

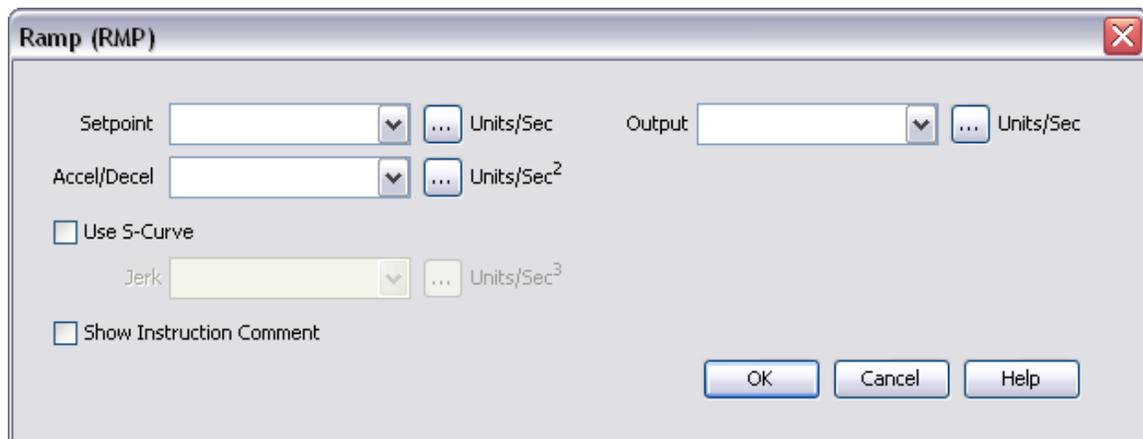
Productivity³⁰⁰⁰TM Monthly Instruction Showcase

June 28, 2010

Ramp, Ramp Generator, Find Min and Max

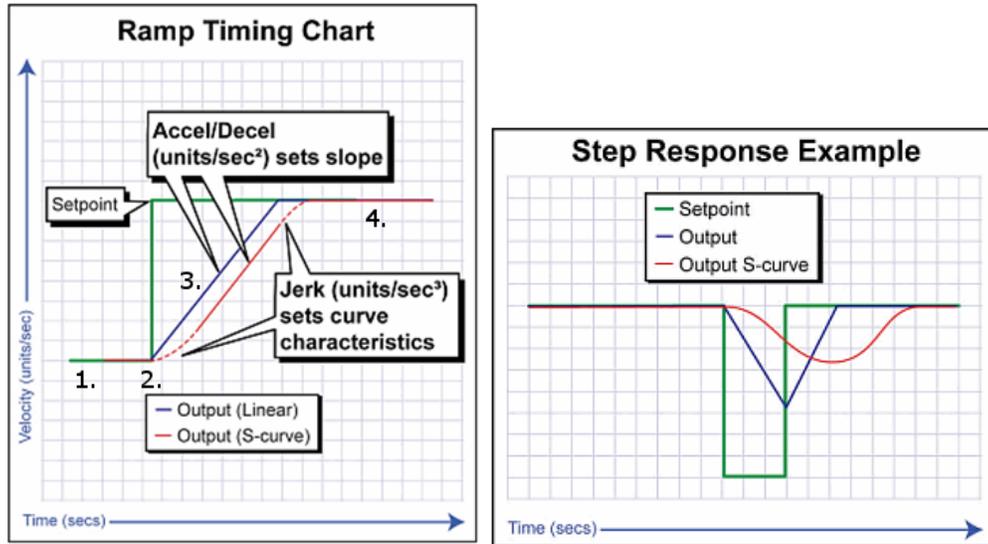
1. Ramp (RMP)

The ramp instruction allows you to gradually increase or decrease an output tag's value to match that of a Setpoint tag. The Accel/Decel tag controls how fast the output's value will change. Previously, with DirectSOFT, a ramp/soak table was available but was meant for use with a PID loop and thus could not be used unless you placed a loop in your project.



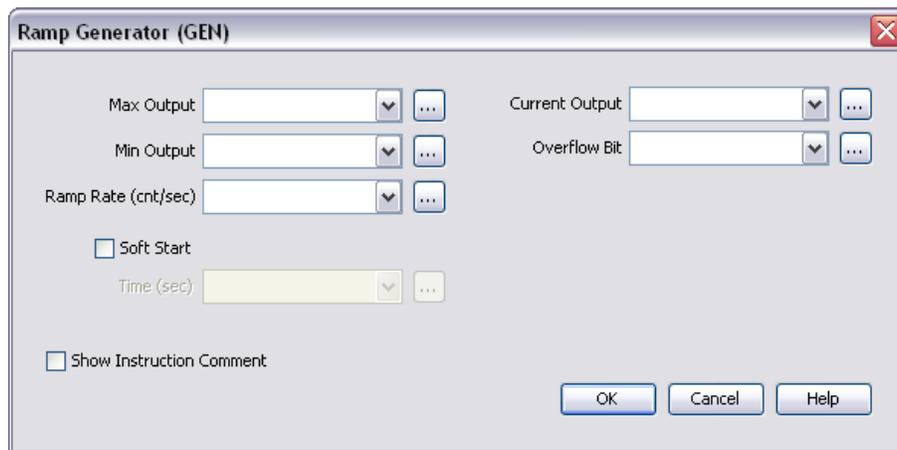
Application Example:

The two charts below demonstrate how the ramp instruction works and what happens when you enable the S-Curve function. The first diagram represents a velocity versus time profile. Every tick on the Time axis is equal to one second and every tick on the Velocity axis represents one unit/sec. At point 1, the Setpoint and Output are equal. At point 2, the user decides he wants the velocity to go up 8 units/sec and the Setpoint increases accordingly. The output starts ramping up here and continues through point 3 with Accel/Decel equal to 1 unit/sec². After 8 seconds the output levels off to equal the Setpoint and continues through 4.

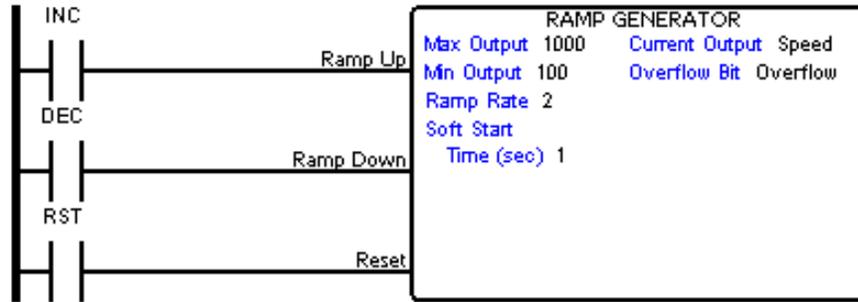


2. Ramp Generator (GEN)

The Ramp Generator instruction is similar to the Ramp instruction but with a few additional features. Instead of defining a Setpoint, the user can increase and decrease the Output at a defined rate called the Ramp Rate. In order to prevent over or under loading the Output the user is required to define an upper and lower limit for that tag. The Soft Start Time functions much like the Jerk setting by slowly increasing the acceleration over a defined period before reaching the desired rate.

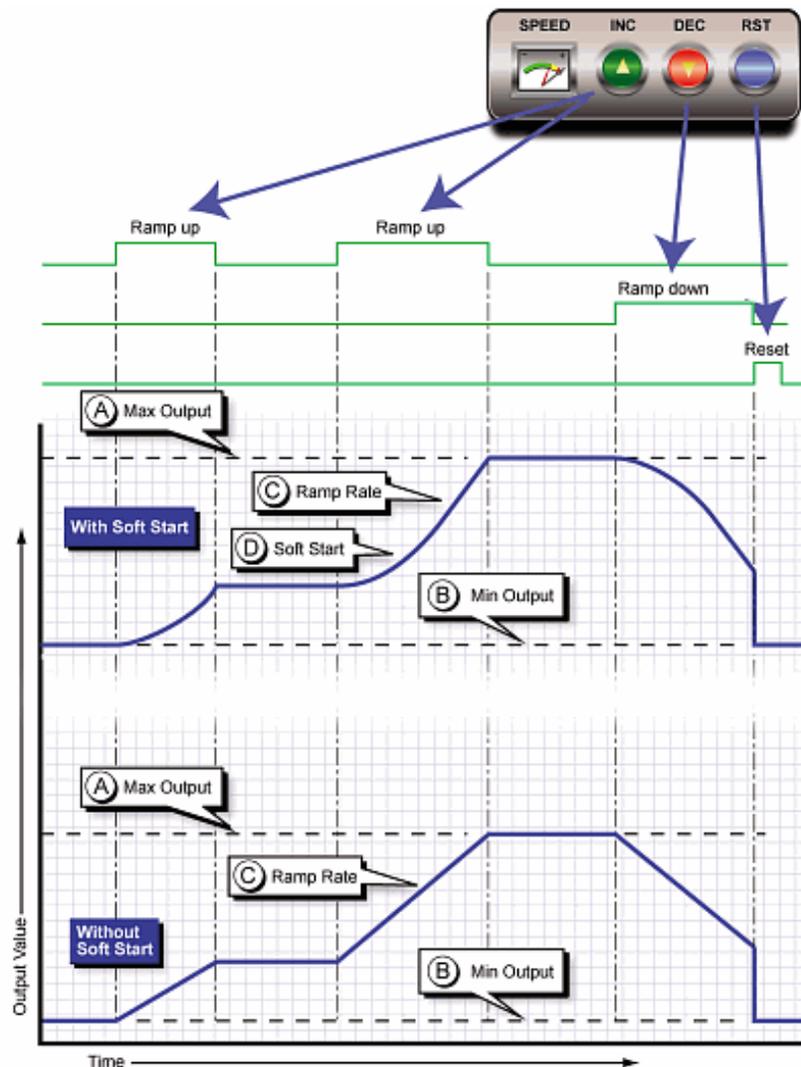


There are two more input rungs for the Ramp Generator instruction compared to the regular Ramp instruction. One will ramp the Output up when closed and the other will ramp the Output downs when closed. The reset input will set the current Output to equal the Min Output.



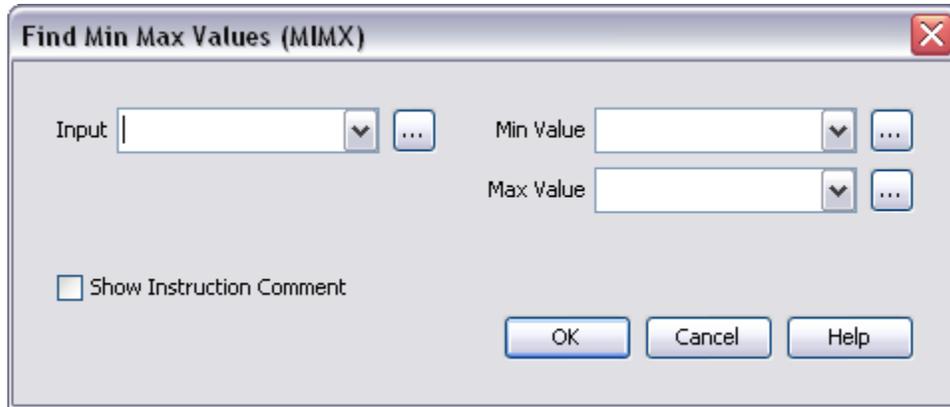
Application Example:

The diagram below shows how the Ramp Up (INC), Ramp Down (DEC), and Reset (RST) inputs affect the Output, represented as Speed here. The top chart shows what would happen if you enabled the Soft Start feature and the bottom one is what would happen without it.



3. Find Min Max Values (MIMX)

If you are interested in recording the extremes of any analog signal, then this box will be very convenient to you. When enabled, the cpu will monitor any non-discrete input and write its minimum and maximum values to their corresponding tags. It will then store those values until a new maximum or minimum is reached. When the box is disabled, the tags will not update. Instead, they will wait until the enable wire is closed. This box does what used to take many rungs of logic in only two thus saving programming time and project memory.



Application Example:

Here, a meter is used to monitor flow rate on the outgoing side of a turbine or pump. The MIMX instruction box will run when the “Flow Min Max Capture” normally open contact is closed. When the “Flow Min Max Reset” contact is closed, the previously stored minimum and maximum values will be disregarded so the box can start polling data for values that may be of a lesser degree.

