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LAMPIRAN

1. M–file simulink pembangkit

```
%%%%% Data Generator %%%%%

%%% parameters of three-phase synchronous machine %%%

xd=0,85;

Ld=xd;

xq=0,55;

Lq=xq;

xd1=0,27;

Ld1=xd1;

xq1=0,27;

Lq1=xq1;

xd11=0,17;

Ld11=xd11;

xq11=0,18;

Lq11=xq11;

xl=0,10;

ld=xl;

lq=xl;

ra=0,00;

tdo1=8.55*377;

tqo11=0,16*377;

H=2.51; %25;

tj=2*H*377;

D=0,2; %50;


%%%%%%%% Conversion Process %%%%%%%%%%%%%%%

LAD=xd-ld;
```

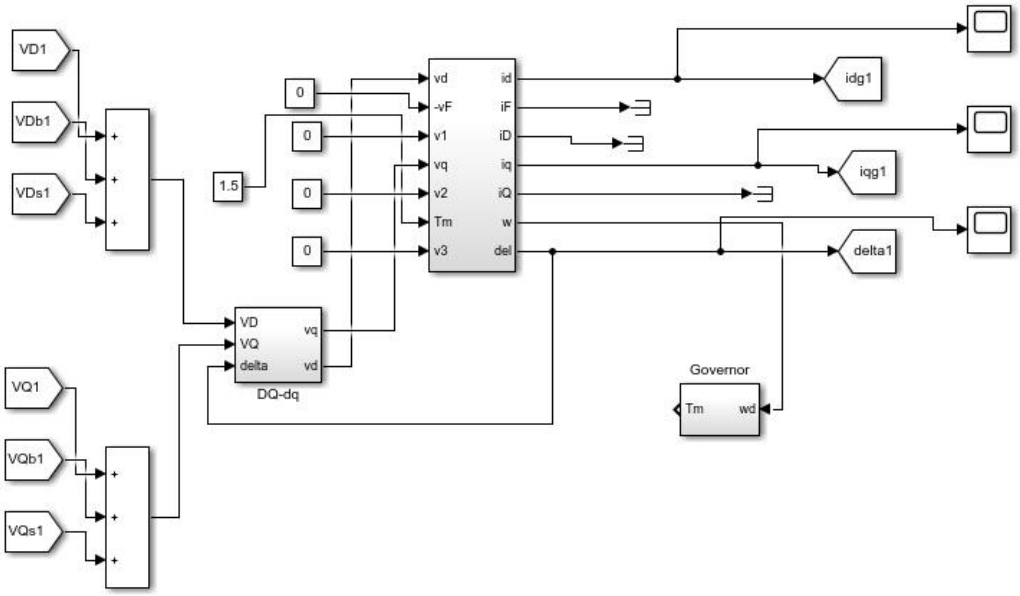
```
kmf=LAD;

kmd=LAD;

mr=LAD;

LAQ=xq-lq;

kmq=LAQ;

lF=LAD*(xd1-ld)/(xd-xd1);

LF=lF+LAD;

lD=(LAD*lF*(xd11-ld))/((LAD*lF)-LF*(xd11-ld));

LD=lD+LAD;

lQ=LAQ*(xq11-lq)/(xq-xq11);

LQ=LAQ+lQ;

rF=LF/tdo1;

rD=((LD*LF-LAD*LAD)/LF)*(xd11/xd1);

tq11=(xq11/xq)*tqo11;

rQ=(xq11/xq)*(LQ/tq11);

%%%%%% Operating Condition Data for Gen.1 %%%%%%

wo=1;

rad=360/(2*pi);

%nominal

Vto1=1.00;

beta1=0;

beta1=beta1/rad;

Po1=2624.78/1000;

Qo1=848.51/1000;

%% Data Process

IRo1=Po1/Vto1;

IXo1=-Qo1/Vto1;

gama1=atan((xq*IRo1+ra*IXo1)/(Vto1+ra*IRo1-xq*IXo1));
```

```
do1=beta1+gama1;

shi1=atan(Qo1/Po1);

taw1=gama1+shi1;

Ia1=sqrt(IRo1^2+IXo1^2);

Iqo1=Ia1*cos(taw1);

Ido1=-Ia1*sin(taw1);

ido1=sqrt(3)*Ido1;

iqo1=sqrt(3)*Iqo1;

IDo1=cos(do1)*Ido1+sin(do1)*Iqo1;

IQo1=-sin(do1)*Ido1+cos(do1)*Iqo1;

Vtqo1=Vto1*cos(gama1);

Vtdo1=-Vto1*sin(gama1);

VtQo1=Vto1*cos(beta1);

VtDo1=Vto1*sin(beta1);

vtqo1=sqrt(3)*Vtqo1;

vtdo1=sqrt(3)*Vtdo1;

E1=Vtqo1+ra*Iqo1-xd*Ido1;

iFo1=sqrt(3)*E1/LAD;

Lamdo1=Ld*ido1+kmf*iFo1;

Lamqo1=Lq*iqo1;

k1=sqrt(3)*Vto1;

% perhitungan matrikss A dan B generator %

M1=[Ld   kmf  kmd  0   0   0   0;

   kmf LF   mr   0   0   0   0;

   kmd mr   LD   0   0   0   0;

   0   0    0    Lq   kmq 0   0;

   0   0    0    kmq LQ  0   0;

   0   0    0    0   0   -tj 0;
```

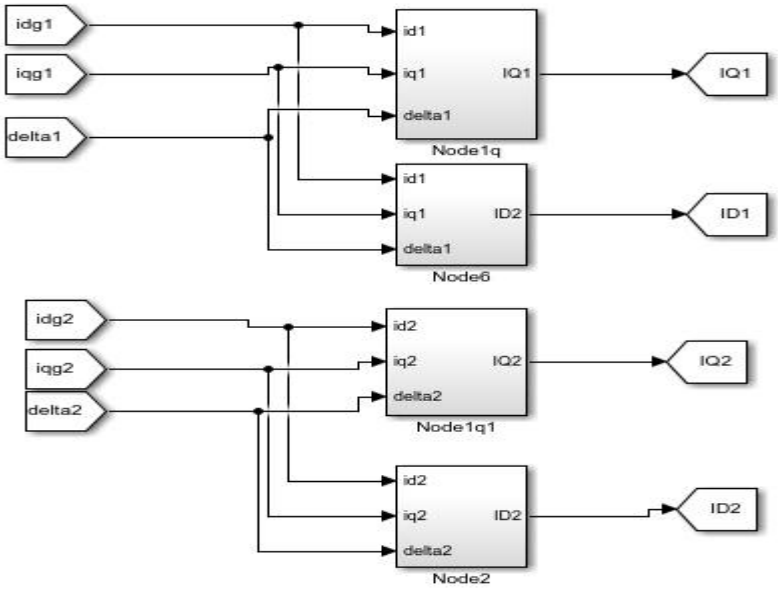
```
   0   0    0    0   0   0   1];


M1=M1/377;

b1=-inv(M1);


K1=[ra                  0            0            wo*Lq
wo*kmq      Lamqo1    0;

   0                    rF           0            0
0           0         0 ;

   0                    0            rD           0
0           0         0 ;

   -wo*Ld               -wo*kmf      -wo*kmd      ra
0           -Lamdo1   0;

   0                    0            0            0
rQ          0         0;

   (Lamqo1-Ld*iqo1)/3 -kmf*iqo1/3  -kmd*iqo1/3  (-
Lamdo1+Lq*ido1)/3 kmq*ido1/3  -D        0;

   0                    0            0            0
0           -1        0];

a1=b1*K1;

eigen=eig(a1);

d1=zeros(7);

c1=[1 0 0 0 0 0 0;0 1 0 0 0 0 0;0 0 1 0 0 0 0;0 0 0 1 0 0 0;0 0 0
0 1 0 0;0 0 0 0 0 1 0;0 0 0 0 0 0 1];

%%% Data Exciter %%%

Ka1 = 10; %400; %10;

Ta1 = 0,02; %0,05; %0,02;

VAmax1 = 18.3;

VAmin1 = -18.3;


%%% Data Governor %%%
```

```
Kg1 = 20; %2;

Tg1 = 1; %0,02;
```

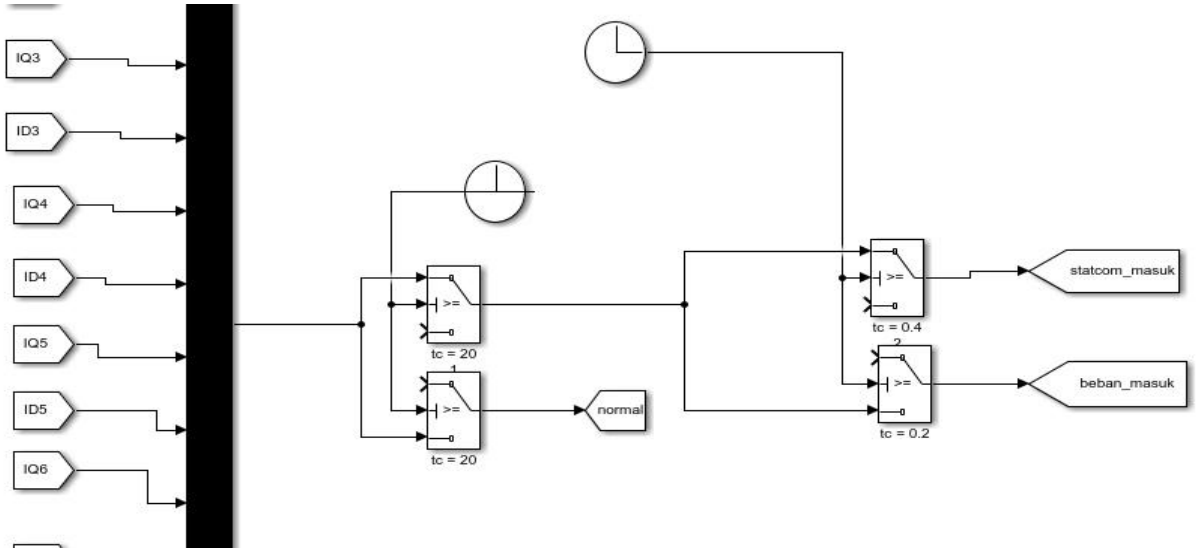
2. Desain kontrol pembangkit



3. Desain sistem dq–DQ



4. Desain sistem Saklar



5. Desain sistem LQR