

How to Select the Right Digital Readout



One of the decisions facing machine-shop owners when buying a machine or trying to increase productivity of existing machines is deciding which accessories to add. Accessories include power feeds, quick-change tool holders, draw bars, CNCs, and digital readouts—commonly known by their acronym, DROs. Selecting a CNC is best achieved with a visit from a sales person. Selecting the other accessories is not too difficult; however, some feel selecting the right DRO for their machine can be a headache. This does not have to be the case. With a few guidelines, purchasing a DRO can be as simple as ordering lunch at your favorite restaurant.

Once you've decided to purchase a DRO, where do you start? A good place to begin is with your application.

What features do you desire? Today's DROs are made for both general and specific applications. I group DROs into three categories:

- 1.) Basic, or general
- 2.) Machine application
- 3.) Programmable

Keep Your Eye on Travel

Determining the travels of your machine is the most

important area to address. Many machines come with a specification sheet that lists the travel of each axis. However, because brands may vary and models change, it is highly recommended that you measure the actual travel. To achieve this goal, follow these steps:

1.) Travel the moving surface all the way to one end until it stops.

2.) With a marking pencil or marker, draw a line across the table and the saddle (stationary surface).

3.) Traverse the table until it stops at the other end.

4.) Use a tape measure, to note the difference between the mark on the moving surface and the mark on the stationary surface. This is your "travel".



Sony Precision programmable digital read out with lathe package attached. (Photo courtesy of Antarra Communications.)



Anilam Digital Readout Systems. (Photo courtesy Acu-Rite Companies Inc., Jamestown, NY.)

You must, however, take into consideration anything that can change the table travel, such as:

- A power feed on a vertical knee mill could be restricting the travel by as much as four inches.
- Movable stops on the machine should be secured.
- Compensating for the gap in Gap-bed lathes should be addressed.
- A machine with no stops should be modified when possible.

Selection Guide

Each manufacturer may vary in what features they include on each model. Here's a guide:

Basic units have a reset button along with inch/mm, diameter/radius, fine/course, and machine or table error compensation. Some units feature a numerical preset keypad. The basic unit is for the operator who is looking for the least expensive model and who only wants to set his DRO to zero and move to the desired dimension.

Machine application units include all of the basic DRO features in addition to machine-specific features. For example, a mill application DRO usually includes bolt circle programmability; conversely, a lathe DRO usually includes programmable tool offsets. This unit is for the operator that needs a few strategic features without the complexity of programming to do job work. In addition, features may also include datum point setting, center finder, polar/Cartesian conversion, and touch probe/edge finder input.

Programmable units have all of the features of the lesser units with the addition of entering blocks of data (similar to a CNC) that would be run later. Some models also have a teach mode. That is, the operator can store the move as the part is machined. The difference is that your hands provide the automation (turning the dials). Some manufacturers offer a CRT (Cathode Ray Tube) in place of a DRO. This unit is for the operator looking for production efficiency but does not have access to a CNC. In addition to the features of the lesser units, RS232 input, job clock, and many more features are available.

Failure to adjust for these and other variables could result in "over travel" and cause damage to the scales.

Also, do not confuse table size with travel size. For example, a 9 x 42 table mill on average has 13" and 30" of travel. If you are replacing an existing DRO, keep in mind that the existing scales' overall length is not the travel of the scale. For example, one brand scale with an overall length of 34" will have a 30" travel length. Ordering the incorrect size scales is the most common mistake made by purchasers.

DRO manufacturers have taken most of the guesswork out of obtaining the correct travel, resolution, and mounting brackets by creating "packages." Most mill DROs are packaged with .0002"/5uM or .0005"/10uM resolution scales. Conversely, most lathe DROs are packaged with .0002"/5uM on the cross slide and .0005" on the bed travel. If you do not see your machine travel or resolution in a package, then call the distributor. Chances are they may be willing to substitute for a nominal charge. Generally, mounting brackets are universal and will adapt to most standard machine types with little or no modification. For other applications, additional universal brackets may be available or fabricated by the installer with just a little engineering.

Which Brand?

Like cars, every DRO manufacturer will tell you why theirs is the superior brand. My recommendation is to ask your salesperson what each provides by way of pricing, features, warranty, and customer support. If you plan to buy a used DRO, especially from Internet auction sites, then remember the old adage—Buyer Beware—and keep the following in mind:

- 1.) Make sure your prospective purchase is the correct size.
- 2.) Ask yourself, is it the right unit for your application (you wouldn't put a lathe unit on a mill).
- 3.) Check with the manufacturer if the unit is obsolete, serviceable, and if parts are still available.
- 4.) If it is missing a display, scales, or needs service, then check for pricing on replacement parts or what a repair would run before you buy it. What often occurs after buying a used DRO at a bargain price, is one of the components fail. After paying for replacement parts and service, as much could've been spent on purchasing a new unit. And what would you have left? You will have a used unit, with no warranty, and a small hope that you'll make your money back on it.

Where to Buy?

Now that you have all your information and have decided on a brand, where do you buy? Catalog houses are a good place for bargain hunters when ordering standard packages. However, be sure that you know exactly what you are ordering to avoid what could be a costly return; order takers are not experts. Original equipment manufacturers (OEMs) usually stock a good number of one or two brands. Because of the volume of merchandise handled with a particular DRO manufacturer, they usually offer these with their machines at a bargain price designed to help sell the machine. They can usually accommodate a request for another brand at a fair price. Machine service companies and DRO "niche" specialists offer sales and installation, and generally have the expertise to answer pre-purchase questions and provide after-purchase support.

With correct installation, you should get years of performance from your DRO. Industry surveys have shown an average of 30% productivity increase with the aid of DROs. This means a quick payback time on your purchase and a long-term cost savings. **st**

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