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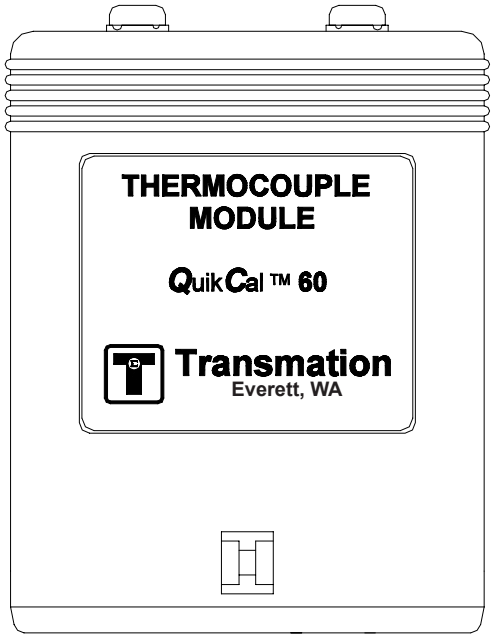
Transmation

QUIKCAL™ 60 THERMOCOUPLE MODULE USER'S GUIDE



NOTE!

Do not discard this user's guide. The information provided in this document is essential to safe equipment operation and maintenance. To prevent possible personal injury or equipment damage through misuse, the procedures outlined in this document should be performed by qualified service personnel.

Table of Contents

Introduction

The QuikCal™ 60 Thermocouple Module is an input/output module designed to plug into a QuikCal™ 190 Base Unit. The QuikCal 60 is designed to measure and simulate thermocouple signals as well as read mV inputs and generate mV output signals.

NOTE!

The QuikCal 190 Base Unit must be running software version 4.0 or higher to communicate with the QuikCal 60.

Specifications

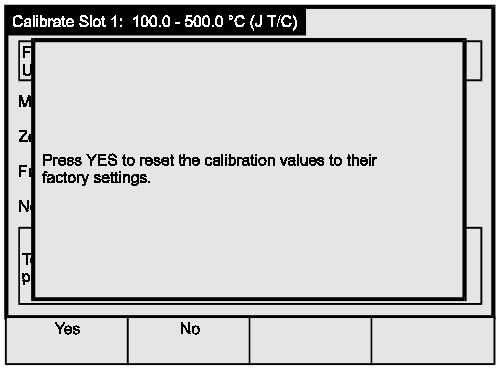
Unless otherwise indicated, all specifications are referred to an ambient temperature range of 13ºC to 33ºC (55°F to 91°F).

T/C Types, Linearity, and Accuracy (ITS-90 Tables):

T/C Type	°C Range	°C Accuracy*	°F Range	°F Accuracy*
B	+350 to 1820	±0.7	+662 to 3308	±1.3
E	-240 to 1000	±0.2	-400 to 1832	±0.4
J	-210 to 1200	±0.2	-346 to 2192	±0.4
K	-230 to 1372	±0.3	-382 to 2500	±0.5
N	-230 to 1300	±0.3	-382 to 2372	±0.5
R	-50 to 1768	±0.6	-58 to 3214	±1.1
S	-50 to 1768	±0.6	-58 to 3214	±1.1
T	-260 to 400	±0.2	-436 to 752	±0.4

* The stated accuracy does not include the Cold Junction Accuracy.

7. At the prompt, press the **Yes** key.



8. Press the **Done** key.

   The calibration settings are reset to the Factory calibration correction factors.

9. "Lock" user calibration as described in "Logging Out" in the QuikCal 190 User's Guide.

Factory Service

Should service become necessary, the QuikCal 60 should be returned to the Factory for repair or replacement. Do not return any item to Transmation without first contacting us and obtaining an authorization number. This number should appear clearly on the outside of all packages sent to Transmation and on all associated paperwork.

Warranty

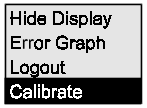
Transmation products are warranted to be free from defects in material and workmanship (excluding fuses, batteries and leads) for a period of one year from the date of shipment. Warranty repairs can be obtained by returning the equipment prepaid to our factory. Products will be replaced, repaired, or adjusted at our option. *Transmation gives no other warranties, including any implied warranty of fitness for a particular purpose*. Also, Transmation shall not be liable for any special, indirect, incidental or consequential damages or losses arising from the sale or use of its products.

Restoring Factory Calibration Correction Factors

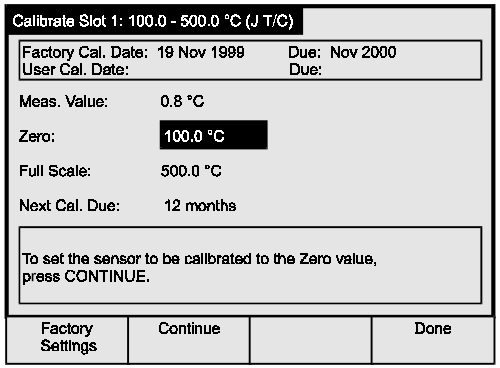
If any problems are encountered during a user calibration, the calibration data can be reset to the Factory calibration correction factors. Bear in mind this is **not** equivalent to a new calibration.

To restore the Factory calibration settings, do the following:

1. As required, “unlock” user calibration as described in “Logging In” in the QuickCal 190 User’s Guide.
2. Insert the QuikCal 60 into Slot 1 (or Slot 2) of the Base Unit.
3. Select the appropriate data window.
4. Press the **Commands** key to call up the Commands list.
5. Select “Calibrate”, then press **Enter**.



6. Press the **Factory Settings** key.



mV Range: -110 to +110 mV

mV Accuracy: ±(0.015% of Reading + 0.006 mV)

Cold Junction Accuracy: 0.1°C

Resolution: 0.1° or 1 µV for mV

Update Rate: >2 times/second

Common Mode Rejection: 50/60 Hz, >120 dB

Normal Mode Rejection: 50/60 Hz, >50 dB

Temperature Effect: Included in **Accuracy** specification for ambient temperature range of 13°C to 33°C (55°F to 91°F); outside this range: 0.05°C per ºC

Module Isolation: 250V RMS minimum

Open Circuit Detection: Low energy pulse

Input/Output Protection: 150V RMS for 30 seconds

Input/Output Terminals: Single set of miniature T/C connectors and screw terminals

Output Noise: ≤1 LSD from 0.1 Hz to 10 Hz

Communication Protocol: LonTalk Protocol

Operating Temperature Range: -10°C to 50°C (14°F to 122°F)

Storage Temperature Range: -40°C to 85°C (-40°F to 185°F)

Housing: Black ABS/Polycarbonate (UL 94 V-O)

Case Size (HWD): 76 mm x 64 mm x 51 mm (3” x 2.5” x2”)

Weight: ~0.154 kg (5.5 oz.)

Power: Provided by QuikCal Base Unit (5 VDC at 150 mA maximum)

OPERATION

NOTE!

The screen illustrations are representative of the screens a user will see during normal QuikCal operation. As new features and enhancements are incorporated, the actual screens may be visually different from the illustrations; however, they will continue to function as described.

INSERTING/REMOVING A MODULE

The QuikCal 60 can be installed into either of the two slots in a QuikCal 190 Base Unit. A module may be installed or removed while power is applied to the Base Unit. The Base Unit will indicate a successful connection as soon as communication has been established.

To insert a QuikCal 60 module into a Base Unit, do the following:

1. Orient the module so the data label is facing forward (towards the keypad).
2. Insert the module into one of the slots and firmly press down until the module seats.

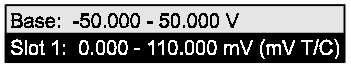
To remove a QuikCal 60 module from a Base Unit, do the following:

1. Push inward on the locking tab on the rear of the module while pulling upward on the module.

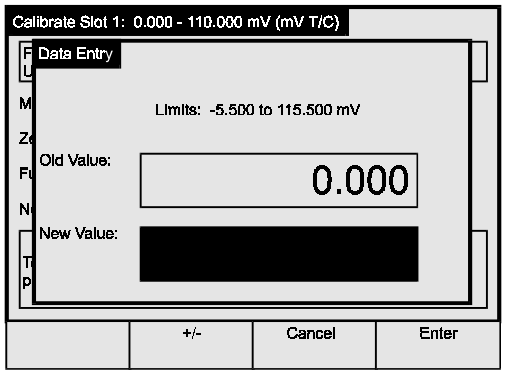
USING THE SETUP FEATURE

The Setup key allows the configuration of the QuikCal 60 or the Base Unit. To review and/or modify a setup parameter, do the following:

1. Press **Setup** to call up the Setup list.
2. Select the desired item, then press **Enter**.

   The Setup screen will be displayed. Each Setup screen displays parameters and information pertinent to the combination of module and slot in use.
3. Use the ▲ and ▼ keys to select a parameter, then press **Enter** to call up the selection list or data entry window associated with the selected item.



10. Enter the Zero value corresponding to the reading of the external precision source in the New Value field, then press **Enter**.
11. Press the **Continue** key to highlight the Full Scale field, then press **Enter** to call up the Full Scale data entry window.
12. Enter the Full Scale value corresponding to the reading of the external precision source in the New Value field, then press **Enter**.
13. Press the **Continue** key to highlight the Next Cal. Due field, then press **Enter** to call up the Next Cal. Due data entry window.
14. Enter the calibration interval in months in the New Value field, then press **Enter**.
15. Press the **Continue** key.
16. Press the **Done** key.
17. When the verification screen is displayed, press **Ok** to accept the calibration values or press **Factory Settings** to reset to the default factory calibration settings.

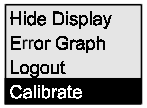
    All data collection and computation is performed automatically. When the display returns to normal, the QuikCal 60 is ready for use.
18. "Lock" user calibration as described in "Logging Out" in the QuikCal 190 User's Guide.

values of 0-100 mV (0.005% of reading accuracy). A low accuracy source with an adequately high accuracy instrument monitoring the value (series or parallel) is a suitable alternative. The accuracy of the reference instrument at the listed values and at the ambient temperature should be better than ±50 ppm (0.005%).

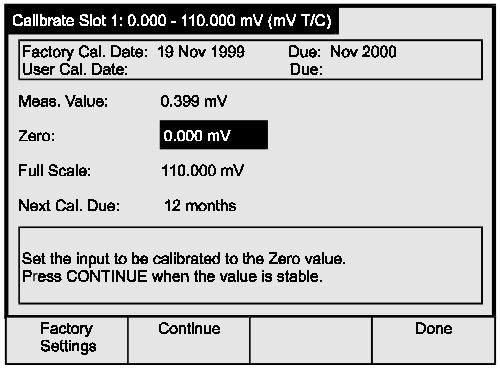
User Calibration Procedure

To calibrate the zero and span, do the following:

1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of the Base Unit.
2. Select the appropriate data window.
3. Press **Setup** to set Service: to *Read* as instructed in "Using the Setup Feature" on page 4.
4. Select *mV* from the Type: selection list, then press **Enter**.
5. Press the **Save Changes** key to exit the Setup screen.
6. As required, "unlock" user calibration as described in "Logging In" in the QuickCal 190 User's Guide.
7. Press the **Commands** key to call up the Commands list.
8. Select "Calibrate", then press **Enter**.

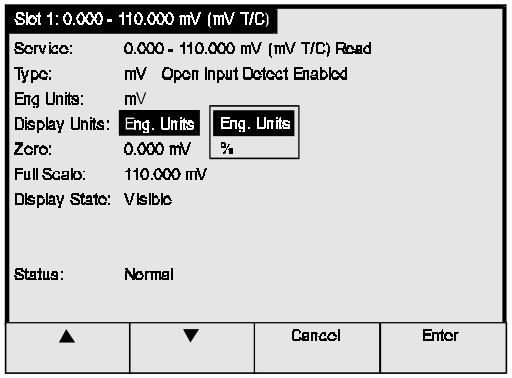


The Calibration screen will be displayed.



9. Press **Enter** to call up the Zero data entry window.

4. Select an item from the selection list or enter a value, then press **Enter**.



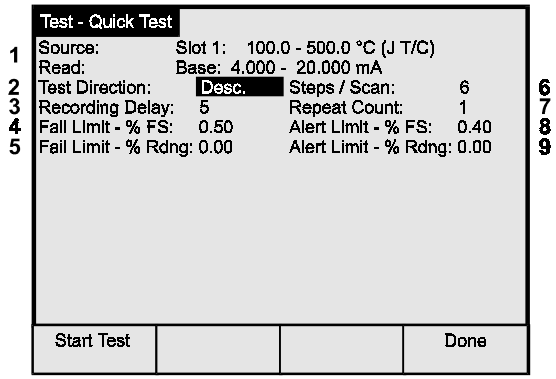
5. When finished, press the **Save Changes** key to save the changes and exit the Setup screen.

Performing a Quick Test

The Quick Test feature allows a pre-configured test to be performed and recorded with just a few keystrokes.

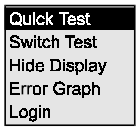
The following test parameters can be configured:

1	Source/Read	The configured ranges and service (Source or Read) for the QuikCal 60 and the Base Unit. These values must be configured via the Setup feature as described in "Using the Setup Feature".
2	Test Direction	The direction of the test (Ascending, Descending, or Both).
3	Recording Delay	The delay (in seconds) before data recording begins.
4	Fail Limit - % Full Scale	The fail limit as a percentage of full scale.
5	Fail Limit - % Reading	The fail limit as a percentage of reading.
6	Steps/Scan	The number of steps during the test.
7	Repeat Count	The number of times the test is performed.
8	Alert Limit - % Full Scale	The alert limit as a percentage of full scale.
9	Alert Limit - % Reading	The alert limit as a percentage of reading.



To perform a Quick Test, do the following:

1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of a Base Unit.
2. Select the appropriate data window.
3. As required, press **Setup** to configure the Source and Read parameters as described in "Using the Setup Feature" on page 4.
4. Perform the applicable connections from the QuikCal 60 to the device under test.
5. Press the **Commands** key to call up the Commands list.
6. Select "Quick Test", then press **Enter**.



7. Verify that the test parameters are correct. If not, do the following:
   a. Press **Setup**.
   b. Use the ▲ and ▼ keys to select a parameter, then press **Enter** to call up the selection list or data entry window associated with the selected item.
   c. Select an item from the selection list or enter a value, then press **Enter**.

3. Press **Setup** to set Service: to *Source* as instructed in "Using the Setup Feature" on page 4.
4. Connect the negative input lead of the mV transmitter/alarm to the negative (-) terminal on the QuikCal 60.
5. Connect the positive input lead of the mV transmitter/alarm to the positive (+) terminal on the QuikCal 60.
6. Enter the mV output to be generated via the numeric keypad. Press the **0%**, ▲, ▼, or **100%** keys to generate other mV outputs.

Maintenance

Since the QuikCal 60 was designed as a low maintenance unit, field service procedures are limited to cleaning the case exterior. Use a damp, soft cloth with mild non-abrasive detergent; solvents or abrasives should not be used since they can damage the case finish.

Calibration

Due to the QuikCal 60's sophisticated electronics and software, calibration beyond the zero and span adjustment procedures described in "User Calibration" below requires equipment and procedures available only at Transmation. We recommend that the QuikCal 60 be returned to Transmation for calibration annually to ensure optimum operation. Our service department can also inform the customer of any recent product upgrades, retrofits, modifications, or enhancements.

User Calibration

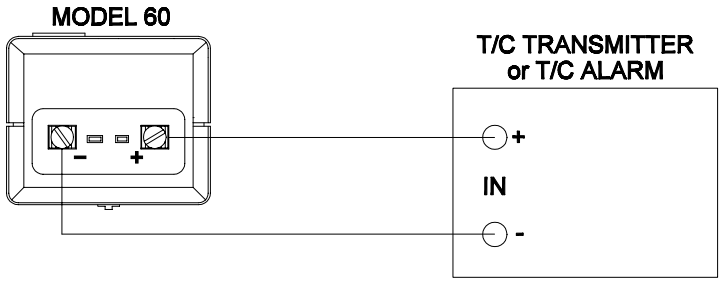
The QuikCal 60 actually stores two sets of correction factors. The first set of factors is determined during factory calibration. Factory calibration numbers can only be accessed by factory authorized service personnel.

The second set of correction factors used by the QuikCal 60 can be calibrated by users that have suitable calibration standards. This allows the user's qualified service personnel to calibrate the QuikCal 60 using suitably accurate equipment without returning the unit to the Factory. This set of factors does not replace the factory calibration, but is used in conjunction with the factory values.

Calibration Equipment

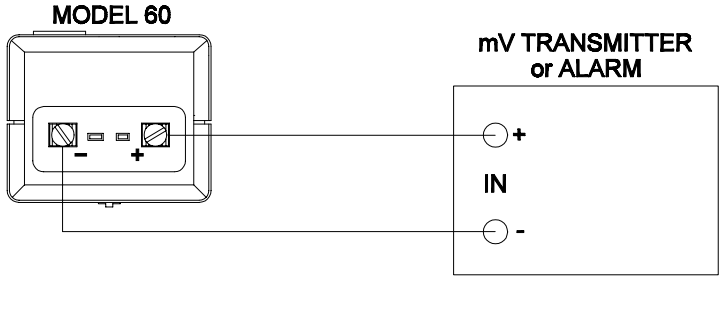
The electrical I/O calibration requires a voltage/current source capable of generating

Simulating a Thermocouple Output



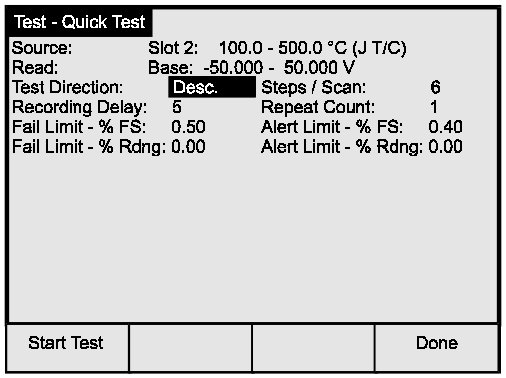
1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of a Base Unit.
2. Select the appropriate data window.
3. Press **Setup** to set Service: to *Source* as instructed in "Using the Setup Feature" on page 4.
4. Connect the negative input lead of the thermocouple transmitter/alarm to the negative (-) terminal on the QuikCal 60.
5. Connect the positive input lead of the thermocouple transmitter/alarm to the positive (+) terminal on the QuikCal 60.
6. Enter the output signal to be generated via the numeric keypad. Press the **0%**, ▲, ▼, or **100%** keys to generate other signals.

Generating a mV Output

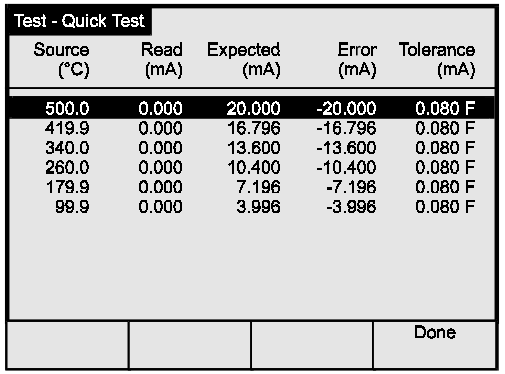


1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of a Base Unit.
2. Select the appropriate data window.

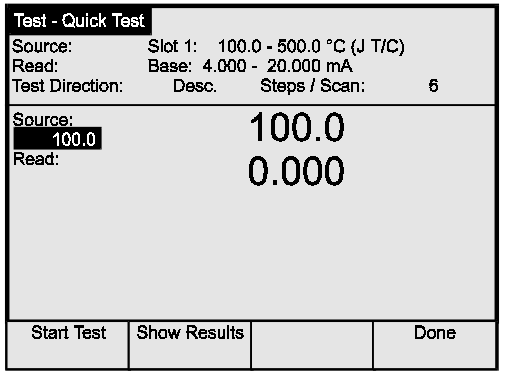
8. Press the **Start Test** key to start the Quick Test.



9. When the test sequence is complete, press the **Show Results** key to view the test results.



10. When the test results have been noted, press the **Done** key.



11. Press the **Done** key to exit the Quick Test screen.

Input/Output Terminals

The input/output terminals on the QuikCal 60 consist of a single set of miniature thermocouple connectors and a pair of screw terminals.

Error Conditions

The display will flash if a value falls outside the measurement range of the QuikCal 60 or the Base Unit. Five exclamation points ("!!!!!") will be displayed if a measured value is significantly beyond the measurement range of the module or Base Unit. An asterisk next to the displayed value indicates that an error condition has been detected. The Status field in the data window will indicate the cause of the error.

Read Mode Errors

Over Calibrated Range:	The signal is over the calibrated range.
Under Calibrated Range:	The signal is under the calibrated range.
A/D Overrange:	The signal is too high to be read correctly.
A/D Underrange:	The signal is too low to be read correctly.
Open Input:	Absence of an input has been detected; check for proper connections.

Source Mode Errors

Output Setpoint Overrange:	The output setpoint is over the calibrated range.
Output Setpoint Underrange:	The output setpoint is under the calibrated range.

Using the QuikCal 60

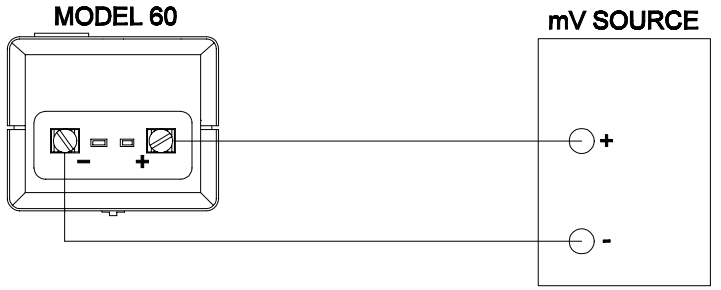
Monitoring Thermocouple Inputs

60001

1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of a Base Unit.
2. Select the appropriate data window.

3. Press **Setup** to set Service: to *Read* as instructed in "Using the Setup Feature" on page 4.
4. Connect one leg of the thermocouple probe to the negative (-) terminal on the QuikCal 60.
5. Connect the other leg of the thermocouple probe to the positive (+) terminal on the QuikCal 60.
6. The measured thermocouple input will be displayed.

Monitoring mV Inputs



60002

1. Insert the QuikCal 60 into Slot 1 (or Slot 2) of a Base Unit.
2. Select the appropriate data window.
3. Press **Setup** to set Service: to *Read* as instructed in "Using the Setup Feature" on page 4.
4. Connect the negative output lead of the mV source to the negative (-) terminal on the QuikCal 60.
5. Connect the positive output lead of the mV source to the positive (+) terminal on the QuikCal 60.
6. The measured mV value will be displayed.