DRO PROS
The Digital Readout Experts

How to Choose a Digital Readout System

Buying a Digital Readout (DRO) can be a difficult experience. Usually, the first decision is whether or not to buy one in the first place. Frustrating the process is the fact that a decent DRO system may cost as much or sometimes even more than the machine you're putting it on! Of course, anyone who's ever used a DRO knows what a time and money saving device it can be, but for those who've never used a DRO before, the process of getting to the "okay I'm going to buy one, but now which one do I choose" point may take a while. This article is written for those who've decided to buy a DRO, but who may appreciate getting some "inside" advice on which DRO to buy.

Keep in mind we've written this article to reflect, in order, what we consider to be the most important points to consider when purchasing a DRO system for the first time. As always, you're particular situation may vary. Your personal experience may dictate a different arrangement of priorities than we present here. Regardless of your past experience, though, the following priorities are worth considering for anyone contemplating the purchase of a DRO.

#1 Priority - Ease of use – We consider this to be the most important qualification. Most all brands of digital readouts, in the end, perform the same functions. Any decent DRO can perform, in one way or another, bolt hole circles, line hole, power out memory etc. The difference is **how** they perform these functions. In general, there are two methods manufacturers incorporate these functions into their readouts – the first (and most common) method is to use a "menu system". The second method is the "dedicated button" or "hard key" system. Let's take a look at the advantages and disadvantages of each:

The Menu System. The readout functions are "buried" in a menu system that must be accessed in order to perform a function. Outwardly, the display looks simple and easy to use, as less buttons, or keys, populate the front of the readout. From a manufacturing standpoint, the displays are cheaper and easier to produce. The smaller overall width means less material is required to cast the display. Additionally, a smaller front keypad means less buttons or components are required for manufacture. Although the display may initially appear 'cleaner' or 'sleeker', it is typically **not** easier to operate this type of display. In order to access a desired function, the operator must "drill down" into a menu system to find the desired function. Menu driven systems often require the operator to memorize keystrokes or "shortcuts" to access key functions. This type of design is definitely not a "walk up and operate" type of system, and must be studied prior to using. Many operators find this type of system extremely frustrating as they must constantly refer back to the manual for locating functions instead of machining.

The Dedicated Button System. This design philosophy uses a dedicated key or button to run each function. The display is populated with buttons, and hence is typically physically larger in size. Each function has it's own dedicated button, which necessitates a larger keypad design. Consequently, manufacturing costs are much higher for this type of display. For the operator, however, the dedicated button system is much easier to use, as each function has it's own dedicated key or button. Want to compute a Bolt Hole Circle? Just push the button with a

Bolt Hole Circle design on the front of it. Unlike the “menu system” design, there are no hidden menus or complicated shortcut keys to memorize. While this design is more expensive to manufacture, by far it is easier to use, and is truly a “walk up and operate” type of system.

Think **AFTER** the sale — Every time you turn on the DRO, is it easy to use, or will you need to go back to the manual? Remember – “menu systems” are COMPLICATED. How many times do you want to refer to the manual in the middle of a job?

#2 Priority - Price –Ten years ago, digital readout systems were expensive. As we all know, times have changed, and today you simply don’t have to allocate the same amount of money to get a quality digital readout.

The “Legacy” Manufacturers - The legacy digital readout manufacturers (Fagor, Acu-Rite, Anilam, Heidenhein etc.) carry great quality digital readouts, but they also still charge legacy prices, not only for their kits, but ***especially*** for parts.

The El Cheapo ebay Special - On the other extreme, there are overseas ebay vendors that will sell you a bargain basement digital readout for a fraction of what the legacy manufacturers charge. But as expected, tech support, parts and meaningful warranties are non-existent.

DRO PROS – With DRO PROS, you get the best of both worlds. You get a professional, quality built DRO at a reduced price. You get a 3 year, comprehensive warranty. You get excellent customer service and superb tech support.

So what ***don’t*** you get with DRO PROS? You ***don’t*** get black and white, translated “all in one” manuals. Instead, you get full color, machine specific, english authored Operator ***and*** Installation manuals.

And while we’re talking price, don’t forget the price of parts. DRO PROS part prices are a ***fraction*** of what the legacy companies charge. Consider a replacement scale for the longitudinal (X axis) of a Bridgeport 9x42 mill, the most popular kit we sell. While this scale can cost well over $800 at the “other guys”, our 800mm (32”) scale is only $197, out the door, with an included 3 year warranty. Remember - don’t paint yourself into a corner – ***Go DRO PROS!***

#3 All The Other Priorities

Machine specific vs “All-in-One” readouts – The easiest readout to use is designed to work specifically for the machine it’s mounted on. DRO PROS readouts are machine specific, meaning our milling machine readout is different from our lathe readout, which is different from our grinder readout, etc. Sure, it costs a little more to manufacture machine specific readouts, but we think our customers are worth it!

Warranty – The only meaningful warranty is a written warranty honored by the same company that sold you the digital readout. Other companies warranties cover as few as 30 days, require you to send parts back overseas to the ‘manufacturer’, and don’t specify what is or is not covered (ie unwritten). DRO PROS 3 year warranty is written, and everything is serviced by us. Check out our warranty – we’re proud of it! It’s at the bottom of every page of our website.

Resolution – Some manufacturers best resolution is only 10 microns! (.0005”). Keep in mind, .0005” resolution turns into only .001” resolution when used on a lathes cross slide in diameter mode. DRO PROS offers both 5 micron (.0002”) and 1 micron (.00005”) scales – that’s 10 times better resolution!

Scale type – There are currently four methods used to determine scale position. Inductive, magnetic, rack & pinion, and optical.

Inductive/Magnetic - Newall only offers inductive and magnetic scales. Inductive scales are essentially a tube filled with balls, that’s mounted much like a towel rack, spaced away from the machine. They’re expensive, bulky to mount, and did we mention, expensive?

Rack and Pinion – "Shooting Star" in Canada sells these. This is an older technology, and the best resolution is only 10 microns (.0005"). No capability of Linear Error Compensation, or "power out memory". Ten years ago, this was a great alternative to higher priced, optical scales. But since then, optical scale prices have fallen, and the price advantage of buying a rack & pinion system no longer exists. Interestingly enough, the rack and pinion design suffers from backlash, which is precisely what a digital readout system is supposed to remove…

Optical – Glass scales are considered to be "the industry standard". A glass scale consists of a thick etched glass strip, cemented into an enclosed aluminum housing. One side of the housing has a slit running the length of the scale, which is protected by four neoprene seals, which effectively act like a double zip-loc type seal to protect the scale from contaminates. Contrary to what magnetic scale manufacturers may promote, glass scales are not susceptible to contamination when mounted properly. The compact size and ease of mounting make glass scales the most popular choice of consumers. DRO PROS, Fagor, Mitutoyo, Acu-Rite, Anilam, Jenix, Heidenhain all manufacture glass scales.

Scale size – DRO PROS carries 58 different length scales to perfectly fit your machine. And when the thickness of the scale matters (like when mounting a scale on a lathes cross slide), we automatically include SlimLine scales at no extra charge!

Armored cables – Some companies scales do not include armored cables. DRO PROS does.

Build Quality / Construction – All DRO PROS displays are protected by a cast, rugged aluminum housing. The ebay "El Cheapos" are notorius for using plastic casings.

Accuracy – All DRO PROS displays have Non-Linear and Linear Error Compensation. This is a feature used to compensate for temperature and other inherent "flaws" present in any measuring system. DRO PROS has it. Many of our competitors don't.

Power Supply – Internal vs External - DRO PROS power supplies are integrated inside the cabinet, where they're protected and can't be damaged or lost.

Readability / Viewing angle – DRO PROS LED segments allow a full 180 degrees offset viewing angle.

Functions – All DRO PROS display functions are "dedicated button" style – not "menu system".

Warranty – All warranties are not equal. If it's not written, then it essentially doesn't exist. We're proud of our warranty. 3 Years. It's proudly displayed at the bottom of every web-page!

Customer Support – At DRO PROS, we're here to help! We help before the sale with choosing the proper scale sizes. We help during installation with advice on where and how to mount, and it doesn't stop there! Maybe it's two years after the sale and you decided to figure out how to perform an ARC radius cut? No problem – call us up and we'll walk you through it! Try that with the "other guys".

Parts – No-one beats our part prices, period.

Inventory – Our inventory of parts is the highest in the industry, but our part prices are the lowest!

Shipping – Because we're on the West Coast, most of our kits ship the same day! All stateside kits are shipped FedEx with a tracking number. We also insure all of our shipments – and of course, we do this at no extra cost to you.

Manuals – Full color, and written in english, by us. Not black and white, and not translated like the "other guys" manuals.

Training – DRO PROS Mill kits include a free DVD.

Cheat Sheet – Included for free with every DRO PROS kit we sell!

Well that pretty much sums it up. Hopefully we've answered more questions than we've raised! Probably the best advice we can give you, is to take your time, carefully evaluate both the company you're buying from, and identify which of the above priorities matter to you, and then just go for it! By employing the above criteria, buying a Digital Readout (DRO) should be a whole lot easier!

Best of luck, but most of all, enjoy your new DRO kit!

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