

Matrix Controls

TEXCHECK

OPERATING MANUAL

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TEXcheck OPERATION MANUAL

1. INTRODUCTION

The TEXcheck Electronic Thread Counter is a portable instrument which counts and displays the total events (thread, yarn, wire, etc.) in ten inches of material (fabric, wire screen, paper, etc.).

The instrument is designed to count stationary fabric or with the proper technique, moving fabric from a loom. It is ideal for the laboratory, office production stations, weave rooms, and finishing plants. It will count greige or finished fabrics as well as completed garments. The TEXcheck will count most styles of knitted and woven fabrics. It will count picks, filling, weft, courses, warps, ends, or wales.

The TEXcheck consists of two primary components, the chassis and the scanner.

The chassis is enclosed in its own metal case and consists of the power supply, integrated electronics, and a 4-digit LED display. The scanner section houses the lens system, photodetector, light source, and hardware for gliding the scanner back and forth over the fabric. The chassis and scanner are interfaced by means of a plug-in cable assembly.

The standard TEXcheck has an accuracy of one-tenth of a thread. It is very reliable and extremely fast. It will eliminate time-consuming and inaccurate manual counting techniques. The instrument is virtually maintenance free, needs little

calibration, and has few moving parts to wear out.

STANDARD FEATURES

The TexCHECK comes standard with a 4 digit bright LED display, a remote reset switch on the scanner and a glass plate bottom which is used to flatten down wrinkles on fine materials. It is calibrated to threads/inch with other measurements available as an option.

AVAILABLE OPTIONS

A number of options are available to the basic unit. The most important option is the addition of an oscilloscope (display). The oscilloscope allows the operator to visually observe the electronic signal that the photodetector is generating from the fabric. By adjusting the width and/or angle of the light beam in the scanner, a setting can be found that best approximates an ideal signal (a sine wave) on the oscilloscope. By watching the oscilloscope and simultaneously adjusting the scanner's control knobs, one can observe at what settings the best signal occurs.

This would then be the adjustments or settings used on this particular fabric to give the most accurate count. The closer the signal approximates a sine wave the more accurate the count will be.

The TEXcheck can also be modified to count in different units

such as threads per centimeter or decimeter. Model J104 has a switchable display for threads/inch or threads/10 centimeters and a switch for 110/220VAC input. This makes the J104 ideal for international use. Different scan lengths (10 inches is

standard) are also available. A battery operated version or 240 VAC unit are available along with a printer option and a computer interface option.

2. OPERATION

MODEL J-100 (Figure 1)

The standard TEXcheck is powered with a 120 VAC source. It can be plugged into any 120 VAC grounded electrical outlet. A power switch on the front of the chassis turns the instrument on. There is a replaceable ½ Amp Slo-Blo fuse accessible from the front panel. The digital display and manual reset switch (depressing the switch displays all zeros) are also on the front panel. Plugging the cable assembly on the chassis into the cable assembly on the scanner completes the electronic circuits and provides power to the lamp and photodetector in the scanner.

MODEL J-100 with display(Figure 2)

The Model J-100 TEXcheck with display has an oscilloscope to allow visual viewing of the fabric signal. This model also operates off 120 VAC. The chassis has the LED digital display, reset switch, power switch, BNC oscilloscope connector and a replaceable ½ Amp Slo-Blo fuse on the front panel. The oscilloscope has a power switch, control knobs, and banana plug signal connectors on its front panel. The scope also has a replaceable ½ Amp Slo-Blo fuse and control knobs on the rear panel. The chassis connects to the oscilloscope with the included cable. The cable has a BNC connector on one end that connects to the chassis and a dual banana plug connector on the other end that connects to the oscilloscope's VERT

INPUT. The dual banana connector is connected to the oscilloscope with the GND tab facing to the right (Figure 2). There are a number of control knobs associated with the oscilloscope. There are eight control knobs on the front panel. Two controls are for Focus and Intensity adjustments. The Focus and Intensity controls should not need adjusting very often. The other six control knobs on the front Panel are used for positioning the signal and controlling the amplitude and speed of the signal for the best viewing. The SWEEP RANGE switch has four positions. This switch controls the speed at which the signal moves across the screen. For most applications, position 10-100 Hz will be used. Positions 100-1K, 1K-10K, and 10K-100K increase the sweep speed and will only be necessary for very high thread counts. The SWEEP VARI knob is a fine tuning control for the SWEEP RANGE. By turning this knob clockwise (faster speed) or counter clockwise (slower) the signal can be adjusted to a speed which is most comfortable for the user to observe. The VERT GAIN ATT switch has four positions. This knob adjusts the height or amplitude of the signal. Almost all applications will use position 1/10 or 1. Position 1 increases the amplitude by about ten times the signal as position 1/10. The VERTICAL GAIN knob is the fine tune control for the VERTICAL GAIN ATT control. Turning this knob clockwise increases the amplitude of the signal. The four controls discussed so far all have to do with adjusting the signal so that it can be viewed with the best clarity. The actual amplitude (in millivolts) or the actual time sweep (in milliseconds) of the signal is not important as long as the shape of the waveform is good. The two remaining front controls move the oscilloscope signal up or down " \updownarrow POSITION" knob or left to right, " \leftrightarrow POSITION" knob.

MODEL J-104 International TexCHECK

The Model J-104 TEXcheck (Figure 3) has a switch that allows the display to measure threads/inch and also threads/10 centimeter. To change between modes, flip the switch to the desired position and press the reset button. The indicator lamp will show which count mode is currently set. This lamp will not change to the other mode until the reset switch is pressed. The International TexCHECK comes with a IEC input power connector and a 110/220 VAC switch on the back of the unit (Figure 3).

**CAUTION: THE UNIT MAY BE DAMAGED IF THE VOLTAGE SELECTOR
SWITCH IS SET TO THE WRONG POSITION!**

USING THE SCANNER

To begin counting, a fabric sample (16" x 16" is a good size) is placed under the scanner. The fabric and scanner should be on a smooth level surface. If the fabric is an open style or very sheer, a smooth aluminum or steel plate should be placed under the fabric to prevent the TEXcheck from counting scratches or marks on this surface. A flat black paint is recommended for the plate. Turn the power switch on and reset the TEXcheck. All zeros should be displayed and the lamp should be on in the scanner.

The scanner is placed on the fabric sample so that the oval cutout in the bottom plate of the scanner is positioned over the area of the sample that is to be counted. Make sure that the complete cut-out (approximately 6 inches) is over the fabric. Pressure should be applied downward with the left hand on the scanner handle. This will prevent slipping or movement of the scanner on the fabric. The lamp and photodetector assembly should be moved back along the tracks until the nylon stop hits the end plate (this will be towards the operator). This is the starting position. It may be necessary at this time to reset the TEXcheck so that all zeros are displayed. With the scanner in starting position one can now complete a count. The lamp and photodetector assembly is moved five inches forward (away from the operator) along the tracks until it hits the far end. It is then moved back five inches to the initial position. This is one scan of the fabric. A total of ten inches (or

centimeters) has been counted, five inches forward and five inches back. The total threads for that ten inches is now displayed. The decimal point has been moved over one place in the LED display so that the TEXcheck displays the threads per inch for that ten inch scan. The TEXcheck can be reset and another count can be made. It is recommended that three to five scans be made before moving the scanner to a new position. The consistency between these three to five scans on the same piece of material will indicate how accurate the count is. These counts should be within 0.1 to 0.4 threads depending on the count and stability of the fabric. Woven goods will tend to be more accurate than knit goods. If the count is not consistent, then an adjustment with either the angle or beam adjust knobs (Figure 4) may be necessary or the scanner may not be aligned on the fabric properly. By observing the signal on the oscilloscope one will be able to determine whether the count is an accurate one or if further adjustments are necessary.

It is important to move the scanner back and forth with a smooth, consistent motion. Make sure that the scanner does not move when it comes to rest at either stop. There is a magnet and reed switch assembly at either end of the scanner. This starts and stops (electronically) the counting devices in the chassis at exactly five inch (or centimeter) increments to ensure high accuracy. It is important to make the complete scan so that these electrical signals are produced.

The fabric sample should be free of any wrinkles, folds, creases, dirt, oil, or defects. Any skewing or bowing in the fabric should try to be minimized. The sample should

be free of any distortion and when the scanner is placed on the fabric there should be no pulling or snagging. Only a single layer of fabric should be counted at one time. Any stitching, quilting, seams, or backing should be removed.

3. COUNTING TECHNIQUES

There are two adjustments that can be made on the scanner. The beam adjust knob varies the width of the beam. Different fabric styles require different light beam settings. A setting of 0 is the narrowest beam and the beam increases in width as the setting number increases. Almost all applications require a beam setting between 0 and 4. The angle adjust knob allows changing the angle of the light beam. The light beam should be parallel with the threads that are being counted. The angle can vary from +60° to -60°. Most woven goods use a 0° angle. Occasionally an angled beam is needed when counting twills and knits. Some styles can use either a plus or a minus angle and certain fabrics will use both a plus and minus angle for a complete scan. By observing the signal on the oscilloscope and changing the angle or beam width, one can determine at what settings the best signal occurs which will give the most accurate count.

When counting threads (either picks or warp) in woven goods it is important to line up the end (Figure 4) of the scanner parallel to the line of threads you wish to count. For knit goods the wales would also be counted this way. However, to count the courses, the side of the scanner should be parallel with the wales to give the best signal.

For each TEXcheck application a fabric report detailing the proper settings and

actual thread counts is furnished. This report is prepared by Matrix from fabric samples received from the user. The fabric samples should represent all styles that are to be counted. The sample should include the entire width of the cloth with selvages. It should be approximately one yard long and identified with a style number. If there is a specified number of threads per inch, this information is also helpful.

The particular sample of cloth may be counted in more than one way. There are four possible counting positions, two on the face of the fabric (one in each direction) and two on the back side of the fabric. Most fabrics will not be countable in all positions. Sometimes one direction will give a much better count even on the same side of the fabric. On the fabric report, one can determine which side and/or direction will produce the best signal and most accurate count. The fabric report also gives information on the proper light beam angle and light beam setting. More than one angle or light beam setting may be able to count the same style. It is not uncommon to have a light beam setting of 0,1, and 2 for the same sample. If different settings can be used, it is best to leave the knob on the setting used the most, so that changes from style to style will be minimized. Information on the thread count is available from the fabric report also. There are three columns, 'Repeats', 'Mult. Factor', and 'Count'. The Count column will indicate the actual thread per inch for that style. On some styles (woven, twills in particular) the actual count will not be displayed after one complete scan. Depending on the construction of the fabric the count may only be a fraction or a multiple of the proper count. The

count may be a $1/4$, $1/3$, or $1/2$ of the real thread count. Occasionally the count is twice as many threads as there actually are. These occurrences are due to the fact that some threads are hidden by others and because of the physical limits on the light beam and photodetector in the scanner. For these cases, the Repeat, and Mult. Factor are used. The Repeat Column shows the thread count that is displayed after one scan (up and back once) is completed. It may be a quarter, or half or twice the actual count. The Mult. Factor will then have a number to indicate what must be done to the Repeat figure in order to give us the actual count. For example, it is known that the pick count for a particular style is about 100 picks per inch. After one scan, the TEXcheck reads only 24.8. The number 24.8 will then be placed in the repeat column. The Mult. Factor would have a 4 in it to show that the count can be multiply 24.8×4 or 4 complete scans with the scanner can be made to total the threads electronically. Multiple scans is recommended for better accuracy. In the case where the count is twice the actual amount of threads then $1/2$ would be the Mult. Factor and the count in the Repeat Column would be divided by 2. If the operator has some idea as to what the thread count should be, it will be helpful in determining the Mult. Factor needed.

4. PREVENTIVE MAINTENANCE

The TEXcheck will operate accurately over a long period of time if a few routine steps are taken. The Chassis section should be wiped free of oil and lint, and the LED lens should be wiped occasionally with a mild cleaner. Rarely will the fuse or an LED ever need replacing and this can usually be performed by the user. Any other electrical problems will require sending the unit back to Matrix for testing. The Scanner requires a little more care. Most important is to keep the tracks and wheels free of dirt, lint and rust. They should be cleaned periodically with a solvent and then coated with an oil or grease lubricant. The rest of the Scanner should also be cleaned of lint. The lamp and photodetector are fragile electrical components. Unnecessary shock may cause failure. Replacements of lamp and/or photodetector requires returning TEXcheck to Matrix for repair and recalibration.

5. SCANNER ALIGNMENT

WOVEN:

Pick Counting - Line up END of Scanner parallel with pick. Warp Counting - Line up END of Scanner parallel with warp.

Warp Counting using Twill - Line up SIDE of Scanner parallel with pick

KNIT:

Course Counting - Line up SIDE of Scanner parallel with wale

Wale Counting - Line up END of Scanner parallel with wale.

6. TEXcheck CALIBRATION GRID

The enclosed metal calibration grid (Figure 5) is to be used for periodic calibration checks on the TEXcheck Electronic Thread Counter.

The scanner should be placed over the grid so that the grid is perfectly covered by the scanner. The TEXcheck readings from the calibration grid on consecutive scans should be 100.0 ± 0.1 threads/inch (394 ± 1 threads/centimeter) . If this reading is not obtained, the complete TEXcheck should be returned to Matrix Controls for checking and recalibration. (Use TEXcheck Beam setting 0,1, or 2. Angle 0°)

CARE INSTRUCTIONS

Protect the grid from scratches by returning the grid to the protective plastic bag after use. Place the scanner gently onto the grid so the bottom of the scanner doesn't scratch the grid.

MODEL J100

TEXcheck

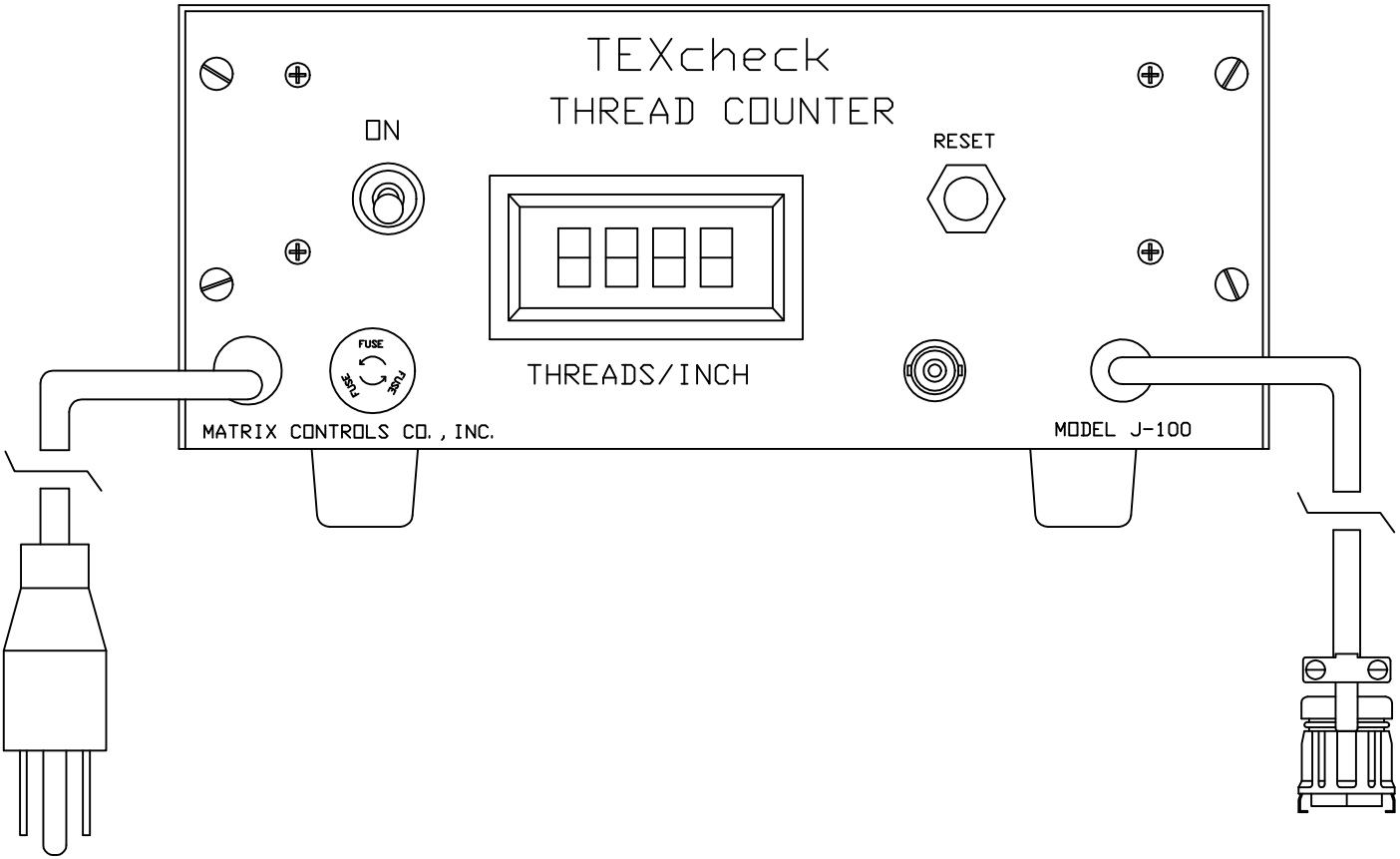


FIGURE 1

J-79083A

MODEL J101

TEXcheck with Scope Option

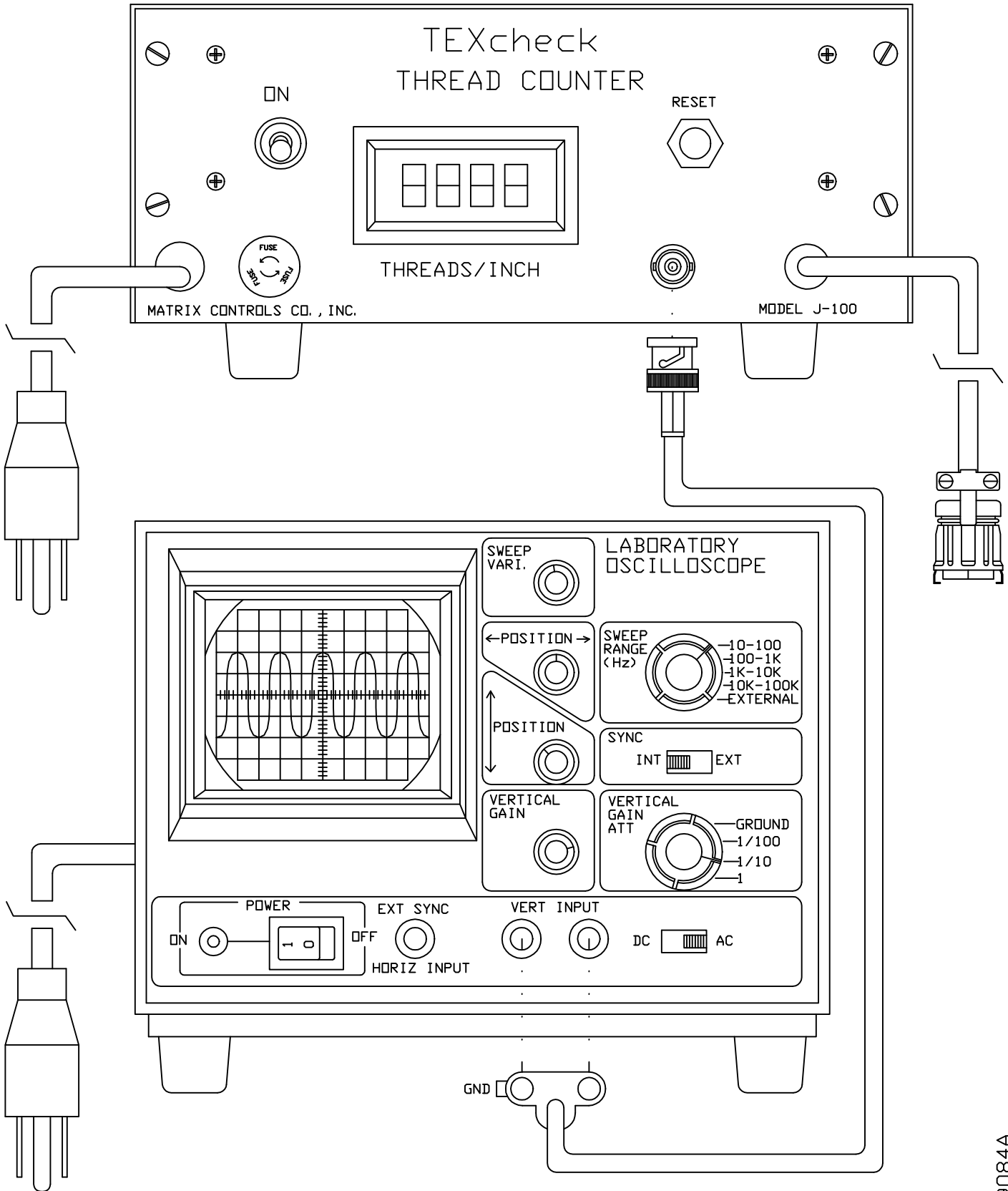


FIGURE 2

J-79084A

INTERNATIONAL TEXcheck MODEL J104

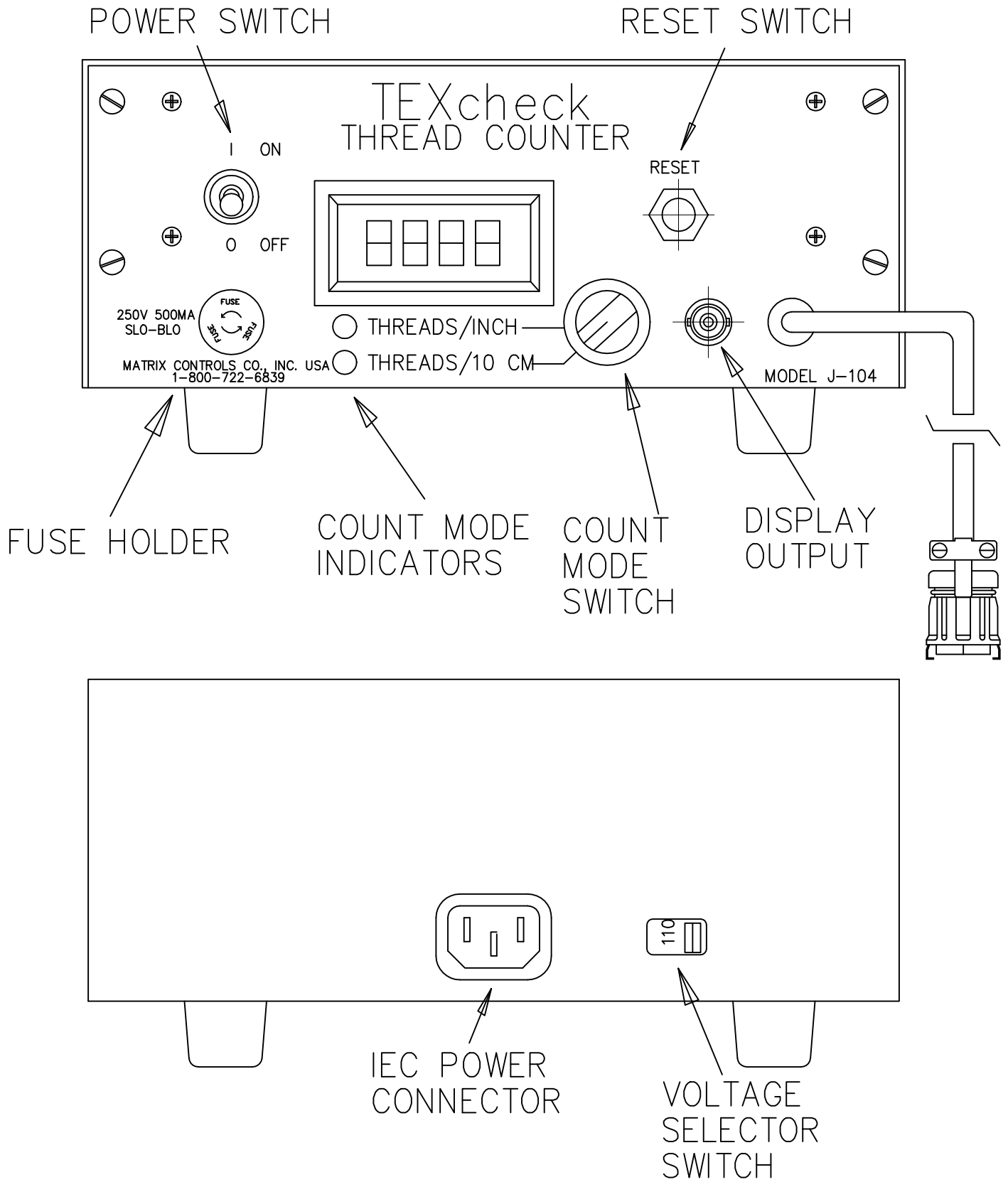


FIGURE 3

TEXcheck SCANNER

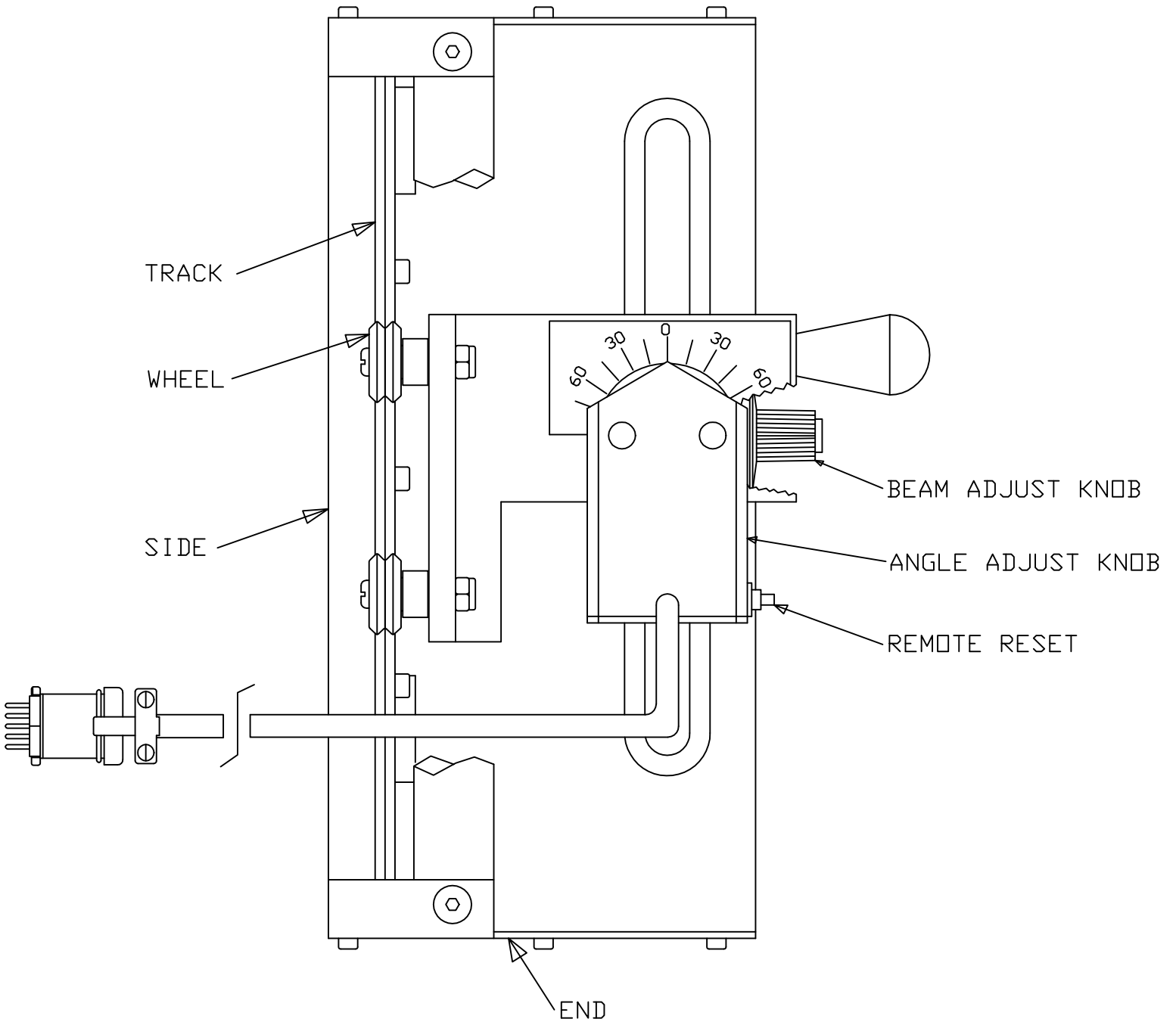


FIGURE 4

CALIBRATION GRID

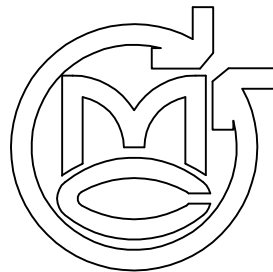
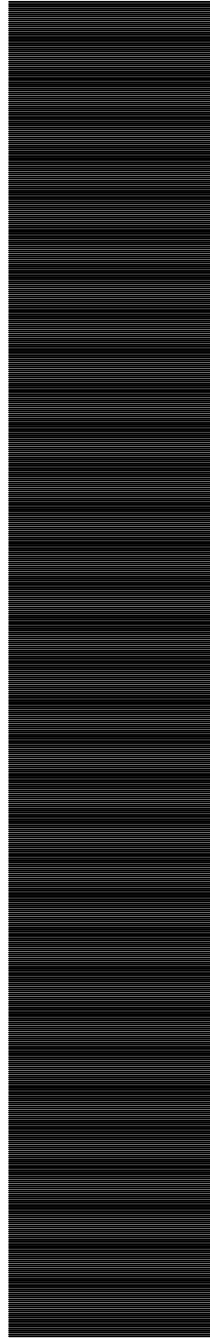
TEXCHECK

MODEL J100

CALIBRATION GRID

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FIGURE 5