User Manual

BS&W Viewer – Centrifuge Tube Reader

Firmware Version: ≥ 2201

Document Version: F470063_R0

Table of Contents

1 General Information

1.1 Introduction

Thank you for your purchase of the Parkes BS&W Viewer. The BS&W Viewer is the easiest way to manually read centrifuge tubes with its ability to magnify the tube, and illuminate directly into the tip of the tube. This provides consistent and reproducible readings. In situations where many personnel could potentially read a tube, the viewer is invaluable at providing consistent readings. The viewer is designed to work with:

- Short Cone (6”) Centrifuge Tubes
- Long Cone (8”) Centrifuge Tubes
- Long Cone (8”) Sediment Centrifuge Tubes

While every precaution has been taken in the preparation of these documents, Parkes Scientific Canada Inc. assumes no responsibility for technical or printing errors or omissions.

Nor is any liability assumed for damages resulting from the use of the information contained in this manual.

Parkes Scientific Canada Inc. does not make a commitment to update the information in this manual. Specifications are subject to change without notice.

1.2 Safety Information

This operating manual does not claim to address all of the safety issues associated with the use of the BS& Viewer, nor the samples used during the operation. It is the responsibility of the user to establish health and safety practices and determine the applicability of regulatory limitations prior to use.

Parkes Scientific Canada Inc. cannot be held liable for any safety issues as a result of misuse by the user.

The BS&W Viewer contains two high-intensity blue LED light sources. The design of the viewer is such that exposure to the LEDs is minimized, however the customer should take care to avoid looking directly into the LEDs. The LEDs have an adjustable intensity, if the current level of intensity is causing safety concerns, an attempt should be made to lower the LED intensity.

Do not look directly down at the LED light source(s) through the centrifuge tube opening when the LEDs are on.

Do not look directly at the LED light source(s) at any angle that causes eye strain.

Performance of installation, operation, or maintenance other than those described in this manual may result in a hazardous situation and may void the manufacturer’s warranty.

Never operate the BS&W Viewer if it is not correctly installed. Ensure that all users are fully trained to use the viewer correctly and safely. Unqualified personnel must not operate the viewer. All attempts should be made to avoid causing damage to the equipment or its accessories through incorrect operation.

Always consult the safety datasheet (SDS) for any sample, chemical used for measurement, cleaning and maintenance and ensure that proper safety equipment is available and used by the operator. Contact your Health and Safety department for best practices and procedures relevant for your company.

1.3 Warranty

The Parkes BS&W Viewer (herein after referred to as Product) manufactured by Parkes Scientific Canada Inc. (herein after referred to as Manufacturer) is sold to the purchaser (herein after referred to as Customer) on the following terms and conditions. All implied warranties regarding the Product may be subject to an approval process by the Manufacturer upon request.

a. The Product is warrantied against defects in material and workmanship for a period of one (1) year (Warranty Period) from the date of shipping.

b. Manufacturer will, without charge, at its option, replace or repair the Product that fail as a result of defective materials or workmanship with the Warranty Period.

c. The warranty of the Product may be voided at the discretion of Manufacturer in the event that the Product is modified in a way that is not expressly approved by Manufacturer.

d. None of the obligations of Manufacturer in this Warranty shall apply to any Product which have been subjected to misuse, neglect, accident, or any extreme environmental condition or improper handling.

e. If the Product is found to be defective, the Product must be returned to Manufacturer at the cost of the Customer. If replacement parts are shipped to the Customer, the freight costs associated are at the expense of the Customer.

LIMITATION OF REMEDIES

Neither Manufacturer nor the Customer will be liable to the other for any special, incidental, consequential, indirect or other similar damages arising from breach of warranty, indemnifications, breach of contract, negligence, strict liability or any other kind of civil liability. Manufacturer‘s total liability in connection with this agreement shall in no event exceed the amount paid or payable by the Customer in respect of the product which is the cause of such liability on the part of the company.

OBLIGATION OF THE CUSTOMER

The Customer agrees, as a condition of purchase of a product from Manufacturer, not to reproduce any part of the Product. The Customer also agrees not to make unauthorized use of the proprietary information which belongs to Manufacturer.

2 Unpacking

2.1 Contents

When unpacking the BS&W Viewer, please ensure that the viewer has not been subjected to excessive vibration or shock and that the following items were included with your shipment:

- 2 x BSW-C104A – Short Cone Centrifuge Inserts
- 2 x BSW-C105A – Long Cone Centrifuge Inserts
- 1 x BSW-C107 – Power Adapter (Region Plug)
- 1 x BSW-C121A – Wall Mount/Flange Kit

2.2 Installation

Place the viewer on a stable level surface, or mount the viewer to a stable level vertical surface. The enclosure that the BS&W Viewer uses has a “draft”. This means that the box is angled slightly towards the back of the enclosure. The lift assembly in the viewer counters this draft angle such that when placed on a level surface, the linear plate bracket (tube rest) will be level. The included power adapter has about 5 feet (1.5 m) of length.

This model is approved for general area classification only. An intrinsically safe version of this is planned, please contact us for more details if this is of interest for you.

Maintain reasonable temperature and humidity conditions for the BS&W Viewer like any other laboratory device. The LEDs produce heat that is dissipated on the aluminum heat sinks, but extreme lab temperatures may impair this and cause premature failure of the LEDs.

3 Operation

3.1 General Operation

3.1.1 Powering on the Unit

Once the unit has been plugged in to the supplied adapter, the LEDs will automatically turn on. If the viewer is already plugged in and the power is off, simply short press the Power button to turn the LEDs on.

3.1.2 Reading a Centrifuge Tube with the Viewer

Operation of the BS&W Viewer is designed to be as easy and user-friendly as possible. When following ASTM D1796, ASTM D4007, API MPMS 10.4, ISO 3734, and many other relevant methods, it is generally required that two tubes of the same sample, spun at the same time, for the appropriate duration, should be compared. It is expected that the user has followed the procedure in accordance with their test method and Standard Operating Procedure for preparation, sampling, and spinning of the tubes prior to use with the viewer.

The below instructions assume that two (2) tubes are being compared:

1. Ensure that the appropriate inserts for your tube style are installed into the viewer. The inserts have a lip that should be snapped into place with firm pressure down onto the viewer body.
2. Turn on the viewer with a short press of the power button
    a. If applicable, select desired LED intensity
        See 3.3 Changing LED Intensity
3. Keeping the centrifuge tubes as vertical as possible, wipe the exterior of the tubes clean especially around the tip area.
4. Insert the tubes into the corresponding holes on the viewer; while holding the tube upright gently articulate the tip of the tube so that it rests in the chamfered LED hole.
5. With the viewer on a stable level surface, view the tube through the magnifying lens at eye level and rotate the lift assembly knob to position the section of centrifuge tube you'd like to read aligning it in the middle of the lens. The lift raised to the highest point will correspond with reading the very tip of the tube.
6. Once you're viewing the tube in the position you want to read, you can optionally change the LED intensity to examine if a different intensity gives a better view of the separation
    See 3.3 Changing LED Intensity
7. Record your tube reading and refer to your test method and SOP for calculation of the final result for BS&W.

3.2 Operating Modes

The BS&W Viewer has two (2) operating modes depending upon your requirements. The two modes are as follows:

3.2.1 Timer Mode

In this mode, the BS&W Viewer will automatically turn itself off after 15 minutes from power on.

Flashing Pattern: This is indicated by slow flashing of the LEDs during the selection mode.

3.2.2 Always On Mode

In this mode, the BS&W Viewer will remain on indefinitely. Press and release the Power button to turn the viewer off.

Flashing Pattern: This is indicated by rapid flashing of the LEDs during the selection mode.

3.2.3 Entering Selection Mode (Changing the Operating Mode)

In order to change the operating mode for the BS&W Viewer it must first be turned off. Follow the below outlined procedure to change the operating mode:

1. Turn the BS&W Viewer off by press and release of the Power button
2. Press and hold the Power button while it turns on. Do not release. The LEDs will turn on.
3. After roughly five (5) seconds of holding the Power button, the LEDs will indicate the now changed current mode by a unique flashing pattern according to the described modes.

Use the below sections to determine the expected LED flashing pattern for each mode:

3.3 Changing LED Intensity

The BS&W Viewer has five (5) intensity modes depending upon your desired illumination level. They correspond to 20%, 40%, 60%, 80%, and 100% of the available light intensity. In order to change the current intensity setting, please follow the outlined procedure:

1. Press and release the Power button to turn the BS&W Viewer on.
2. Press and hold the Power button.
    a. The LEDs will begin to cycle through the five (5) possible light intensity settings.
    b. **Note:** while the Power button is held down, the LED intensity will cycle from lowest to highest and then immediately back to the lowest intensity until an intensity is chosen by releasing the Power button.
3. Once the desired light intensity setting has been reached, release the Power button to save your choice.

The selected intensity setting will persist between power cycles of the BS&W Viewer. You can change the intensity setting at any point while the device is turned on by following the steps outlined above.

3.4 Changing the Lift Position

The BS&W Viewer has a lift mechanism that allows you to view a range of the tube for reading, while being able to correct for any distortion / parallax correction. The knob on the top of the unit can be used to raise or lower the tube to the desired position. The rotation of the knob is labelled to convey the direction the lift will move.

- Rotating the knob counter-clockwise will lower the lift, which corresponds with reading higher up on the tube. This is labelled as “Lower” on the viewer.
- Rotating the knob clockwise will raise the left, which corresponds with reading lower on the tube. This is labelled as “Raise” on the viewer.

Stops are built-in to the unit to prevent the platform from going below or above its lower and upper positions. No attempts should be made to modify these stops without the express written consent from Parkes Scientific Canada Inc.

4 Care and Maintenance

4.1 General Care Instructions

The BS&W Viewer is relatively maintenance free, however a few things should be considered for the care and maintenance of the viewer. Spills from chemicals or products should be cleaned immediately in order to keep the enclosure and parts in good working order.

The centrifuge tubes should have their exterior wiped with a clean cloth prior to insertion into the viewer to ensure spillage does not occur inside the enclosure.

A glass splash guard is installed beneath the Mounting Plate Bracket to prevent contamination of the LED Board. If product spills onto the Mounting Plate Bracket, remove the bracket by removing the two 3 mm Allen head screws, and clean with an applicable solvent. You can use a Q-tip or similar device to clean the glass surface where the LED opening is.

The lift mechanism operates with two linear bearings and an Acme thread worm gear. Keep these surfaces cleaned and lubricated with a light oil to ensure proper working condition.

5 Disassembly and Reassembly

5.1 Tools Needed

The following tools are required to fully disassembly the BS&W Viewer.

- 1.3 mm Allen Key
- 2 mm Allen Key
- 3 mm Allen Key
- Phillips #1 Screwdriver
- Phillips #2 Screwdriver
- 13 mm Wrench or Adjustable Wrench
- 19 mm Wrench or Adjustable Wrench
- Small Slot / Flat Blade Screwdriver

5.2 Instructions for Disassembly

To begin with any internal disassembly, please ensure the power is disconnected. Begin by removing the four (4) Phillips #2 screws securing the front cover to the enclosure box.

5.2.1 Removing the Lift Assembly

1. Use the 1.3 mm Allen Key to remove the set screw on the lift assembly knob, remove the knob, and remove the white knob spacer.
2. Disconnect the wire harness from the LED board. It can be rocked side-to-side. You may need to pry the connector slightly with a flat blade screwdriver but be cautious of causing damage to the connector or pins.
3. Use the 2 mm Allen Key to remove the four (4) lift assembly screws.
4. Use the 2 mm Allen Key to loosen the four (4) set screws holding the lift assembly posts. You do not need to fully remove the set screws. These set screws must be loosened or the lift assembly won't be able to tilt out.
5. With the wire harness disconnected, the knob and washer removed, the lift assembly screws removed, and the lift post set screws loosened, you should be able to tilt out the lift assembly.

5.2.2 Removing the Lenses

The magnification lenses are threaded into the front cover and should be able to turn out with firm pressure. If it cannot be turned out by hand, a small rubber belt wrench can be used to twist it with more force.

5.2.3 Removing the Inserts

The tube inserts are pressed in with firm pressure past an angled notch on the OD of the insert that is slightly larger than the opening. This causes the insert to snap into place when installed correctly. To remove the inserts, place two fingers inside the insert and underneath, brace your thumb on the top of the box and pull up. One half of the insert should release. Repeat on the other half to fully remove.

5.2.4 Removing the Electrical Components

Use a small Phillips screwdriver to release the wires from the power switch by loosening the two screw terminals. Disconnect the wire harness connector from the LED board. Use a 19 mm wrench or adjustable wrench to loosen the retaining nut on the power switch. Use a 13 mm wrench or adjustable wrench to loosen the retaining nut on the power connector. Feed the two (2) power switch wires into the retaining nut and lock washer from the power connector. Move the nut and washer to the end of the connector. Carefully angle the wire harness connector through the nut and washer. The wire harness can now be pulled through the power connector hole.

5.2.5 Removing the Plate Bracket

Use a 3 mm Allen Key to remove the two (2) socket cap screws that secure the linear plate bracket to the linear plate. The bracket will be free, but take care to not damage or scratch the glass splash guard that is attached underneath the LED holes on the bracket.

5.2.6 Removing the Plate

To remove the plate, you must first remove the lift assembly.

See 5.2.1 Removing the Lift Assembly

After removing the lift assembly, use a 3 mm Allen Key to remove the two (2) countersunk socket cap screws securing the plate to the lift assembly.

5.3 Installing the Wall Mount / Flange Kit

The BS&W Viewer comes with a wall mount kit (BSW-C121A) to secure the viewer. The kit includes four (4) brackets and four (4) screws. The brackets attach to the back of the viewer enclosure on the four (4) smaller holes. The bracket is installed with the stop against the side of the enclosure such that the bracket points perpendicular to the side. When looking at the back of the enclosure, the bracket would point left or right depending on the side. Once bracket is in position, secure with the supplied screw which will cut threads into the unthreaded hole. See Figure 1.

Figure 1

Once the brackets are installed and a suitable location is selected, ensure that the viewer is suitably level and plumb. The lift assembly is installed counter to the draft angle of the enclosure to level it in the box. If the box is placed on a level surface, this means the plate is level. For wall mounting, aim to level the enclosure relative to the back face.

6 Parts List

6.1 Table Listing of Parts

The below table outlines the parts for the BS&W Viewer. If you are in need of a replacement part, please contact info@parkesscientific.com or your local authorized dealer.

	SKU	MPN	Unit
	PSC-47-13943 Enclosure	BSW-C100A	Each
	PSC-47-14057 Linear Table Plate	BSW-C101A	Each
	PSC-47-14223 Linear Table Plate Bracket	BSW-C102A	Each
	PSC-47-14052 LED Board, Blue Light	BSW-C103A	Each
	PSC-47-14258 Short Cone Insert	BSW-C104A	Each
	PSC-47-14259 Long Cone Insert	BSW-C105A	Each
	PSC-47-14526 Power Switch	BSW-C106A	Each
	PSC-47-14527 Power Adapter (US Plug)	BSW-C107A	Each
	PSC-47-14528 Power Adapter (Euro Plug)	BSW-C107B	Each
	PSC-47-14529 Lift Assembly	BSW-C108A	Each
	PSC-47-14530 Lens, 49 mm +10 Diopter	BSW-C109A	Each
	PSC-47-14531 Black Rubber Knob	BSW-C110A	Each
	PSC-47-14532 Threaded-Stud Bumpers	BSW-C111A	Pack of 4
	PSC-47-14533 Linear Plate Socket Head Screws	BSW-C112A	Pack of 2
	PSC-47-14534 Linear Plate Bracket Socket Head Screws	BSW-C113A	Pack of 2
	PSC-47-14535 Lift Assembly Mounting Screws	BSW-C114A	Pack of 4
	PSC-47-14536 HDPE Spacer, 25 mm	BSW-C115A	Each

Picture	SKU	MPN	Unit
	PSC-47-14537 HDPE Spacer, 20 mm	BSW-C116A	Each
	PSC-47-14538 Knob Washer	BSW-C117A	Each
	PSC-47-14540 Glass Splash Guard	BSW-C118A	Each
	PSC-47-14541 Barrel Connector	BSW-C119A	Each
	PSC-47-14542 Wire Harness	BSW-C120A	Each
	PSC-47-14547 Wall Mount/Flange Kit	BSW-C121A	Kit
	PSC-47-14548 LED Board Screws	BSW-C122A	Pack of 2

Page Intentionally Left Blank

Parkes Scientific Canada Inc.
17360 - 108 Ave NW
Edmonton, AB, T5S 1E8
Phone: (780) 484-1849
Fax: (780) 484-0601
info@parkesscientific.com
www.parkesscientific.com