

AGTRON, INC
S-SERIES II PROCESS ANALYZER
OWNERS MANUAL
Version 1.35
01/06/09

Special Applications
Abridged Spectrophotometer
Made in the USA

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AGTRON S-SERIES II OPERATION MANUAL

Version 1.35

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INTRODUCTION

The new S-SERIES is the result of Agtron's 50 years of experience supplying analytical equipment to the food industry. It is an all solid-state replacement for the previous Agtron M-45D general small area analyzer.

Agtron analyzers have become the quality control standard for a variety of products worldwide. The S-SERIES is suited for appearance and color measurement of a wide range of color homogenous small particle, powder, liquid, sauce, and paste products. Other applications include but are not limited to bake, toast, par-fry / fry, and roast assessment of single cookie and cracker, potato plug, and meat products.

The AGTRON S-SERIES has a 4.8sq.in. circular viewing area and is a reflectance measuring abridged spectrophotometer designed to deal with the challenge of measuring color and process related change associated with food.

S-SERIES FEATURES

- Continuous Sample Reading (Updates Reading every two seconds)
- Self Contained Micro-Processor Control
- Excellent Linearity & Resolution
- Ultimate Stability
- Long Life Solid State Illumination
- Fully Automated Calibration
- Easily adaptable to analyze many product types
- Durable Synthetic Calibration Standards
- Only One Two-Sided Calibration Disk Required for All Scales
- Calibration Flexibility
- High Contrast Backlit LCD Display
- Super-Regulated & Isolated Power Supply
- Production Environment Construction
- Access to Agtron's 50 years of food analysis application experience

MODES OF OPERATION

The S-SERIES features eight selectable analytical modes:

ALL COLOR MODE

Displays reflectance score of all four color-bands simultaneously

RED MODE

Displays reflectance score of the red color-band

YELLOW MODE

Displays reflectance score of the yellow color-band

GREEN MODE

Displays reflectance score of the green color-band

BLUE MODE

Displays reflectance score of the blue color-band

RATIO MODE (Optional)

Special mode for determining the maturity (ripeness) of fresh tomato juice and/or the degree of process (cook) for tomato sauce, paste, and other tomato based products. A lower score signifies a more mature or more processed sample.

APPEARANCE MODE

Displays a numeric score related to a difference perceived in the appearance of like-products. This mode mimics the way human vision senses a relative change of chromaticity and saturation for the entire visible spectrum. It is the difference in score from one like-product to another that is significant, and not the actual score.

BRIGHTNESS MODE

Displays a numeric score based on all-four color bands, where each band has equal significance. It is similar to lightness/darkness or gray scale analysis. A lighter product will have a higher score.

For a further description of the analyzer modes refer to section IV SELECTING THE OPERATING MODE

INTRODUCTION SUMMARY

Simple calibration requiring only one durable two-sided calibration disk for all scales, non-critical sample preparation, easy to understand numeric scores, and robust construction make the S-SERIES the ideal choice for both product development and production quality control.

**PLEASE TAKE THE TIME TO READ THIS OPERATOR MANUAL
BEFORE ATTEMPTING TO USE YOUR AGTRON S-SERIES
ANALYZER**

CONTACT AGTRON

To discuss your specific application, for a more detailed explanation of how the Agtron S-SERIES can solve your product development or production needs, or if you are having problems operating or calibrating the analyzer, please contact us directly:

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I. INITIAL SETUP

Remove the analyzer from the shipping box and carefully inspect for any sign of shipping damage.

Contact Agtron immediately if any sign of damage is apparent. A claim for shipping damage needs to be filed immediately with the carrier.

IMPORTANT: *Keep the box and all packing material. Equipment returned to Agtron for service must be shipped in the original packaging or Agtron will not accept delivery.*

- The Carton Contains - One S-SERIES Analyzer
- One power Cord with Surge Protector Attached
 - One Two-Sided Calibration Disk
 - Two Glass Bottomed Sample Cups
 - This Manual

- Place the Agtron on a clean and level surface

Avoid placing the analyzer where it will be directly below overhead light or direct sunlight


WARNING:

Before connecting the analyzer to mains power, check the serial number tag to confirm that the unit is correctly configured for both your Mains Voltage and Frequency. Contact Agtron immediately if a power incompatibility exists. Do not attempt to connect to either an incorrect Voltage or Frequency line. Use only a 3-prong earth grounded connection. Do not bypass the power cord grounding pin or serious electrical shock to the operator and damage to the unit may occur.

Connect the AC power cord to its mating socket on the back of the analyzer. Make certain that the plug is firmly seated. Connect the other end of the power cord to mains power.

NOTE: *The power switch for the S-SERIES is on the back panel directly above the power-cord connector. Leave the unit on for best accuracy and stability; it uses very little power, about as much power as a 15-watt light bulb.*

- Turn the power switch to the -ON- position

The display will activate and begin timing a 45-minute warm-up period 

- Wait about two-minutes then momentarily depress the RESET button on the back panel to reset the internal computer

The model type, serial number and other information will appear on the display. The startup display information will repeat until the 45-minute warm-up period is over. At the end of the warm-up period, the display will first show:

**<< ALL COLOR MODE >>
** PLEASE SET GAIN **
RED= XXX.X YEL= XXX.X
GRN= XXX.X BLU= XXX.X**

Followed by:

Alternately showing: **RED= XXX.X YEL= XXX.X
** PLEASE SET GAIN ****

II. SETTING SYSTEM GAIN

System gain must be set anytime the analyzer is restarted after being disconnected from power. It must also be reset whenever the display prompts the operator to do so. System gain may be set as frequently as desired but setting gain once per shift is usually sufficient.

NOTE:

Recalibration of the analyzer is required whenever system gain is set

- Place the two-sided Calibration Disk **white-side facing down** so that it sits flat on the viewing window glass
- Depress the **SET GAIN** Key on the function keypad

The display will ask if the high reference disk is in place

- Depress the **YES** key on the function keypad to confirm the disk is in place
- The analyzer will automatically adjust the system gain; this may take several minutes. The display will show a number that represents how many of the color modes have unresolved gain and will also show the three digit position of the electronic gain circuits.

IMPORTANT:

Do not move the disk during this procedure or depress any of the keypad buttons

When the gain adjustment is finished, the display will first show:

**<< ALL COLOR MODE >>
GRN= XXX.X BLU= XXX.X**

Followed by: **RED= XXX.X YEL= XXX.X
GRN= XXX.X BLU= XXX.X**

Alternately showing: **RED= XXX.X YEL= XXX.X
** PLEASE CALIBRATE ****

This completes SETTING SYSTEM GAIN

III. CALIBRATION

For best results, calibrate the unit a least every four-hours of operation

The S-SERIES has four calibration options:

- 1) Factory Default Calibration

- 2) Quick Calibration
- 3) Manual Calibration
- 4) Calibration to Product

NOTE:

The S-Series uses different illumination and detection geometry than the M45D. For this reason, even if the unit were calibrated with the same disks and values used for the M45D, product readings may be different. Refer to the **PRODUCT CALIBRATION** section for the technique necessary to emulate older Agtron M45D analyzer scores.

A) FACTORY DEFAULT CALIBRATION

This mode resets the calibration references to the factory default values. The default values for the supplied two-sided calibration disk are stored in the analyzers memory and cannot be edited by the operator. The default values for each of the four color-bands used by the M-Series analyzer apply only to the two-sided disk supplied with the unit. These calibration values are traceable and are the “Agtron Standard Values” for calibration.

NOTE:

Default values are only relative to the two-sided calibration disk supplied with the analyzer. If it becomes necessary to replace the calibration disk, please consult Agtron for assistance.

- Place the two-sided Calibration Disk, **white-side facing down**, so that it sits flat over the viewing window

IMPORTANT: Do not move the disk during this procedure

- Depress the **DEFAULT CAL** key on the function keypad

The display will ask if the high reference disk is on the viewing window

- Depress the **YES** key

The top line of the display will show:

== HIGH REFERENCE ==

The bottom line of the display will momentarily display each of the four colors and factory default high reference scores in sequence followed by a confirmation that they have been accepted

When the High Reference default calibration is finished, the display will show:

**== HIGH REFERENCE ==
=== COMPLETE ===**

Followed by: **-- LOW REFERENCE --**

The display will also provide additional information and ask if the low disk is on the sample window

- Turn the two-sided calibration disk over, **black-side facing down** over the viewing window

IMPORTANT: Do not move the disk during this procedure

- Depress the **YES** key to confirm that the low reference disk is in place

The top line of the Display will show:

-- LOW REFERENCE --

The bottom line of the display will quickly display each of the four colors and relative factory default low scores followed by a confirmation that they have been accepted

When the **FACTORY DEFAULT CALIBRATE** procedure is completed, the display will first show:

**<< ALL COLOR MODE >>
GRN= XXX.X BLU= XXX.X**

Followed by: **RED= XXX.X YEL= XXX.X
GRN= XXX.X BLU= XXX.X**

This completes the **FACTORY DEFAULT CALIBRATE** procedure

B) QUICK CALIBRATION

QUICK CAL mode is the most common method of calibration. The values entered during a previous **MANUAL CALIBRATE** mode will be automatically entered in rapid sequence in the **QUICK CAL** mode.

NOTE:

There is no provision for editing calibration values in the **QUICK CAL** mode. All editing must be done in the **MANUAL CALIBRATE** mode

- Place the two-sided Calibration Disk, **white-side facing down** over the viewing window

IMPORTANT: Do not move the disk during this procedure

- Depress the **QUICK CAL** key on the function keypad

The display will ask if the high reference disk is in place

- Depress the **YES** key to confirm that the high reference is in place

The top line of the Display will show:

== HIGH REFERENCE ==

The bottom line of the display will quickly display each of the four colors and high scores stored during the previous **MANUAL CALIBRATE** mode followed by a confirmation that they have been accepted

When all of the high references have been accepted, the display will first show:

**== HIGH REFERENCE ==
=== COMPLETE ===**

Followed by: **-- LOW REFERENCE --**

The display will ask if the low disk is on the viewing window

- Turn the two-sided calibration disk over, **black-side facing down** on the viewing window

NOTE: Do not move the disk during this procedure

- Depress the **YES** key to confirm that the low reference is in place

The top line of the Display will show:

-- LOW REFERENCE --

The bottom line of the display will quickly display each of the four colors and the relative low scores in sequence stored during the previous **MANUAL CALIBRATE** mode followed by a confirmation that they have been accepted

When the **QUICK CALIBRATE** procedure is completed, the display will first show:

<< ALL COLOR MODE >>
GRN= XXX.X BLU= XXX.X

Followed by: **RED= XXX.X YEL= XXX.X**
GRN= XXX.X BLU= XXX.X

This completes the **QUICK CALIBRATE** procedure

C) MANUAL CALIBRATION

This calibration procedure is used when the operator wishes to edit the high and/or low calibration references. Values entered during this procedure will be stored for use in the **QUICK CALIBRATE** mode.

A new analyzer will have the normal scale values displayed in this mode until edited by the user.

NOTE: Factory Default settings can also be restored anytime by calibrating using the **DEFAULT CAL** key. (See “FACTORY DEFAULT CALIBRATION”, III A)

NOTE: MANUAL CALIBRATE is the only mode that allows the operator to edit calibration values

NOTE: Analytical resolution can be expanded or compressed by changing the high and low values. See section III E: “ CALIBRATING USING SCALE EXPANSION”

NOTE: The difference between high and low calibration values must be at least **40** points

- Place the two-sided calibration disk, **white-side facing down** onto the viewing window

IMPORTANT: Do not move the disk during this procedure

- Depress the **CAL** key on the function keypad

The display will ask if the high calibration reference is in place

- Depress the **YES** key to confirm the high reference is in place

The display will show: == **HIGH REFERENCE** ==
RED SCORE : XXX.X

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a red high reference score of: **100.0**

NOTE: Only positive numbers can be entered for the high reference

The display will first show:

== **HIGH REFERENCE** ==
ACCEPTED : XXX.X

Followed by: == **HIGH REFERENCE** ==
YELLOW SCORE : XXX.X

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a yellow high reference score of: **100.0**

The display will first show:

== **HIGH REFERENCE** ==
ACCEPTED : XXX.X

Followed by: == **HIGH REFERENCE** ==
GREEN SCORE : XXX.X

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a green high reference score of: **100.0**

The display will first show:

**== HIGH REFERENCE ==
ACCEPTED : XXX.X**

Followed by: **== HIGH REFERENCE ==
BLUE SCORE : XXX.X**

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a blue high reference score of: **100.0**

The display will first show:

**== HIGH REFERENCE ==
ACCEPTED : XXX.X**

Followed by: **== HIGH REFERENCE ==
COMPLETE**

Followed by: **-- LOW REFERENCE --**

The display will also ask if the low calibration reference is in place

- Turn the two-sided calibration disk over so that the black side faces down

IMPORTANT: Do not move the disk during this procedure

- Depress the **YES** key on the function keypad to confirm that the low reference is in place

NOTE: Positive or negative numbers can be entered for the low reference

To change the sign from plus (+) to minus (-), Depress the (+/-) key

The display will show: **-- LOW REFERENCE --
RED SCORE : +XXX.X**

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a red low reference score of: **+000.0**

The display will first show:

**-- LOW REFERENCE --
ACCEPTED : +XXX.X**

Followed by: **-- LOW REFERENCE --
YELLOW SCORE : +XXX.X**

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a yellow low reference score of: **+000.0**

The display will first show:

**-- LOW REFERENCE --
ACCEPTED : +XXX.X**

Followed by: **-- LOW REFERENCE --
GREEN SCORE : +XXX.X**

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a green low reference score of: **+000.0**

The display will first show:

**-- LOW REFERENCE --
ACCEPTED : +XXX.X**

Followed by: **-- LOW REFERENCE --
BLUE SCORE : +XXX.X**

- Enter the desired value using the numeric keypad and depress the **E** key, or depress the **E** key to enter the value already displayed. The analyzer is shipped from the factory with a blue low reference score of: **+000.0**

The display will first show:

**-- LOW REFERENCE --
ACCEPTED : +XXX.X**

Followed by: **<< ALL COLOR MODE >>
GRN= XXX.X BLU= XXX.X**

Followed by: **RED= XXX.X YEL= XXX.X
GRN= XXX.X BLU= XXX.X**

This completes the MANUAL CALIBRATE procedure

D) CALIBRATING THE S-SERIES TO MATCH M45D PRODUCT SCORES

This procedure is used to obtain M45D product scores with the S-SERIES. A sample of the product with an M45D score over 50.0 is required. For products with scores lower than 50.0, consult Agtron for assistance.

- ① Select the desired color mode on the M45D

- ② Calibrate the M45D using the normal method you use for the product to be measured
- ③ Read the product sample and record the score
- ④ Without disturbing the sample, transfer it to the S-Series viewing window
- ⑤ Select the color mode matching that used on the M45D
- ⑥ Depress the **CAL** key
- ⑦ The display will ask if the high reference is in place, depress the **YES** key
- ⑧ Using the numeric keypad, enter the product score obtained from the M45D and depress the **E** key
- ⑨ When the display asks if the low reference is in place on the viewing window, place the two-sided calibration disk, **black-side facing down**, on the viewing window and depress the **YES** key
- ⑩ Enter +000.0 and depress the **E** key

IMPORTANT:

Do not move the calibration disk during this procedure

- Turn the two-sided calibration disk over so that the **white-side is facing down**
- Record the score displayed for the white-side of the calibration disk.
- Use the calibration disk with this newly established reference number for future High Calibration Reference for this product.
- Recalibrate with the manual calibration procedure using the value determined above for the white-side of the calibration disk and +000.0 for the black-side of the disk.

E) CALIBRATING TO EXPAND THE SCALE

Unlike the M45D which required many disks of different reflectance value for calibration and scale expansion, the S-SERIES uses only one two-sided calibration disk for all calibration procedures including scale expansion.

Scale expansion increases the analyzers resolution; the difference the analyzer will see between two samples. The high calibration value used can only be set as a positive number but the low reference value can be set as either a positive or negative number.

NOTE: For best results, you should select calibration values that keep the product readings between +010.0 and +90.0

NOTE: The difference between high and low calibration values must be at least **40** points

The actual span of the supplied two-sided calibration disk is approximately 100 points with the absolute reflectance values very close to 100% for the white-side of the disk and 0% for the black side of the disk.

Here are several calibration examples and their relationship to scale expansion:

① Setting the high reference to 100.0 and the low reference to +000.0 with the supplied two-sided calibration disk sets the scale to the analyzers normal resolution representing an expansion factor of 1.00:

Calculated as $\Rightarrow (100.0 - 000.0)$ divided by 100 = 1.00

Note: A constant denominator of 100 used for calculating scale expansion. It represents the span of the calibration disk and is used to calculate all relative scale expansions

② Setting the high reference to 150.0 and the low reference to +000.0 increases the analyzers resolution and has an expansion factor of 1.50:

Calculated as $\Rightarrow (150.0 - 000.0)$ divided by 100 = 1.50

③ The same 1.50 expansion factor and resolution can be achieved by setting the low reference to a negative number. With this procedure, the analyzer would see the same difference in score between two products, but the scores would be lower in value (move down the scale).

Setting the high reference to 100.0 and the low reference to -050.0 also increases the analyzers resolution and has an expansion factor of 1.50:

Calculated as $\Rightarrow ((100.0 - (-050.0))$ divided by 100 = 1.50

There are an infinite number of scale expansion and resolution possibilities.

NOTE: Calibration values are software limited to:

High = +300.0
Low = -150.0

F) SCALE EXPANSION USING THE MULTIPLIER FEATURE

In addition to setting the supplied calibration disk references to values that expand the scale to increase analytical resolution; a Scale Multiplier may also be used for scale expansion.

Once activated, this feature displays all score results obtained multiplied by a user entered constant.

As an example, if product readings for two products are 18.4 and 33.6 with the Scale Multiplier feature deactivated (OFF), the difference between the two products would be 15.2 calculated as: $(33.6 - 18.4) = 15.2$

If the Scale Multiplier feature is activated, and 1.50 was entered as the multiplier constant, the product readings would become 50.4 ($33.6 \times 1.50 = 50.4$) and 27.6 ($18.4 \times 1.5 = 27.6$). The difference between the same sample scores would become 22.8 ($50.4 - 27.6 = 22.8$); which is 1.50 times greater than without the Multiplier.

IMPORTANT: Always turn the Scale Multiplier function **OFF** before setting gain or calibrating the analyzer

NOTE: Multipliers can be any number from 1.01 to 3.00

To activate (turn ON) the Scale Multiplier:

- ① Select the desired color mode
- ② Calibrate the analyzer using the method you normally use for the product to be tested

IMPORTANT: The Scale Multiplier function must be **OFF** before setting gain or calibrating the analyzer

- ③ Momentarily depress the **F1** key

The display shows: SCALE EXPAND (Off)
 MULTIPLIER: 1.00

- ⑤ Enter the desired multiplier using the numeric keypad (In this example: 1.50)

- ⑥ Momentarily depress the **E** key

The display first shows: SCALE EXPAND (Off)
 ACCEPTED: 1.50

The display then shows: SCALE EXPAND (Off)
 <SKIP> KEY TO CHANGE

 Alternating with: SCALE EXPAND (Off)
 <YES> KEY TO AGREE

- ⑦ Momentarily depress the **SKIP** key to turn the Scale Multiplier function “ON”

The display first shows: SCALE EXPAND (ON)
 <SKIP> KEY TO CHANGE

 Alternating with: SCALE EXPAND (ON)
 <YES> KEY TO AGREE

- ⑧ Momentarily depress the **YES** key

The Multiplier Feature is now active (ON)

To deactivate (turn OFF) the Multiplier feature:

① Momentarily depress the **F1** key

② The display shows: SCALE EXPAND (Off)
 MULTIPLIER = 1.50

③ Momentarily depress the **E** key

The display first shows: SCALE EXPAND (ON)
 ACCEPTED: 1.50

The display then shows: SCALE EXPAND (ON)
 <SKIP> KEY TO CHANGE

 Alternating with: SCALE EXPAND (ON)
 <YES> KEY TO AGREE

④ Momentarily depress the **SKIP** key to turn the Score Multiplier function “Off”

The display first shows: SCALE EXPAND (Off)
 <SKIP> KEY TO CHANGE

 Alternating with: SCALE EXPAND (Off)
 <YES> KEY TO AGREE

⑤ Momentarily depress the **YES** key

The Multiplier feature is now inactive (OFF)

IV. SELECTING THE OPERATING MODE

The S-SERIES has eight user-selectable Operating Modes:

ALL COLOR MODE

Displays the analysis result as a numeric score for each of the (four) color-bands simultaneously (640nm Red & 580nm Yellow & 520nm Green & 460nm Blue)

RED MODE

Displays the reflectance for CW 640nm, 25nm FWHM band-pass

This is the mode most suited for evaluating Maillard reaction (food browning) progression such as degree of bake, fry, roast, or toast. Many thermally processed products are suited for this mode. Fried or par-fried potato products, toasted or baked cereals, fried breaded products, and roasted nuts are a few. Accurate control of Maillard development is essential to both appearance and flavor.

Maillard Reaction: An endothermic reaction in which the amino group in an amino acid forms condensation products with aldehydes; believed to cause the browning reaction when an amino acid and a sugar co-exist evolving into favorable color and flavor.

YELLOW MODE

Displays the reflectance for CW 580nm, 25nm FWHM band-pass; this mode is also suitable for assessing Maillard reaction development in certain products

GREEN MODE

Displays the reflectance for CW 520nm, 25nm FWHM band-pass

BLUE MODE

Displays the reflectance for CW 460nm, 25nm FWHM band-pass

RATIO MODE (optional software and hardware required)

Special mode for determining the maturity of raw fruit or amount of process of tomato based products. Applications include uncooked tomato (raw fruit) prepared as a juice, and cooked products such as sauce, paste, and Ketchup. Displays the analysis result as a numeric score based on the ratio of selected wavelengths, multiplied by a defined constant. A more mature (ripe) or more processed (cooked) tomato product will have a lower score.

The RATIO MODE has a unique calibration procedure that requires optional software and a tomato products analysis kit. Consult Agron for information

APPEARANCE MODE

Analysis result displayed as a numeric score calculated using all four colors-band values with each color-band biased to emulate the human eye's sensitivity to that color band. This score relates to how differences in the complex color of like-products will appear to the consumer. It is the difference in score from one like-product to another that is significant and not the actual score.

BRIGHTNESS MODE

Displays the analysis result as a numeric score calculated using all (four) color band values where each color has equal significance. It is similar to lightness/darkness or gray scale analysis. A lighter product will have a higher score.

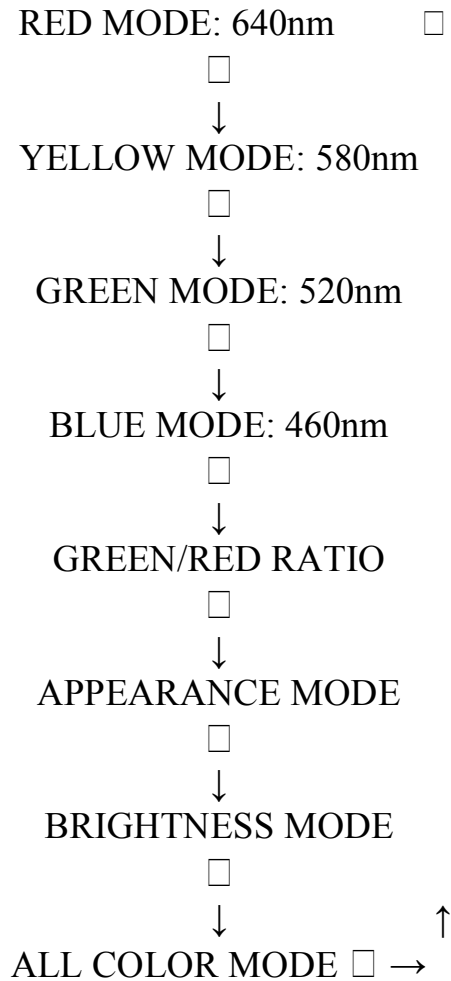
NOTE: In most instances, each time a new mode is selected, the analyzer will prompt a recalibration

TO SELECT AN OPERATING MODE

- Depress the **MODE** key on the function keypad

The display will show: KEY SCROLLS MODES
SKIP KEY TO EXIT

- Depress the key once to scroll through the modes in the following sequence:



The mode selection sequence is a continuous loop. If you pass the desired mode depress the key repeatedly until you again arrive at the desired mode

- Depress the **E** key to select that mode

Once the mode is selected the top line of the display will verify the mode

The bottom of the display will first show:

SCORE : XXX.X

Alternately displaying: ****PLEASE CALIBRATE****

- Perform one of the following calibration procedures:

Manual **CAL** / **Quick Cal** / Factory **Default Cal**

The analyzer may be returned from any mode to the ALL COLOR MODE at any time by depressing the **AGTRON NUMBER** key

If you experience difficulty during the calibration procedure, return to the ALL COLOR MODE by depressing the **AGTRON NUMBER** key and start over

NOTE: It may be necessary to depress and hold the **SKIP** key first to exit from certain steps in a calibration routine before depressing the **AGTRON NUMBER** key

NOTE: When returning to the ALL COLOR MODE with the **AGTRON NUMBER** key, depending on the mode you are leaving and the calibration used for that mode, the analyzer may not prompt recalibration. If recalibration is not prompted, the analyzer will use the previous calibration. Recalibrate if this is not the calibration desired.

V. PREPARING SAMPLES FOR ANALYSIS

Agtron has over 50 years of experience analytically assessing food products. Please feel free to contact us for S-SERIES application assistance

There are three main geometry categories for dry product:

- 1) Powders
- 2) Small Particulates
- 4) Medium Particulates

Each of the geometry categories has two sub-categories:

- 1) Uniform Geometry- Particles are of similar shape and size

2) Irregular Geometry- Particles vary noticeably in shape and size

For all geometries there are two color classifications:

- 1) Color Homogenous- Uniform color appearance throughout the sample
- 2) Semi-Color Homogenous- Noticeable variation in color throughout

Powders

Any product similar to flour in consistency can be considered a powder.

Products to be evaluated that appear non-color homogenous to the eye should be well stirred before preparing the sample for testing.

To prepare the sample for evaluation:

- Pour the sample into the sample cup so that it covers the entire bottom of the cup.
- Spread the sample evenly; use a minimum product depth of approximately one-inch. Be careful not to compress the sample as this may alter the analytical result.
- Cover the top of the sample cup with an Agtron 6” black zero disk (available from Agtron) or 6” disk of heavy black craft paper to prevent illumination from overhead or ambient light affecting the reading

Small Particulates

Granular products similar to table salt, course milled grains, instant coffee, ground nuts, and fine bread-crumbs, etc. would be considered small particulate products.

Products to be evaluated that appear non-color homogenous to the eye should be well stirred before preparing the sample for testing.

To prepare the sample for evaluation:

- Pour the sample into the sample cup covering the entire bottom of the cup
- Spread the sample evenly and use a product depth of approximately one-inch. As with powders, be careful not to compress the sample as this may alter the analytical result.
- Cover the top of the sample cup with an Agtron 6” black zero disk (available from Agtron) or 6” disk of heavy black craft paper to prevent illumination from overhead or ambient light affecting the reading

Medium Particulates

Products like rice, milled potato chips, capers, and flakes, etc. are typical of medium particulate products.

Products to be evaluated that appear non-color homogenous to the eye should be well stirred before preparing the sample for testing.

To prepare the sample for evaluation:

- Pour the sample into the sample cup covering the entire bottom of the cup to a minimum product depth of approximately one-inch.
- Spread the sample evenly and use a product depth of about one-inch
- Cover the top of the sample cup with an Agtron 6” black zero disk (available from Agtron) or 6” disk of heavy black craft paper to prevent illumination from overhead or ambient light affecting the reading

VI. APPLICATION NOTES

It may be advantageous to cover the sample cup during sample testing to prevent ambient light from affecting analytical results.

To determine if covering the sample cup is required:

- Cover the sample cup with a dark opaque material such as black craft paper while it sits on the viewing window to see if the displayed score changes appreciably

- General sample preparation techniques may not suit every product. The objective of good sample preparation is to provide accurate and repeatable data. To obtain satisfactory results, some products may require milling, chopping, sieving, special sample dishes or masks
- For most common food products, Agtron can recommend an analytical mode and calibration method. Selecting the correct analytical mode for special products may require experimentation.
- Use a soft cloth and Windex glass cleaner and keep the sample viewing window clean
- Avoid spilling liquids on the analyzer sample viewing window, keypads, or LCD display window
- Use a soft lint free cloth moistened with Windex to clean the cabinet surfaces, LCD display window, and keypads

Warning: Apply only very-light pressure to the LCD display window when cleaning

- Turn the analyzer off when it will not be used for 48-hours or more

Consult Agtron if you require special application assistance

S-SERIES II SPECIFICATIONS

GENERAL: Self Contained Visible-Spectrum Abridged Spectrophotometer

VIEWING AREA: Circular, Approximately 4.8 Inches-Square

MEASUREMENT GEOMETRY: Field-Coincident

MEASUREMENT BAND SPECIFICATIONS

Red: CW 640nm (+/- 2.0nm), 25nm FWHM (+/- 2.5nm)
Yellow: CW 580nm (+/- 2.0nm), 25nm FWHM (+/- 2.5nm)
Green: CW 520nm (+/- 2.0nm), 25nm FWHM (+/- 2.5nm)
Blue: CW 460nm (+/- 2.0nm), 25nm FWHM (+/- 2.5nm)

ANALYTICAL RESOLUTION: +/- 0.10%

LINEARITY: +/- 0.20%

INTER-INSTRUMENT AGREEMENT: +/- 0.50%

BASE REFLECTANCE SCALE: 000.0 to 100.0%

MAXIMUM EXPANDED SCALE: -150 to +300

ILLUMINATE:

Broad Spectrum Solid-State Precision Aligned Semi-Diffused Coaxial

ILLUMINATE MTBF: 8-Years Continuous Duty

CONTROL & LOGIC: Dual Microprocessor

DISPLAY: Dual Line 42 Character Back Illuminated Alpha/Numeric LCD

DUTY RATING: Continuous

POWER SUPPLIES:

Dual Sequential with Digital PWM primary / Analog Secondary

0.10% Line / Load regulation

90db Line Isolation

High-Q EMI /RFI Filtered

POWER REQUIREMENT: 25-Watts

Factory Configured for one of the Following 50/60Hz Mains Connections:

100volt / 115volt / 220volt / 240volt

AGTRON, INC. _____

Reno, Nevada USA

CE MARKING

DECLARATION OF COMPLIANCE

This declaration certifies that this product is in total compliance with CE - Marking and CE Legislation.