

HACH® Instruction Sheet

FilterTrak™ 660–Series 2 Supplemental Operating Information

Introduction

This instrument is supplied with the FilterTrak™ 660 Instruction manual. That manual is an appropriate reference for the Series 2 instrument when coupled with the following information:

- A new offset feature will allow up to a 0.05 mg/L offset of the value of the standards used for calibration. The offset value will be subtracted from the value displayed on the AquaTrend® Interface. The 0.05 mg/L offset can be entered after a calibration is complete and is based on an independent determination of the water used in the preparation of the turbidity standards.

For example, if a standard is prepared with a value of 0.8 mg/L, the 0.05 mg/L offset would result in a displayed value of 0.75 mg/L. See Setting the Offset to change the offset value.

- New measurement units—mg/L, NTU, FTU—have been added (mNTU is no longer available). 1 mg/L is approximately equal to 1 NTU. Refer to the comparison chart in Table 1 to view the correlation between NTU and mg/L of kaolin.
- A new upper limit of 2.5 mg/L has been established.

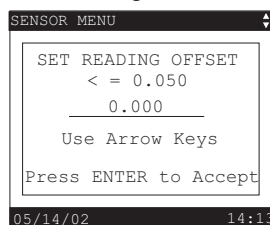
Setting the Offset

Follow the steps below to enter an offset:

Note: The data log for this channel will be erased if the offset is changed to anything other than zero.

1. Press the **MENU** key to access the Main Menu. Select Sensor Menu and press the **ENTER** key.
2. Using the arrow keys, select FT660 S2 and press **ENTER**.
3. Select Calibration from the menu choices and press **ENTER**.
4. Move the pointer to Set Reading Offset and press the **ENTER** key.
5. The display will prompt Set Reading Offset. Use the arrow keys to enter the offset. The value entered must be between 0–0.05 mg/L, values outside this range are not accepted.

Note: Offset is not used during calibration. During calibration the instrument assumes the offset is zero.



6. Press **ENTER** to accept the reading offset.

Correlation Study Between Kaolin Standards and Measured Turbidity

A study was performed on the FilterTrak 660 Series 2 (FT660 S2) Laser Nephelometer to determine the specific correlation between Kaolin and the NTU value reported using this instrument.

FilterTrak™ 660–Series 2 Supplemental Operating Information

Two sets of Kaolin standards were prepared for turbidity measurement. Each set was prepared from an independent lot of stock kaolin standard that was obtained from the manufacturer. Each test standard was prepared immediately before measurement using ultra-filtered water.

After preparation, each standard was introduced into the FT662 S2, beginning with the lowest value. Measurements on the standard were performed at 30-second intervals and 15 to 25 measurements were recorded for each standard. From the measurement on a specific test standard, the respective average and standard deviation was determined.

Table 1 contains the statistical summary from this study. When the turbidity values obtained for each of the Kaolin lots were averaged together and compared to the theoretical kaolin values, the results correlated very closely to each other. In fact, the correlation is better than one percent over the test range of 0–2.5 mg/L kaolin.

Even though there was a strong correlation between the mg/L and the NTU values when using the FT660 S2, the reproducibility of these measurements was poor. This is exhibited in Table 1, where the pooled standard deviations and predicted 95% confidence intervals are very high. The error was primarily traced to the variability in measurement for each standard, and the distinct differences between each manufacturer lot of stock standard.

Table 1 Summary of the Correlation Between Kaolin mg/L Values and NTU Turbidity Values on the FT660 S2

Standard Value (Theoretical) in mg/L Kaolin	Averaged Turbidity in NTU for Kaolin Lots A and B	Std. Dev. Pooled, for Kaolin Lots A and B	Predicted 95 Confidence Range +/-NTU from the Averaged Kaolin Value	Percent Uncertainty at 95% Confidence
0.10	0.098	0.0273	0.0546	55.6%
0.20	0.169	0.0594	0.1187	70.3%
0.41	0.339	0.0239	0.0479	14.1%
0.80	0.754	0.0504	0.1009	13.4%
1.01	0.999	0.0534	0.1069	10.7%
1.20	1.186	0.0414	0.0829	7.0%
1.59	1.573	0.0870	0.1740	11.1%
1.80	1.850	0.0487	0.0974	5.3%
2.10	2.065	0.0480	0.0960	4.6%
2.40	2.338	0.0466	0.0932	4.0%

Slope		0.9932		
Correlation coefficient		0.9990		
% Error (Range)		0.6804		

From the data collected in this study, it was determined that 1.0 mg/L kaolin is equivalent to 1.0 NTU turbidity. However, significant deviations from this trend can occur, depending on the deviations between lots of kaolin standard materials.



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
 In the U.S.A. – Call toll-free 800-227-4224
 Outside the U.S.A. – Contact the HACH office or distributor serving you.
 On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

HACH COMPANY
 WORLD HEADQUARTERS
 Telephone: (970) 669-3050
 FAX: (970) 669-2932