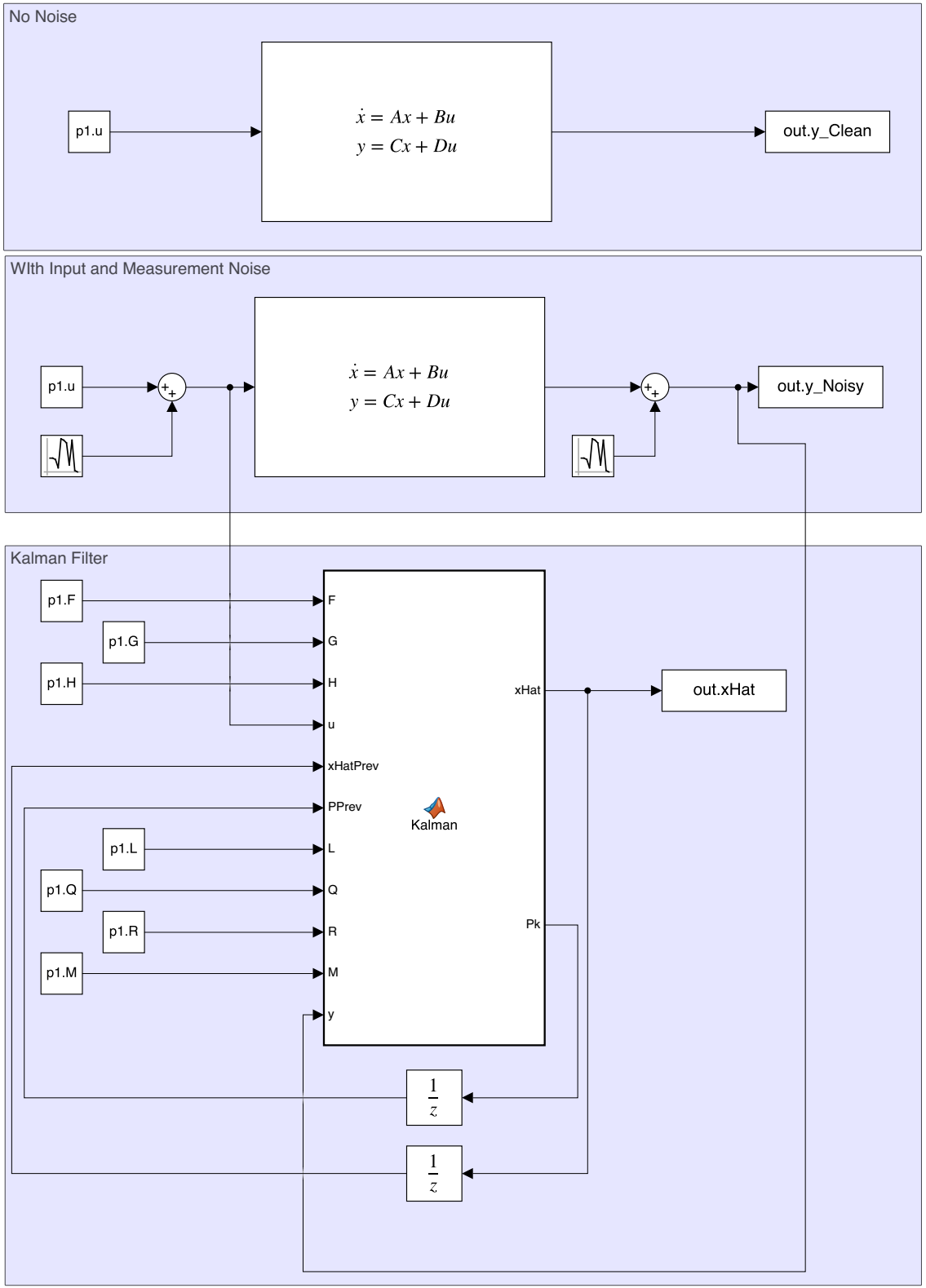
No Noise
p1.u
$\dot{x} = Ax + Bu$
$y = Cx + Du$
out.y_Clean
WIth Input and Measurement Noise
p1.u
$\dot{x} = Ax + Bu$
$y = Cx + Du$
out.y_Noisy
Kalman Filter
p1.F
p1.G
p1.H
F
G
H
u
xHatPrev
PPrev
L
Q
R
M
y
xHat
Pk
Kalman
p1.L
p1.Q
p1.R
p1.M
out.xHat
$\frac{1}{z}$
$\frac{1}{z}$

```
function [xHat, Pk] = Kalman(F, G, H, u, xHatPrev, PPrev, L, Q, R, M, y)

% predictor
xHatMinus = F*xHatPrev + G*u;
PkMinus = F*PPrev*F' + L*Q*L';

% corrector
W = H*PkMinus*H' + M*R*M';
K = PkMinus * H' * inv(W);

yHatMinus = H*xHatMinus;

xHat = xHatMinus + K*(y - yHatMinus);
Pk = PkMinus - K*H*PkMinus - PkMinus*H'*K' + K*W*K';

end
```