

## ***DeltaV to MATLAB OPC connection***

### ***What you need to write in MATLAB to open the communication port to DeltaV:***

```
% The following MATLAB m file opens a port to read DeltaV
%   Washington University ChE433 Process Control Lab
%   Robert Heider Sept 11, 2003

% clear data space
clear all

mxOPC ?

% From EMERSON's instructions ...

% Initialize Client (One time)
hr=mxOPC('open','Opc.DeltaV.1','localhost');

% sample time delay
ts = 5.0;

pause(1);

% Set Device Mode (One time)
r=mxOPC('ReadMode','Device');

% Set Scan - Sleep (One time)
mxOPC('Sleep',500);

% Activate Sleep / Test missing scans (Once per scan)
Nmissed = mxOPC('Sleep');
```

### ***When you run this you will get the following error:***

"This product is not licensed for this computer. Run the MATLAB version of mxOPC for more information"
--

***Just click on OK and get: The MATLAB OPC client © IPCOS should run anyway! (I don't know why.)***

***Now you can run your m script file:  
Example:***

```

% The following MATLAB m file opens a port to read DeltaV
%   Washington University ChE433 Process Control Lab
%   Robert Heider Sept 11, 2003

% Control code
ctrl = 1
ii=0;
% start repeating portion
while ctrl==1

% Start timer
t0 = clock;

% Read Value from the loop (Once per read/write)
[value,hr]=mxOPC('ReadDouble','EX2_SIM/TC2-4/PV.CV')
[value,hr]=mxOPC('ReadDouble','LAB1/FC1-1/PV.CV')
[value,hr]=mxOPC('ReadDouble','LAB1/FC1-1/SP.CV')

ii = ii+1;
if ii > 2
    ctrl = 0;
end

% wait ts; sample time delay
j=0;
while etime(clock,t0) < ts,
% this keeps the program from hanging the clock
j=j+1;
k=j;
l=k;
pause(.1);
end;
end;

```

***And it runs and can read the DeltaV data.***

***If you want to send data from MATLAB, you need to do a write command. This is an example of a simple PI control loop in DeltaV with MATLAB simulating a first order lag, the controller output is read by MATLAB and filtered, sent to DeltaV as an input:***

```
% The following MATLAB m file opens a port to read DeltaV
% Washington University ChE433 Process Control Lab
% Robert Heider Sept 11, 2003
% Created a Control Loop

% Control code
ctrl = 1
ii=0;
tstPV = 0.0;
lambda = 0.8;

% start repeating portion
while ctrl==1

% Start timer
t0 = clock;

% Read Value from the loop (Once per read/write)
[value,hr]=mxOPC('ReadDouble','EX2_SIM/TST1-1/OUT.CV')

tstPV = (1.0-lambda)*tstPV + lambda*value;

%[value,hr]=mxOPC('ReadDouble','LAB1/FC1-1/PV.CV')
%[value,hr]=mxOPC('ReadDouble','LAB1/FC1-1/SP.CV')
%mxOPC('writedouble','LAB1/FC1-1/SP.CV',0.5)
mxOPC('writedouble','EX2_SIM/INPUT1',tstPV)

ii = ii+1;
if ii > 100 % 3*12*5*60
    ctrl = 0;
end
% wait ts; sample time delay
j=0;
while etime(clock,t0) < ts,
% this keeps the program from hanging the clock
j=j+1;
k=j;
l=k;
pause(.1);
end;
end;
```

***When you close MATLAB, you get a “Dr. Watson” with no error code. Just close it.***