Previous in Forum: Meter Max For Orifice Next in Forum: Film printers question

Anonymous Poster

Automatic, Manual, and Cascade Control Mode

12/17/2007 8:50 AM

Can some out there explain to me the difference between Automatic and Cascade mode. There are controllers which have these control modes. Use select the mode which best suit his control strategy. Can you illustrate especially Cascade mode. I want to set-up a controller getting set-point from computer. Is it possible to select Automatic mode and the controller to recognise the external 4-20mA setpoint from the computer or I should set to cascade mode.

Kilowatt0

Guru

Join Date: Aug 2007
Location: Earth - I think.
Posts: 2143
Good Answers: 165

Re: Automatic ,Manual and Cascade control Mode

12/17/2007 12:38 PM

Simple answer: You should use Cascade mode.

The Standard PID setup allows an operator to enter the setpoint that the controller uses in it's calculations.

A Cascade PID gets it's setpoint from an external source e.g. another PID loop or the computer you mentioned. But the relationship of that variable, as a setpoint to the Cascade loop is fixed.

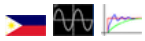
A Ratio PID also gets it's setpoint from an external source, but the relationship of that variable, as a setpoint to the Ratio PID loop is varied, depending upon some other variable.

Hope this helps!

_____
TANSTAAFL (If you don't know what that means, Google it - yourself)

Vulcan

Guru



Join Date: Oct 2006
Location: Philippines
Posts: 2056
Good Answers: 49

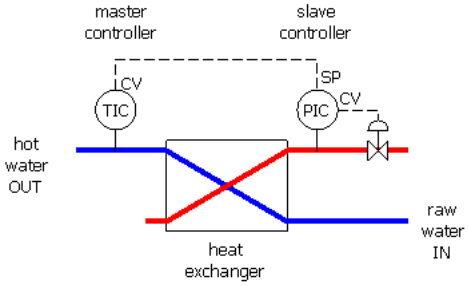
Re: Automatic, Manual, and Cascade Control Mode

12/17/2007 10:00 PM

Manual mode - also called "open-loop control" is where the control element (usually a control valve) is controlled by the operator (a human, usually). He manipulates the control valve and hopes that he can maintain the process at the required setpoint. Eventually he gets tired and switches it over to automatic mode.

Automatic mode - also called "closed-loop control" is where the control element is controlled by the controller (not a human, definitely). It checks the process, compares it to the setpoint and adjusts the control valve to bring the process back to the setpoint. The controller is usually much better at this than the human which is why some humans hate them.

Cascade control is not a mode. It's a control scheme like Feedback, Feedforward, and Ratio control. Cascade control always involves two controllers each measuring separate but inter-related processes. One controller is the master and the other is the slave. The master provides the setpoint being used by the slave.



Take this heat exchanger (HE), for example. You need to maintain the temperature at the outlet of the HE at a certain level. To do that, you open and close a steam valve as required. The steam valve is controlled by a pressure controller. The setpoint of the pressure controller is provided by the temperature controller.

In this type of cascade control, the pressure controller keeps the steam pressure constant, making the job of the temperature controller easier. If there is a change in steam pressure, the slave will compensate without bothering the master.

Note: not all instances where the setpoint comes from somewhere else is called cascade control. If the setpoint is not coming from another controller, that is simply called Remote Setpoint or RSP. If it comes from another controller, it can be called Cascade or Ratio control.

Vulcan
Guru

Join Date: Oct 2006
Location: Philippines
Posts: 2056
Good Answers: 49

Re: Automatic, Manual, and Cascade Control Mode
12/18/2007 3:42 AM

In reply to

...take a setpoint from the computer and feed to my controller one working in Auto Mode and one selected Cascade both fed with same PV

Well, they will work, per se, but it won't be the same as Cascade control. In essence, your two controllers will be ordinary feedback controllers.

Remember, in order to be called Cascade Control, one controller will have to provide the setpoint for the other controller. If you wish, you can feed your setpoint from your computer into the master but your master's output still needs to go into the setpoint of the slave.

_____
Miscommunication: when what people heard you say differs from what you said. Make yourself understood.

Anonymous Poster

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 12:49 AM

In reply to

Can you please shed light on Remote Setpoint. If I want to make a controller receive an external set-point (4-20mA) from another source which can be a computer or another controller what options are availablle for me. Do I need a special controller capable of this?

Vulcan
Guru

Join Date: Oct 2006
Location: Philippines
Posts: 2056
Good Answers: 49

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 1:19 AM

In reply to

If you need remote setpoint capability then you purchase a controller with this feature. Some have it, some don't.

This is a picture of a Honeywell UDC 3000 controller. You'll see a button below the display that says "Setpoint Select". That button allows you to choose a local setpoint or remote setpoint. When you select remote setpoint, an LED will light beside the RSP label on the display telling you that the setpoint is coming from outside the controller.

The signal from your computer, or other controller, goes into a terminal at the back.

This is an obsolete unit but we have a couple still being used. There are lots of other brands and models to choose from.

_____
Miscommunication: when what people heard you say differs from what you said. Make yourself understood.

MarkTheHandyman

Re: Automatic, Manual, and Cascade Control Mode
12/18/2007 11:40 AM

In reply to

Vulcan

Re: Automatic, Manual, and Cascade Control Mode
12/18/2007 7:16 PM

In reply to

ronald
Power-User

Join Date: Dec 2007
Location: Miami, FL.
Posts: 304

Re: Automatic, Manual, and Cascade Control Mode
12/18/2007 7:15 PM

I believe Cascade control is used in cases where wild output swings and responses cannot be conrolled by conventional methods. Cascading is a form of Dampening!

_____
WARNING! All suggestions are informative only. It is the prerogative of the user to implement under his sole responsibility. This commentator will not be liable any damages or injuries incurred.

ronald
Power-User

Re: Automatic, Manual, and Cascade Control Mode
12/20/2007 11:20 AM

In reply to

Ooops! Not necessarily so! Its used for large lag-times also!

I'm sorry I answered this question without doing my homework...

_____

WARNING! All suggestions are informative only. It is the prerogative of the user to implement under his sole responsibility. This commentator will not be liable any damages or injuries incurred.

Join Date: Dec 2007
Location: Miami, FL.
Posts: 304

Anonymous Poster

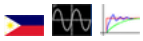
Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 4:26 AM

In reply to

Gents

With a controller capable taking a remote set-point. With this remote setpint One controller which controller will peform satisfactorily. With this remote set-point. One is set as Automatic control and one is selected Cascade?

Vulcan
Guru



Join Date: Oct 2006
Location: Philippines
Posts: 2056
Good Answers: 49

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 5:10 AM

In reply to

I cannot quite understand what you're asking.

For all intents and purposes, selecting Cascade Control is the same as Remote Setpoint. If your controller doesn't have Cascade Control but has Remote Setpoint, you can still use it for cascade control.

In order to work normally, both controllers need to be in Automatic Mode. The slave needs to have Cascade Control selected but it still needs to be in Automatic Mode.

_____

Miscommunication: when what people heard you say differs from what you said. Make yourself understood.

Anonymous Poster

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 6:23 AM

In reply to

Vulcan

You have actually answered my question despite you introduction to your answer. Thanks Gents (Vulcan, Kilowatt0 and ronald) for your patients and time

ronald
Power-User

Join Date: Dec 2007
Location: Miami, FL.
Posts: 304

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 10:05 AM

In reply to

You are very welcome! That's what we do!

And to the commentators of the forum, I salute you!

_____

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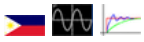
Vulcan
Guru



Join Date: Oct 2006
Location: Philippines
Posts: 2056
Good Answers: 49

Re: Automatic, Manual, and Cascade Control Mode
12/19/2007 8:55 PM

In reply to

I just took a shot at what I thought you meant. 'Good to know that I hit it anyway.

You're welcome. Always glad to help.

_____

Miscommunication: when what people heard you say differs from what you said. Make yourself understood.

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