

# MODIFICATION RECOMMENDED

## U1401B-02A

# S E R V I C E N O T E

Supersedes:  
U1401B-02

### U1401B Handheld multi-function calibrator or meter

Serial Numbers: See Appendix (B)

Constant current output may be out of specification

#### Parts Required:

P/N	Description	Qty.
NONE		

## ADMINISTRATIVE INFORMATION











SERVICE NOTE CLASSIFICATION: <b>MODIFICATION RECOMMENDED</b>	
ACTION X ON SPECIFIED FAILURE CATEGORY: <input type="checkbox"/> AGREEABLE TIME	STANDARDS LABOR: 0.5 Hours
LOCATION x CUSTOMER INSTALLABLE CATEGORY: <input type="checkbox"/> ON-SITE ( <b>active On-site contract required</b> ) X SERVICE CENTER <input type="checkbox"/> CHANNEL PARTNER	SERVICE <input type="checkbox"/> RETURN INVENTORY: <input type="checkbox"/> SCRAP <input type="checkbox"/> SEE TEXT USED <input type="checkbox"/> RETURN PARTS: <input type="checkbox"/> SCRAP <input type="checkbox"/> SEE TEXT
AVAILABILITY: PRODUCT'S SUPPORT LIFE	NO CHARGE AVAILABLE UNTIL: 31 August 2016
X Calibration Required <input type="checkbox"/> Calibration NOT Required	PRODUCT LINE: WC AUTHOR: KT
ADDITIONAL INFORMATION: . . 1 This service note is only valid within the 1 <sup>st</sup> year of shipment AND for 1 time only 2. Calibration required for constant current output path only as describe below	

**Situation:**

Unit with the Serial number listed below may experience the constant current output failing its guaranteed performance specification when shipped out from factory.

**Loopback Verification procedure:**

Users can verify if the unit is impacted by performing the following steps below

- i. Connect the output terminal to the input terminal on U1401B.  
Photo needed...
- ii. Turn the rotary switch to the  (constant current output/input) positions.
- iii. Press SHIFT to access the shifted operations of the keypad. The  annunciator will appear on the display.
- iv. Press MODE to cycle through  $\pm 25$  mA,   $\pm 25$  mA, and   $\pm 25$  mA output modes. Select the  $\pm 25$  mA output mode for constant output.
- v. With the instrument in standby mode (you should see the  annunciator on the display; if not, press OUTPUT), you can adjust the amplitude of the output by pressing  and  to select the digit to be adjusted, and then pressing  and  to adjust the value of the selected digit.
- vi. Press OUTPUT to start the source output. The  annunciator will appear on the display.

The impacted units will have the actual current output different from the setting current output. Please refer to example picture as below.

- Setting: +01.000 mA
- Specification: 01.000 mA  $\pm$ 0.010mA (output specification + input specification)
- Measured: -08.835 mA(out of specification)



**Solution/Action:**

Users can choose to

- I. readjust the unit's constant current output back to meet the performance specification by following the steps below OR
- II. Contact the nearest Service Center to have the unit's constant current output recalibrated.

Recommended Instrument:

3458A 8.5 digits Digital Multi Meter

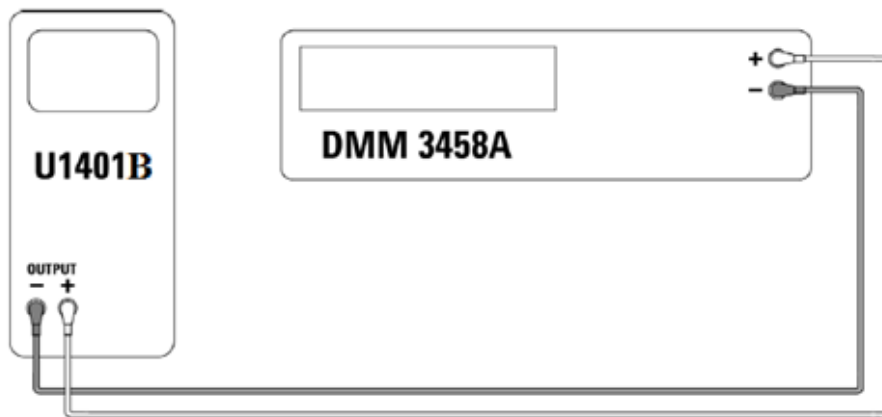
**Output calibration**

1. Set the slide switch to the M/S position
2. Allow the instrument to warm up for 10 minutes before performing the calibration.
3. To enter the calibration mode, press  $\leftarrow$  and  $\rightarrow$  for more than one second. The primary display will indicate "CHEEP".
4. Press  $\text{Hz}$  to enter the input calibration mode.
5. Turn the rotary switch the "current Input/Voltage output" positions, and press **SHIFT** for more than one second to enter the output calibration mode.

**CAL-0 & CAL-1**

In the output calibration mode, the primary and secondary display will show "CAL-0" and "-rdy-" respectively.

Connect the output terminals to the voltage input terminals of 3458A multimeter as show in below picture. Set the 3458A to measure DCV, 100mV and NPLC = 100.



**Output voltage verification**

**•CAL-0:**

1. Press **OUTPUT**. The primary and secondary displays show "CAL-0" and "00000" respectively.
2. Wait until the instrument reading becomes stable, and then record DCV value on the 3458A.

**•CAL-1:**

1. Press **MODE**. The primary and secondary displays show “CAL- 1” and “- rdy” respectively.
2. Press **OUTPUT**. The primary and secondary displays show “CAL- 1” and “00000” respectively.
1. Press **▲** or **▼** to adjust the output voltage until the reading on the 3458A is the same as the **CAL-0** value recorded above.
2. Press **MODE** to finish the **CAL-0** and **CAL-1** calibration.

After finishing the **CAL-0** and **CAL-1** calibration procedures, the instrument will automatically enter the 1.5 V output calibration modes.

**Output voltage calibration**

Follow the steps below to perform calibration for the output voltage ranges and values listed in Table1-1:

1. As you enter each calibration step, the primary and secondary displays show the *output voltage value* and “-rdy-” respectively.
2. Press **OUTPUT**. The primary and secondary displays show the *output voltage value* and “00000” respectively, which means the present output level is as shown on the primary display.
3. Press **▲** or **▼** to adjust the output voltage until the 3458A reading is the same as the value shown on the primary display.
4. Press **MODE** to enter the next calibration step.

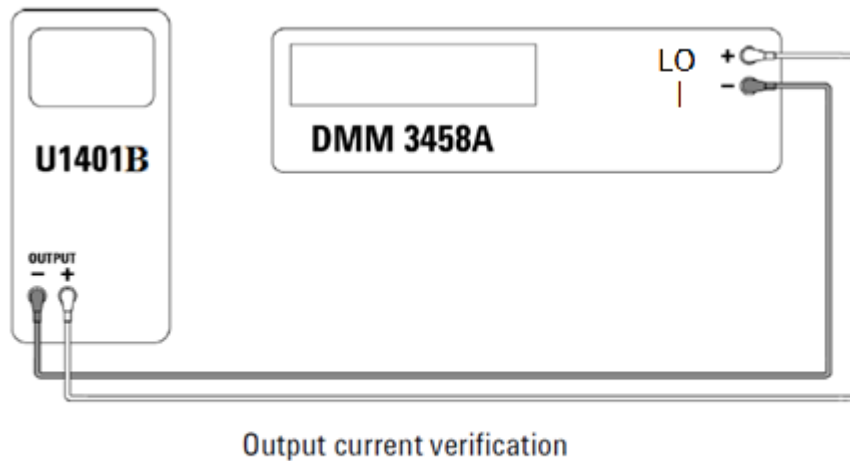
**Table 1-1** Output voltage calibration steps

Voltage range	Calibration step	Output voltage value	3458A range
1.5V	1	+0.0000 V	100mV
	2	+1.1000 V	1V
	3	-1.1000 V	1V
15V	4	+00.000 V	100mV
	5	+11.000 V	10V
	6	-11.000 V	10V

At the end of the last calibration step, the primary display will show “PASS” after the **MODE** button is pressed.

**Output current calibration**

1. Without exiting the calibration mode, turn the rotary switch to the “Current Input/Current Output” positions.
2. Connect the output terminals to a 3458A multimeter as show in below picture. Set the 3458A to measure DCI and NPLC = 100.





Follow the steps below to perform calibration for the output voltage ranges and values listed in Table 1-2:

1. As you enter each calibration step, the primary and secondary displays show the *output current value* and “-rdy-” respectively.
2. Press **OUTPUT**. The primary and secondary displays show the *output current value* and “00000” respectively, which means the present output level is as shown on the primary display.
3. Press ▲ or ▼ to adjust the output current until the 3458A reading is the same as the value shown on the primary display.
4. Press **MODE** to enter the next calibration step.



**Table 1-2** Output current calibration steps

Current range	Calibration step	Output current value	3458A range
25mA	1	+00.000 mA	100uA
	2	+11.000 mA	10mA
	3	-11.000 mA	10mA

At the end of the last calibration step, the primary display will show “PASS” after the **MODE** button is pressed. The output calibration is completed. To exit from calibration mode, press the  &  button for more than one second. The DUT's will be restarting, indicated by all display segment briefly shown for approximately 3 seconds.

Lastly, do the output performance verification tests as per table 7-4 in the service guide pages 137.

**Table 7-4** Output performance verification tests

Step	Function	Recommended test equipment and connection	Range or parameter	U1401B output	Nominal error within 1 year
1	Turn the rotary switch to any one of the  positions.	Connect the U1401B output terminals to the 3458A Multimeter.	±15.000 V	-1.5 V	±0.75 mV
				0 V	±0.3 mV
				+1.5 V	±0.75 mV
			±15.000 V	-15 V	±7.5 mV
				0 V	±3 mV
				+15 V	±7.5 mV
2	Turn the rotary switch to any one of the  positions.	Connect the U1401B output terminals to the 3458A Multimeter.	±25.000 mA	-25 mA	±12.5 µA
				+25 mA	±12.5 µA

Remark: Detail calibration process is available in the service guide.

**Revision History:**

Service Note Revision	Date	Author	Reason For Change
01	1/29/15	KT	As published
02	3/12/15	KT	Revise the affected serial number and please see Appendix (B). Remove the Appendix (A).

**Appendix (B)**

MY53030018	MY53420004	MY53500005	MY54060042	MY54100019	MY54160012
MY53060002	MY53420006	MY53500008	MY54060043	MY54100021	MY54160014
MY53100005	MY53420007	MY53500009	MY54060045	MY54100022	MY54160015
MY53100059	MY53420008	MY53500010	MY54060047	MY54100028	MY54160016
MY53300001	MY53420009	MY53500045	MY54070003	MY54130011	MY54160019
MY53300002	MY53420011	MY53500046	MY54070005	MY54130012	MY54160023
MY53300003	MY53420013	MY53500053	MY54070006	MY54130016	MY54160024
MY53300004	MY53420014	MY53500054	MY54070007	MY54130025	MY54160025
MY53300005	MY53420015	MY53500055	MY54070008	MY54130029	MY54160026
MY53300006	MY53420016	MY53500056	MY54070009	MY54130031	MY54170001
MY53300007	MY53420017	MY53500058	MY54070012	MY54130032	MY54170003
MY53300008	MY53440001	MY53500059	MY54070014	MY54130033	MY54170004
MY53300009	MY53440004	MY53500060	MY54070015	MY54130035	MY54170005
MY53300010	MY53440005	MY53520001	MY54070016	MY54130036	MY54170006
MY53300011	MY53440013	MY53520002	MY54070023	MY54130038	MY54170007
MY53300013	MY53440014	MY53520003	MY54070024	MY54130039	MY54170008
MY53300014	MY53440015	MY53520004	MY54070028	MY54130040	MY54170009
MY53300015	MY53440017	MY53520005	MY54070032	MY54130041	MY54170010
MY53300016	MY53440018	MY53520009	MY54070034	MY54130042	MY54170011
MY53300017	MY53440019	MY53520010	MY54070038	MY54130043	MY54170013
MY53300018	MY53440020	MY54060002	MY54070041	MY54130046	MY54170014
MY53300019	MY53460001	MY54060004	MY54070044	MY54130048	MY54170016
MY53300022	MY53460002	MY54060006	MY54070045	MY54130049	MY54170018
MY53390001	MY53460004	MY54060009	MY54070047	MY54130050	MY54170019
MY53390002	MY53460010	MY54060011	MY54090001	MY54130055	MY54170020
MY53390003	MY53460023	MY54060015	MY54090002	MY54130056	MY54170021
MY53390006	MY53460024	MY54060016	MY54090004	MY54130058	MY54170022
MY53390008	MY53460025	MY54060021	MY54090005	MY54130059	MY54170023
MY53390010	MY53460026	MY54060022	MY54090006	MY54130061	MY54170024
MY53400003	MY53460028	MY54060023	MY54090008	MY54130062	MY54170027
MY53400006	MY53460031	MY54060024	MY54100001	MY54130063	MY54170028
MY53400010	MY53460034	MY54060025	MY54100002	MY54130064	MY54170029
MY53410005	MY53460035	MY54060026	MY54100006	MY54130066	MY54180003
MY53410006	MY53460036	MY54060028	MY54100008	MY54130068	MY54180005
MY53410007	MY53460037	MY54060029	MY54100009	MY54160002	MY54180007
MY53410009	MY53460038	MY54060031	MY54100011	MY54160003	MY54180008
MY53410010	MY53460040	MY54060032	MY54100014	MY54160004	MY54180009
MY53420001	MY53500001	MY54060034	MY54100016	MY54160005	MY54180010
MY53420002	MY53500002	MY54060035	MY54100017	MY54160006	MY54180015
MY53420003	MY53500004	MY54060041	MY54100018	MY54160008	MY54180017

**Appendix (B)**

MY54180020	MY54240025	MY54240080	MY54470031
MY54180022	MY54240026	MY54270001	MY54470036
MY54180023	MY54240028	MY54270002	MY54470037
MY54180026	MY54240029	MY54270004	MY54480002
MY54220001	MY54240031	MY54270005	MY54480007
MY54220006	MY54240033	MY54320001	MY54480008
MY54220008	MY54240036	MY54320002	MY54480009
MY54220009	MY54240037	MY54320004	MY54480012
MY54230002	MY54240038	MY54320005	MY54480015
MY54230003	MY54240040	MY54320006	MY54480016
MY54230004	MY54240042	MY54320008	MY54480017
MY54230006	MY54240043	MY54320009	MY54480020
MY54230008	MY54240044	MY54320011	MY54480025
MY54230011	MY54240045	MY54320014	MY54500002
MY54230012	MY54240047	MY54320015	MY54500004
MY54230013	MY54240048	MY54320016	MY54500005
MY54230015	MY54240049	MY54320017	MY54500008
MY54230016	MY54240050	MY54320018	MY54500009
MY54230017	MY54240051	MY54320025	MY54500010
MY54230019	MY54240052	MY54320026	MY54500012
MY54230020	MY54240054	MY54320027	MY54500014
MY54240001	MY54240055	MY54320028	MY54500015
MY54240002	MY54240056	MY54320029	MY54500016
MY54240004	MY54240057	MY54320031	MY54500017
MY54240005	MY54240058	MY54320032	MY54500018
MY54240006	MY54240059	MY54320040	MY54500020
MY54240007	MY54240060	MY54320044	
MY54240008	MY54240061	MY54320045	
MY54240009	MY54240062	MY54320048	
MY54240010	MY54240064	MY54320049	
MY54240011	MY54240065	MY54320051	
MY54240012	MY54240066	MY54320052	
MY54240013	MY54240067	MY54320055	
MY54240014	MY54240068	MY54320056	
MY54240017	MY54240069	MY54320058	
MY54240018	MY54240073	MY54470021	
MY54240020	MY54240074	MY54470024	
MY54240022	MY54240075	MY54470025	
MY54240023	MY54240078	MY54470026	
MY54240024	MY54240079	MY54470029	