

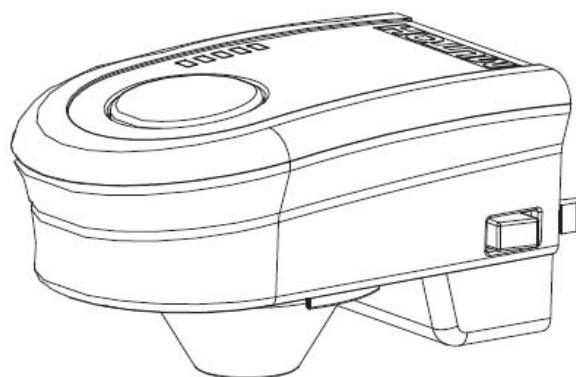
# MUTOH

## OPERATION MANUAL

Spectrophotometer

# SPECTROVUE

## VM-10



**Please Read this Manual Before  
Using the Instrument**

Revision	Errata-100804
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# SPECTROVUE VM-10 ERRATA (FOR VJ-1608HS)

Some contents of the Operation Manual have changed. Please review the list shown below.

## TIP

- The content of this document is based on printer firmware versions later than 1.00.

## Operation Manual

Chapter	Item	Description
Chapter 2	Add “2.2.4 Spectrophotometer (SPECTROVUE VM10)”	Refer to sheet 2
Chapter 4	Add “4.5 Using the Spectrophotometer (SPECTROVUE VM10)”	Refer to sheets 3 - 10



The above label identifies a printer as having a SPECTROVUE™ Interface Port.

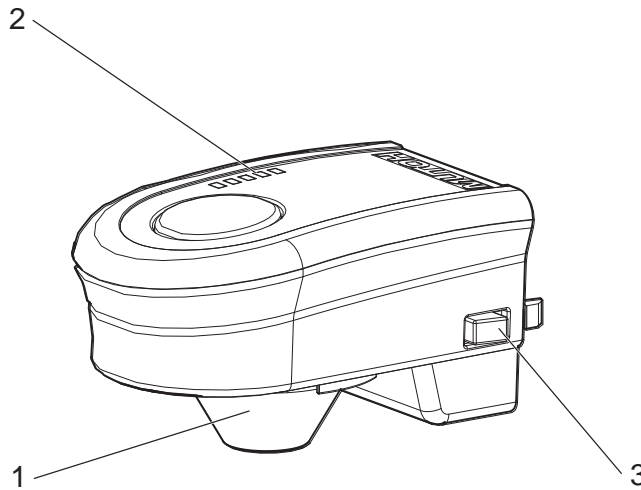
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## 2.2.4. Spectrophotometer (SPECTROVUE VM-10)

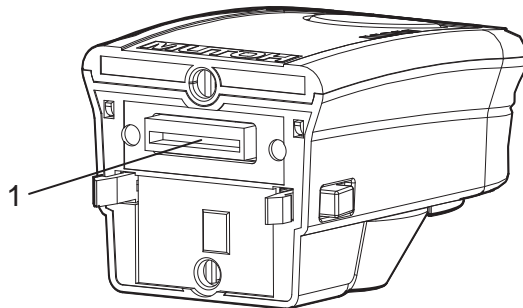
The SPECTROVUE VM-10 is a precision instrument used to measure color targets on-printer automatically. When used with appropriate RIP software, it allows for more accurate and consistent reproduction of color in color images. Part names and functions are as follows:

### (1) Front Side



No.	Name	Function
1	Aperture Cone	Optical window used to measure target
2	Status LEDs	LED lamps to display instrument status
3	Release Button	Button to push when removing the instrument from the printer

### (2) Rear Side





No.	Name	Function
1	Connector	Connects the instrument to the printer

## 4.5 Using the Spectrophotometer (SPECTROVUE VM-10)


Install the SPECTROVUE VM-10 to measure a color target printed by the printer. Compatible RIP software is required for performing color calibration and/or creating color profiles. Accurate calibration and consistent implementation of a color workflow are necessary to achieve accurate color reproduction.

Follow the instructions below:

### NOTE


- The SPECTROVUE VM-10 is a precision opto-electronic instrument, and should be treated carefully:
  - Remove the instrument from the printer during all printing operations.
  - Do not subject the instrument to shock or extended vibration; do not drop. Store in packing box.
  - Do not subject the instrument to excess heat (over 120° F) or cold (less than 40° F).
  - Do not expose the instrument to harsh chemicals, solvents, solvent vapors, alcohol, petroleum distillates, or water.
  - Do not attempt to clean the aperture or optical window; avoid touching the optical window.
  - Do not attempt to disassemble or modify the instrument; there are no user-serviceable components. Attempted disassembly of the instrument may adversely affect factory calibration and void the instrument warranty.
  - Do not subject the instrument to static shock or electrical surge; always use an approved surge protector.
- Position the printer **away from strong overhead lights** or direct sunlight, or **turn off overhead lighting** during the measurement cycle. Strong overhead lights can reflect off the media being sampled, affecting measurement accuracy.
- When using the SPECTROVUE VM-10, the printer must be set as follows; make sure to check settings before use:
  - Media Detection : Height + Width or Height + T&W  
 [5.1.5 Media Initial Menu](#)
  - Take-up Unit : OFF  
 [5.1.7 Take-up Unit Menu](#)
- If the media thickness value is changed manually, measurement accuracy may be adversely affected.
- Color measurements should not be performed on translucent (non-opaque) or colored (non-white) media.
- Color measurement accuracy may be impacted on ribbed or textured media, including some woven materials.

1. Connect the printer and the computer.


 [3.7 Connecting to the Computer](#)

2. Turn power to the printer ON.

3. Set the media.

 [3.4 Mounting Media](#)

4. Set up the Media Type.

 [3.4.5 Setting Media Type](#)

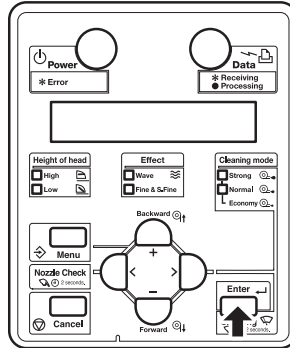
⇒ Once the Media Type setting and Media Initial operations are complete, “Ready to Print” should be displayed on the Operation Panel.

5. Launch RIP software to print and measure color target.

**NOTE**

- For the settings and operating instructions of the RIP software, please refer to the software's user manual.

- The printer will print the color target (determined by the RIP software).
- On the Operation Panel, "Printing..." is displayed.
- Once completed, "Attach Instrument [Enter]" is displayed.

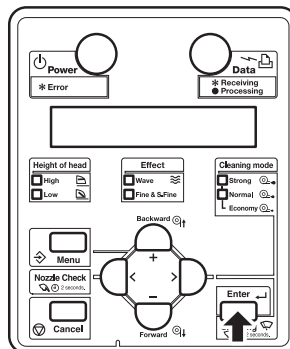


**NOTE**

- Do **not** move the covers or the Media Set Lever while printing.

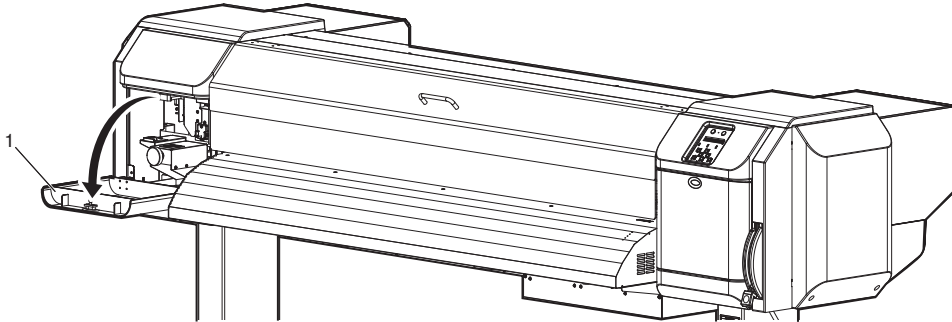
7. Press the "Enter" key.

- On the Operation Panel, "Wait for a While..." is displayed.
- The print head will move to the left of the printer.
- On the Operation Panel, "Open Left Maintenance Cover" is displayed.



8. Open the **Maintenance Cover** on the left side of the printer.

- On the Operation Panel, “Remove Connector Cap and Attach Instrument [ENTER]” is displayed.

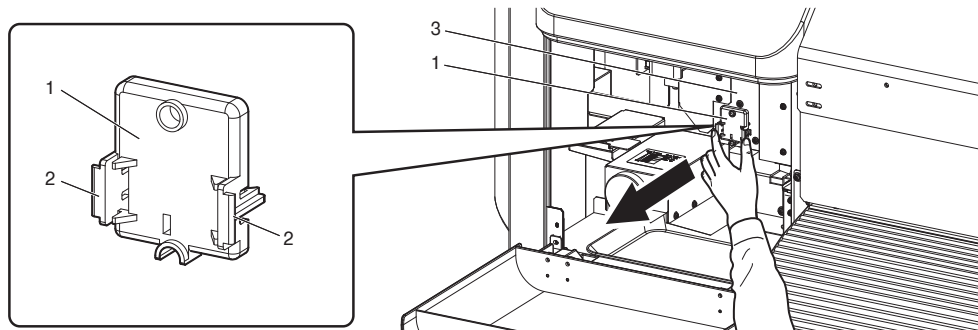


No.	Name
1	Maintenance Cover

**NOTE**

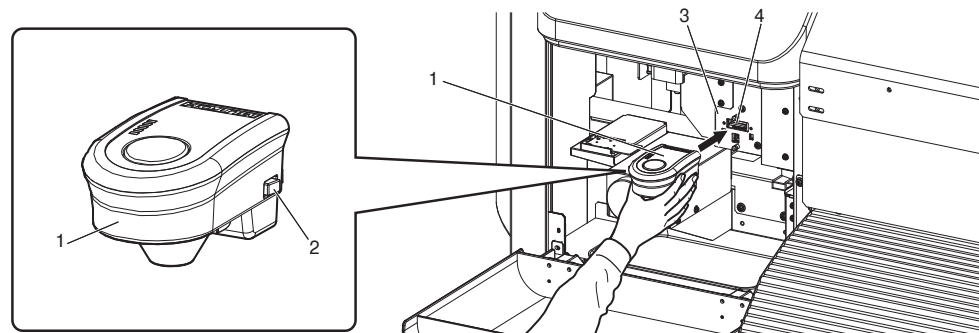
- After a period of time without opening the Maintenance Cover, the Print Head will move back to the right side of the printer for protection to prevent nozzle dropouts. On the Operation Panel, “Attaching Instrument [ENTER]” will be displayed. If this happens, **restart from Step 7**.

9. While pinching the tabs of the Connector cap on both sides, pull the cap forward to remove it from **SPECTROVUE Interface Port** on the side of the Print Head.



No.	Name
1	Connector Cap
2	Tabs
3	Print Head

10. While pressing the **Release Buttons** on both sides of SPECTROVUE VM-10, install the instrument onto the SPECTROVUE Interface Port connector on the side of the Print Head.



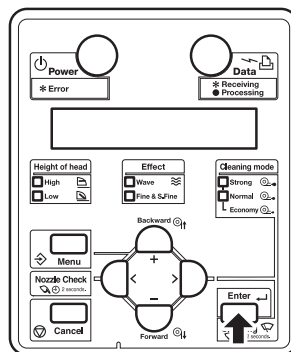
No.	Name
1	SPECTROVUE VM-10
2	Release Button
3	Print Head
4	SPECTROVUE Interface Port Connector

**NOTE**

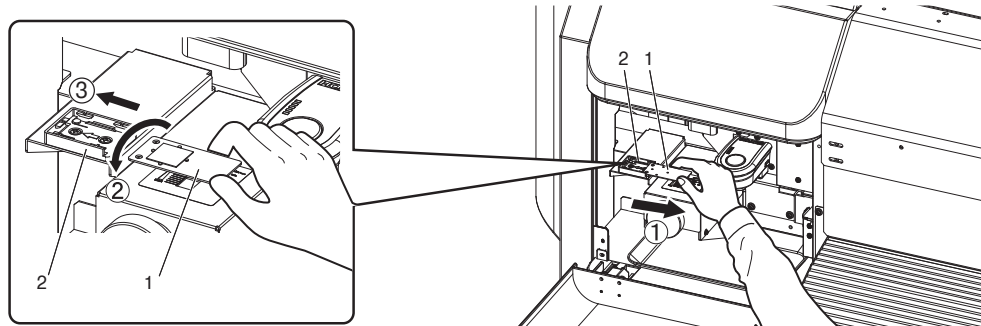
- Make sure that the SPECTROVUE is not installed obliquely, that it fit securely onto the Interface Connector and that there is no gap between the Interface Connector and the instrument.

11. Press the **“Enter”** key.

- On the Operation Panel, “Wait for a While...” is displayed.  
⇒ The connection between the printer and SPECTROVUE VM-10 is being checked.
- On the Operation Panel, “Set White Plate then Close Left Maintenance Cover” is displayed.



12. Remove the **White Reference Plate** from the plate mounting position, turn it over so that the **WHITE** side is facing **up**, and install it back into its original mounting position.



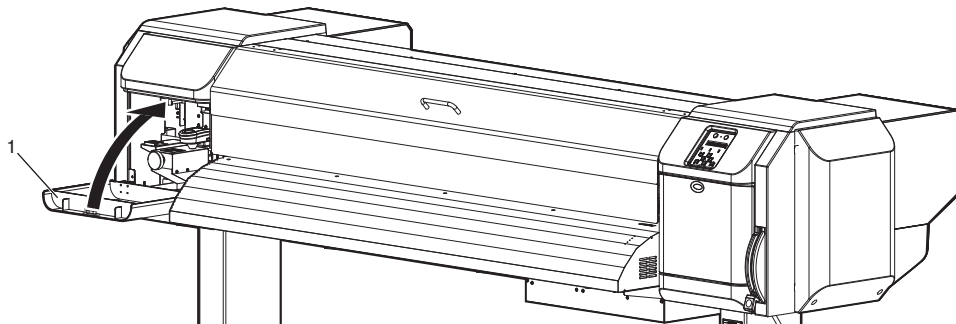
No.	Name
1	White Reference Plate
2	Plate Mounting Position

**NOTE**

- Before measuring the color target, make sure that the white side of White Reference Plate is facing up. If the black side is facing up, you cannot measure accurately; an error will occur.

13. Close **Maintenance Cover**.

- On the Operation Panel, “[ENTER]” is displayed.

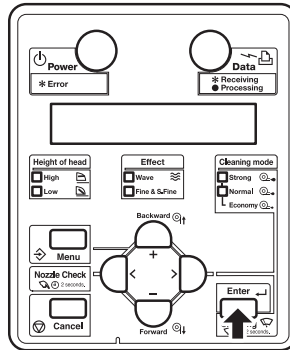


No.	Name
1	Maintenance Cover

14. Press the **“Enter”** key.

- The Print Head will move to the right side of the printer.
- On the Operation Panel, “Wait for a while...” is displayed.

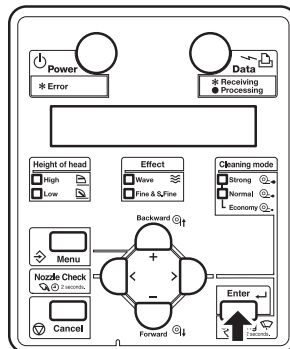
15. When “**Start Measurement [ENTER]**” is displayed on the Operation Panel, press “Enter”.
  - The SPECTROVUE VM-10 will begin to measure the color target, as directed by the RIP software.
  - On the Operation Panel, “Measuring...” is displayed.
  - Once measurements complete, “Detaching instrument [ENTER]” is displayed on the Operation Panel.



**NOTE**

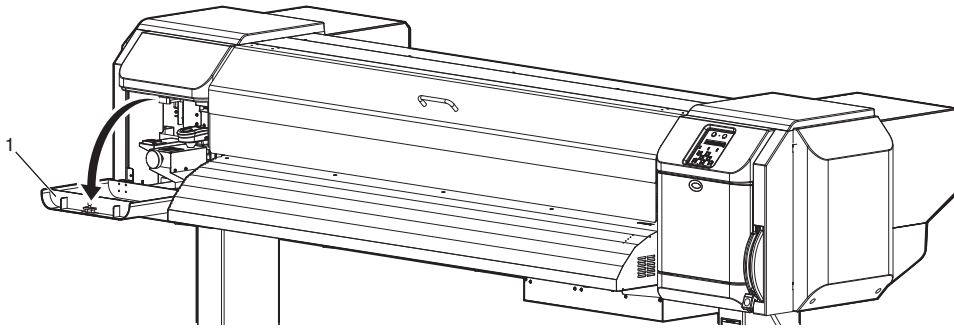
- Depending on the settings of your RIP software, color measurements may begin automatically or manually. The above instructions refer to when measurements are started manually.
- When starting measurements automatically, “Ink Drying xxxxx s” (where xxxxx is the number of seconds) is displayed on the Operation Panel. This is the number of seconds the printer will wait before measurements begin.
- While measuring, do **not** move the covers or Media Set Lever.
- Before entering measurement mode, turn off or dim overhead lights to avoid ambient light reflections from media.

16. Press the “**Enter**” key.
  - On the Operation Panel, “Wait for a while...” is displayed.
  - The Print Head will move toward the left side of the printer.
  - On the Operation Panel, “Open Left Maintenance Cover” is displayed.



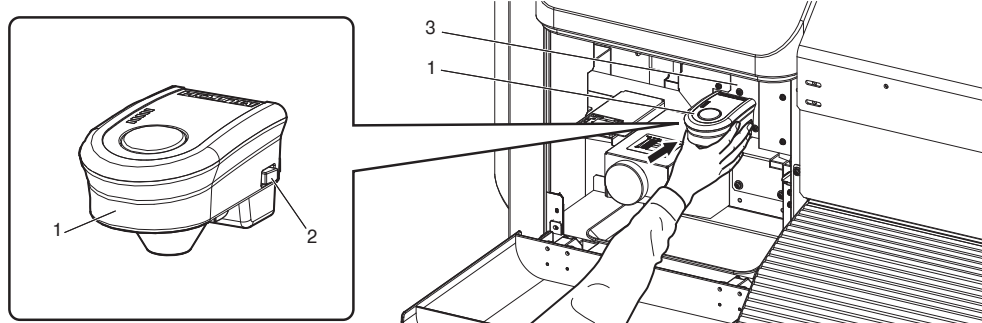
17. Open **Maintenance Cover** on the left side of the printer.

- On the Operation Panel, “Remove Instrument and Attach Connector Cap [ENTER]” is displayed.



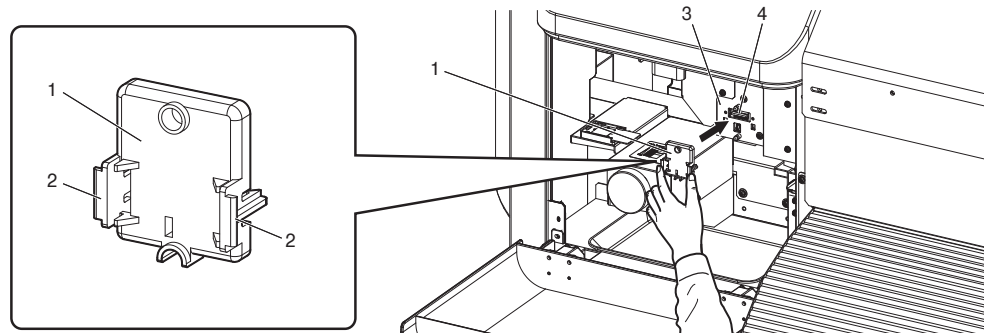
No.	Name
1	Maintenance Cover

18. While pinching the **Release Buttons** on both sides of SPECTROVUE VM-10, pull the instrument forward to remove it from the SPECTROVUE Interface Port connector on the side of the Print Head.



No.	Name
1	SPECTROVUE VM-10
2	Release Button
3	Print Head

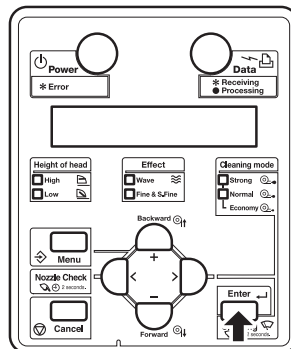
19. While strongly pinching the tabs on both sides of the **Connector Cap**, install it to the Interface Port.



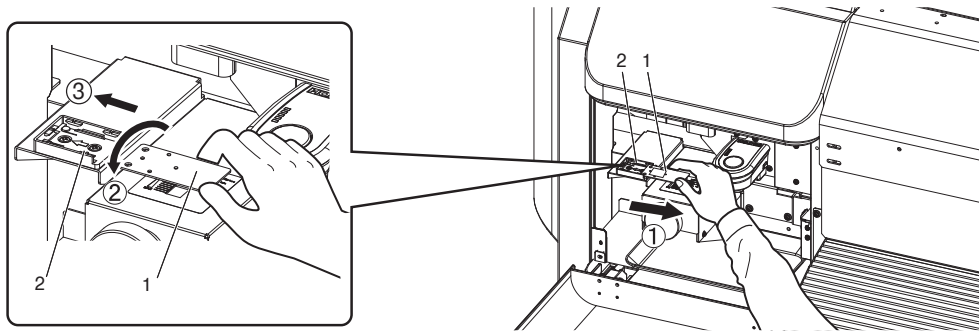
No.	Name
1	Connector cap
2	Tabs
3	Print Head
4	Connector

20. Press the “**Enter**” key.

- On the Operation Panel, “Wait for a while...” is displayed.
- On the Operation Panel, “Remove White Plate then Close Left Maintenance Cover” is displayed.



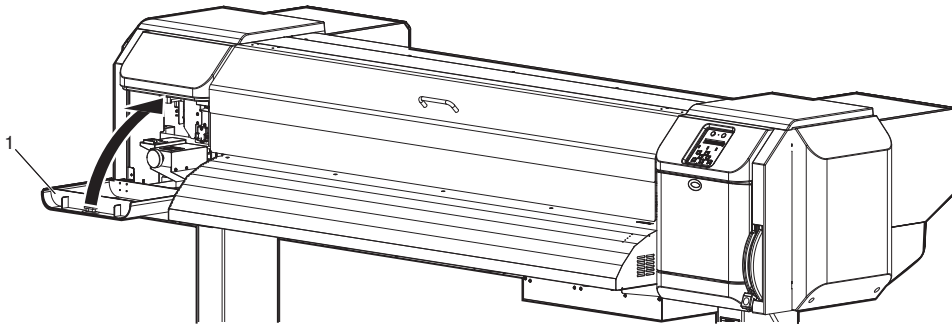
21. Remove the **White Reference Plate** from the plate mounting position, turn it over so that the **BLACK** side is facing **up**, and install it back into its original mounting position.



No.	Name
1	White Reference Plate
2	Plate Mounting Position

22. Close the **Maintenance Cover**.

- On the Operation Panel, “Ready to Print” is displayed.
- For subsequent instructions, follow the directions provided by the RIP software.



No.	Name
1	Maintenance Cover

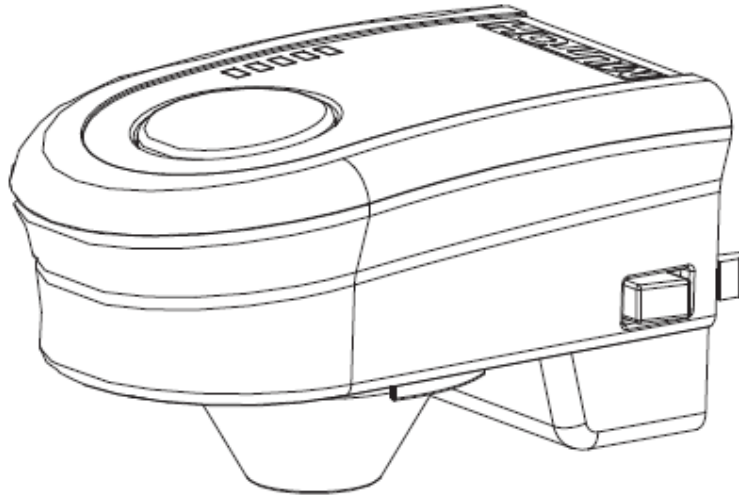
**Note Regarding Color Measurement Data**

- Your RIP software will now use the measurement data obtained from the SPECTROVUE VM-10 to perform some additional function, such as setting ink limits, adjusting linearization curves, generating a color profile, or analyzing color reproduction accuracy. These functions are entirely defined by your RIP software, and may be different for different RIP packages. **For RIP software-related questions, please contact the RIP software vendor, or your dealer.**

INSTRUMENT SPECIFICATIONS

Model	VM-10
Illumination Source	Broad Spectrum LED+Fluorescent Phosphor with UV Boost
Illumination Geometry	45/0° Illumination/Observer (CIE Pub. No. 15)
Aperture Diameter / Sample Area	14.5 mm / 6.0 mm @ 1.5 mm Aperture-to-Media Gap
Spectral Element / Detector Type	Interference Wedge Filter / 128 Pixel Si Photodiode Array
Optical Spectral Resolution	~ 385 to 715 nm @ 2.5 nm (approximate)
Reported Spectral Resolution	400 to 700 nm @ 10 nm Intervals
Spectral Repeatability	< 0.5% $\lambda$ Standard Deviation (Avg. of 14 Calibrated CERAM BCRA Tiles)*
Inter-Instrument Agreement	< 1.0 $\Delta E_{2000}$ Standard Deviation (Avg. of 14 Calibrated CERAM BCRA Tiles)*
Sampling Resolution / Rate / SNR	12 bits / 8 MHz / 1000:1 (Avg. of 10 Samples of Calibrated CERAM BCRA Medium Gray Tile)*
Measurement Time / Cycle	200 ms (Typical) / 350 ms (Max) / 3 Samples per Second
Defined Illuminants	A, B, C, D50, D55, D65, D75, D93, F1 - F12, Daylight CCT 4000 - 25000 K
Standard Observer Functions	Selectable 2° (CIE 1931) or 10° (CIE 1964)
Defined Color Models	CIELAB (1976) and CIE XYZ
CPU / RAM / EEPROM	16-bit MCU 40 MIPS @ 80 MHz / 16KB / 128KB
Internal Thermistor Accuracy	$\pm 1^\circ$ C (For Operating Temperature Range) / 10-bit
Dark Current / Signal Variability	~ 2.0% Vdd 66 mV / ~ 0.2% Vdd / 7.0 mV
A/D Converter Resolution / Noise	0.8 mV / $\pm 1$ LSB / 1.6 mV

\* Part # BCRA-14-02C(450) Calibration # AT200900220-1(450) Temperature: 76° F / 26° C  
 Specifications given here are subject to change without prior notice.



**VM-10**

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