Section 1. Installation

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

- 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).

Figure 1. Rear view of 3-axis Qwikcount.
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 110VAC, 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 cord 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 HFZ/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 display will be 0.00).
Figure 2. Front view of 3-axis 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.

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
   - P6 - 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/GAd 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 0.01 mm, or 10 μm

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

Qwikcount
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 (1μm) 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.

Qwikcount
P2 - Encoder resolution

The encoder resolution parameter has been factory set for 10μm encoders on all axes. If the encoder installed on any axis is other than 10μm 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

<table>
<thead>
<tr>
<th>Display</th>
<th>Encoder Resolution</th>
<th>ACU-RITE Encoder Resolution Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2 .01</td>
<td>0.01mm, 10μm</td>
<td>10μm (.00039&quot;)</td>
</tr>
<tr>
<td>P2 .005</td>
<td>0.005mm, 5μm</td>
<td>5μm (.00020&quot;)</td>
</tr>
<tr>
<td>P2 .002</td>
<td>0.002mm, 2μm</td>
<td>2μm (.00008&quot;)</td>
</tr>
<tr>
<td>P2 .001</td>
<td>0.001mm, 1μm</td>
<td>1μm (.00004&quot;)</td>
</tr>
<tr>
<td>P2 .0005</td>
<td>0.0005 inches</td>
<td>.0005&quot;/10μm</td>
</tr>
<tr>
<td>P2 .00025</td>
<td>.00025 inches</td>
<td>.00025/&quot;5μm</td>
</tr>
<tr>
<td>P2 .0001</td>
<td>0.0001 inch</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* 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

2-4
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.

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.

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.
1. 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 P6 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.

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.

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.

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.

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.
Display zeroing

When the incremental mode is active, the current measurement must be zeroed by using an encoder fractional trip output (FTO) signal. The FTO marks are located at fixed points on the object being measured. To trigger a convenient method for zeroing the display, press the ZERO switch located on the hand-held controller.

Reference zeroing

The display for an axis may be reset to zero by pressing the ZERO switch located on the hand-held controller when the encoder reading head passes an FTO mark. The FTO marks are located at fixed points on the object being measured. To trigger a convenient method for zeroing the display, press the ZERO switch located on the hand-held controller.
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:

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

**E2** Encoder n skips count 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/ODI 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.

Qwikcount
Section 4. Appendices

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

Input frequency 47-63Hz
Input current 0.1A 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
| With various switch settings | Qwikcount counting instrument displays |

| Appendix B | 43 |
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 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/ES 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 in 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.

Qwikcount 4-4
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.

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

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**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, return it in the original packing materials and contact your ACU-RITE Distributor, OsMOR, or the ACU-RITE Sales and Service Center at (800) 944-2311 for return instructions.

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

<table>
<thead>
<tr>
<th>Qwikcount readout information:</th>
<th>Encoder catalog and serial numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog number</td>
<td>X-axis</td>
</tr>
<tr>
<td>Serial number</td>
<td>Y-axis</td>
</tr>
<tr>
<td>Software version</td>
<td>Z-axis</td>
</tr>
<tr>
<td>Date of purchase</td>
<td></td>
</tr>
</tbody>
</table>

Distributor

Address

Telephone

Qwikcount