INSTRUCTION SHEET

DR/2000 and DR/2010 Spectrophotometer

Wavelength Calibration Adjustment

Purpose

These instructions provide a step-by-step procedure for performing a wavelength calibration adjustment for the DR/2000 Spectrophotometer (software versions 2.0, 2.2, 3.0 and greater) and DR/2010 Spectrophotometer. Do not perform this procedure if your instrument has 1.261 or 1.27 software! Perform the adjustment any time the lamp assembly (Cat. No. 46644-00) is replaced and periodically for optimum performance. The adjustment assures the best possible accuracy and repeatability. Use the Calibration Filter Assembly (Cat. No. 46646-00) to make the adjustment.

Start by following the three steps below. Then choose the step-by-step instructions that apply to the specific instrument and software you are using to finish the calibration adjustment.

1. If lamp replacement is necessary, see the Lamp Replacement instructions shipped with the lamp.

2. Determine which software version applies to the spectrophotometer being adjusted. For the DR/2010 Spectrophotometer, the software version will briefly appear after the instrument is turned on. For the DR/2000 Spectrophotometer, different messages will appear, depending on the software in the instrument (see *Table 1*):

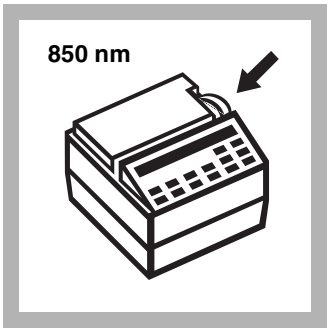
Table 1 DR/2000 Messages Indicating Software Versions

DR/2000 Software Version	Display
2.0 or 2.2	If the first display is **Method #?**, press **SHIFT CONFIG/METH**, then enter **888** with the numeric keys. Press **READ/ENTER**. The display will show **V2.0** or **V2.2**.
3.0 and greater	**Self-Test V3.X**
1.261 and 1.27	**DO NOT perform the calibration adjustment.** Monochromator calibration could be permanently lost (Hach Service cannot restore the calibration).

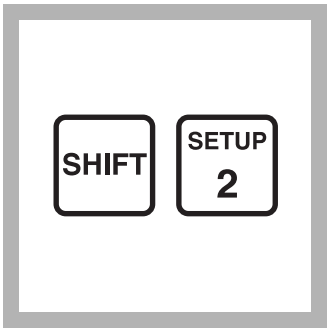
Select the appropriate wavelength calibration adjustment procedure on the following pages and continue.

Wavelength Calibration Adjustment, continued

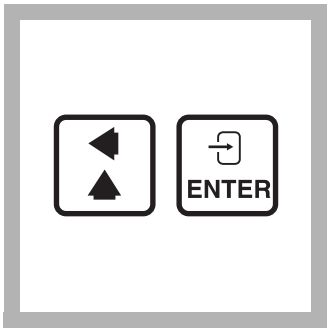
DR/2010 Spectrophotometer Procedure



1. Empty the cell compartment and close the cover. Adjust the wavelength to about 850 nm.

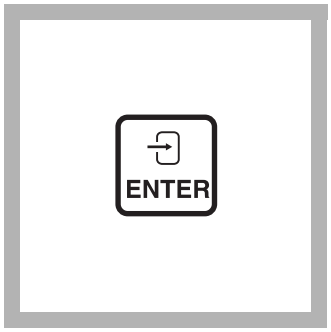


2. Press **SHIFT SETUP/2** to enter the Setup Menu. Press the **DOWN ARROW** twice to access **Lamp:**. If in Momentary mode, press **ENTER** then **UP ARROW,** then **ENTER** again. If in Constant-On mode, go to *step 3*.



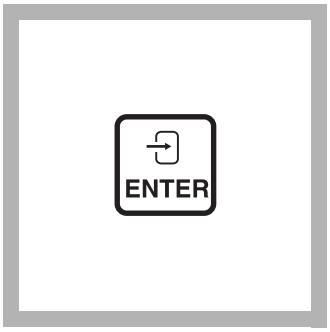
3. Scroll to the **Adjust nm** option with the **UP ARROW** key and press **ENTER**. The display will show:

Peak Filter:



4. Press: **ENTER**. The display will show:

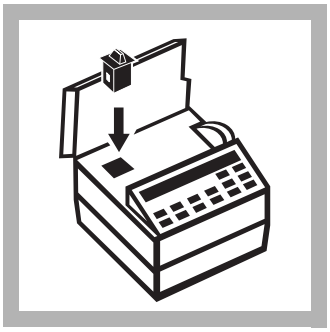
Zero Required



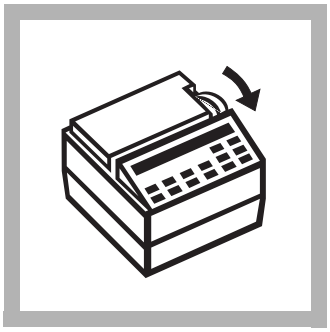
5. Press: **ENTER**

The display will show:

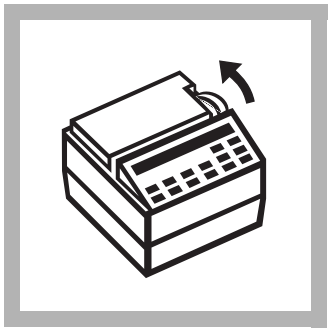
100 %T Peak Filter



6. Insert the calibration filter into the cell compartment with the tab facing right. Close the cover.

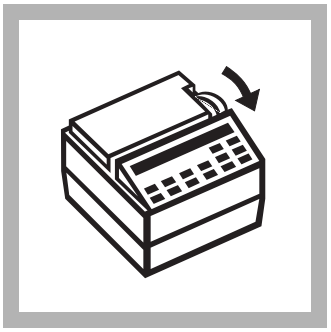


7. Slowly adjust the wavelength by turning the control counterclockwise. Record the wavelength where the % transmittance reading is greatest.

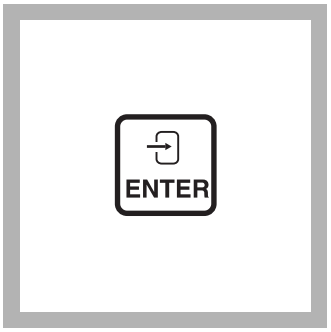


8. Turn the wavelength control clockwise so the wavelength is at least 10 nm higher than the wavelength value recorded in *step 7*.

Wavelength Calibration Adjustment, continued



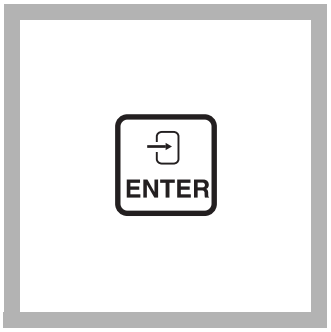
9. Slowly turn the wavelength control counterclockwise. Watch the %T values displayed. Stop exactly on the highest transmittance.



10. Press: **ENTER**

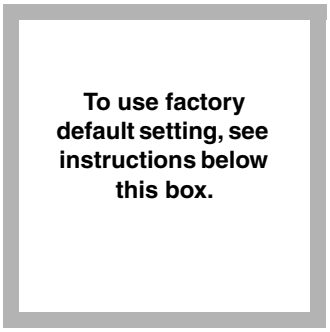
The display will show:

Are You Sure?



11. Press: **ENTER**

The calibration adjustment will occur automatically. If successful, the display will show **Completed** and then **Adjust nm**. If you cannot obtain a good adjustment, contact the Hach Service center serving you.

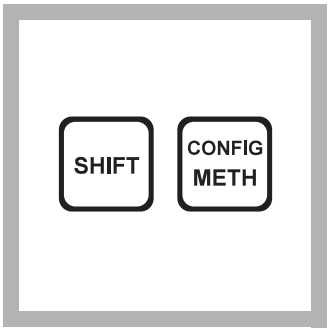


12. To use the factory default setting, press **SHIFT SETUP**, then press **UP ARROW** twice.

The display shows **Adjust nm:**. Press **ENTER**. Press **UP ARROW** once to display **Default Setup:**, then **ENTER**.

The display shows **Completed**. Press **EXIT** twice to get the **Enter Program #** prompt.

DR/2000 Spectrophotometer Procedure, Version 3.0 and Greater



1. Press:

SHIFT CONFIG/METH

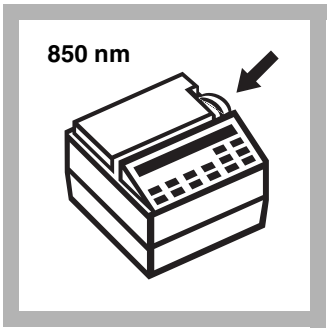
If **CONSTANT ON** is displayed, go to *step 2*. If **MOMENTARY** is displayed, press **READ/ENTER** to toggle to **CONSTANT ON**.

1. *Do not do this calibration if your instrument has version 1.261 or 1.27 software!*

2. Press **CONFIG/METH** twice to return to the **METHOD #?** prompt.

3. Press **SHIFT % T** to select the %T mode. The display will read:

%T



4. With the cell compartment empty and the cover closed, rotate the wavelength dial until the small display shows:

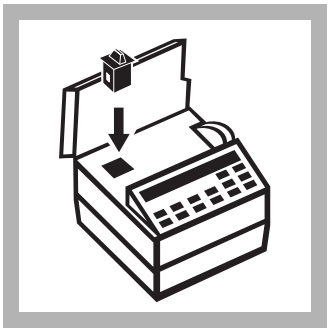
850 nm

Wavelength Calibration Adjustment, continued

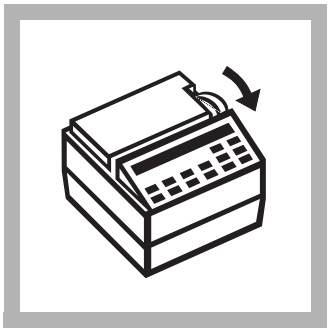
5. Press: **CLEAR/ZERO**
The display will show:

100.0 %T

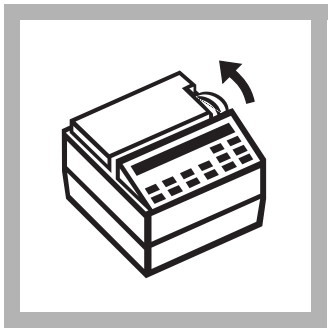
Note: *If the display does not read within ±0.3 %T, press* **CLEAR/ZERO** *again.*



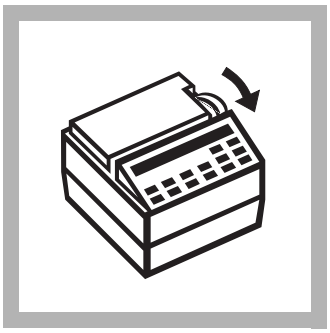
6. Place the Calibration Filter into the cell holder. Close the cover.
Note: *Align the tab with the notch in the cell holder opening.*



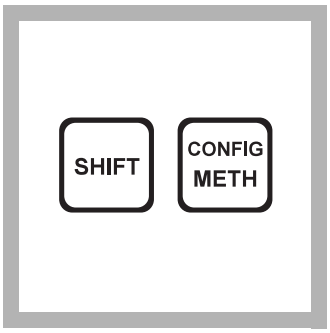
7. Slowly turn the wavelength dial counter-clockwise (decreasing wavelength). Record the wavelength where the %T is highest.



8. Turn the wavelength control clockwise so the wavelength is at least 10 nm higher than the wavelength value recorded in *step 7*.

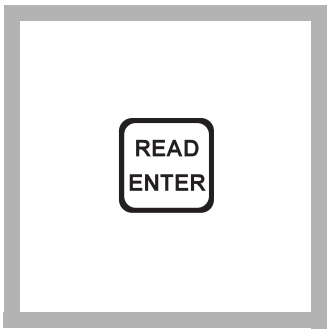


9. Slowly turn the wavelength control counterclockwise. Watch the %T values displayed. Stop exactly on the highest transmittance.



10. Press **SHIFT** **CONFIG/METH** and scroll with the Arrow keys until the display shows:

ADJUST nm



11. Press: **READ/ENTER**
The display will show:

ARE YOU SURE?

Press **READ/ENTER** again. If the wavelength calibration adjustment was successful, the display will show:

COMPLETED

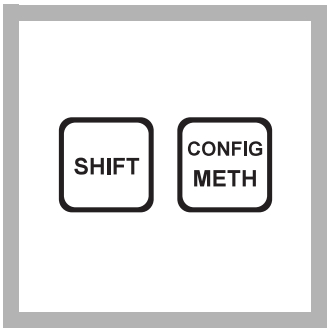
with **808** in the nm field and then: **ADJUST nm**

If you cannot obtain a good adjustment, contact the Hach Service center serving you.

12. Press **CONFIG/METH** three times to return the display to:

METHOD #?

DR/2000 Spectrophotometer Procedure, Versions 2.0 and 2.2



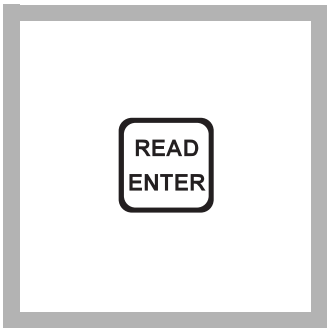
1. Press:

SHIFT CONFIG/METH

Scroll with the Arrow keys until the display shows:

CONSTANT ON

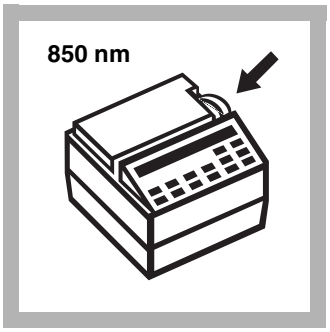
Note: *Do not do this calibration if your instrument has 1.261 or 1.27 version software!*



2. Press **READ/ENTER** three times to accept the mode choice and return to the **METHOD #?** prompt.

3. Press **SHIFT %T** to select the %T mode. The display will show:

%T



4. With the cell compartment empty and the cover closed, rotate the wavelength dial until the small display shows:

850 nm

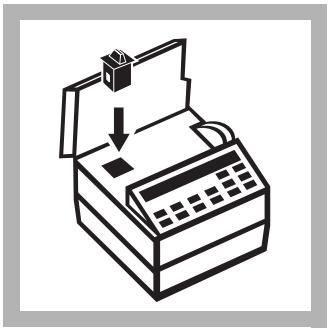
5. Press:

CLEAR/ZERO

The display will show:

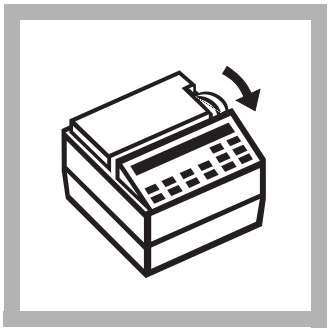
100.0% T

Note: *If the display does not read within ±0.3 %T, press* **CLEAR/ZERO** *again.*

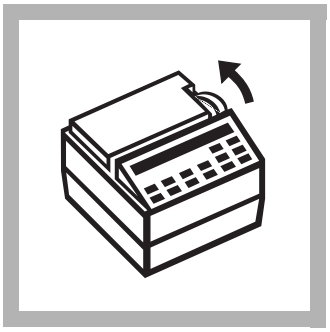


6. Place the Calibration Filter into the cell holder. Close the cover.

Note: *Align the key with the notch in the cell holder opening.*

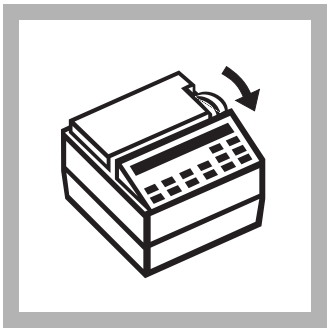


7. Slowly turn the wavelength dial counter-clockwise (decreasing wavelength). Record the wavelength where the %T is highest.

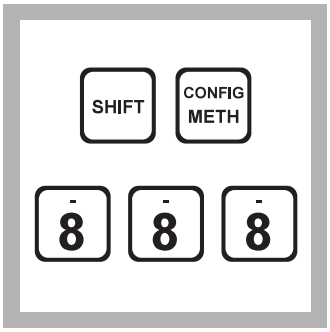


8. Turn the wavelength control clockwise so the wavelength is at least 10 nm higher than the wavelength value recorded in *step 7*.

Wavelength Calibration Adjustment, continued



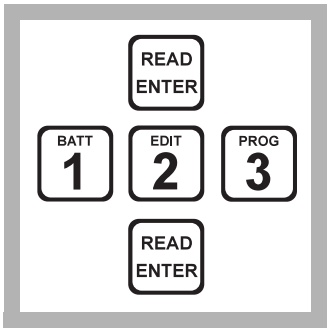
9. Slowly turn the wavelength control counterclockwise. Watch the %T values displayed. Stop exactly on the highest transmittance.



10. Press:

SHIFT CONFIG/METH

Enter **888** with the numeric keys.



11. Press **READ/ENTER** and immediately key in **1 2 3** and **READ/ENTER**.

If the calibration was successful, the display will show **808** in the nm field with the **METHOD #?** prompt.

If you cannot obtain a good adjustment, contact the Hach Service center serving you.

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In the U.S.A. - **Call toll-free 800-227-4224**
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