Panel
d.p
(dp)
(cm)
c.m
Section1Monitor
d.m
(dm)
a.hw1
oi hw1:Hallway oo
x.hw1
xi1
b.hw1
(HallwayInp)
(HallwayOutp)
(hw1Outp)
a.off2
oi off2:Office1D oo
x.off2
xi2
b.off2
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off3
oi off3:Office1D oo
x.off3
xi3
b.off3
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off6
oi off6:Office1D oo
x.off6
xi4
b.off6
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off1
oi off1:Office2D oo
x.off1
xi5
b.off1
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off4
oi off4:Office2D oo
x.off4
xi6
b.off4
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off5
oi off5:Office2D oo
x.off5
xi7
b.off5
(RoomInp)
(RoomOutp)
(RoomOutp)
a.mr1
oi mr1:MRoom oo
x.mr1
xi8
b.mr1
(RoomInp)
(RoomOutp)
(RoomOutp)
a.cl1
oi cl1:CompLab1D oo
x.cl1
xi9
b.cl1
(RoomInp)
(RoomOutp)
(RoomOutp)
a.cl2
x.cl2
b.cl2

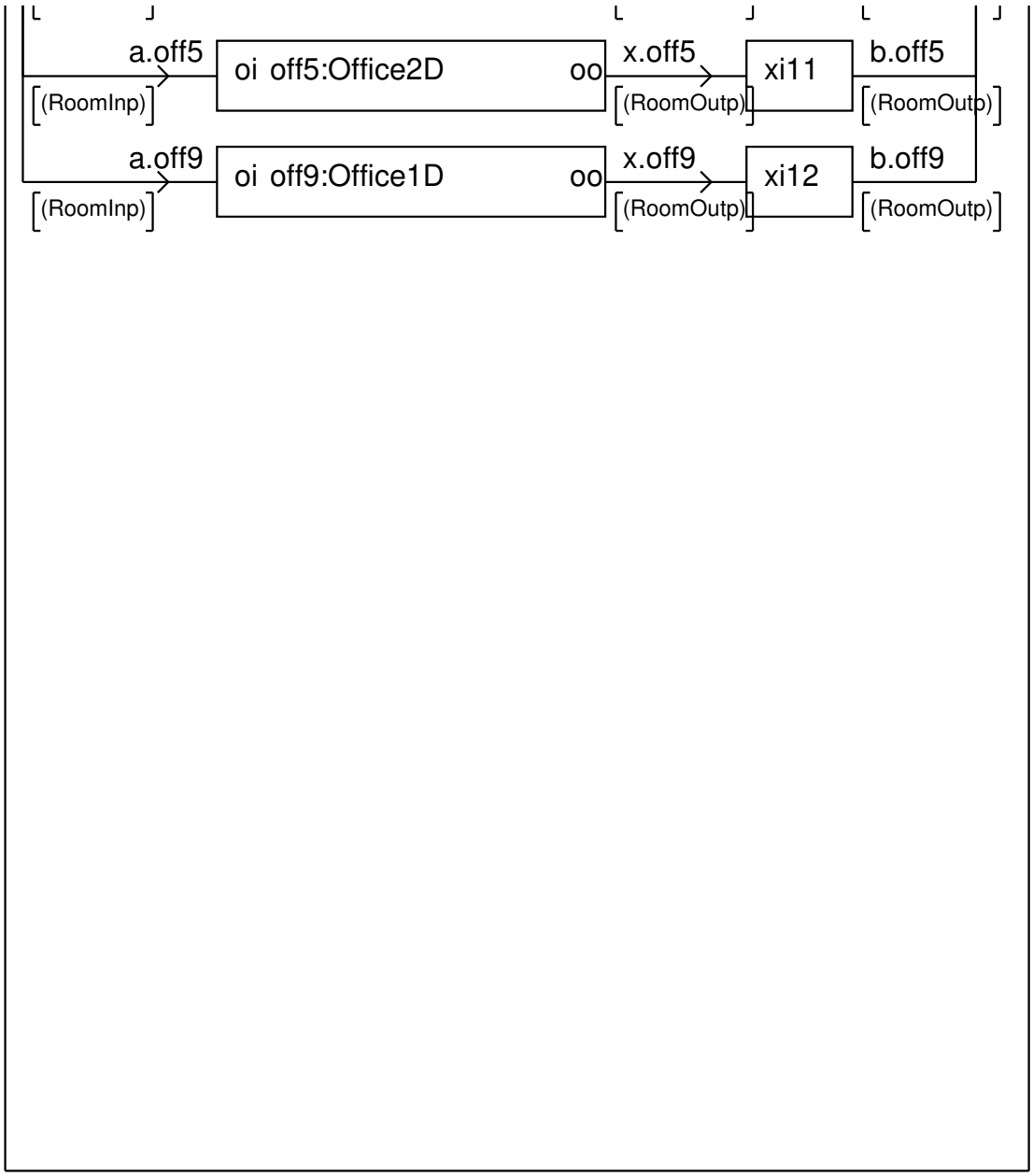

(RoomInp)
(RoomOutp)
(RoomOutp)

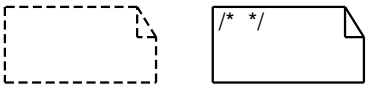



```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

```
SIGNAL getIlluminanceHw1;
SIGNAL newHwEnergyConsumptionHw1( Joule, Duration);
SIGNAL newHwMalFunctionHw1( Errortype );
SIGNAL getHwPBDelayHw1;

SIGNALLIST hw1Outp =  ident, getIlluminanceHw1, newHwEnergyConsumptionHw1,
                newHwMalFunctionHw1, getHwPBDelayHw1;
```

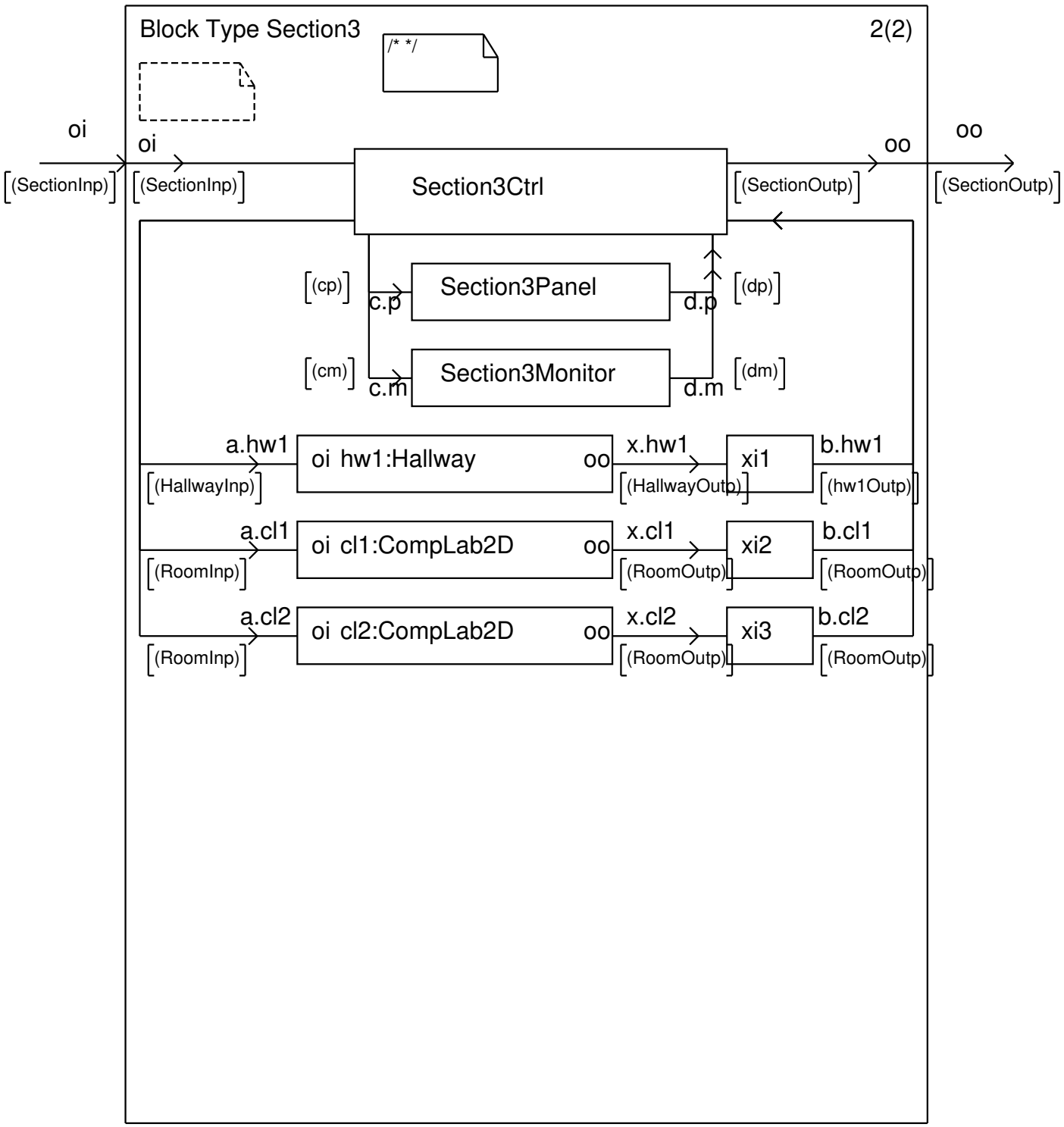

Block Type Section2
2(2)
/* */
oi
oi
oo
oo
(SectionInp)
(SectionInp)
Section2Ctrl
(SectionOutp)
(SectionOutp
(cp)
c.p
Section2Panel
d.p
(dp)
(cm)
c.m
Section2Monitor
d.m
(dm)
a.hw1
oi hw1:Hallway oo
x.hw1
xi1
b.hw1
(HallwayInp)
(HallwayOutp)
(hw1Outp)
a.off1
oi off1:Office1D oo
x.off1
xi2
b.off1
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off2
oi off2:Office1D oo
x.off2
xi3
b.off2
a.off3
oi off3:Office1D oo
x.off3
xi4
b.off3
a.off6
oi off6:Office1D oo
x.off6
xi5
b.off6
a.off8
oi off8:Office1D oo
x.off8
xi6
b.off8
a.off4
oi off4:Office1D oo
x.off4
xi7
b.off4
a.off7
oi off7:Office2D oo
x.off7
xi8
b.off7
a.cl1
oi cl1:CompLab2D oo
x.cl1
xi9
b.cl1
a.pr1
oi pr1:PRoom oo
x.pr1
xi10
b.pr1


a.off5
oi off5:Office2D
oo
x.off5
xi11
b.off5
(RoomInp)
(RoomOutp)
(RoomOutp)
a.off9
oi off9:Office1D
oo
x.off9
xi12
b.off9
(RoomInp)
(RoomOutp)
(RoomOutp)




```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

```
SIGNAL getIlluminanceHw1;
SIGNAL newHwEnergyConsumptionHw1( Joule, Duration);
SIGNAL newHwMalFunctionHw1( Errortype );
SIGNAL getHwPBDelayHw1;

SIGNALLIST hw1Outp =  ident, getIlluminanceHw1, newHwEnergyConsumptionHw1,
                newHwMalFunctionHw1, getHwPBDelayHw1;
```


Block Type Section3
2(2)
/* */
oi
oi
oo
oo
(SectionInp)
(SectionInp)
Section3Ctrl
(SectionOutp)
(SectionOutp)
(cp)
c.p
Section3Panel
d.p
(dp)
(cm)
c.m
Section3Monitor
d.m
(dm)
a.hw1
oi hw1:Hallway oo
x.hw1
xi1
b.hw1
(HallwayInp)
(HallwayOutp)
(hw1Outp)
a.cl1
oi cl1:CompLab2D oo
x.cl1
xi2
b.cl1
(RoomInp)
(RoomOutp)
(RoomOutp)
a.cl2
oi cl2:CompLab2D oo
x.cl2
xi3
b.cl2
(RoomInp)
(RoomOutp)
(RoomOutp)

```
USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;
```

Package CP3 1(1)

Hallway

```
SIGNAL setHwLight2;

SIGNALLIST HallwayOutp = ident, getIlluminance,
                newHwEnergyConsumption,
                newHwMalFunction, getHwPBDelay, setHwLight2;


SIGNALLIST HallwayInp = setHwEnergyDiffTime, setHwLight,
                 setHwPbDelay, newIlluminance,
                 /*newSll,*/ newEntrance, setHWOccDelay;
```

Block Type Hallway 1(3)

HWLight

```
SIGNAL newEnergy (Joule);
SIGNAL newSll( Binary );
SIGNALLIST HWLightOutp = ident, newSll, newEnergy;
SIGNAL setEnergyDiffTime (Duration);
SIGNAL setHwLight2( Boolean );
SIGNALLIST HWLightInp = setEnergyDiffTime, setHwLight2;
```

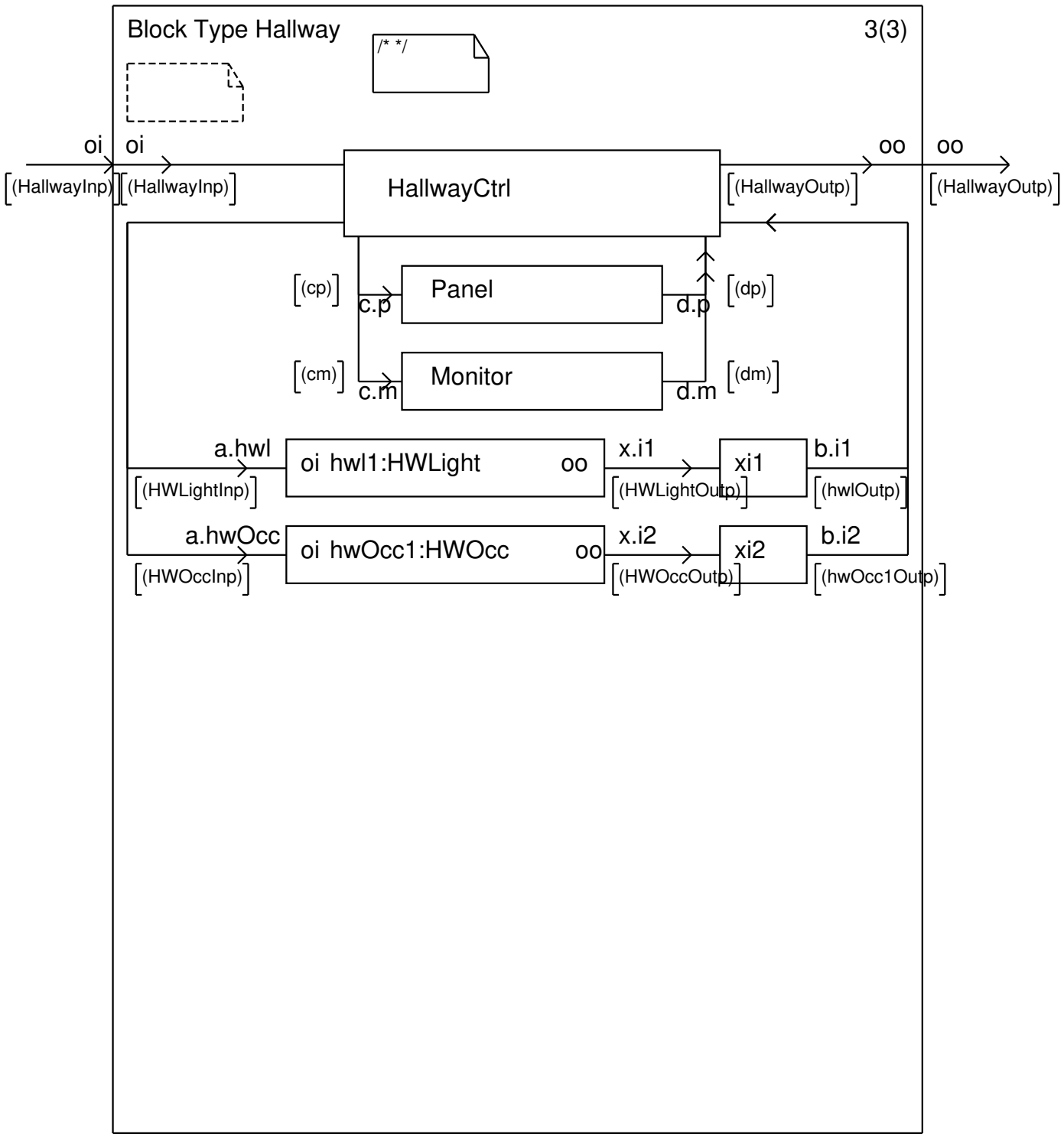
HWOcc

```
SIGNAL newHwOcc( Boolean );
SIGNALLIST HWOccOutp = ident, newHwOcc, getHwOccDelay;

SIGNAL getHwOcc;
SIGNALLIST HWOccInp = newEntrance, getHwOcc,
                      setHWOccDelay;
```

```
/*  */
```

```
/* Signals to and from panel and monitor */
SIGNALLIST cp = dummy ; /*   */
SIGNALLIST cm = dummy ; /*   */
SIGNALLIST dp = dummy ; /*   */
SIGNALLIST dm = dummy ; /*   */
```

```
/* Signals from subobjects via b */
SIGNAL newSllHwl1 (Binary);
SIGNAL newEnergyHwl1 (Joule);
SIGNALLIST hwlOutp = ident, newEnergyHwl1, newSllHwl1 ; /*   */

SIGNAL newHwOccHwOcc1(Boolean);
SIGNAL getHwOccDelayHwOcc1;
SIGNALLIST hwOcc1Outp = ident, newHwOccHwOcc1,
   getHwOccDelayHwOcc1 ; /*   */
```


Block Type Hallway
3(3)
/* */
oi
oi
(HallwayInp)
(HallwayInp)
HallwayCtrl
oo
oo
(HallwayOutp)
(HallwayOutp)
(cp)
c.p
Panel
d.p
(dp)
(cm)
c.m
Monitor
d.m
(dm)
a.hwl
oi hwl1:HWLight oo
x.i1
xi1
b.i1
(HWLightInp)
(HWLightOutp)
(hwlOutp)
a.hwOcc
oi hwOcc1:HWOcc oo
x.i2
xi2
b.i2
(HWOccInp)
(HWOccOutp)
(hwOcc1Outp)

```
USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;
```

Package CP2

```
/* Signal Declarations */


/* ---- Door ----*/
SIGNAL newDoor (Boolean);
SIGNAL getDoor;
/* ---- RoomOcc ---- */
SIGNAL newOcc (Boolean);
SIGNAL newOccMal (ErrorType);
SIGNAL newDoorsOpen (Boolean);
/* ---- Desk ---- */
SIGNAL newTaskLight (Boolean);
SIGNAL setTaskLight (Boolean);
SIGNAL getTaskLight;
/* ---- Rooms ---- */
SIGNAL setDimLight (Percent);
SIGNAL setLight (Boolean);
SIGNAL getLight;
SIGNAL getDimLight;
SIGNAL setCIA;
SIGNAL getOcc;
SIGNAL newLight (Boolean);
SIGNAL newEnergy (Joule);
SIGNAL setEnergyDiffTime (Duration);

/* ---- Light ----*/
```

USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;

Package CP2 2(5)

SIGNALLIST DoorOutp = ident, newDoor;
SIGNALLIST DoorInp = getDoor;

SIGNALLIST RoomOccOutp = ident, newOcc, newOccMal, getDoor;
SIGNALLIST RoomOccInp = getOcc, newMotDet, newMotDetMal,
newDoorsOpen;

SIGNALLIST DeskOutp = ident, newTaskLight, newEnergy;
SIGNALLIST DeskInp = setEnergyDiffTime, setTaskLight, getTaskLight;

SIGNALLIST LightOutp = ident, newLight, newEnergy;
SIGNALLIST LightInp = setEnergyDiffTime, getLight, setLight, setDimLight, setCIA;

USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;

Package CP2 3(5)

Office2D

Office1D

CompLab2D

CompLab1D

SIGNALLIST RoomOutp = ident, getSun, newOccMal, newRoomMalfunction, newRoomEnergyConsumption, newIlluminance, newEntrance;

SIGNALLIST RoomInp = newSun, newSunDetMal, setRoomDelay, setRoomReoccDelay, setDefaultLightScene, setDefaultAmbientLightLevel, setRoomEnergyDiffTime, getIlluminance, setRoomLight;

USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;

Package CP2

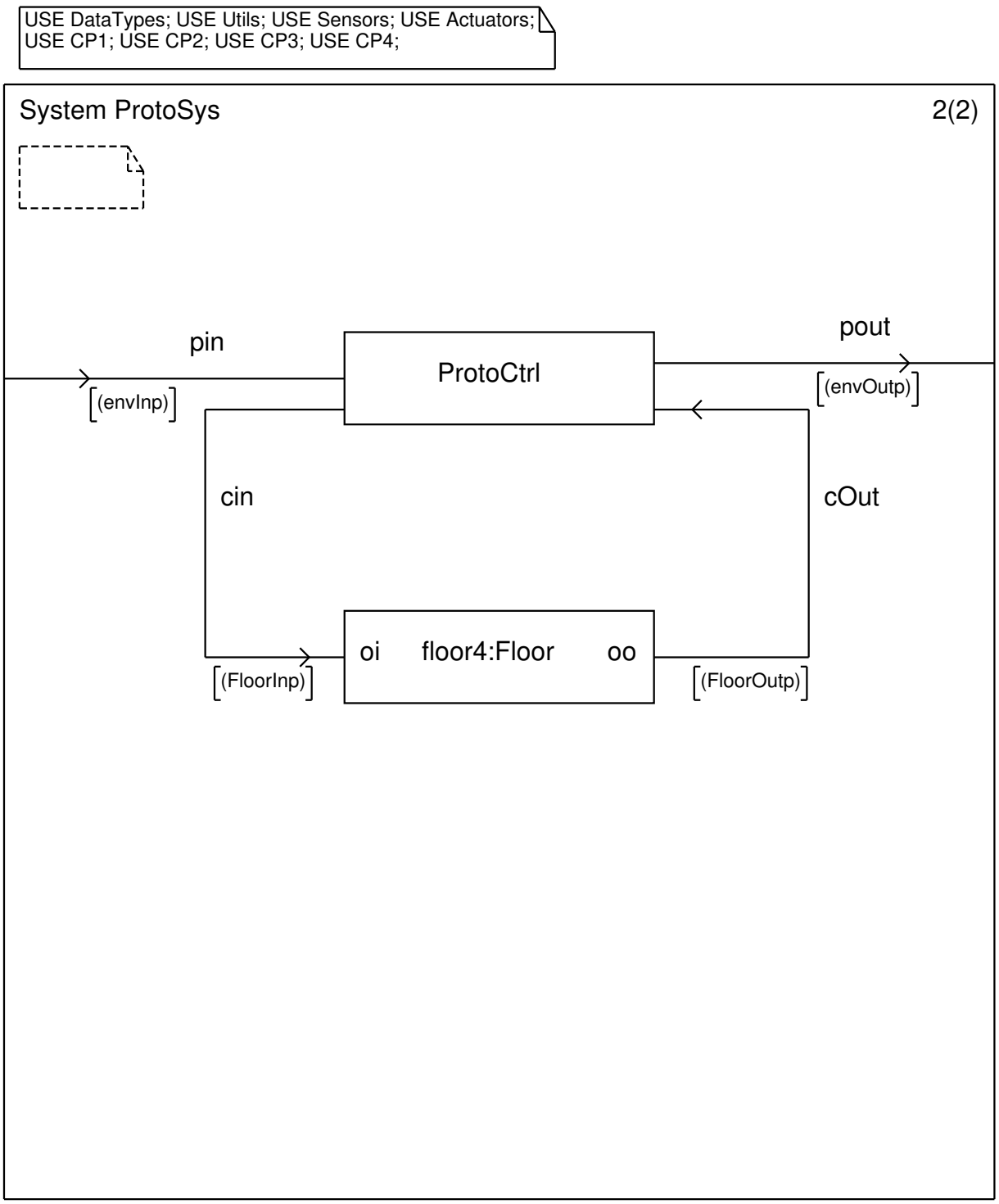
USE DataTypes;
USE Utils;
USE Sensors;
USE Actuators;

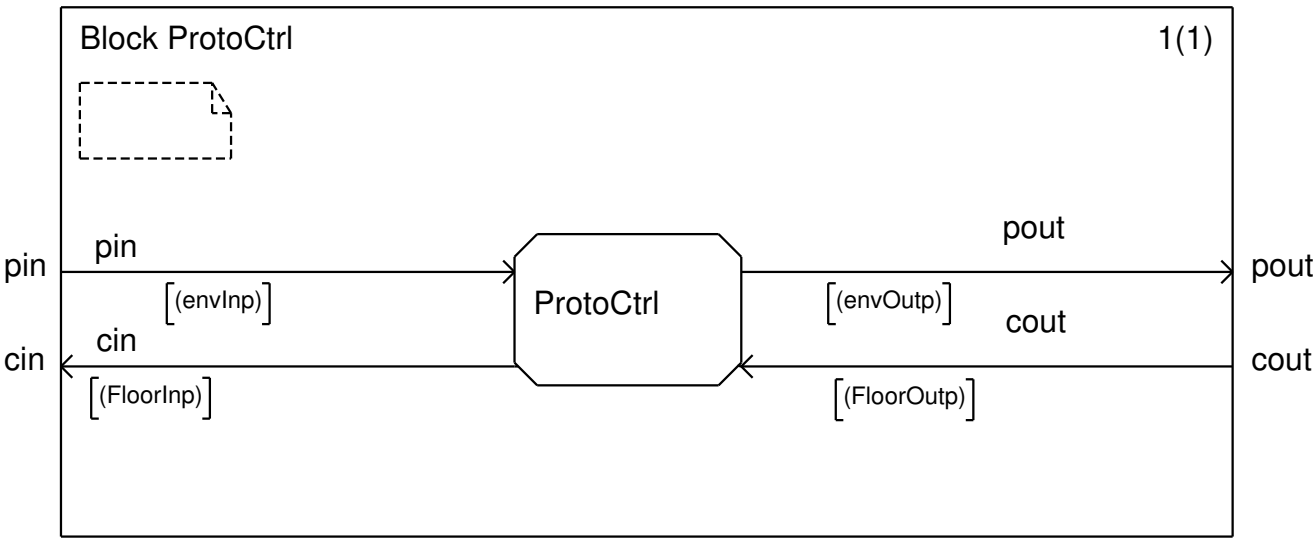
Package CP2 5(5)

```
USE DataTypes; USE Utils; USE Sensors; USE Actuators;
USE CP1; USE CP2; USE CP3; USE CP4;
```

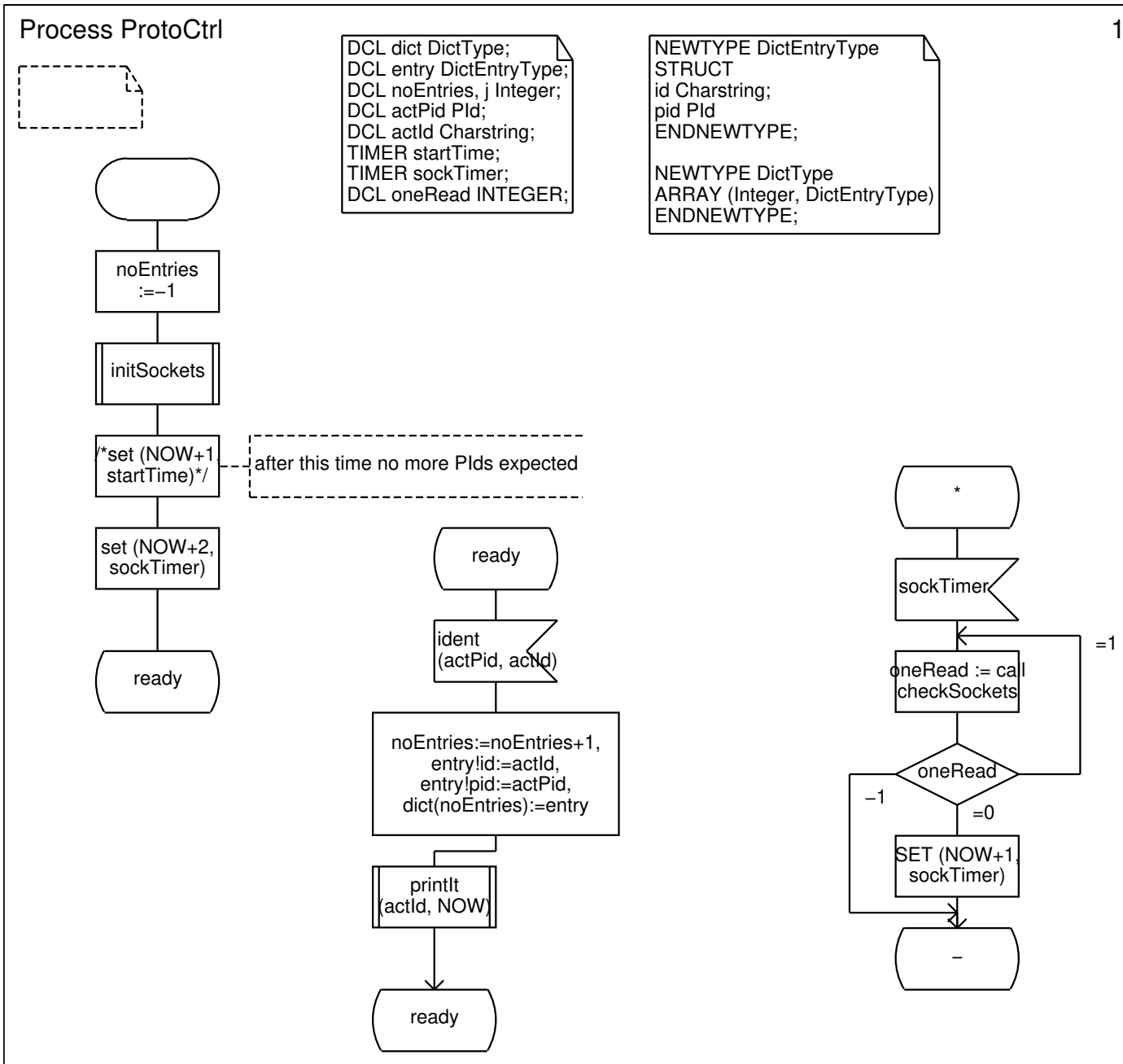
System ProtoSys 1(2)

```
/*ProtoSys signals*/
SIGNAL getPhysVal (CharString);
    /* requests the phys val of the given sensor */
SIGNAL physValIn(Charstring, Analog);
    /* Analog and binary inputs (objectname, value)*/
SIGNAL analogOut(Charstring,Analog), binaryOut(Charstring, Binary);
    /* Binary and analog outputs (objectname, value)*/
SIGNALLIST envInp= physValIn;
SIGNALLIST envOutp= analogOut, binaryOut, getPhysVal;
```

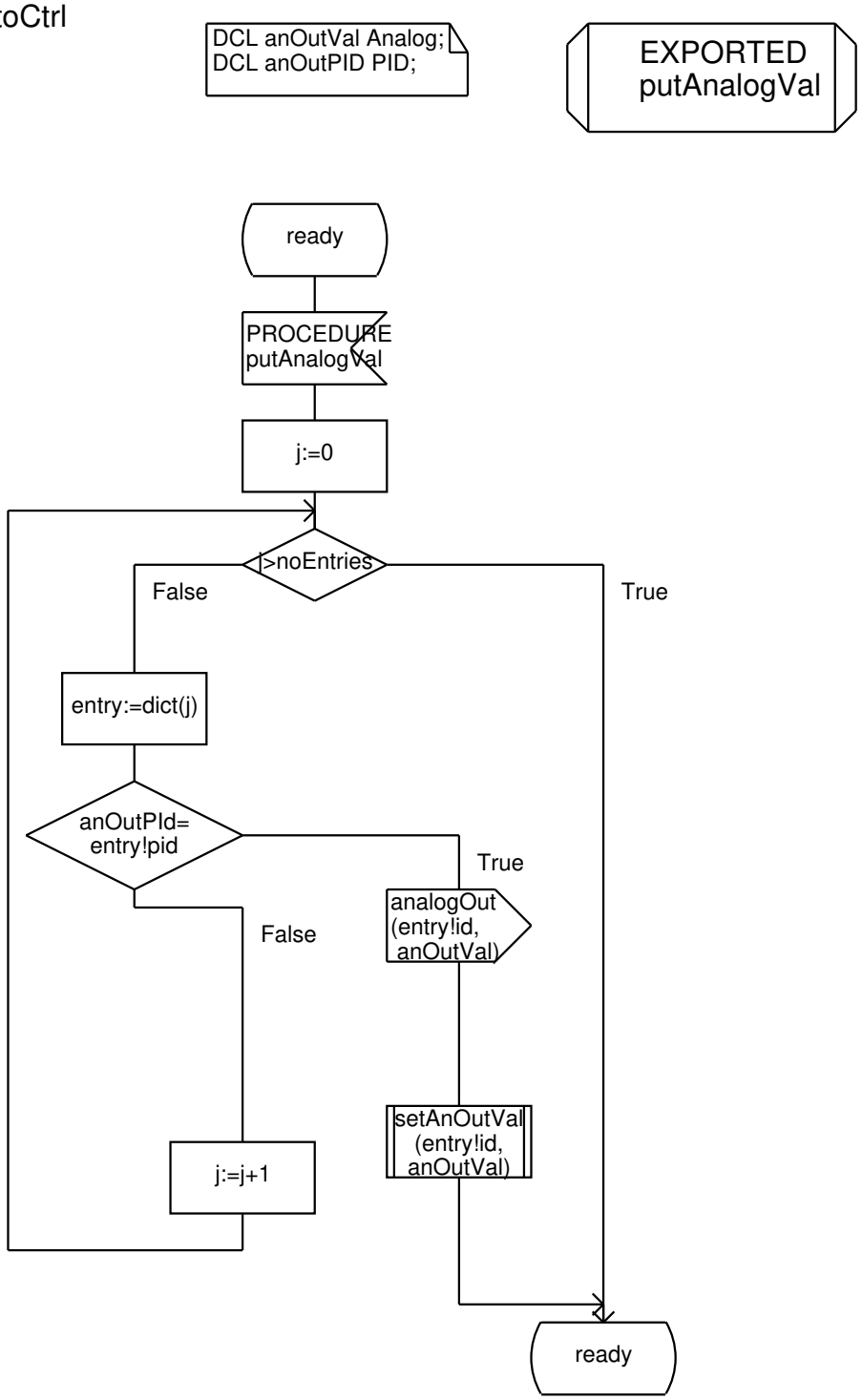

USE DataTypes; USE Utils; USE Sensors; USE Actuators;
USE CP1; USE CP2; USE CP3; USE CP4;
System ProtoSys
2(2)
pin
ProtoCtrl
pout
(envInp)
(envOutp)
cin
cOut
oi
floor4:Floor
oo
(FloorInp)
(FloorOutp)

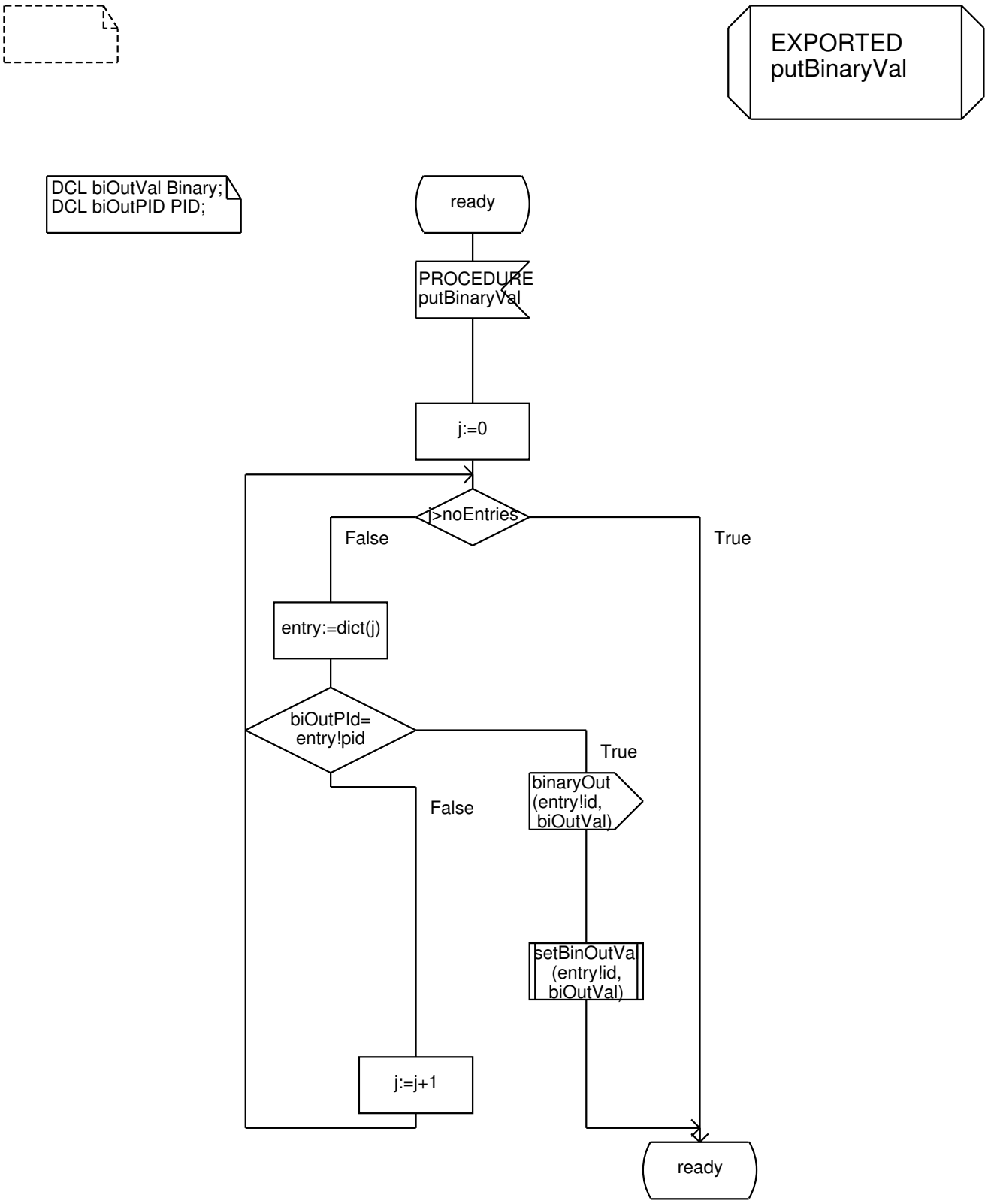

Block ProtoCtrl
1(1)
pin
pin
(envInp)
cin
cin
(FloorInp)
ProtoCtrl
pout
(envOutp)
pout
cout
cout
(FloorOutp)

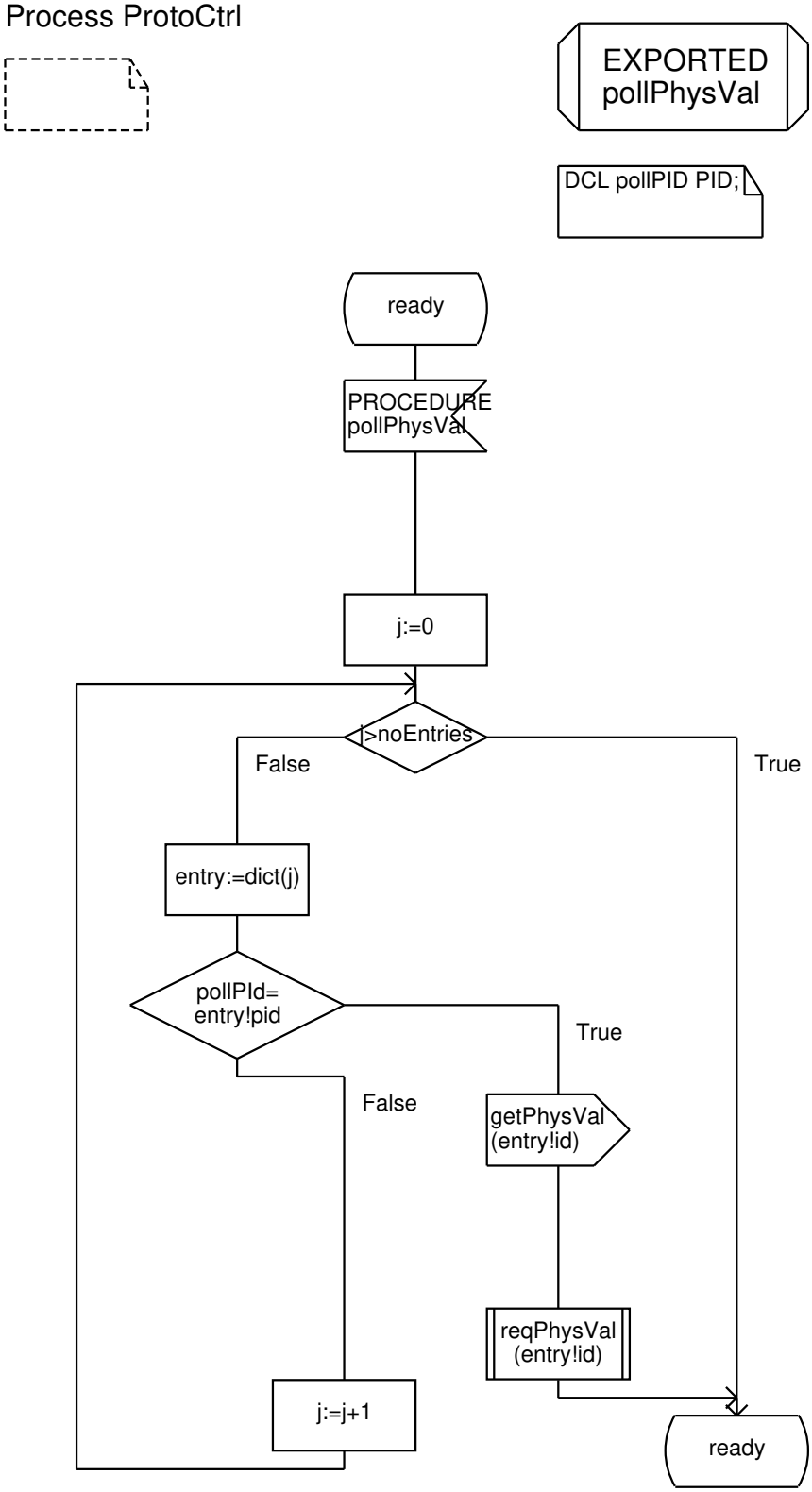
Process ProtoCtrl

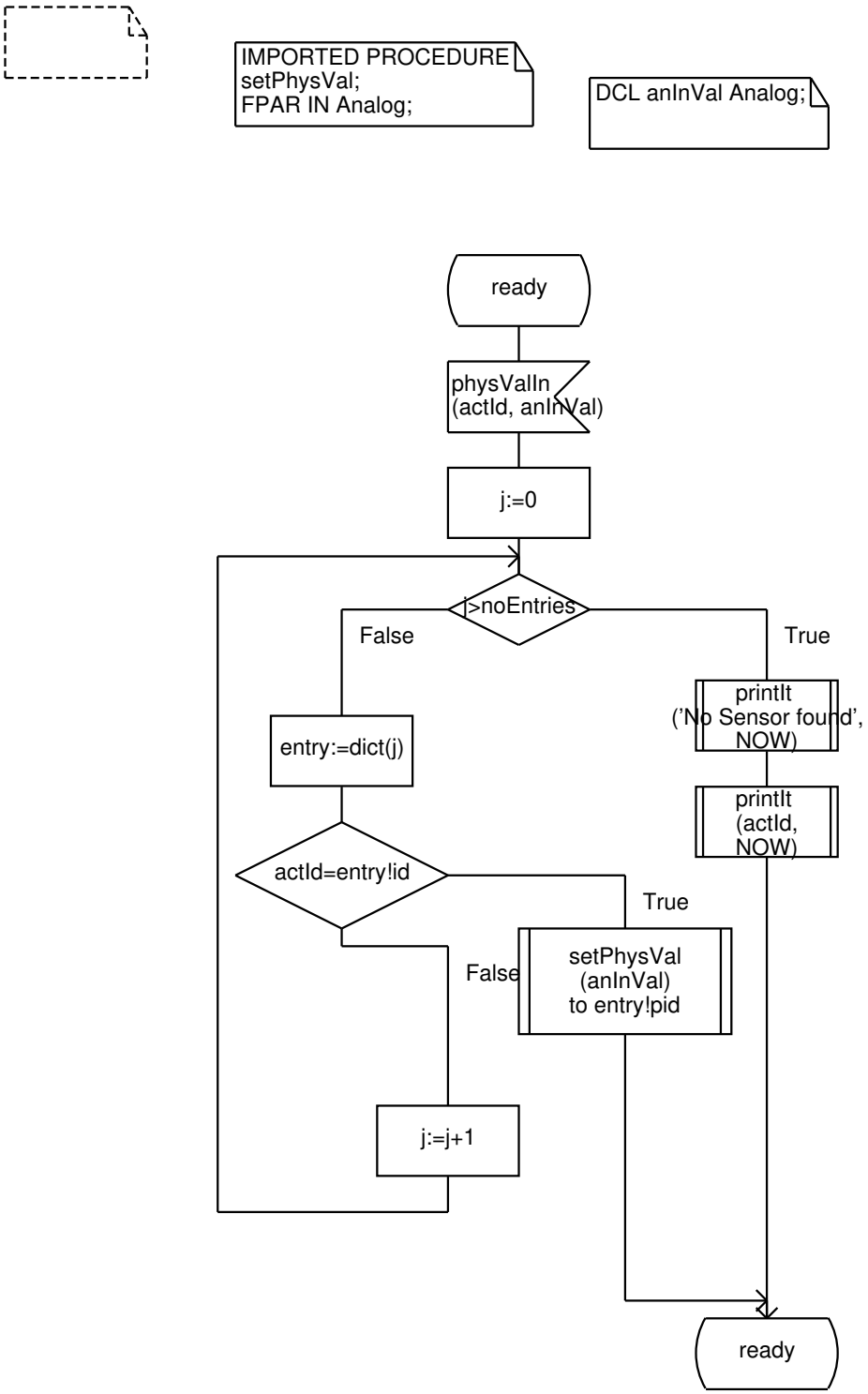


Process ProtoCtrl

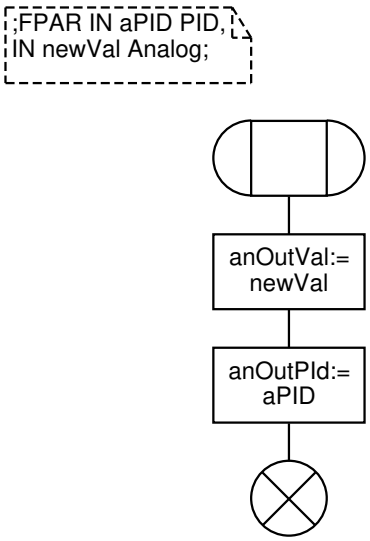



EXPORTED
putBinaryVal
DCL biOutVal Binary;
DCL biOutPID PID;
ready
PROCEDURE
putBinaryVal
j:=0
j>noEntries
False
True
entry:=dict(j)
biOutPId=
entry!pid
True
False
binaryOut
(entry!id,
biOutVal)
setBinOutVal
(entry!id,
biOutVal)
j:=j+1
ready

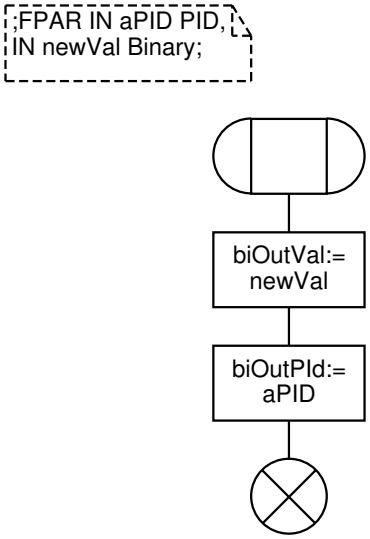
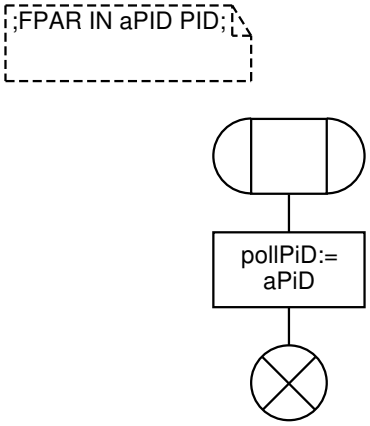

EXPORTED
pollPhysVal
DCL pollPID PID;
ready
PROCEDURE
pollPhysVal
j:=0
j>noEntries
False
True
entry:=dict(j)
pollPId=
entry!pid
True
False
getPhysVal
(entry!id)
reqPhysVal
(entry!id)
j:=j+1
ready


IMPORTED PROCEDURE
setPhysVal;
FPAR IN Analog;
DCL anInVal Analog;
ready
physValIn
(actId, anInVal)
j:=0
j>noEntries
False
True
printIt
('No Sensor found',
NOW)
entry:=dict(j)
printIt
(actId,
NOW)
actId=entry!id
True
False
setPhysVal
(anInVal)
to entry!pid
j:=j+1
ready

Procedure putAnalogVal 1(1)



Procedure putBinaryVal 1(1)



Procedure pollPhysVal 1(1)