Model Predictive Control (MPC):

Remote Lab instructions

MPC

V1

Created By:		Date:	
Reviewed By:		Date:	

EIT ENGINEERING INSTITUTE OF TECHNOLOGY

Instructions
Basics

Getting Started

- Logon to Electromeet (Follow the How to Connect to Remote Labs_Electromeet_HTML5_Remote_Lab instructions document)

Software used:

- PC-ControLAB 3 -> MPC-LAB module
- All the above is installed on the Remote Lab computer
- Optional documents to View: "MPCUsrGd.pdf"; "MPCLabEx.pdf"

MPC-LAB

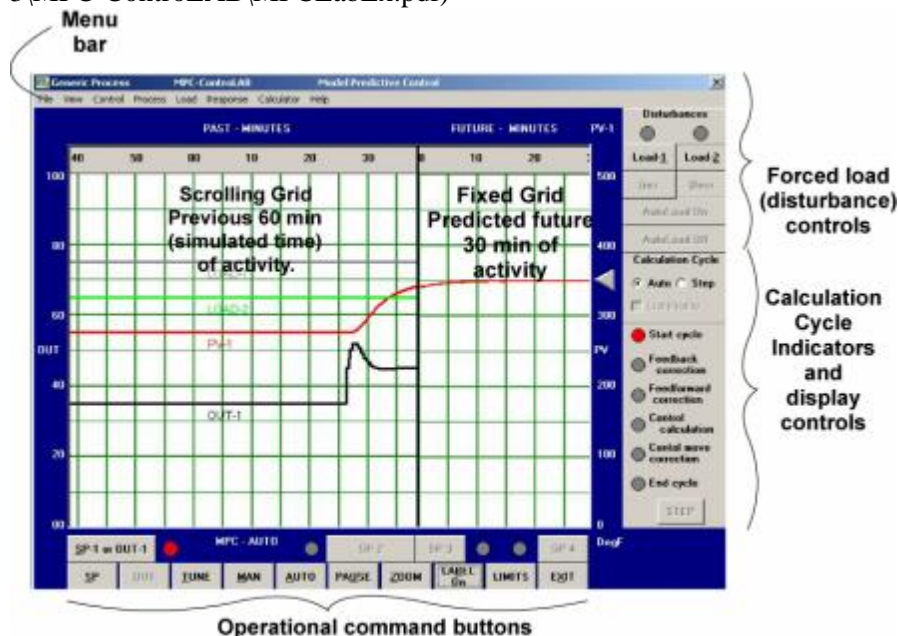On the remote lab:
Access MPC LAB by going to
"Start" ->
"All Programs" ->
"PC-ControLAB 3" ->
"MPC-LAB"

This question will make use of Remote Labs and the PC-ControLABs' MPC module
(A practical example is in the installation directory C:\Program Files (x86)\PC-ControLAB 3\MPC-ControLAB\MPCLabEx.pdf)

Example of loading a model and initializing control:

- Open MPC-Lab

- Go to "Process" -> then "Select Model" and browse to "Desktop/PC Practicals/" and open the "Mill_Model.mdl"

- Go to "View" -> "Variable Plot Selection" and set to yes: PV-1, PV-2, OUT-1, OUT-2, LOAD-1, LOAD-2

- Go to "Control" -> "Control Options" and set CV's = 2 and MV's = 2 (Leave the rest default)

- Determine the system response (internal model) in order to start the controller by:
  - o Make sure "SP-1 or OUT-1" is selected.

  - o Click "OUT" and set the value to 15

  - o Click "Response" and wait and only click "Capture" when the response has nearly gone across the screen. If missed, set OUT to 10 and wait to stabilize and try above again.

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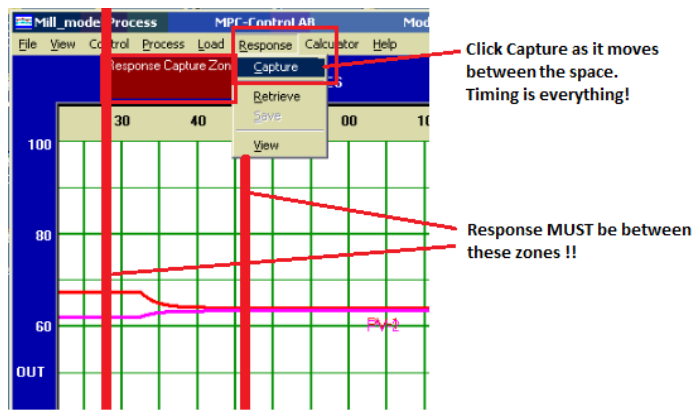
  - o Repeat the same procedure as above for "SP-2 or OUT-2" by clicking it and setting "OUT" to 15 and record the response.

  - o Click "Load-1" (at the top RHS of the screen) and click "Incr" once and "Capture" the "Response" the same as previously.

  - o Click "Load-2" and "Incr" it once, and repeat the Capture procedure.

  - o If the above is done correctly, the LED's on the RHS will flicker indicating the model response has been captured and the controller is active.

- Click "SP-1 or OUT-1" then "MAN" and then "AUTO". The predictive simulation should now be active.

Move the setpoint indicator up or down and inspect the response.