

# DRO PROS

The Digital Readout Experts

## How to Cut Magnetic Scales

One of the major advantages of magnetic scales is the ability to cut them to exactly the length you need.

This document explains in detail how to shorten magnetic scales. One thing to note, however: If the scale lengths in your kit will work well “as is” then there is no reason to cut them, scales don’t “need” to be cut.

The first step in shortening scales is to prep the scale. Locate the “hash marks” on the stainless steel scale insert:



Using a permanent marker, transcribe these hash marks to the “shoulder” on the same side of the scale. Accuracy is not important, all we’re doing is marking the scale to aid in later scale re-assembly.



The second step in cutting scales is to determine at what point we’re going to make our cut. There are two measurements you need to be concerned with - **Machine Travel** and **Max Length**.

### Machine Travel

This is the maximum travel of your machine, to which we always need to add another 4 inches. This value is the *minimum* or *shortest point* at which you can cut your scale.

**WARNING: Cutting your scale to “Machine Travel + 4 inches” results in the shortest length scale possible. Some situations legitimately require obtaining the shortest length scale possible, but most do not. Be careful to not cut your scale too short!**

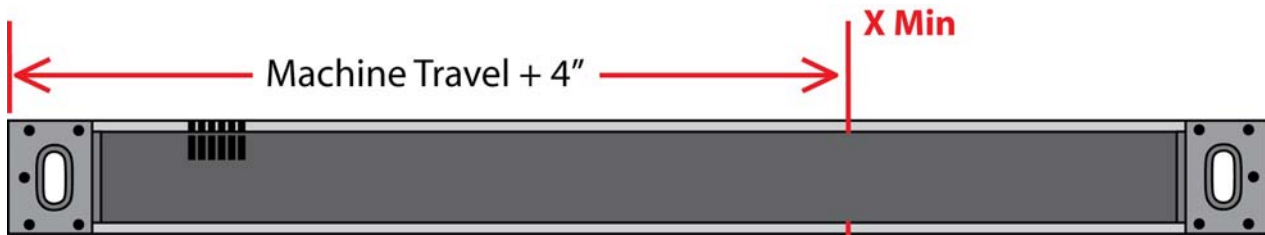
DO NOT RELY on manufacturer spec sheets as they are not always up to date, nor are they always accurate. DRO PROS always recommend to manually measure this value by moving your machine through it’s full range of motion. Power feeds can reduce this travel by several inches.

### Max Length

Cutting a scale using the “Max Length” value results in the longest possible length scale that will still fit on your machine. Most likely, this length would be your longest mounting surface, or the longest length that would conveniently fit within an allotted space. For example, on the cross slide of a lathe, the distance would be the ‘width’ of the cross slide mounting surface. For a lathes’ carriage, it would be the longest scale that would conveniently fit on the back side of the bed, without interfering with the splash guard and/or motor housing. For a milling machine, the length of the table would typically dictate max length.

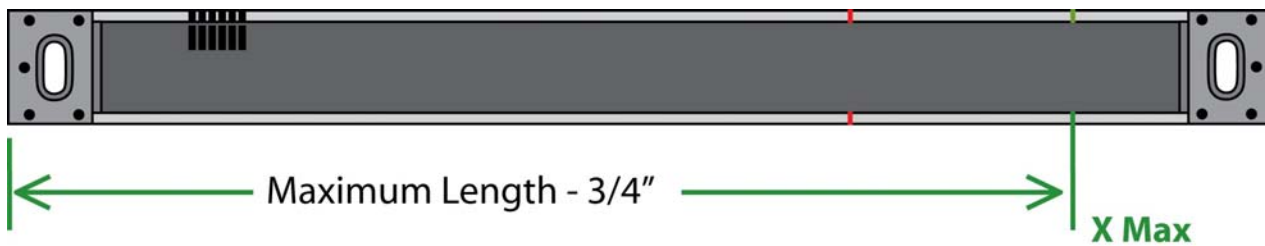
### Marking “Machine Travel”

Remember, this value is the *shortest length* at which you can cut your scale. Mark this point starting from the *hash end* of the scale. Don't bother marking the stainless steel strip as it will soon be removed. Instead, mark the shoulders of the scale as shown below:



### Marking “Max Length”

Mark the “Max Length” value starting from the *hash end* of the scale. As before, don't bother marking the stainless steel strip as it will soon be removed. Mark the shoulders of the scale as shown below in green:



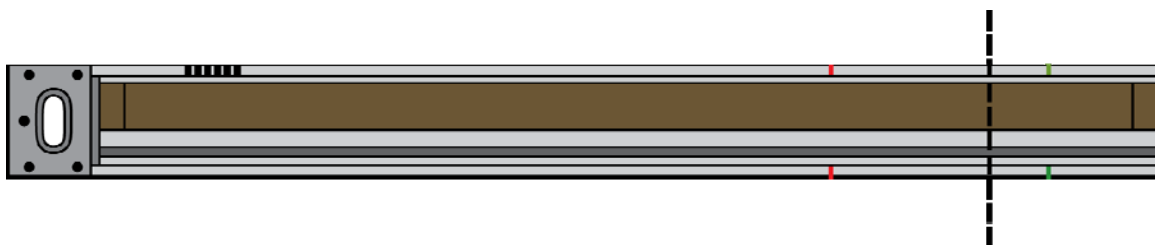
Next, we need to prep the scale. Remove the two 2.5mm cap screws holding the endcap *opposite* from the hash end of the scale:



Slide the stainless steel protective strip out, and this is what remains:



So where do you actually make your cut? Anywhere between the two sets of marks, but we recommend erring towards the green or “Max Length” marks, as a longer scale makes mounting the readhead easier:



**WARNING - While there are many different ways to cut a scale, we've found that a high quality diamond blade in a good, solid chop saw works best. Your individual abilities and shop equipment may dictate a different method. Regardless of your method, be safe, measure twice, and always wear eye protection!**

The scale after the cut:



**OPTIONAL:** You may notice 2 separate ~ 3/8" long magnetic strips on either ends of the magnetic strip. These are "shedding strips". These special non-magnetized strips allow the readhead to "shed" any debris it may have accumulated as the readhead reaches the end of the scale. In our experience, the usefulness of the shedding strips are questionable. IF you want a "shedding strip" on both ends of the scale, remove the 3/8" shedding strip from the "old" end of the scale, trim back the "new" end of the magnetic strip the same distance, and secure the shedding strip in place.

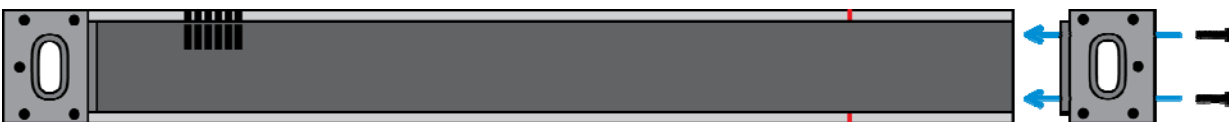
Next, slide the stainless steel strip into the scale while aligning the "hash marks" made earlier. Mark the strip where it needs to be cut:



Slide it out, trim it, and slide it back in:



Next, fasten the endcap back to the end of the scale. Note the endcap cap screw hole is a groove that runs the entire length of the scale. In other words, you don't have to drill a hole for the cap screws (It's already there):



And congratulations – you've now created a custom length magnetic scale!

