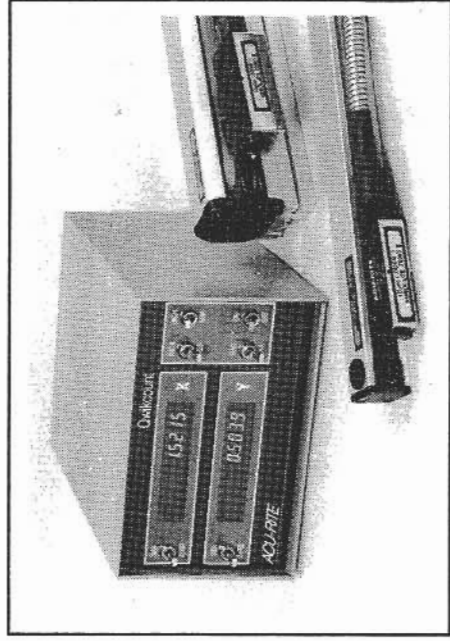


QWIKCOUNT

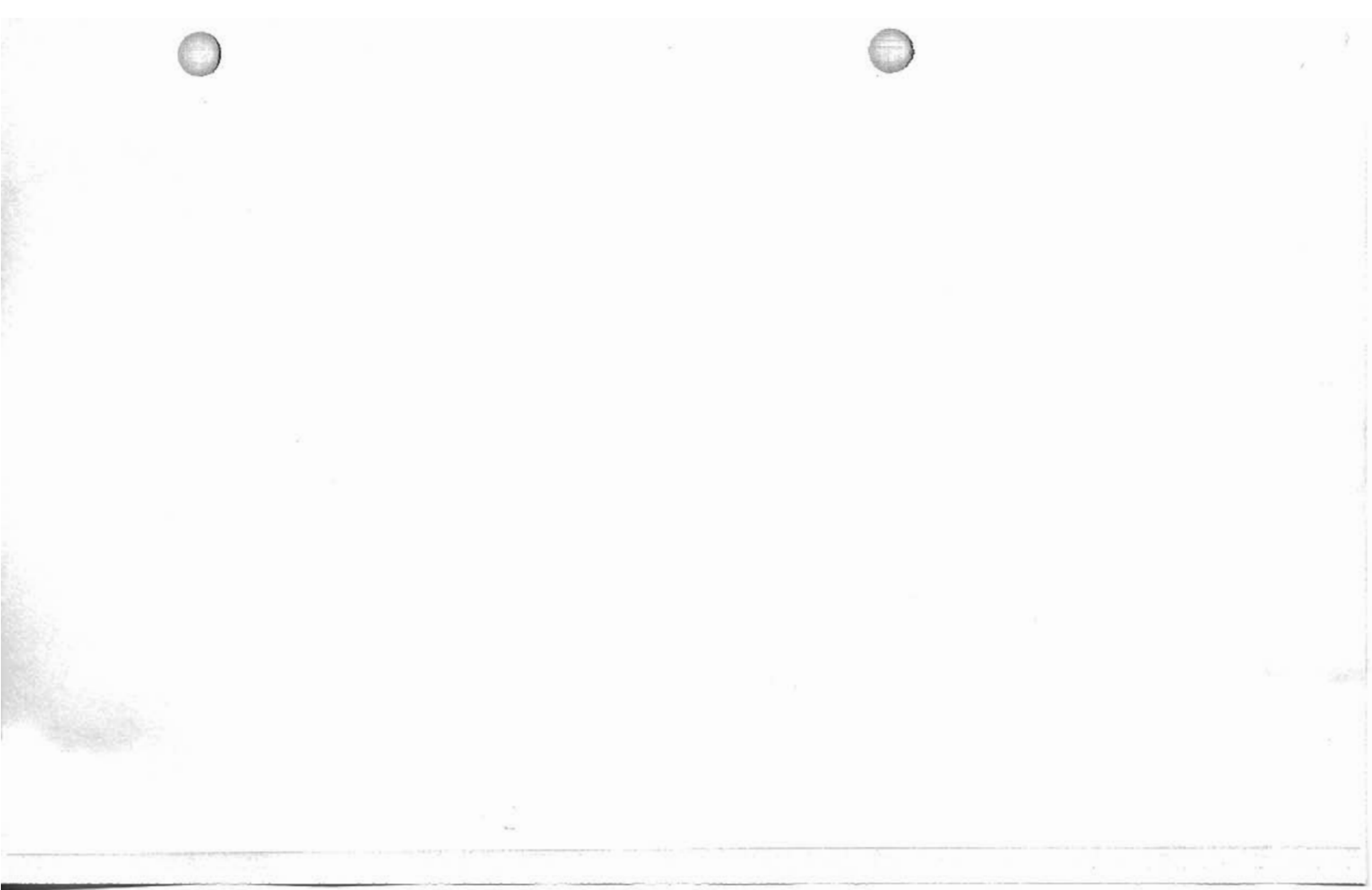
Qwikcount™

Digital Readout System



**REFERENCE
MANUAL**

ACU-RITE®



Section 1. Installation

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Qwikcount

Section 1. Installation

For safety and convenience, a location for the Qwikcount should be chosen so that:

Location

- The readout is located near eye level, or is tipped towards the normal viewing location
- There will be no interference with the operation of the machine tool or the encoder cables
- The readout will be out of the way of chips and coolant
- The readout is securely fastened and cannot be accidentally knocked off its mounting

Connect the cables from the encoders to the respective input connectors on the rear panel of the Qwikcount; give each a 1/4-turn to lock (Figure 1).

Encoder Connections

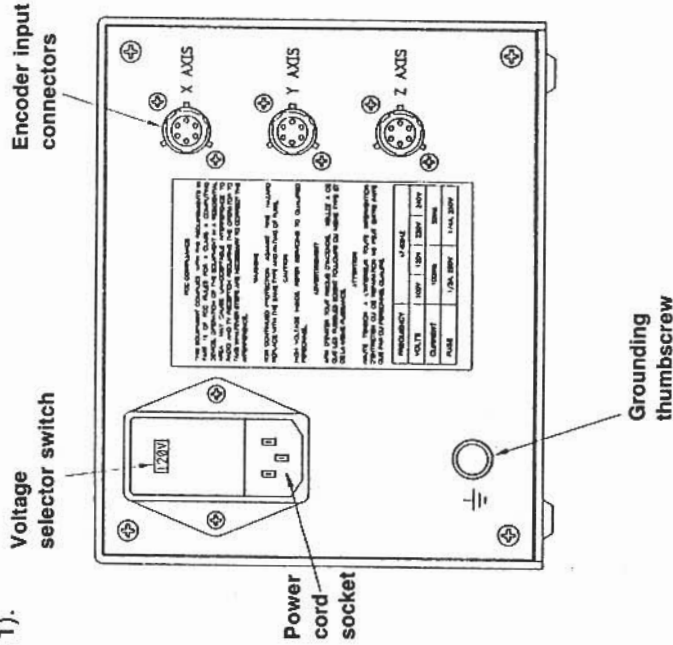


Figure 1. Rear view of 3-axis Qwikcount

Electrical connections

Connect a ground strap or copper wire from the thumbscrew terminal on the rear of the readout to a convenient point on the machine base. The ground wire should be a minimum length and routed so that it will not be pulled or rubbed during machining operations. Connect the machine base to a solid earth ground.

The Qwikcount is supplied with a power cord and is set for use with 120VAC (USA standard). The voltage select switch on the power input module may be set for 100VAC, 120VAC, 220VAC, or 240VAC. Check the supply voltage to determine the proper setting for the selector switch.

To reset the selector switch, remove the cover of the power input module with a thin-blade screwdriver at the top (Figure 1). Set the thumbwheel to the correct voltage. Snap the input module cover back in place.

Make certain that the voltage is properly set before plugging the readout into the supply. Damage to the readout could result from an incorrect voltage setting.

Plug the power cord into the socket on the power input module, and plug the opposite end into a properly grounded supply outlet of the correct voltage.

Operation check

Turn the front panel power switch ON (Figure 2). The readout will show **E1** in the X-axis display, noting that power had been interrupted. Press the ZERO switch on any axis (press the REF/ZERO switch down); the displays should now all read **0.0000** (if the INCH/MM switch is in the INCH position; if the switch is in the MM position, the displays will be **0.00**).

Qwikcount

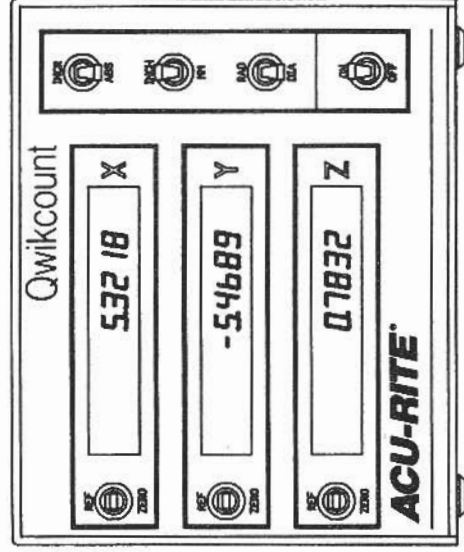


Figure 2. Front view of 3-axis Qwikcount

Qwikcount

Section 2. Configuration

Several parameters must be set to match the conditions of the installation for each axis. Parameters must be set for radius/diameter feature enabling, encoder resolution, display resolution, count direction, and error compensation. **Descriptions of each parameter can be found in the following section.**

Setting parameters

Initial values have been factory-set for each parameter. Refer to Figure 2 for locations of front panel switches. The parameter setting steps are:

1. Begin the parameter setup procedure by holding the REF/ZERO switch for the X-axis in the REF position for about 5 seconds, while the readout is ON; the displays will blank. When the REF switch is released, all displays will show **P1**, indicating that the parameter setup mode is active.

P1

All axes

2. The parameters are:

P1 - radius/diameter feature enable
P2 - encoder resolution
P3 - display resolution
P4 - count direction
P5 - error compensation

Press one of the REF switches to begin the parameter setup routine for that axis. **P1** and the current setting will appear in that display. All other displays will be blank.

P1 rAd

For the selected axis, the radius/diameter feature is set to radius mode, disabling the RAD/DIA switch.

4. Press the ZERO switch to change the current setting. Successively pressing the ZERO switch scrolls through a list of possible settings.

P1 diA

For the selected axis, the radius/diameter feature is set to diameter mode, enabling the RAD/DIA switch

5. Press the REF switch to advance to the next parameter.

P2 .01

For the selected axis, the current setting for encoder resolution is 0.01mm, or 10µm

6. When all parameters for the first axis have been set and the REF switch is pressed once more, the first parameter is shown again.

P5 -123

Last parameter for the axis, as set

P1 diA

Parameter setting program scrolls back to first parameter for that axis

7. To set parameters for another axis, press the corresponding REF switch for that axis. P1 and the current setting appears in the newly-selected axis.

(blank)

X Displays during setting of Y-axis

P4 1

Y parameters

P1 diA

X Displays after pressing X-axis

(blank)

Y REF switch

8. To save the new settings press and hold the X-axis REF switch for approximately 5 seconds. The readout returns to normal operation.

P1 dia X X-axis display showing last parameter setting made

0.0000 All displays after pressing and holding the X-axis REF switch. Exact displays will depend on current parameter and switch settings for each axis.

9. To exit without saving parameter changes, turn the readout OFF, then back ON.

P2 .001 X X-axis display, showing a new (but not saved) setting for a 0.001mm (1 μ m) resolution encoder

0.00 All displays are zeroed after OFF/ON. Exact displays will depend on current parameter and switch settings for each axis.

Any axis can display radius or diameter measurements corresponding to the position of the RAD/DIA switch. The radius/diameter enabling parameter must be set to allow the feature to be used.

Settings can be either **P1 rAd** (feature disabled; radius measurements regardless of RAD/DIA switch setting) or **P1 diA** (feature enabled; radius measurements with switch in RAD position, diameter measurements in DIA position). Press the ZERO switch to change the setting. All axes are factory set to disable this feature.

Parameter descriptions

P1 - Radius/diameter feature enable

P2 - Encoder resolution

The encoder resolution parameter has been factory set for 10 μ m encoders on all axes. If the encoder installed on any axis is other than 10 μ m resolution, P2 must be changed for that axis. Refer to Table 1 for encoder resolution settings and their displays.

Table 1. Encoder resolution parameter P2 displays vs. encoder resolution

Display	Encoder Resolution	ACU-RITE Encoder Resolution Label
P2	0.01mm, 10 μ m	10 μ m (.0005")
P2	0.005mm, 5 μ m	5 μ m (.00025")
P2	0.002mm, 2 μ m	2 μ m (.0001")
P2	0.001mm, 1 μ m	1 μ m (.00005")
P2	0.005 inches	.0005"/10 μ m
P2	0.00025 inches	.00025"/5 μ m
P2	0.0001 inches	N/A

* This is the factory setting, and will be the first value displayed if the parameter has not been changed.

P3 - Display resolution

Qwikcount readouts feature three display resolutions: high (fine), medium, or low (coarse) resolution. An operator can choose low resolution for rough machining, and high resolution for finish cuts.

Subsequently pressing the ZERO switch will cycle through high resolution (more precise), medium, and low resolution (less precise) values for counting increments. The factory setting is for high resolution displays. Refer to Appendix B for a listing of the counting increments with various switch and parameter settings.

Qwikcount

This parameter defines the sense of encoder movements. Movement of a table to the right can be defined as positive or negative, and varies with different applications. The count direction parameter can be set to match current practice.

P4 - Count direction

The parameter display is toggled between **P4 1** and **P4 2** by pressing the ZERO switch; selecting the opposite mode will switch the counting direction. The factory setting for this parameter is **P4 1**.

A linear error compensation factor can be set to correct for machine tool errors. Machine tool errors are usually the result of machine wear or Abbé error.

P5 - Error compensation

Compensation factors are displayed as positive or negative whole numbers, in parts-per-million (PPM). An example would be **P5 -123**. The factory setting for this parameter is zero compensation.

Compensation is set by a semi-automatic routine, using a measurement standard.

1. Touch one end of the standard, then press the ZERO switch for that axis.
2. Move to, and touch, the other end of the standard, then press the REF switch.
3. The display shows the movement sensed by the encoder. If the display is not the same as the standard, move the table so that the display reads the same length as the standard.

4. Press the REF switch to automatically calculate and display the error compensation factor.

If a compensation factor is calculated that is beyond the range of ± 9999 PPM, an error message **P5 E4** will be displayed. Press the ZERO switch to start the procedure again.

Hold REF switch on X-axis up for 3 seconds to save your changes.

Section 3. Operation

When the Qwikcount is first connected and turned on, the X-axis will display E1, indicating that power had been interrupted. All other displays will be blank.

Initial power-up

Pressing a ZERO switch on any axis will return the readout to a normal condition ready for measuring, with a "zero" value in all displays.

During normal use, the Qwikcount is commonly turned OFF at night. With the power switch OFF, power to the encoders is interrupted. When the power is turned ON once again, a "zero" value is shown in both displays. The displays will correspond to the current settings for the various parameters.

Normal power-up

The Qwikcount will display measurements in either inches or millimeters, corresponding to the setting of the INCH/MM switch. Refer to Appendix B for illustrations of displays with various switch and parameter settings.

Inch/mm displays

The Qwikcount can keep track of two separate, but linked, measurements on each axis. The desired mode is activated by setting the appropriate position for the INCR/ABS switch.

Incremental/ absolute measuring modes

The absolute measuring mode is used to display measurements from the absolute zero point of a part to the current tool location. This mode is commonly zeroed only once on each part.

The incremental measuring mode is used to display point-to-point measurements (hole center-to-center, edge-to-edge, etc). This mode is commonly zeroed several times on each part, to begin the next measurement.

Radius/diameter measuring

The RAD/DIA switch allows either radius or diameter measurements to be displayed. With the switch in the DIA position, radius measurements are doubled and displayed to show diameter measurements. The P1 parameter must be enabled (see **Setting parameters**, page 2-1); otherwise measurements will be radius regardless of switch position.

Display zeroing

The current measurement must be reset to zero or "zeroed", before starting a new measurement sequence. Any axis display may be zeroed at any time by pressing the appropriate ZERO switch.

When the **incremental mode** is active, the current **incremental** measurement for that axis will be zeroed when the ZERO switch is pressed. When the **absolute mode** is active, **both absolute and incremental** measurements for that axis will be zeroed when the ZERO switch is pressed.

Reference zeroing

The display for an axis may be reset to zero by using an encoder fiducial trigger output (FTO) signal. FTO marks are located at fixed points on most ACU-RITE encoders. This feature provides a convenient method of re-establishing a tool/part relationship to recover from a momentary loss of power, or to continue work on a part after the readout has been turned OFF.

Reference zeroing is activated by pressing the REF switch on a particular axis; a vertical mark appears along the left side of the display. When the encoder reading head passes an FTO mark in the positive counting direction, the display for that axis is zeroed. The indicator mark turns off.

The effects of zeroing by using the encoder FTO signals are the same as those obtained by pressing the ZERO switch.

The Qwikcount provides several error codes to alert the operator to problems. The error code shows in one or more of the displays to indicate the type and location of the problem. The codes are:

Error codes

E1 Power interruption. A.C. power was interrupted. Positioning information has been lost. Press the ZERO key on any axis.

E2 Encoder miscount detected. Positioning information for this axis has been lost. Zero the axis with the ZERO switch, or perform an encoder reference zeroing operation on that axis.

E4 Display overflow. Measuring information is too large to be displayed. Move the table so that the measurement is smaller, or set a new zero reference point and zero the display.

E5 Memory error. Parameters have not been saved. Unplug the unit, and plug it back in. Reset the parameters. If error E5 appears again, the readout must be serviced. Contact your Distributor, OEM/OEI, or the ACU-RITE Sales and Service Center for assistance.

Self tests

The Qwikcount has built-in self-testing circuits. Tests are provided to assist with diagnosing problems involving:

- Software version
- Memory - both ROM and RAM
- Front-panel switches
- * Display

Self-testing is initiated from the OFF state; hold the X-axis REF switch up while turning the Qwikcount ON. The software version will be shown on the X-axis display; the remaining displays are blank. Software version information may be necessary when contacting your Distributor, OEM/OEI or the ACU-RITE Sales and Service Center for further assistance with your Qwikcount. Press the X-axis REF switch to begin the memory test.

A memory test is performed, and a **Good** or **bAd** message is shown in the X-axis display. Press the X-axis REF switch to begin the switch test.

The front-panel switch test begins with a **0** display for the X-axis. Each time a front panel switch is pressed (except for the X-axis REF switch and the ON/OFF switch), the number will increment one digit, up to nine; then start again at 0. Press the X-axis REF switch to begin the display test.

The display test lights all elements of all displays at the same time. This allows a visual inspection of the displays to assure that all elements are functioning. The displays will show **8.8.8.8.8.8.8.8**. Press the X-axis REF switch to return to the beginning of the test routine, showing the software version.

Section 4. Appendices

Input voltage requirements 100VAC setting: 90-110VAC
120VAC setting: 108-132VAC
220VAC setting: 198-242VAC
240VAC setting: 216-264VAC

Input frequency 47-63Hz

Input current 0.10A continuous

Operating conditions 0° to 40°C (32° to 104°F)
25% to 85% relative humidity
(non-condensing)

Storage conditions -40° to 60°C (-40° to 140°F)
25% to 85% relative humidity
(non-condensing)

Electronics Microprocessor/custom LSI with
non-volatile memory for operating
software and custom setup
parameters.

Display Aqua vacuum fluorescent

Encoder resolutions supported 10μm
5μm
2μm
1μm
0.0005"
0.00025"
0.0001"

Encoder input signals TTL-level channel A and B
square wave signals in
quadrature (90° nominal phase
relationship) with fiducial trigger
output (FTO) encoder reference
signal

Input rate 50kHz

Size 1-, 2-axis: 4.1"h x 6.7"w x 8.0"d
3-axis: 5.5"h x 6.7"w x 8.0"d

Weight 1-, 2-axis: 4.6 lbs
3-axis: 6.3 lbs

Mounting From bottom, four 6-32 threaded holes

Recognition/
approval CSA approved
UL pending

FCC compliance Class A

Appendix B

Qwikcount counting increments/P3 displays with various switch settings

Encoder Resolution	INCH, RAD			INCH, DIA			MM, RAD			MM, DIA		
	High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low
10µm	0.0005	0.001	0.002	0.001	0.002	0.005	0.01	0.02	0.05	0.02	0.05	0.1
5µm	0.0002	0.0005	0.001	0.0005	0.001	0.002	0.005	0.01	0.02	0.01	0.02	0.05
2µm	0.0001	0.0002	0.0005	0.0002	0.0005	0.001	0.002	0.005	0.01	0.005	0.01	0.02
1µm	0.00005	0.0001	0.0002	0.0001	0.0002	0.0005	0.001	0.002	0.005	0.002	0.005	0.01
0.0005"	0.0005	0.001	0.002	0.001	0.002	0.005	0.01	0.02	0.05	0.01	0.05	0.1
0.0025"	0.00025	0.0005	0.001	0.0005	0.001	0.002	0.005	0.01	0.02	0.05	0.02	0.1
0.001"	0.0001	0.0002	0.0005	0.0001	0.0002	0.0005	0.001	0.002	0.005	0.01	0.005	0.02

1. The table illustrates the Qwikcount counting increments with various combinations of front-panel switch settings and internal set-up parameter settings.
2. The displays are the same during setting of P3, the display resolution parameter; except that there are no leading zeros displayed for P3 settings.
3. The listings corresponding to a DIA switch setting are only valid if diameter displays are enabled.

Appendix C FCC compliance statement

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits in effect at the time of manufacture for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Appendix D The ACU-RITE warranty

ACU-RITE products and accessories are warranted against defects in material and workmanship for a period of three years from the date of purchase. ACU-RITE will, at its option and expense, repair or replace any part of the ACU-RITE product which fails to meet this warranty. This warranty covers both materials and factory service labor. In addition, ACU-RITE Distributors and OEM/OEI service representatives will provide service labor (field service) for a one-year period at no charge. Notice of the claimed defect must be received by ACU-RITE within the warranty period.

This warranty applies only to products and accessories installed and operated in accordance with this reference manual. ACU-RITE shall have no obligation with respect to any defect or other condition caused in whole or part by the customer's incorrect use, improper maintenance, modification of the equipment, or by the repair or maintenance of the product by any person except persons deemed by ACU-RITE to be qualified.

Responsibility for loss in operation performance due to environmental conditions, such as humidity, dust, corrosive chemicals, depositions of oil or other foreign matter, spillage, or other conditions beyond ACU-RITE's control cannot be accepted by ACU-RITE.

Appendix A Qwikcount specifications

There are no other warranties expressed or implied, and ACU-RITE INCORPORATED shall not be liable under any circumstances for consequential damages.

IMPORTANT

Keep the box and packing materials

Your ACU-RITE Qwikcount readout is covered by a 30-day Red Carpet Warranty Service. If in the first 30 days this product fails for any reason, repack it in the original packing materials and contact your ACU-RITE Distributor, OEM/OEI, or the ACU-RITE Sales and Service Center at (800) 344-2311 for return instructions.

For future ordering information or warranty service, record the following information:

Qwikcount readout information:

Catalog number _____ X-axis _____

Serial number _____ Y-axis _____

Software version _____ Z-axis _____

Date of purchase _____

Distributor _____

Address _____

Telephone _____

Encoder catalog and serial numbers:

Qwikcount

Qwikcount



ACU-RITE Readout Systems
are manufactured in the USA

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