

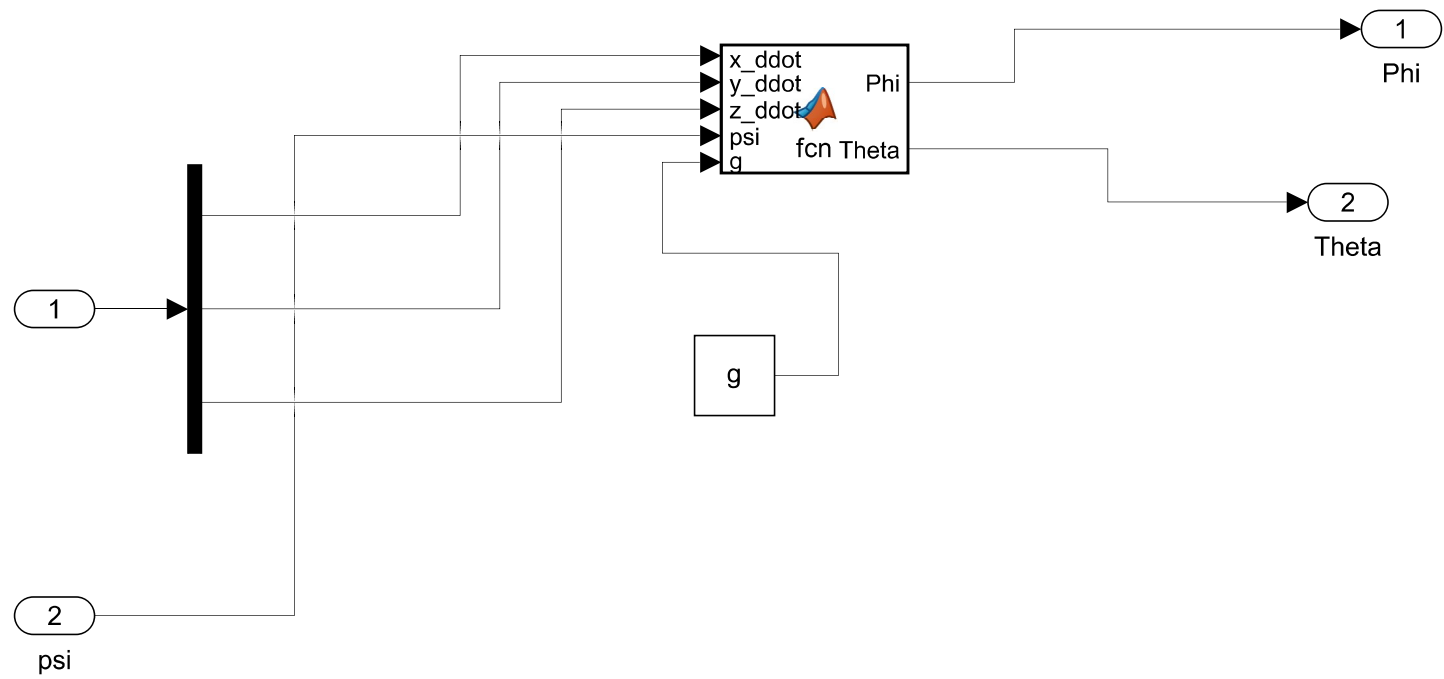
```
function [Sphi,Sth,Spsi] = fcn(phi,theta,psi,phi_dot,theta_dot,psi_dot,lambda_phi,lambda_theta,lambda_psi,K_k_phi,K_k_theta,K_k_psi)
```

```
Sphi=(-phi_dot+lambda_phi*phi);  
Sth=(-theta_dot+lambda_theta*theta);  
Spsi=(-psi_dot+lambda_psi*psi);
```

```
function Rm = R(eta)

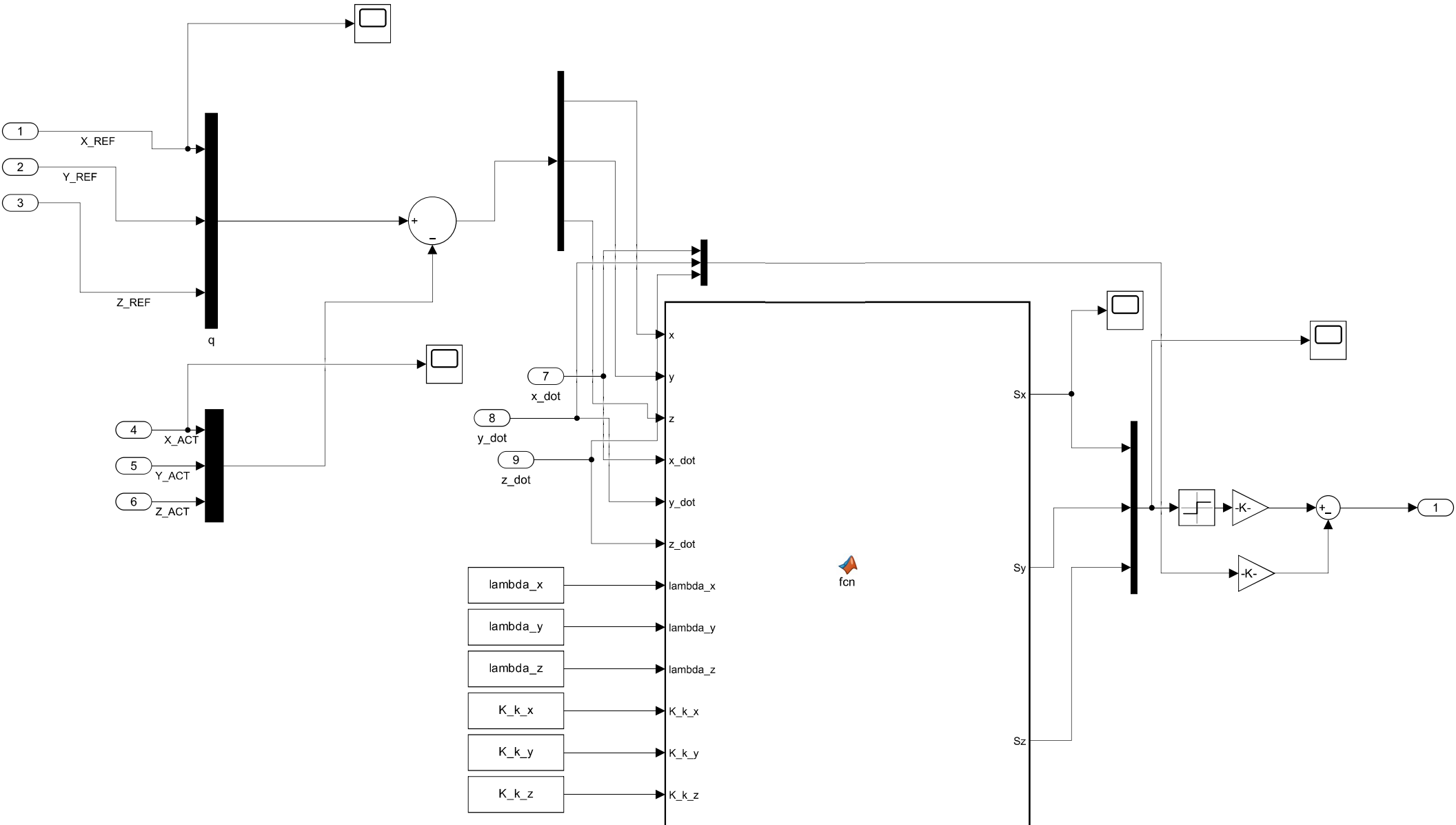
phi = eta(1);
theta = eta(2);
psi = eta(3);

Rx = [1 0 0; 0 cos(phi) -sin(phi); 0 sin(phi) cos(phi)];
Ry = [cos(theta) 0 sin(theta); 0 1 0; -sin(theta) 0 cos(theta)];
Rz = [cos(psi) -sin(psi) 0; sin(psi) cos(psi) 0; 0 0 1];
Rm = (Rz*Ry*Rx)';
```



```
function [Phi, Theta] = fcn(x_ddot,y_ddot,z_ddot,psi,g)
```

```
Phi = asin((x_ddot*sin(psi)-y_ddot*cos(psi))/(sqrt(x_ddot^2+y_ddot^2+(z_ddot+g)^2)));  
Theta =atan2((x_ddot*cos(psi)+y_ddot*sin(psi)), (z_ddot+g));
```



```
function [Sx,Sy,Sz] = fcn(x,y,z,x_dot,y_dot,z_dot,lambda_x,lambda_y,lambda_z,K_k_x,K_k_y,K_k_z)
```

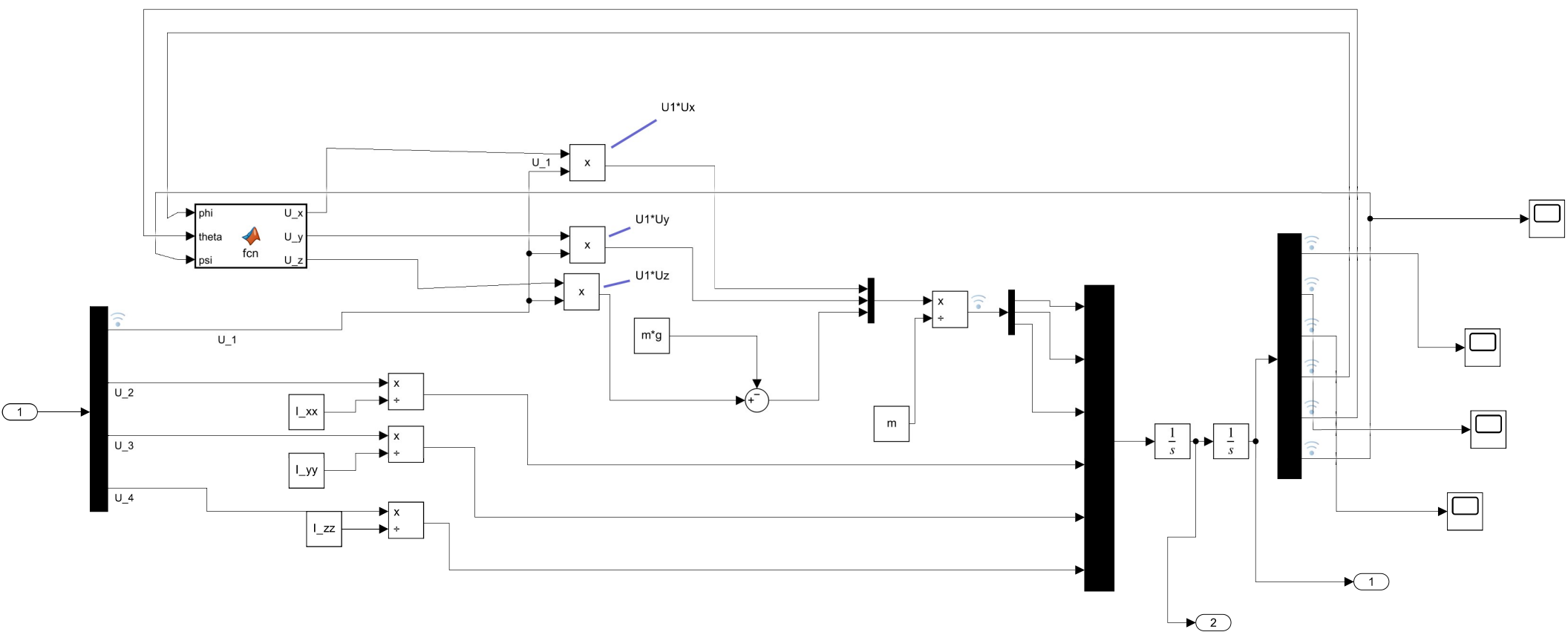
```
Sx=(-x_dot+lambda_x*x);  
Sy=(-y_dot+lambda_y*y);  
Sz=(-z_dot+lambda_z*z);
```



```
function Rm = R(eta)

phi = eta(1);
theta = eta(2);
psi = eta(3);

Rx = [1 0 0; 0 cos(phi) -sin(phi); 0 sin(phi) cos(phi)];
Ry = [cos(theta) 0 sin(theta); 0 1 0; -sin(theta) 0 cos(theta)];
Rz = [cos(psi) -sin(psi) 0; sin(psi) cos(psi) 0; 0 0 1];
Rm = (Rz*Ry*Rx)';
```



```
function [U_x,U_y,U_z] = fcn(phi,theta,psi)
```

```
U_x = cos(phi)*sin(theta)*cos(psi)+sin(phi)*sin(psi);  
U_y = cos(phi)*sin(theta)*sin(psi)-sin(phi)*cos(psi);  
U_z =cos(phi)*cos(theta);
```