Digital Readouts

Overview

DR 400 *series*

The DR 400 series of operator consoles is the latest addition to our family of Digital Readouts. This series brings an intuitive graphical interface and a modern ergonomic design. To further improve and enhance user experience, the DR 400 series also includes the following key features:

- 7" color LCD display with wide viewing angles and daylight brightness
- Real-time graphics display of bolt circles, inclines, radii, etc
- Probing functions for edge, centerline, and circle center.
- Electronic touch probe support.
- Stores up to 99 datum points and 99 tools
- Splash-resistant IP54 front panel with soft touch tactile keypad
- 3 axis position readout with a 4th axis coupling mode (DR 403)
- 4 axis position readout (DR 404)
- User configurable inputs for the foot pedal and external pulse
- RS232 data interface
- USB software upgrade

DR 300 *series*

DR300 consoles are a popular choice for their simplicity and the time-tested reliability of 7 segment LED display. DR 300 features:

- Auxiliary LCD display provides interactive prompts for enhanced user experience
- Stores up to 200 datum points and 99 tools
- Bolt Circle, Hole Array, Incline and Radius machining in any plane
- 3 axis position readout
- USB software update

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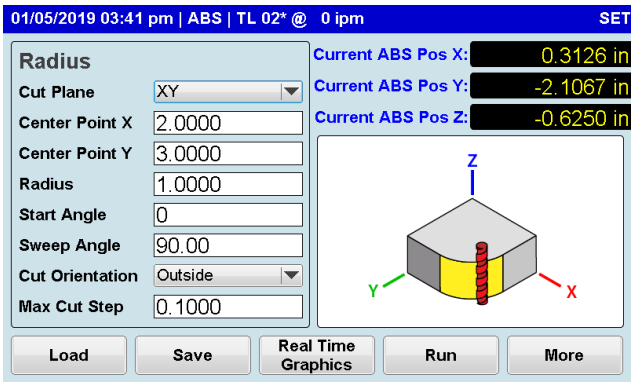
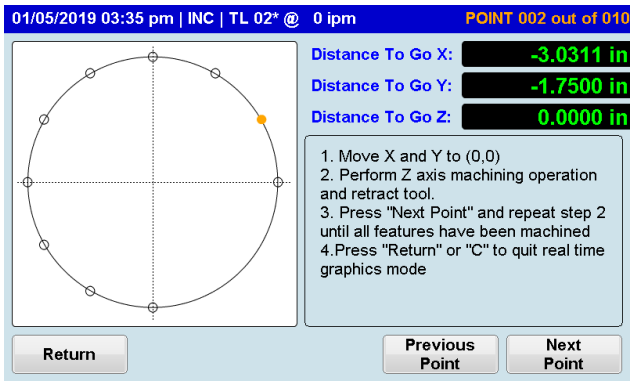
Featured Functions

Hole Patterns

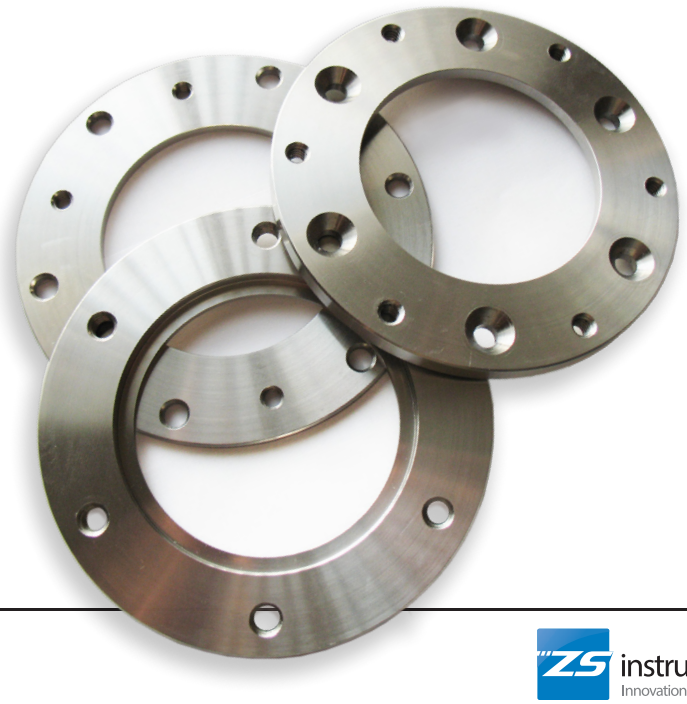
One of the most popular functions of our Digital Readouts is automatic bolt hole pattern calculation. With its help, bolt hole arrays—both full circles and circle segments—as well as linear hole patterns at any angle can be machined easily.

By entering the geometric dimensions and the number of holes to be cut, coordinates for each hole in the working plane are calculated and displayed, one at a time. Machining can be done with the following simple steps. Traverse to "zero," then drill. Then, move to the next point, and so on. You can return to any previously drilled hole at any time to perform chamfering, tapping, counter boring, etc.





The graphic display of the DR400 series is particularly useful for verifying programmed bolt-hole pattern inputs before machining. Moreover, the DR400's real-time graphics eliminate guesswork by displaying the exact drawing of the feature you are machining.



Probing

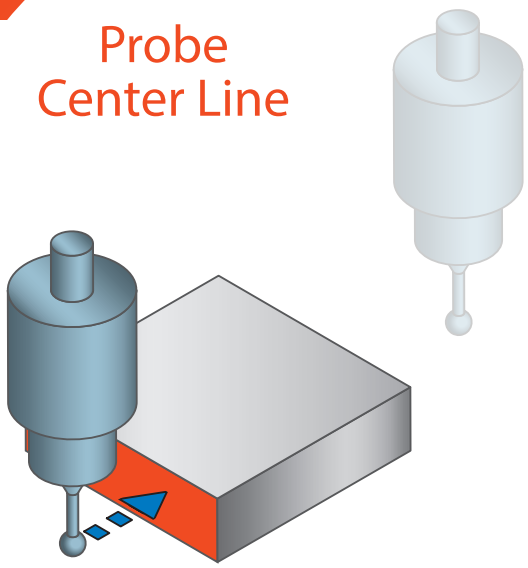
The probing function can be used for efficient and accurate locating of workpiece features and establishing datum points for future reference.

In order to achieve greater accuracy and to avoid marking the part, we recommend using an electronic touch probe. However, the manual edge finder can also perform probing with great success. Similar to tool diameter compensation, probe radius and direction of approach are automatically accounted for by the DRO.

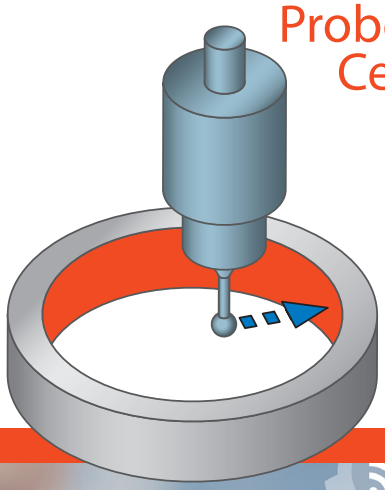
The DRO supports the following probing types:

- **Edge-** determine the location of an edge along one axis
- **Centerline**- by locating two edges, the position of a mid-line between the two can be determined
- **Circle Center**- determine the XY coordinates of a circle center point

Probe Center Line



Probe Circle Center



Connectivity and Data Interface

You can easily integrate our DR400 series consoles with your automated equipment by transmitting position readings via the RS232 interface.

Output of the current position data can be initiated remotely by the foot pedal/hand pendant, external pulse signal, or automatically upon completing of each probing operation with an electronic touch probe.

Additionally, both the foot pedal/hand pendant and external pulse inputs can be configured to set any axis to zero remotely.

Built-in USB firmware upgrade capability ensures that the most recently updated functions are available, allowing protection and future-proofing of your investment.

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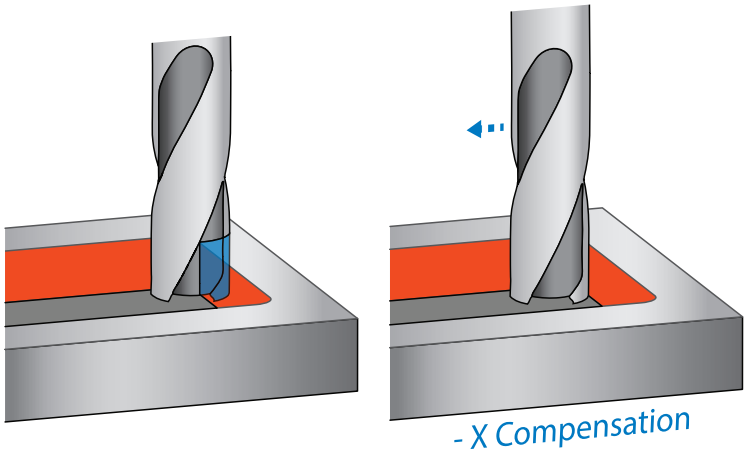
Digital Readouts

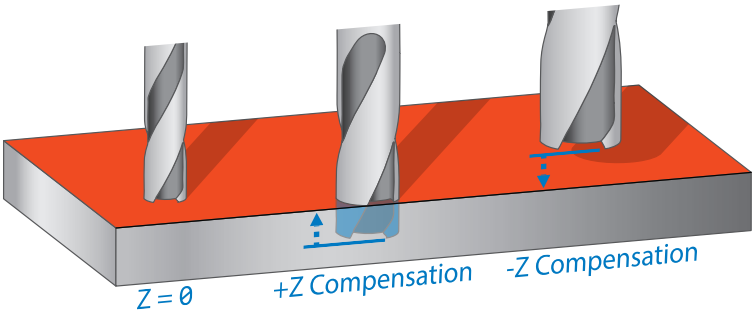
Tool Compensation

Our Digital Readouts have the capability to store up to 99 unique tool configurations, allowing for fast and efficient tool changes in both mill and lathe modes of operation.

Milling Tool Diameter Compensation (X, Y) automatically compensates for tool radii in X and Y directions. When enabled, the digital readout offsets its displayed position by ½ the tool diameter from its actual position. By inputting the tool's current orientation relative to the part (top, bottom, left, right, or no compensation), the offset is automatically applied in the correct axis and direction.



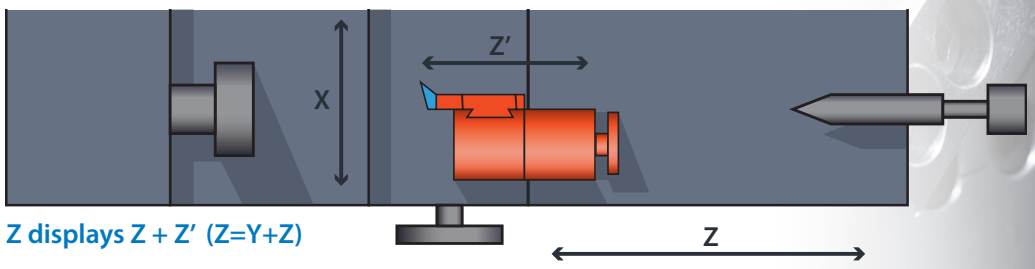
Milling Tool Height Compensation (Z) applies a preset Z offset corresponding to the selected tool number. This allows accurate, consistent cut depths and reduced setup time when switching between tools of different lengths.



Lathe Tool Offsets function improves productivity and eliminates the need to re-zero tools after every tool change if used together with a quick-change or indexable tool post. Simply index the cutter and choose a corresponding tool number from the tool table, and a previously defined offset will automatically apply. ZS Instruments Digital Readouts can store up to 99 lathe tool configurations, each with its own unique X and Z offset.

Lathe Axis Summing

The lathe compound axis (Z') is often aligned with either the longitudinal (Z) or radial (X) axis. To simplify tracking the exact tool position, the DRO provides an axis summing function which automatically adds the compound movement to either X or Z axis and displays the result in either axis position display window.

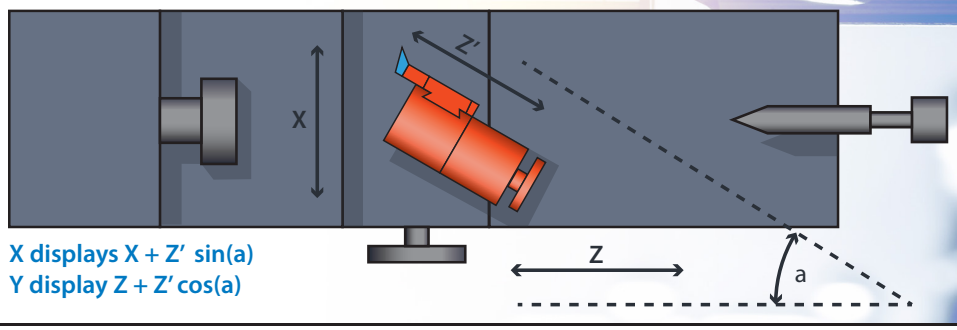


Z displays Z + Z' (Z=Y+Z)

Lathe Axis Vectoring

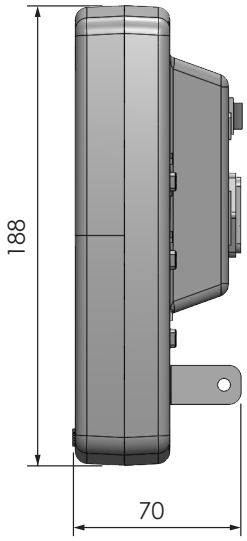
If the compound is not aligned with one of the other two axes and is set at a known angle, vectoring function will split the movement of the compound into its axial components and add them to the X and Z axes.

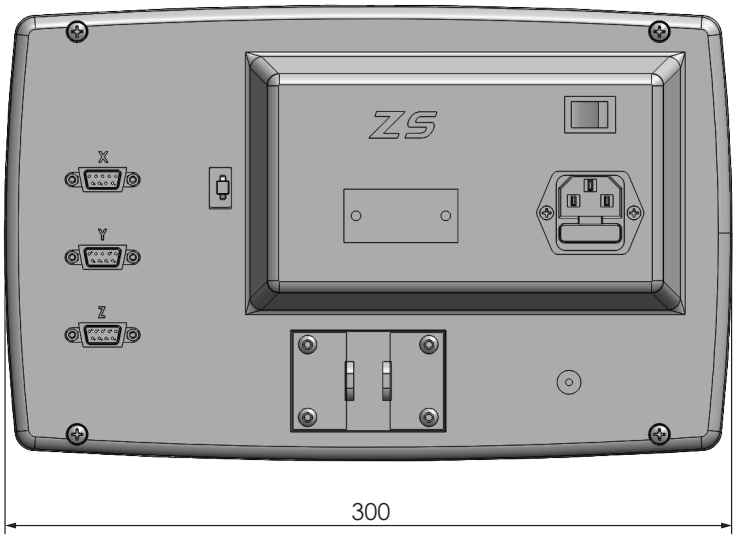
This function allows to track a true position of the tool in relation to the workpiece while performing operations such as thread cutting and taper machining.



X displays X + Z' sin(a)
Y display Z + Z' cos(a)

DR 300





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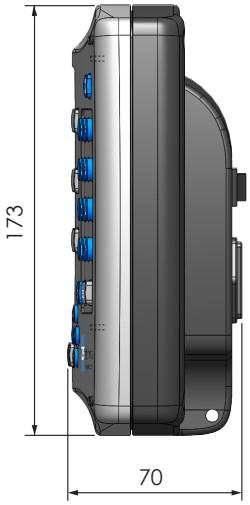

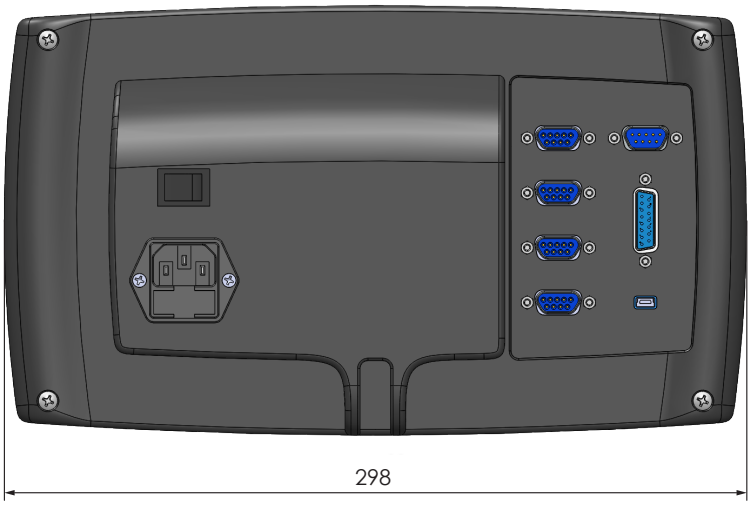

DR 300 & DR400 *series*

	DR 300	DR403	DR 404
Number of Axes	3	3	4
Number of Encoder Inputs	3	4	4
Display Type	7 segment LED	7" Wide Screen Color LCD	
Supported Machines	Universal with user selectable Mill or Lathe set of functions		
Standard Functions	ABS/INC Coordinates; Imperial/Metric units; Sub Datum; Tool Library; Feed Rate Display; Sleep Mode; Zero Reference Restore; USB upgrade		
# of Supported Sub Datums	200	99	99
# of supported Tools	99	99	99
Mill Functions	Directional Tool Compensation; Centerline; Bolt Circle; Bolt Array; Radius Milling; Incline Milling		
Lathe Functions	Tool Offsets; Radius/Diameter Mode with quick toggle button; Summing; Vectoring; Taper Measurement		
Supported Reference Marks	Single; Periodic; Smart (Distance Coded)		
Probing	N/A	Edge; Centerline; Circle Center	
Touch Probe Support	NO	YES	YES
Real Time Clock & Calendar	NO	YES	YES
RS232 Data Output	NO	YES	YES
AC Power Supply Voltage	100-240 VAC 50-60Hz 0.35A max	100-240 VAC 50-60Hz 0.5A max	
Encoder Inputs	Meet or exceed TIA/EIA-422-B and ITU Recommendation V.11		
Internal Encoder Supply	5VDC ±5%		
Max. Encoder Supply Current	75 mA per axis	250 mA per axis	
Max. Encoder input Frequency	5.0 MHz	6.0 MHz	
Environmental protection	IP40	IP54 Front & Sides, IP40 Rear	
Operating temperature range	0°C…+45°C		
Storage temperature range	-40°C…+85°C		
Humidity	Max 90% (non-condensing)		
Housing Material	Aluminum		
Housing Dimensions	300 x188 x 70 mm	298 x 173 x 70 mm	
Weight (without arm)	1.8 kg	2.4 kg	