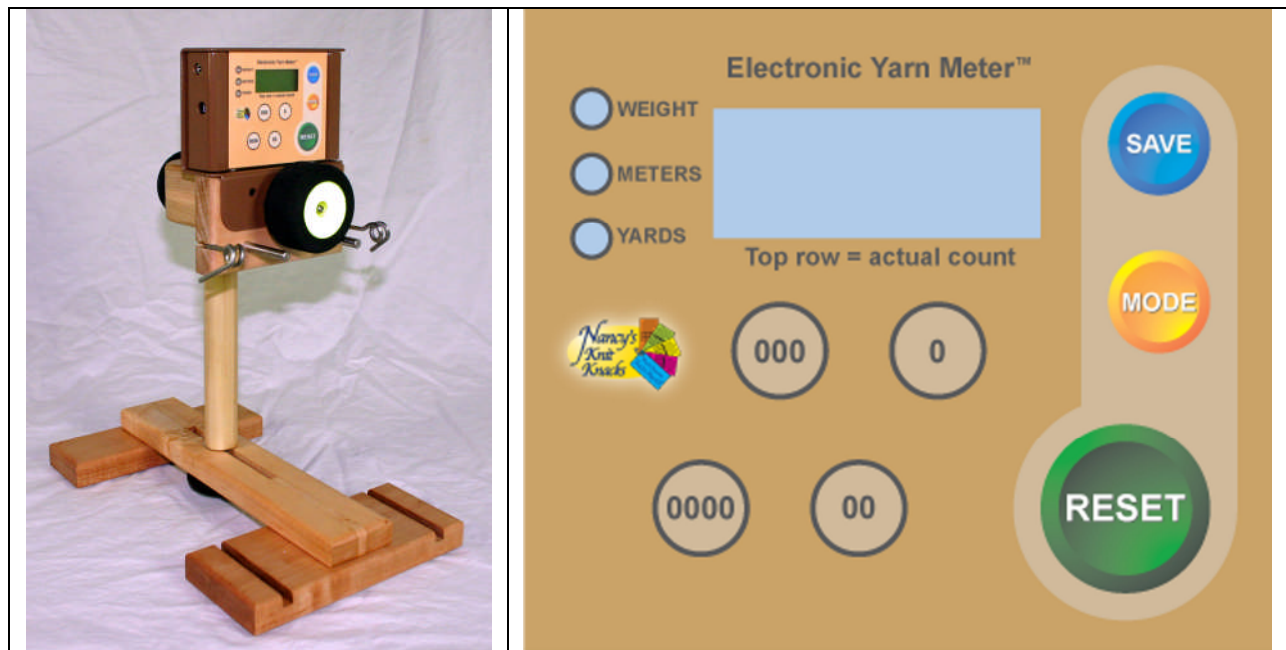


Functional Overview of Electronic Yarn Meter™ (EYM)



- Patents Pending -

What is it?

It is the industry's first non-industrial electronic yarn meter

It is a precision tool that is designed to allow yarn shops, professional fiber artists, and everyone else that needs or wants to measure the length of yarn do so. It represents a quantum leap in the accuracy and flexibility of measuring yarn.

What does it do?

It measures yarn extremely accurately and reliably. It measures ALL yarn weights from the lightest thread to the heaviest handspun.

How does it measure the yarn?

It uses an electronic digital encoder that breaks down each rotation of the special drive wheel that the yarn wraps around into hundreds of pulses. These pulses are fed to a custom computer circuit in the meter which interprets each pulse based on whether the user selected Yards or Meters. The resulting measurement is displayed on the backlit LCD display.

What is the error factor in the measurement?

Due to mathematical rounding in our calculations, the extremely small error factor of the unit equates to:

- 3 yards over 1,000 yards measured (this is equal to 0.003%)
- 1 meter over 1,000 meters measured (this is equal to 0.001%)
- Metric measurement is more accurate because of the higher number of centimeters within a yard (100 vs. 36 inches in a yard).

What ensures the accuracy of the measurement?

The key to the unit's accuracy is in the overall design. This unit was specifically designed to measure yarn.

- The special drive wheel has a non-slip material that will not allow the yarn to slip on the wheel's surface. The way in which the yarn wraps around the wheel (270 degrees) also helps to ensure that the yarn is in contact with the wheel's surface at all times.
- The custom designed stainless steel shaft (axle for the wheel) rides solidly on 2 ball bearing units which remove virtually any friction during its rotation.
- Lastly, the electronic encoder system is designed and manufactured by one of the leading US based companies within the encoder industry. This system can operate in all kinds of environments including dusty yarn shops.
- The unit can be moved within 3 different axes (up and down, in toward the center of the table, and rotated to accommodate the yarn path while not placing undue tension on the yarn

How is this new meter different from NKK's mechanical fishing meter based yarn meters?

We have sold about 10,000 meters since the early 2000's. This is many more than any other yarn meter manufacturer in the world. As a result, we know the weaknesses and the strengths of the fishing meter design.

Strengths of Fishing Meter based systems have been:

- They were inexpensive
- They were easily used by the user in either yarn path direction.
- They used gears which mathematically ensured that the measurement was accurate provided the yarn did not slip on the drive wheel.
- Our special wood mounting system and clamping system made these systems acceptable for knitters. The meters by themselves were useless without these systems.

Weaknesses of Fishing Meter based systems have been:

- The yarn could slip on the drive pulley and thereby create a short measurement causing the entire measurement process to be suspect. The yarn only wrapped around the pulley for about 20-30 degrees which could lead to yarn slippage..
- The user had to apply varying levels of tension by hand (or with one of our tensioning devices) in order to get an accurate reading.
- They had to be mounted near the table's edge which may have caused the yarn path to be too severe, thus adding unwanted tension.
- They were not height adjustable which meant that the yarn path from a high swift down through the meter and back up onto the ball winder may have been too severe causing the ball to be too tight.
- They were not commercial grade and could wear out eventually.

In summary, the fishing meters were generally tolerable for knitters at home, but not appropriate for commercial yarn shops or other high volume operations that needed a more accurate and consistent measurement.

How will the user actually use this new meter?

If they simply want to measure the length of their yarn, they would insert their yarn into the series of yarn guides and idler posts and around the drive wheel. They would reset the count to zero and start winding (or pulling the yarn through the meter in any way they desire). See Continuous Measurement below.

The user can also measure up to a specific count of yards or meters by entering a “preset” number into the unit via the control panel buttons (see Preset Measurement below). So they can have the unit serve as a count-up or count-down counter to measure a specific quantity of yarn. The unit will sound a tone when the target quantity has been reached.

Functions and Modes

Functions

Functions are not something which are controlled or set by the EYM, they are simply a purpose that the user has for using the EYM.

The EYM has two primary measurement functions:

1. Continuous measurement - it measures the length of yarn continuously for whatever length the user wants to measure.
 - a. This is used when a person wants to make a ball out of an entire skein or just wants to know how many yards they have of the yarn.
2. Preset measurement - it allows the user to enter a Preset (i.e. target) quantity of yards, meters, or weights that they want the meter to measure up to and then have it either sound an alarm or shut the Ball Winder off (the shut down feature is only available when used with the NKK Heavy Duty Ball Winder and Power Base).
 - a. This could be used if a person wanted to split a skein into 2 equal amounts, or if they wanted to measure out a specific number of yards or meters.

Most users will generally use the Continuous measurement function.

Mode

Modes are specific operating modes of the EYM.

The EYM has 4 modes:

1. Measuring Yards (length)
2. Measuring Meters (length)
3. Measuring in Ounces (weight)
4. Measuring in Grams (weight)

In the normal mode of measuring length, the user would tap the Mode switch to select either Yards or Meters (the default setting is Yards). The Mode switch cycles between all four modes in a repetitive sequence. As a Mode is elected, its LED lights up.

Whichever Length method the user selects to measure in, the EYM will accurately measure the number of yards or meters and display the number in the LCD.

When a Weight based Mode is selected such as measuring OUNCES (ounces go with Yards because they are both from the English system of measurement), then BOTH the Yards and Weight LEDs light up. When a person wants to measure GRAMS in the metric system, they would select the Mode that has both the Meters and Weight LEDs lit. Ounces and Grams are inferred by the user based on either the Yards or Meters LEDs being lit up when the Weight LED is also lit.

Simultaneous with the LEDS lighting up, the LCD will display the appropriate words requesting the user to enter the number of Meters or Yards and Ounces or Grams.

When measuring Weight, the EYM will ask the user to enter the number of yards or meters that the yarn label has specified for a given increment of weight (such as an ounce or 50 gram skein, etc.). By entering both the length and weight of the yarn on the label, the user is allowing the EYM to create the mathematical relationship between length and weight for that given yarn. Once the EYM has this information, it can calculate the estimated weight based on the length being measured.

Example: if the user wants to measure out 1.5 ounces of yarn but either has no scale to weigh the yarn or does not want to go through the trial and error process of trying to get the correct length of yarn that equates to 1.5 ounces, they can use the EYM to easily determine this by entering the weight and length data from the Yarn Label and then entering the 1.5 Oz Preset input into the EYM. **Then as the EYM is measuring the length it is also calculating the weight.** When it measures the amount that should represent 1.5 ounces, a tone will sound indicating that the 1.5 oz weight has been measured.

Since the weight/length ratio is only approximate and is based on the data provided by the manufacturer of the yarn, it is not as accurate as the length measurement Mode but it is a far superior method for measuring weight than the alternative method which would require that the user try to measure just the right amount of yarn needed to equal 1.5 ounces. This method provides the user with an accurate approximation of the weight in the shortest amount of time of any system available.

Entering a Preset Number

Entering a Preset number involves the use of the 4 switches (decade switches) on the control panel that have zeroes (0000, 000, 00, 0) on their faces.

As soon as a person taps one of the buttons which has zeroes, it is telling the EYM that they want to enter a preset number.

So the sequence is as follows:

- The person first inserts the yarn into the EYM and onto the Ball Winder
- The person hits the RESET button to set the count to 0.
- The person selects the Mode (yards for example).
- They then enter 350 into the Preset by tapping the 000 button 3 times and the 00 button 5 times.
- They then tap the SAVE button to indicate to the EYM that they have completed the entry of the preset number.
- They start winding the yarn onto the ball winder and the LCD display will then display two rows of data: Top row equals the actual count. The bottom row is the Preset amount against which they can compare the actual count to.

The unit will count the yarn being measured and will eventually reach the Preset quantity of 350. When that occurs, an electronic tone will sound signaling to the user that the preset has been reached.

Deluxe feature

If the user also has the Power Base and HDBW attached, the EYM will send a Stop signal to the Power Base which will stop all winding of the yarn at the Ball Winder.

If the user wants to measure another ball of yarn using the exact same Preset, they simply remove their ball of yarn (after breaking the yarn), reload the ball winder, tap the Reset button one time (two taps would reset the Preset quantity, but one tap only resets the actual count to zero).

They then start to pull yarn through the EYM again which would start the creation of another ball with the same Preset quantity.

This is an ideal application for anyone making kits

Removing the Preset number

When the user is finished measuring the Preset number, they simply tap the Reset button twice

1. First tap resets the actual count to zero.
2. The second tap resets the Preset number to zero.

At that point they could enter a new Preset number which is accomplished by simply tapping the new preset number in the decade buttons on the control panel and then tapping the Save button.

Power

After 5 minutes of inactivity, the LCD backlight will turn off and the circuit will go into "sleep" mode to conserve power and to reduce the wear on the electronic components. As soon as the drive wheel is turned or any button pressed, the unit will come out of sleep mode. It is OK to allow the unit to remain on at all times, but for extended periods of inactivity (days), the user should either pull the cable out of the Power jack on the side of the unit or (preferably) remove the AC adaptor from the outlet.

Warranty and maintenance

No lubrication or other maintenance is required for the unit.

The unit is covered by a 1 year commercial and consumer limited warranty.

Contact Information

Please contact Nancy's Knit Knacks if you have any questions about or issues with the Electronic Yarn Meter™

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