TACHTROL 20
Procedure For Scaling Input

BRC 11/24/10

TACHTROL 20 is capable of being scaled for any linear process related to rate. RPM is the most common. The tach requires scaling to define the lowest and highest (endpoints) points on the linear scale. Zero is the default minimum speed; the user must define the maximum. The ratio of input rate (rt-INP) to the desired display rate (rt-dSP) is used to calculate the display value. In order to maximize resolution and accuracy it may be beneficial to identify the high endpoint beyond the actual process speed limit. For example a process with a maximum speed of 500 RPM would benefit from scaling out to 1000 or even 5000 RPM. As long as the relationship is linear, interpolating or extrapolating is acceptable.

Example 1: Scale meter for RPM. The following information is required:

- Maximum application speed = 10 RPM
- Number of teeth on target = 78 PPR

1. Determine maximum speed (in RPM) of process. As mentioned above, multiply the max speed to improve resolution especially if speeds are below 10 RPM. At minimum, multiply by 10 for speeds under 10 RPM and multiply by 100 for speeds below 1.
   Ex: process max RPM = 10. Use 100 or **1000** for calculations

2. Calculate Frequency of sensor signal reading target in Hz (CPS) at maximum RPM.
   Ex: (RPM / seconds in minute) x PPR
   (1000 / 60) x 78 = **1300 CPS**

3. Enter **1000** into the **rt-dSP** value.

4. Enter **1300** into the **rt-INP** value

5. Decimal Position: Add decimal places desired and multiply rt-dSP value by 10 for each decimal place.

Alternate Method for above:

1. RPM scaling is essentially the ratio of 60 to the number of teeth on the target. For the example above: 60/78 = **0.769:1**.

2. Only whole numbers can be entered into the rt-dSP value. Multiply both rt-dSP and rt-INP values by 1000.

3. Enter **769** into the **rt-dSP** value // Enter **1000** into the **rt-INP** value

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As long as the ratio is correct other methods will work: 78/60 = **1.3:1**

4. Multiply rt-INP and rt-dSP by 100 to improve resolution

5. Enter **100** into the **rt-dSP** value // Enter **130** into the **rt-INP** value

Example 2: Scale meter for Surface speed in Inches Per Second (IPS). Use the same procedure for other units of measure. The following information is required:

- Maximum application speed = 10 RPM
- Outside diameter of target = 4.0”
- Number of teeth on target = 78 PPR

1. Determine maximum speed (in RPM) of process. As mentioned above, multiply the max speed to improve resolution especially if speeds are below 10 RPM. At minimum multiply by 10 for speeds under 10 RPM and multiply by 100 for speeds below 1.
   Ex: process max RPM = 10. Use 100 or **1000** for calculations

2. Calculate circumference of target:
   Ex: πD = 3.14 x 4” = 12.57”

3. Calculate surface speed at maximum application RPM (rt-dSP value)
   Ex: (RPM / seconds in minute) x circumference
   (1000 / 60) x 12.57” = **209.4 IPS**

4. Calculate Frequency of sensor signal reading target in Hz (CPS) (rt-INP value)
   Ex: (RPM / seconds in minute) x PPR
   (1000 / 60) x 78 = **1300 CPS**

Note: Only whole numbers can be entered into the rt-dSP value. Multiply both rt-dSP and rt-INP values by 10.

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5. Enter **2094** into the **rt-dSP** value.

6. Enter **13000** into the **rt-INP** value

7. Decimal Position: Add decimal places desired and multiply rt-dSP value by 10 for each decimal place.

Alternate Method for above:

1. Calculate circumference as shown above.

2. Calculate pulses per inch
   Ex: PPR / circumference = 78PPR / 12.57” = **6.2 pulses/inch**

3. Select rt-dSP value from table in manual, page 9:
   a. Rate per second = 1
   b. Rate per minute = 60
   c. Rate per hour = 3600

4. Multiply rt-INP and rt-dSP by 100 to improve resolution

5. Enter **620** into the **rt-INP** value // Enter **100** into the **rt-dSP** value.

Example 3: Scale meter for Frequency (Hz or CPS)

1. Regardless of target and application speed data, frequency is displayed when the display value = the input speed value: rt-dSP = rt-INP (1:1 ratio)

2. Multiply rt-INP and rt-dSP by 100 or 1000 to improve resolution

3. Enter **1000** into the **rt-dSP** value.

4. Enter **1000** into the **rt-INP** value