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Extech Instruments Corporation
EICM421502-CP
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Revision: 1.2

421502 CALIBRATION PROCEDURE

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Revision Log

Revision Number	Date Approved	Pages Affected	Description of Revision
Initial	November 2009	All	Initial Release
1.0	April 2016	3, 4, 5	Changed the equipment in Section 2. Revised the Table of Contents, Introduction and the Accuracy Test.
1.1	July 2016	6	Revised Section 5.0, Version 2
1.2	December 2016	7, 8	Added Figures 1, Version 1 and Figure 2, Version 2.

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1.0. INTRODUCTION

1.1 Purpose

The purpose of this procedure is to provide calibration instructions for Extech Instruments Model 421502

1.2 Scope / Field of Application

This procedure will be used by Extech Instruments Calibration Laboratory staff when calibrating Extech Instruments Model 421502.

1.3 Document Security

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1.4. Document References

- Model 421502 “Type J/K Digital Thermometer” Checking Procedure.
- 421502 Data Sheet – EICDS-421502.

2.0. REQUIRED EQUIPMENT

The following equipment will be needed to properly calibrate the instrument.

- (1) Calibrated Fluke (Model: 525A) or equivalent.
- (1) Premium Grade Type K Thermocouple extension cable with subminiature connector
- (1) Type K Banana Plug Adapter

3.0. 421502 ACCURACY TEST

- 3.1. Install a new 9VDC battery into the instrument.
- 3.2. Connect the Premium Grade Type K Thermocouple extension cable to the “T1” input slot on the 421502.
- 3.3. Connect the other end of the Premium Grade Type K Thermocouple extension cable to the “Input/Output” slot on the Fluke 525A.
- 3.4. Set the Fluke 525A to “°F”, “Output”, and “Type K”.
- 3.5. Power up the 421502, and set it to “T1”, “°F”, and “Type K”.
- 3.6. Set the Fluke 525A to output a value of -30.0°F.

NOTE: The 421502 should indicate a value of -30.0°C +/- (0.05%rdg+0.6°F)

- 3.7. Record the reading on the proper data sheet. (EICDS-421502)
- 3.8. For the remaining test points refer to the “Model 421502 – Checking Procedure” listed on Appendix: A.

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NOTE: When calibrating customer owned instruments, technicians must record all of the “as received” readings on the corresponding data sheet. If the instrument is newly purchased from stock and does not meet the specified tolerances, proceed to Section: 4. Technicians are not required to record “Out of Tolerance” indications for newly purchased instruments.

3.9. If any of the readings were outside of the specified tolerances, proceed to Section: 4.

3.10. If all of the readings were within the specified tolerances, the verification is now complete.

4.0. 421502 CALIBRATION ADJUSTMENTS “Version 1”

NOTE: To perform the following adjustments, the same equipment is required as indicated in Section: 2.0. To access the calibration jumper, remove the four screws located on the back of the unit, then carefully remove the back cover.

- 4.1. Remove the jumper on J3 and place it on J1 on the instrument
- 4.2. Power on the 421502.
- 4.3. Connect the Premium Grade Copper Cable Mini Connector to the “T1” slot on the instrument.
- 4.4. Connect the other end of the Premium Grade Copper Cable Mini Connector to the Fluke 525A.
- 4.5. Set the Fluke 525A to mVDC
- 4.6. Apply 60.00mVDC to the 421502.
- 4.7. Allow the readings to stabilize, then press the “ENTER” key.
- 4.8. Connect the Premium Grade Type K Thermocouple extension cable to the “T1” slot on the instrument.
- 4.9. Connect the other end of the Premium Grade Type K Thermocouple extension cable to the Fluke 525A.
- 4.10. Set the Fluke 525A to “°F”, “Type K”, and “OUTPUT”.
- 4.11. Apply 0.0°F to the 421502.
- 4.12. Allow the readings to stabilize, then press the “ENTER” key.
- 4.13. Remove the jumper on J1 and place it back on J3.

NOTE: After the adjustments have been made, proceed to Section: 3 to retest the instrument. Record the data from Section: 3 as the “Final Reading” of the instrument. If the instrument is new, record the data as the “Calibration Data”.

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5.0 421502 CALIBRATION ADJUSTMENTS “Version 2”

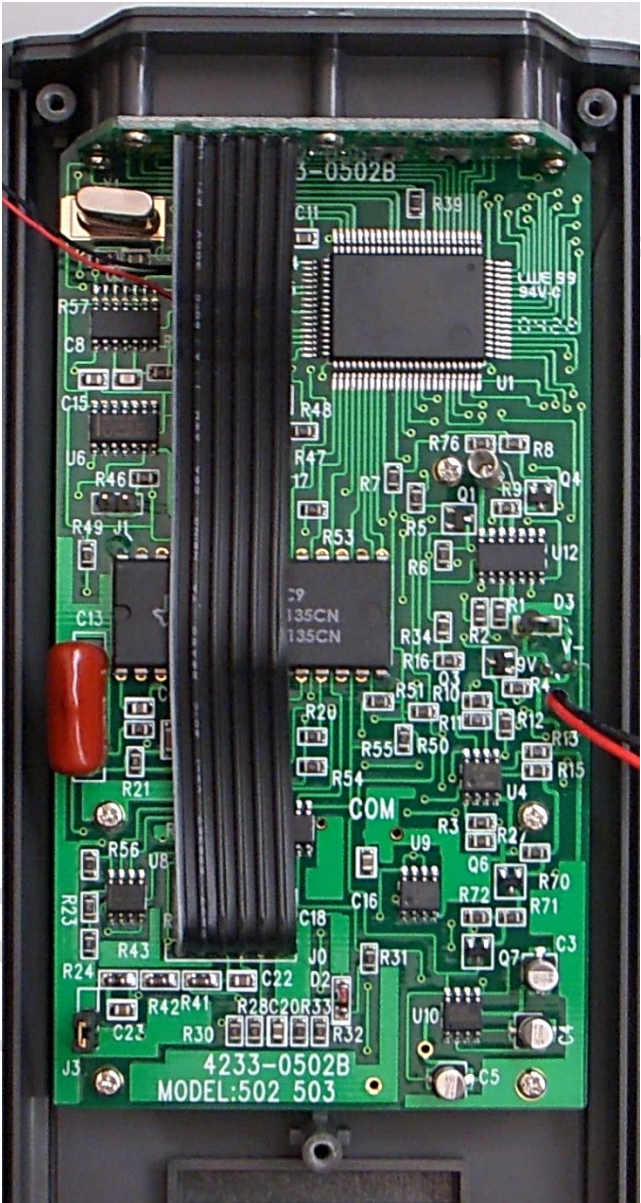
NOTE: To perform the following adjustments, the same equipment is required as indicated in Section: 2.0. To access the calibration jumper, remove the four screws located on the back of the unit, then carefully remove the back cover.

- 5.1. Short the pins J3.
- 5.2. Power on the 421502.
- 5.3. Connect the Premium Grade Copper Cable Mini Connector to the “T1” slot on the instrument.
- 5.4. Connect the other end of the Premium Grade Copper Cable Mini Connector to the Fluke 525A.
- 5.5. Set the Fluke 525A to mVDC
- 5.6. Apply 65.00mVDC to the 421502.
- 5.7. Allow the readings to stabilize, then press and hold the “SET” key until the display shows “0.1”.
- 5.8. Connect the Premium Grade Type K Thermocouple extension cable to the “T2” slot on the instrument.
- 5.9. Connect the other end of the Premium Grade Type K Thermocouple extension cable to the Fluke 525A.
- 5.10. Set the Fluke 525A to “°C”, “Type K”, and “OUTPUT”.
- 5.11. Apply 0.0°C to the 421502.
- 5.12. Allow the readings to stabilize, then press the “SET” button to save, press the SET button again to power off the unit.
- 5.13. Remove the jumper on J3.

NOTE: After the adjustments have been made, proceed to Section: 3 to retest the instrument. Record the data from Section: 3 as the “Final Reading” of the instrument. If the instrument is new, record the data as the “Calibration Data”.

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FIGURE: 1
VERSION: 1



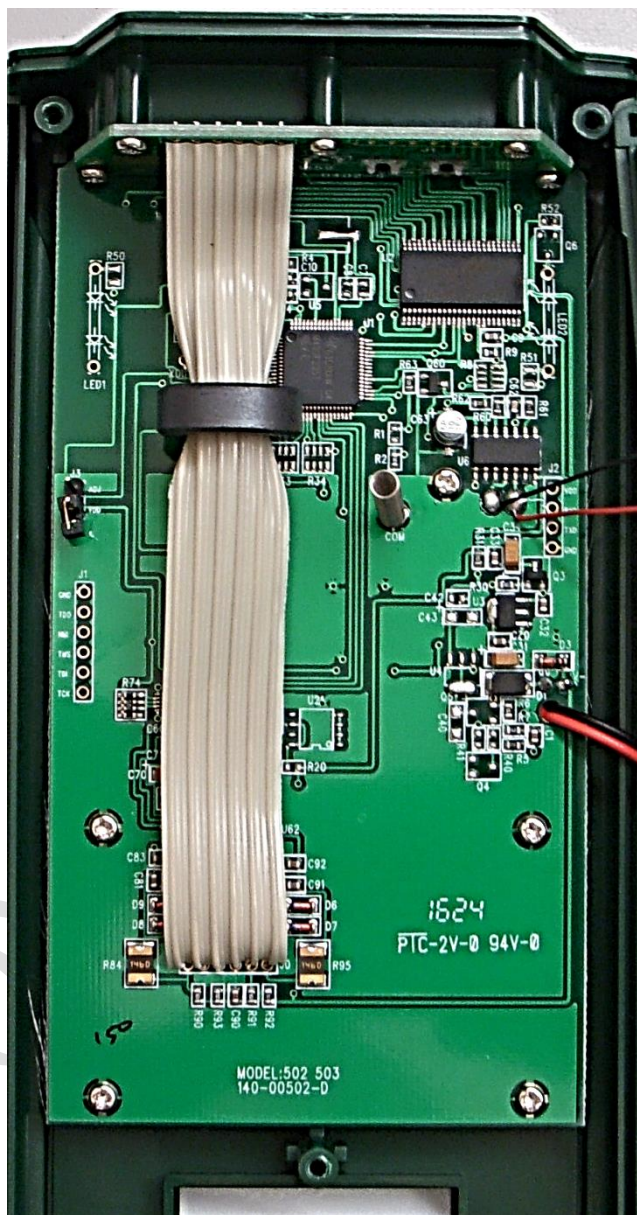
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FIGURE: 2
VERSION: 2



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Appendix: A

CHECKING PROCEDURE

MODEL 421502

Type J/K Digital Thermometer

1. VISUAL - Check for cosmetic problems, scratches, wrong labels, loose labels, etc.
2. Insert 1 each "9V" battery and observe correct polarity.
3. Power ON the unit and preset the 421502 to read degrees F, "T1" and "K" type thermocouple.
4. Set the "Hi/Lo" limits as follows:
 - a. Press "Set" and observe the "Rel" is ON.
 - b. Press "Enter" twice to exit "Rel" mode and observe that the beep icon is ON.
 - c. Press "1700.0" and push "Enter" This sets the Hi limit at 1700 degrees.
 - d. Press "0025.0". Then press the "-" button.
 - e. Verify that the display indicates "-025.0" (Lo Limit) and press "Enter".
 - f. Press "Hi/Lo Limits" (Note beep and beep icon)
5. Test the unit using an input from a MicroCal 2 set up for "K" type and degrees F using the "T1" input

FUNCTION	RANGE	INPUT TOLERANCE	READING	NOTES
"K" type	-30.0 °F	+/- (0.05%rdg+0.6°F)	-30.6 to -29.4	alarm beeps
	32.0 °F	+/- (0.05%rdg+0.6°F)	31.4 to 32.6	
	212 °F	+/- (0.05%rdg+0.6°F)	211.3 to 212.7	
	1000 °F	+/- (0.05%rdg+0.6°F)	998.9 to 1001.1	
	2300 °F	+/- (0.05%rdg+0.6°F)	2298.2 to 2301.8	alarm beeps

6. Change the 421502 to read °C and press the "Hi/Lo Limits button to turn OFF the Hi/Lo function.

"K" type	32.0°F	+/- (0.05%rdg+0.3°C)	-0.3 to 0.3°C
	212.0°F	+/- (0.05%rdg+0.3°C)	99.6 to 100.4°C
	1000°F	+/- (0.05%rdg+0.3°C)	537.2 to 538.4°C
	2300°F	+/- (0.05%rdg+0.3°C)	1259.1 to 1260.9°C

7. Change the 421502 to type "J" thermocouple and set the MicroCal 2 to type "J" (use black thermocouple).

"J" type °F	32.0 °F	+/- (0.05%rdg+0.6°F)	31.4 to 32.6
	212 °F	+/- (0.05%rdg+0.6°F)	211.3 to 212.7
	1000 °F	+/- (0.05%rdg+0.6°F)	998.9 to 1001.1
	1800 °F	+/- (0.05%rdg+0.6°F)	1798.5 to 1801.5

8. Test that the "Max./Min" and "Hold" functions work. Then hold the "Max/Min" button to return to normal.
9. Follow step 5 for the "T2" input
10. Check that the "Auto Power Off" function powers OFF the unit after approximately 30 minutes, then re-pack and check for: 1 ea. - manual, 2 ea. - "K" type thermocouples