PITOPS
System Identification & PID Tuning Optimization

PiControl Solutions

A New Process Control Technological Breakthrough Impacting Industry and Colleges

PID Tuning, APC (Advanced Process Control) Design, System Identification

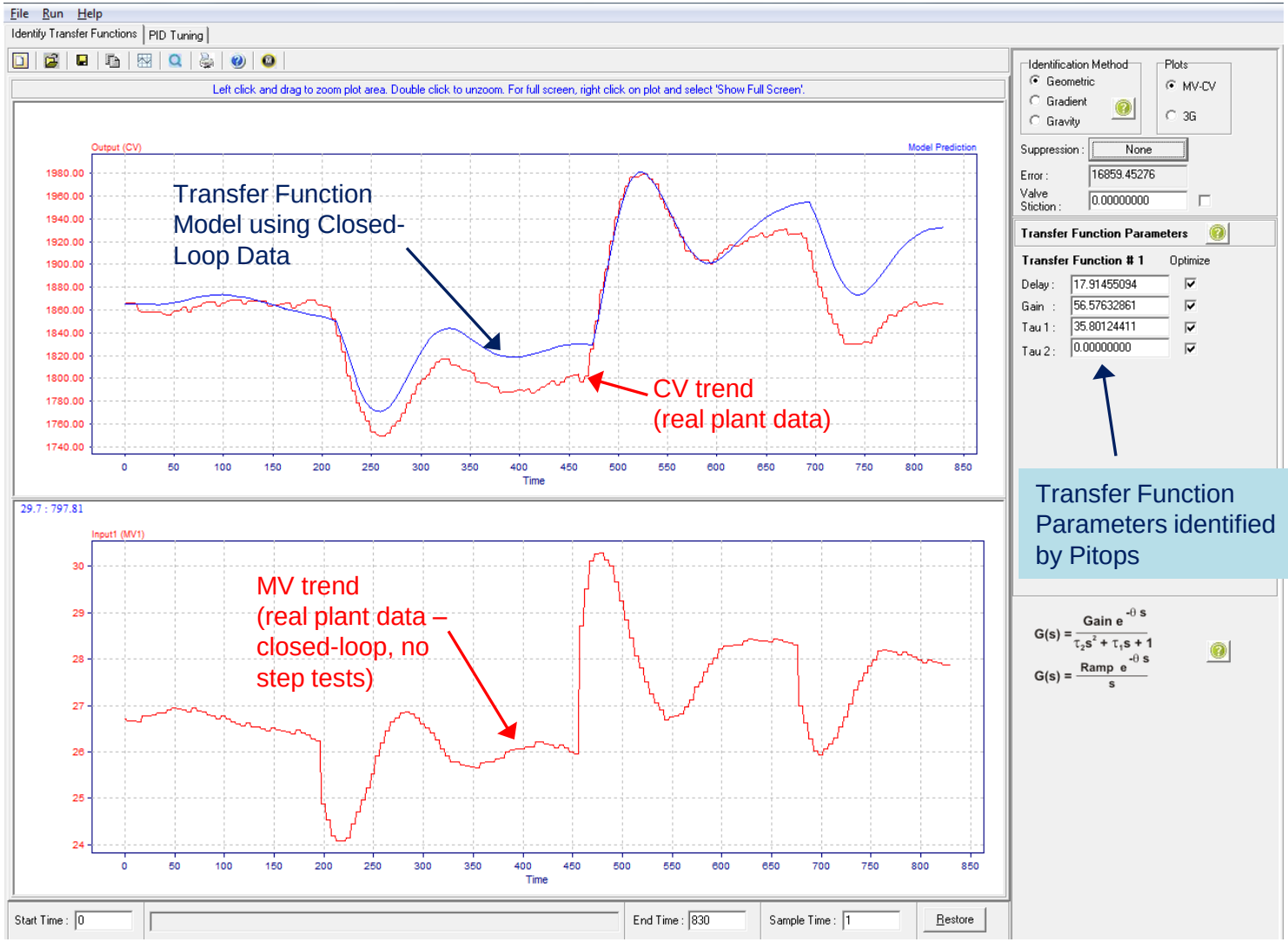
- See the next few slides illustrating
  - Identification of system dynamics (transfer functions) using closed-loop short-duration data amidst noise and unmeasured disturbances
  - Optimization of PID tuning for Slave PIDs, Cascade PIDs and all complex PIDs in DCS/PLC.
- See the power, uniqueness and simplicity of Pitops
- Improve Plant Operation and Control Quality
- Improve Process Control Teaching/Training

Use Excel File Containing Plant Data (or use OPC communication to DCS/PLC)

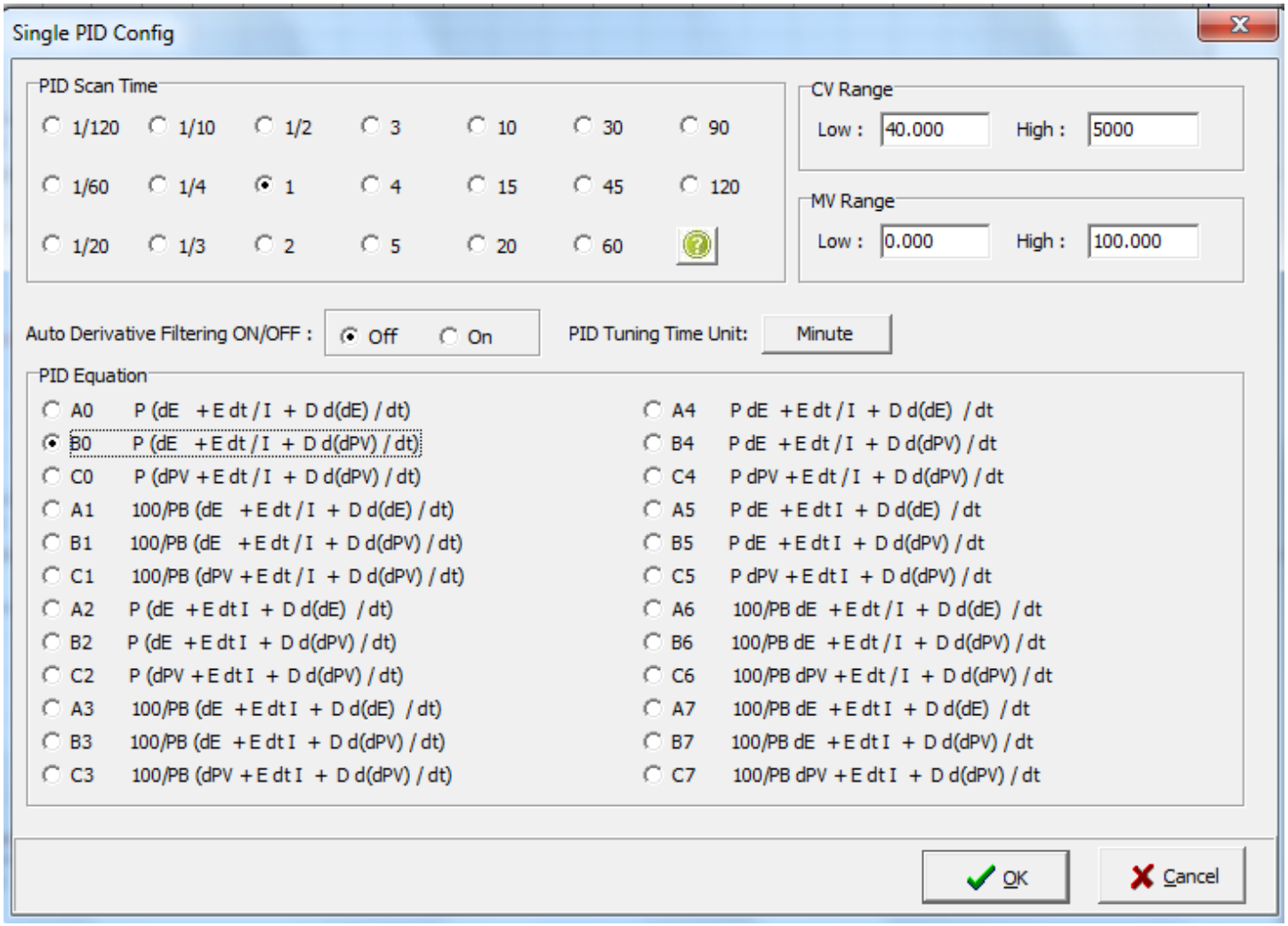
Get Excel file with plant data from plant historian, or use OPC to directly collect data from any DCS/PLC

	Timestamp	AC7777.PV	FC7777.SP
2		PPM	KG/HR
3		Composition	Gas Flow SP
4	1/11/2012 11:00	1865.624218	26.70827938
5	1/11/2012 11:01	1865.816931	26.70827938
6	1/11/2012 11:02	1866.009482	26.66449574
7	1/11/2012 11:03	1866.026692	26.66449574
8	1/11/2012 11:04	1865.985292	26.66449574
9	1/11/2012 11:05	1865.943729	26.66449574
10	1/11/2012 11:06	1865.902329	26.66449574
11	1/11/2012 11:07	1865.860929	26.666217
12	1/11/2012 11:08	1865.819529	26.666217
13	1/11/2012 11:09	1865.778129	26.666217
14	1/11/2012 11:10	1865.736729	26.666217
15	1/11/2012 11:11	1865.695328	26.666217
16	1/11/2012 11:12	1865.653928	26.63603313
17	1/11/2012 11:13	1860.346917	26.63603313
18	1/11/2012 11:14	1858.689125	26.63603313
19	1/11/2012 11:15	1858.676461	26.63603313
20	1/11/2012 11:16	1858.663635	26.63603313
21	1/11/2012 11:17	1858.650809	26.76411484
22	1/11/2012 11:18	1858.637983	26.76411484
23	1/11/2012 11:19	1858.625157	26.76411484
24	1/11/2012 11:20	1858.612332	26.76411484
25	1/11/2012 11:21	1858.599506	26.76411484
26	1/11/2012 11:22	1858.58668	26.77162262
27	1/11/2012 11:23	1858.573854	26.77162262
28	1/11/2012 11:24	1858.561028	26.77162262
29	1/11/2012 11:25	1858.548202	26.77162262

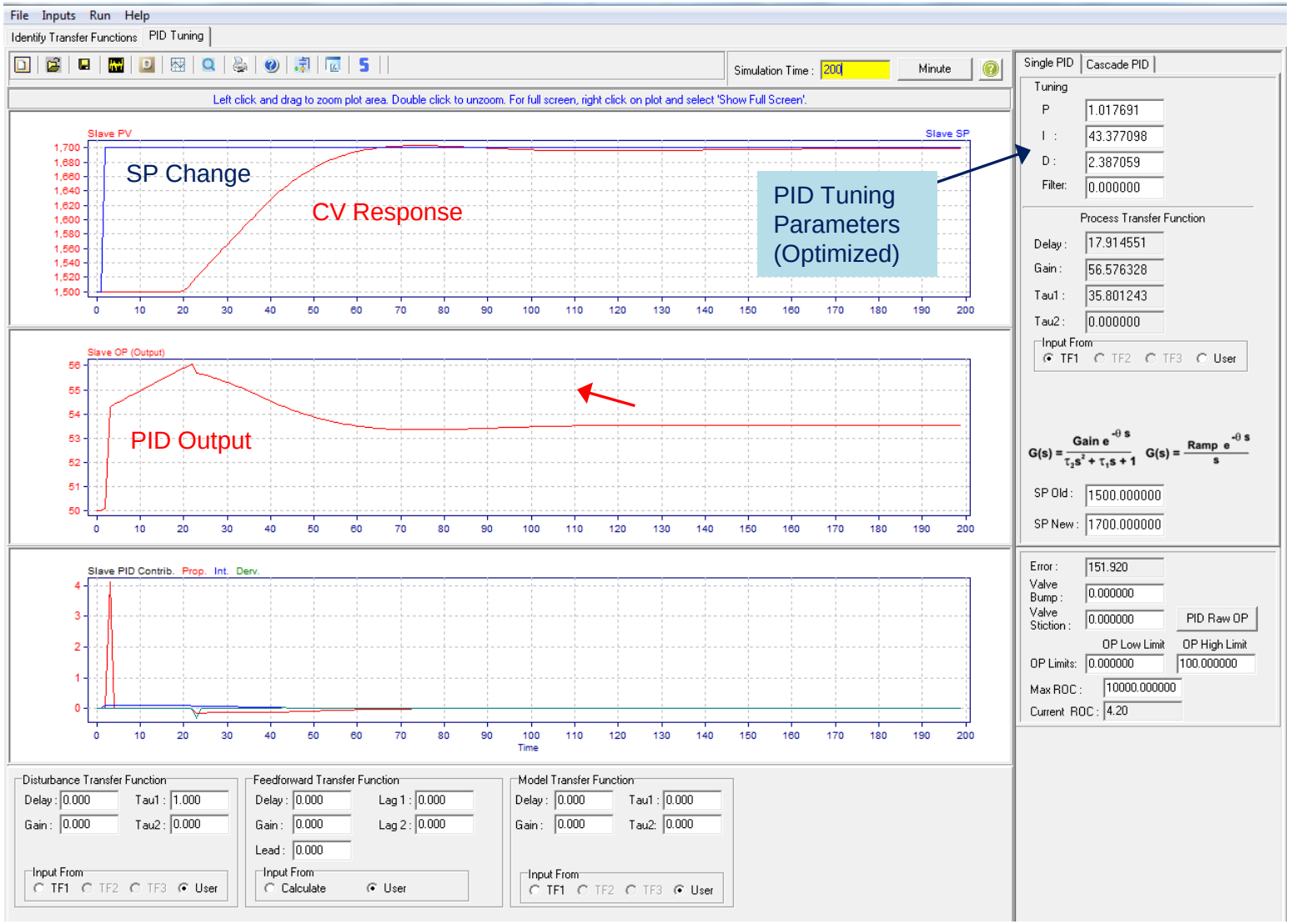
Read Excel Data from Plant into Pitops Identify Closed-Loop Transfer Function



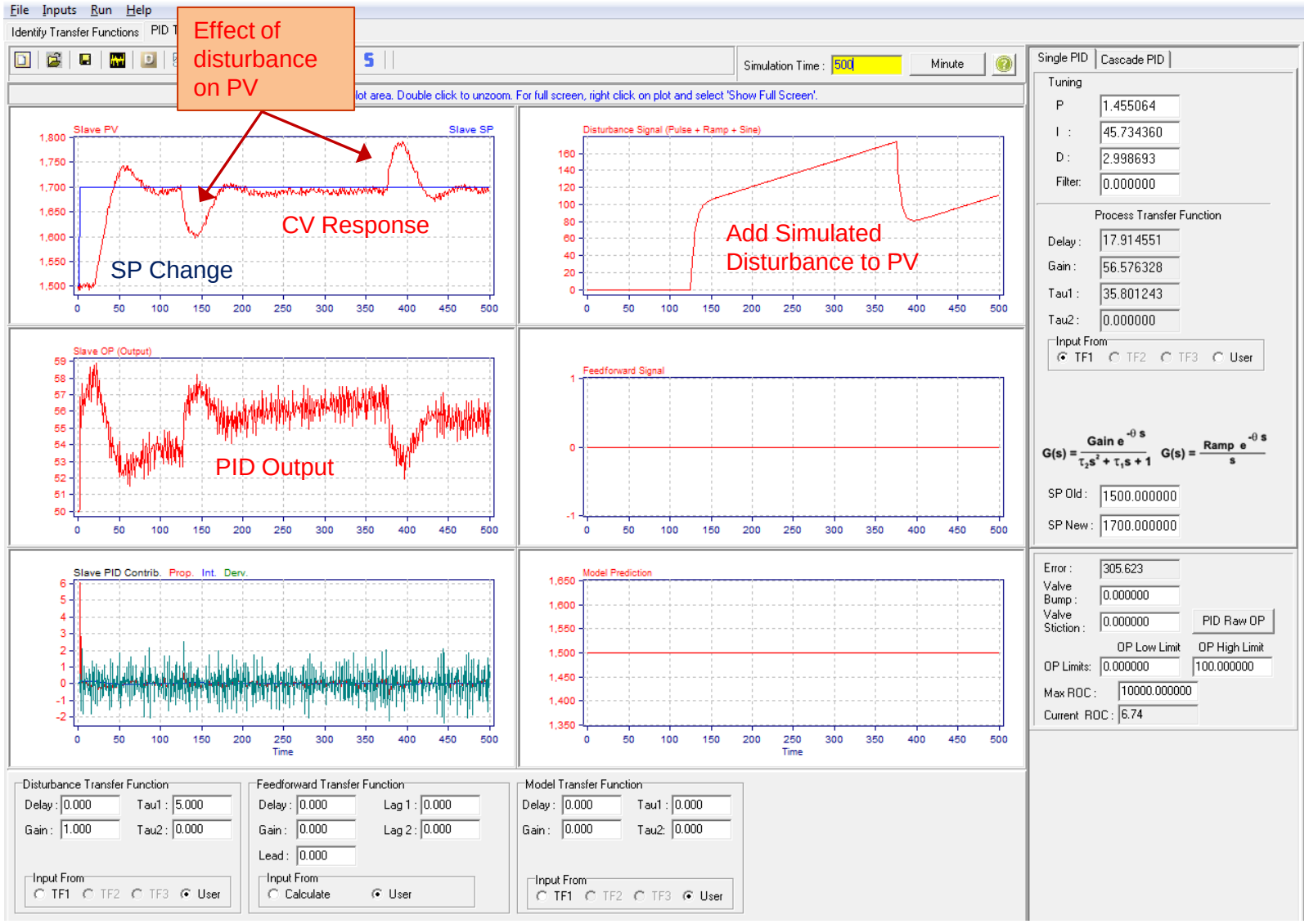
Chose PID Eqn., PID Scan Rate, Set CV and MV Range matching DCS/PLC



Optimize PID Tuning for SP Change



Add Disturbances, Noise and Optimize PID Tuning for SP Change + Disturbances



Pitops Uniqueness

- Multivariable identification– can handle multiple input and multiple outputs.
- Uses Closed-Loop Data (does not need Open-Loop Step Tests).
- Works well even if noise and unmeasured disturbances are present.
- Requires short data window for successful analysis.
- Calculated PID tuning parameters match exactly with DCS/PLC.
- Pitops identification and simulation looks like the real DCS/PLC trends.
- Displays PID output trends explicitly to ensure safe control action.
- Equipped with latest 3G (geometric/gradient/gravity) technology for rejecting noise and disturbances and calculating true transfer functions.
- Super-fast execution and super compact code size.
- Pitops technology is far superior to ARMAX identification, Step Response Coefficient models, Ziegler Nichols, Lambda tuning, frequency domain, Z-discrete domain etc.
- Pitops is far superior and easier than any other product or technology.
- Pitops 4GRG algorithm and technology is a revolutionary, novel and a 21st century genuine breakthrough.
- Does not need advanced education degrees, does not need complex math and theory.
- Visit www.PiControlSolutions.Com, or send an email to Info@PiControlSolutions.Com.