DigiSpooler
Showmark Precision
Fiber Optic and Fine Wire ReSpoolers

Precision and Flexibility for all of your spooling needs
The DigiSpooler is a precision respooler designed for fiber optic wire and other fine wires and filaments. It can also double as a high-speed general purpose respooler. The moving takeup design produces neat and even layers of filament onto a spool or mandrel for many precision winding applications. Several options are offered, and its programmable controller and touchscreen interface allow it to be custom configured for just about any winding application where a precise tabletop system is required.

A Simple Solution
The DigiSpooler is an easy-to-use tabletop system. The control panel provides intuitive adjustments for all winding parameters. Tension is set electronically (on closed-loop constant tension versions) or by adjusting a dial on a hysteresis brake (open-loop versions). Almost any size supply and take-up spools can be mounted in seconds with the Universal Hub System. No tools are required for most operations.

A Precise Solution
The DigiSpooler employs a moving takeup design. This assures that the wire travels in a straight path onto the takeup spool. The result is less twisting of the wire, more control over the winding process, and neater rows and layers onto the spool. It also produces less stress and side loading when winding delicate materials. The traversing system that carries the takeup spool has a positional repeatability of +/- 3 microns.

The DigiSpooler uses servomotors on the takeup and traverse axes. This system produces smooth starts and precise stops to within 5mm of a desired length. A servomotor based closed-loop tension control system with a variety of tension ranges is also available.

Extremely low friction guide wheels with a 35mm bend radius direct the wire through the machine. No pinch rollers or belts are used.
A Smart Solution
The DigiSpooler features a touchscreen interface for easy setup and operation. Adjustments are provided for winding speed, winding pitch, spool width, total length, and other parameters. Controls are also provided for manually jogging each axis on the machine. Custom screens and functions are available.

![Touchscreen Interface](image)

Custom Configuration
The DigiSpooler can be configured with many combinations of motion control, tension control, and other options. Use the following information and accompanying Model Number Configuration Chart to specify a system that meets your exact needs.

Takeup Travel – The takeup spool on the DigiSpooler is carried by a precision actuator. The actuator has positional repeatability of +/- 3µm and is driven by a servomotor. Its function is to traverse back and forth according to the pitch (fiber spacing) and spool width settings input into the touchscreen interface. The length of travel of the actuator should at least be equal to the widest spool that will be wound. Standard traverse lengths are available from 50 – 300mm.

Payoff Travel – For many applications, the payoff spool does not need to move. In these cases the DigiSpooler can be configured without an actuator on the payoff side. In some cases, it is desirable to always keep the payoff point of the fiber from the supply spool aligned with the guide wheels on the machine. This provides the least amount of stress and side loading on the material. It can also result in better winds because less twist is induced in the wire. An actuator that is similar to the one used on the takeup side can be incorporated on the payoff side. This adds an additional servomotor to the machine. Standard traverse lengths are available from 0 – 300mm.

Tension Control – The DigiSpooler is offered with three choices for tension control. For basic needs, a manually adjusted magnetic brake is offered. It provides open-loop control with a typical tension range of 25-300 grams. In addition, two options are available for closed-loop tension control. One uses an electronic hysteresis brake coupled to the payoff shaft in conjunction with a sensor that measures the diameter of the payoff spool. The most accurate option uses a servomotor on the payoff in conjunction with an adjustable dancer arm.

Controls for the hysteresis brake based Closed-Loop Tension Control System

Any Spool – The DigiSpooler can be configured to fit many spool sizes. Several shaft sizes are available for the payoff and takeup. In addition, a shaftless chuck system is available for holding unusual spools or mandrels. Flange diameters up to 400mm can be accommodated. Custom shafts can be provided to meet special needs.

No tools or adapters are required to mount most spools onto standard available shaft sizes. A matching Universal Hub System is provided with each shaft size. The hub adapts to a wide range of spool bore sizes that might be used with the specific shaft size.

Add the Options You Need – Options are available for tailoring the DigiSpooler to your exact needs.

Wire Clamps – A pair of manually operated clamps can be positioned in the path of the wire to facilitate cutting and to increase production. While spooling, the clamps do not interfere with the motion of the wire. They can be lowered before a cut is made so that both ends of the wire are held in place after the cut is complete. This is especially helpful to users making wire coils that must be removed from a winding mandrel or collapsible spool. It allows the operator to maintain control of both ends of the wire so that the coil can be processed and removed. The new end can be quickly secured to the mandrel for the next coil to be made.
**Wire Break Detection** – A sensor monitors the presence of wire or fiber running through the machine. If the wire breaks or if the payoff spool runs out of material, the machine will automatically stop.

**Chuck Option** – This is a precision chuck similar to ones found on milling machines. The chuck provides flexibility for mounting a variety of spool types on the take-up of the DigiSpooler. Standard sized spools can be mounted with the included 10mm diameter stub shaft. Also, very small shafts can be mounted in the chuck for creating small diameter coils.

**Double Wide Payoff** – Some manufacturers provide their material on what are sometimes referred to as “Double Wide Spools.” A longer payoff shaft is required to accommodate these spools. In addition, the length of the machine is increased to ensure that the material is not damaged as it comes off the far edges of the wider payoff spool. The machine does not need to be made longer if a traversing unit is ordered on the payoff side.

**Safety Enclosure (CE Mark Preparation)** – The DigiSpooler can be equipped to meet CE Mark standards for shipment to countries in the European Union.

A safety enclosure with a sturdy aluminum frame and clear Plexiglas panels is added to the machine. The enclosure is hinged and includes gas struts for lifting assistance and holding it in the up position. The enclosure allows full access to the machine controls in the open and closed position. An electronic safety interlock switch is coupled to the enclosure. The machine will not operate with the enclosure in the open position. Additional electronics are added to meet CE safety, electrical noise, and electrical immunity requirements.

**Reversed Operation** – The standard DigiSpooler is setup to operate in a right-to-left orientation. The payoff spool is mounted on the right side of the machine and the wire travels to the take-up spool on the left side of the machine. The orientation can be reversed for operations requiring a left-to-right flow of material.

**Easy Customization** – The design of the DigiSpooler is easily adjusted to meet special needs. Let us know if you do not see a feature that you require. Following are some examples of what can be done to meet special requirements.

**Incorporate your process or sensor** – The DigiSpooler can be modified to accommodate an application specific process such as coating or marking systems or an inspection sensor. This is done by adding a “Workstretch” into the center of the machine. The Workstretch can be any length. The wire travels in a straight and level path through the Workstretch. Showmark can mount your equipment and even integrate your process with the motion controller of the DigiSpooler.

**Other possibilities** – Other customizations that have been employed include:
- Smaller or larger shafts to accommodate very small or heavy spools.
- Shorter or longer traversing stroke.
- Sheaves can be made larger or smaller to meet special bend radius needs. They can also be made from selected materials such as plastic or UHMW.

*A wire defect detector integrated into the Workstretch*
**Accessorize** – The following accessories are available to further customize the DigiSpooler for your unique application.

**Custom spools and mandrels** – Do you require a non-standard spool for your application? Showmark can design and manufacture a spool or winding mandrel for your exact needs. Whether you require custom materials, a special size, or a collapsible design, contact Showmark for assistance.

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**DigiSpooler Model Number Configuration Chart:**

<table>
<thead>
<tr>
<th>TAKEUP TRAVEL (mm)</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYOFF TRAVEL (mm)</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>TENSION CONTROL</td>
<td>Manual Adj. Brake (.17 to 5.0 in-lb) - Open Loop</td>
<td>CLS</td>
<td>Heavy Duty Manual Adj. Brake (1.3 to 5.5 in-lb) - Open Loop</td>
<td>CLSHD</td>
<td>Hysteresis Brake (2 - .65 oz-in) - Passive Closed Loop</td>
<td>CLPPE</td>
<td>Hysteresis Brake (5 - 140 oz-in) - Passive Closed Loop</td>
</tr>
</tbody>
</table>

**Results** – Many kinds of spools and coils can be wound on the DigiSpooler. Below are some possible examples.