Next Generation™ By Exodus Breeders

User Guide

EXODUS BREEDERS CORPORATION

Quick Check ™

User Guide

PPS EQUINE ENGINEERING

Quick Check™ User Guide

Manufactured in the USA by:

Distributed by:

? Primo Ponies and Sporthorses
4808 East China Hill Road
El Dorado, CA 95623
Phone 530-621-4911
Web:
http://www.primoponies.com

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Exodus Breeders Corporation
5470 Mount Pisgah Rd.
York, PA 17406
(717) 252-0721 - Office
(717) 252-4221 - Fax

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Semen Analysis, Simplified!

Thank you for choosing the Next Generation™ Quick Check™ sperm counter. Please take the time to read this user guide in its entirety prior to use.

Accurate semen counting is one of the most critical steps in breeding management. The Quick Check Semen counter is a fast and economical method for analyzing sperm concentration. When preparing semen for shipment, it is important to know the sperm concentration in order to ensure the proper volume for shipment. Ship too few sperm and the probability of conception drops dramatically. Standard methods for counting require a hemacytometer, a microscope, and plenty of time and patience. With the Quick Check, semen analysis takes only seconds.

ICON KEY
✍ Valuable information
Important Safeguards

Using this guide: To make scanning through this manual to obtain key information faster, key data will be highlighted with "icon keys". These icons (shown at left), will help you find information to get started using the Quick Check quickly.

Quick Check Features

The Quick Check uses a four-beam, ratiometric nephelometric turbidity analysis technique to deliver accurate readings for the life of the unit. With other density-based systems, factors such as bulb life and

temperature variation can impact the accuracy of a reading. With the Quick Check, these effects are all fully compensated for.

Many semen analysis systems require sample dilution. With a diluted sample, your reading is only as accurate as your dilution accuracy. In fact, to obtain repeatable results with units requiring dilution , you could spend close to $500 on pipettors and dispensers. The Quick Check can accurately read the concentration of un-diluted semen – no mixing errors possible.

The Quick Check operates on a single 9V battery, making it ideal for use in the field. It also comes with a power cord for bench top use.

The Quick Check includes a serial RS-232 PC communications port that allows the unit to display readings on a PC. This same connection can be used to download software updates as they become available.

The Quick Check comes pre-calibrated to measure undiluted equine semen concentration, and requires no additional user calibration. However, for advanced use with other species or with diluted semen, four user customizable calibration tables are available. These tables are non-volatile (i.e. they will remain in the unit even if power or batteries are removed).

Take a few moments to review the keypad, display, and connectors for the Quick Check.

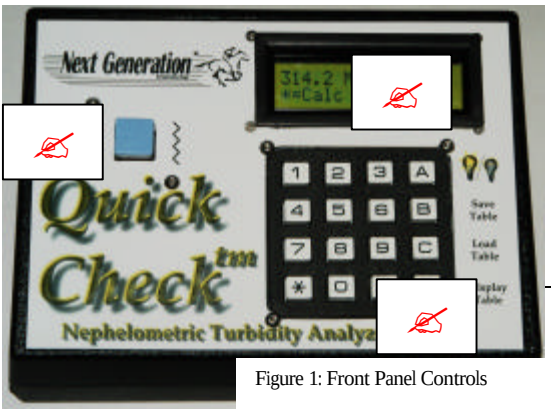


Figure 1: Front Panel Controls

As shown in Figure 1, the Quick Check front panel includes a 16 key keypad ✍, a backlit LCD display ✍, and the cuvette receptacle ✍.

Figure 2 shows the back panel of the Quick Check, including the power switch ✍, the power port ✍, the battery compartment ✍, and the PC communication port ✍.

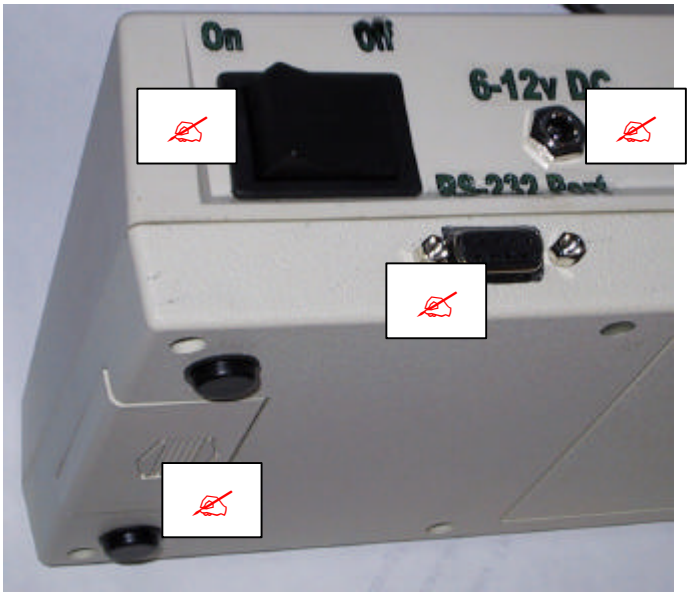


Figure 2: Back Panel View

Operation

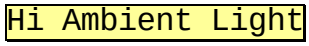
Prior to using the Quick Check, please review the environmental precautions below to ensure a long and trouble-free life of the unit. Failure to observe these precautions could lead to inaccurate readings, or damage to the unit.

? Keep all liquids away from the unit. Prior to inserting a cuvette, ensure that the cuvette is clean and dry so that no foreign material gets trapped inside the optical cavity.

? Ensure that the battery is fresh, or the unit is connected to AC power.

? Although the design of the Quick Check compensates for temperature variations and gives accurate results over a wide range of temperatures, extreme temperatures should be avoided. When temperatures are too cold (less than 32 degrees Fahrenheit), the display will seem "sluggish". When too hot (greater than 110 degrees Fahrenheit), the display will appear dark. Returning the unit to normal temperatures should result in normal operation. Take care, however, when taking readings after a quick temperature change in the unit. In humid environments, condensation can occur when quickly changing from a cold temperature to a warm temperature. Condensation on the optical elements can affect the accuracy of the unit. Any time the unit's temperature is changed dramatically, it is a good idea to allow the unit to stabilize at the new temperature for an hour to ensure proper readings. Leaving the unit on while connected to AC power during this warm-up period will help reduce condensation build-up.

? The Quick Check automatically compensates for ambient light levels. However, under very bright light (e.g. direct sunlight), the accuracy of the unit could be affected. If this occurs during a sample reading, the unit will display the message:



To correct this situation, either move the unit to a less lighted area, or cover the cuvette with the square black light shield

supplied with the unit, and re-read the concentration level. Avoid changing the ambient light levels while a reading is in progress.

? Be careful not to drop the Quick Check, it is a sensitive electronic instrument.

Powering the Unit

The Quick Check operates off of either AC (wall transformer), DC (9v battery) power, or an optional automobile charger.

Battery Installation: Remove the battery compartment cover, and connect a 9v battery to the connector inside. After inserting the battery, replace the compartment cover. Please use a high quality battery for longest life. Rechargeable batte ries are not recommended due to their low voltage levels.

AC Power: Using the wall transformer supplied with the Quick Check, connect the power jack into the power socket on the rear of the unit. Plug the transformer into an 110V/60Hz power receptacle.

Use the switch on the back of the unit to apply power.

Note: If the AC cord is attached to the unit, but not plugged into a powered wall receptacle, the unit will not tum on – even if a battery has been installed in the unit!

The Quick Check requires only a few moments to turn on. The display will look something similar to:

```
Quick Check
v2.6 (TM) *=Read
```

As soon as the display has the "*=Read" text showing, the unit is ready to read the sample.

Firmware version: The firmware version is displayed at power up. In the example above, the Quick Check firmware version is 2.6. The Quick Check is firmware upgradeable. As Primo Ponies develops additional features for the Quick Check, they can be easily downloaded via the PC connection port. Please contact Primo Ponies for additional details.

Reading the display in low light: The Quick Check has a built-in backlight. To toggle the state of the backlight, press the 'A' key whenever the unit is ready to read a new concentration value (i.e. whenever the display contains "*=Read").

The Quick Check is supplied with a calibrated standard. Prior to using the unit, check that the unit is reading within +/- 5% of the value indicated on the standard. If the unit reads more than 5% off of the standard value, contact Primo Ponies for assistance.

Stallion Collection

Stallion collection is the most critical phase of the Artificial Insemination (AI) process. Mistakes during collection will not only frustrate the stallion, but can result in poor fertility. Please follow the following guidelines when collecting your stallion:

A thorough washing of the stallion prior to collection is critical. Any dirt or contaminants introduced into the sample will not only affect the concentration reading, but could also introduce harmful bacteria. Although antibiotics in the extender can help control the growth of bacteria in the sample, it is common sense to control the contamination at the source. In addition, all glassware,

containers, pipettes, etc. that come in contact with the sample must be sterile.

Although the Quick Check will give correct readings for semen samples regardless of morbidity, it is essential throughout the collection process that the temperature of the sample be carefully controlled. The temperature of the AV (Artificial Vagina) should be carefully monitored and maintained at a temperature that is most comfortable for the stallion. We recommend using a non-spermicidal lubricating gel.

After collection, semen should be processed for shipping as quickly as possible, while maintaining a constant temperature of 101 degrees Fahrenheit. Use of an incubator to maintain the correct temperature is essential. Keep all instruments, containers, extenders, slides, and any other equipment that will contact the sample in the incubator. The Quick Check need not be maintained at the incubator temperature, however if the undiluted sample is to be used for insemination, ensure that the new sterile cuvette which is to be used is at the proper temperature.

Follow any instructions with the extender for proper mixing, as each extender may have different usage directions.

Reading Sperm Concentration

1. Fill a 4 ml Cuvette with either straight or formalin-diluted gel free semen. Ensure that the cuvette is filled at least half way (2 ml). Tap the cuvette gently on a hard surface to remove any trapped air bubbles on the side of the cuvette, as they will impact the accuracy of the reading.
2. Insert the cuvette into the unit with clear surfaces facing top and bottom, and the uneven surfaces to the sides.
3. Press the ***'** key. The display should read alternately:

```
Reading Sample.
```

and

```
**********
```

After approximately 20 seconds, the concentration will be displayed:

```
xxx.x Million/ml
*=Calc #=Chg Mot
```

The xxx.x represents the number of spermatozoa in the sample in Millions per ml.

4. Press the **'*'** key to obtain semen extender calculations for a 1 Billion sperm dose (500M motile sperm @ 50% Motility):

```
x.xml semen SH
yy.yml ext*=Read
```

Each dose should be prepared with x.x ml raw semen, and yy.y ml extender. The SH designator following the semen volume indicates that this extension calculation is for Cool Shipping. An FZ indicator would represent the extension required for Freezing. The shipping calculations are based on the following default concentration parameters:

? A minimum of 5:1 ratio of extender to raw semen. Extender ratios less than 5:1 may result in low motility after shipment.

? A maximum post extension concentration of 30M/ml.

Note: for very low concentrations, <100M/ml, large doses (>50ml) must be shipped for a full 1 Billion sperm. A low concentration ejaculate can be increased using centrifuging, however some research shows that this technique can potentially lower conception rates. To improve concentration, limit the time spent teasing the stallion, as it has been shown that while this increases the volume of the ejaculate, total sperm count generally remains constant.

5. To read a new sample, go to step #2.

If after reading a sample you see the following display:

```
Reading:xxxx
```

This indicates that the calibration table has been completely deleted, or the concentration of the sample is above the maximum calibration point. The number represented by xxxx is the internal reading of the unit. This display is useful when developing custom calibrations.

If the display reads:

```
Out of Range
xxxx
```

Then the current sample is more concentrated than the currently loaded calibration table. If you know the sample concentration, you can add this point to your calibration table by following the directions in section: Adding Points to the Current Calibration Table.

Extension Protocol

Version 2.6 of the Quick Check firmware allows the user to easily change the motility and extension protocol used for internal calculations of extension ratios for both freezing and cool shipping. After reading the sample, the concentration value will be displayed:

```
xxx.x Million/ml
*=Calc #=Chg Mot
```

To modify the default motility or other protocol settings, press the '#' key. First you will need to select either Shipping or Freezing.

```
Ship Press 1
Freeze Press 2
```

For both Shipping and Freezing the Motility display will then appear:

```
Motility(xx%)?
```

The value (xx) represents the current motility value (in percent) which will be used for calculation of extension ratios. The default motility setting is 50%. To change the motility, enter the motility of the sample followed by the '#' key. To continue without changing the motility value, press the '#' key without entering any numbers.

Specific Values for Cool Shipping:

The next value which can be changed for cool shipping is the minimum extension ratio:

```
Ext. Ratio(x):1?
```

The current extension ratio is shown in the parenthesis, where x represents the minimum ratio of extender volume to semen volume. The default extension ratio is 5:1. To change the value, enter the new ratio followed by the '#' key. To leave the minimum extension ratio unchanged, press the '#' key.

The maximum extended concentration can changed in the next screen:

```
Extend Conc(xx)
M/ml?
```

The current maximum extended concentration is represented by xx Million sperm per ml. The default value is 30M/ml. Increasing this value will reduce the volume of the dose for high concentration samples, and could lead to low sperm survival during shipment. To change this value, enter the maximum extended concentration followed by the '#' key. To leave the maximum extended concentration unchanged, press the '#' key.

The screen to modify the total number of motile sperm per dose is displayed next.

```
Ship Dose(xxx)M
?
```

The number xxx represents the total motile sperm to ship per Dose in Millions. The default value is 500 Million motile sperm. To change the value, enter the new value followed by the '#' key. To leave the value unchanged press the "# 'key.

After the protocol has been changed, the new numbers are automatically saved even when power to the unit is removed, and will be applied to all future calculations unless changed following the steps above.

The display should now read:

```
Ship Dose(xxx)M
*=Calc #=Chg Mot
```

Press the '*' key to calculate the extension volumes with the new variables.

Specific Values for Freezing:

The target concentration for the extended solution for freezing can be specified in the next screen:

```
Extend Conc(xx)
M/ml?
```

The current maximum extended concentration is represented by xx Million sperm per ml. The default value is 30M/ml, since this variable is shared with the cool shipping calculations. A good concentration to select for freezing is 50M/ml. To change this value, enter the desired extended concentration followed by the '#' key. To leave the maximum extended concentration unchanged, press the '#' key.

The screen to modify the total volume of collected semen is next.

```
Semen Vol(xxx)
ml?
```

The number xxx represents the total volume of raw gel-free semen to be prepared for freezing. The default value is 500ml, as this value is shared with the shipping dose for cool shipping. To change this value, enter the new value followed by the '#' key. To leave the value unchanged press the "#" key.

After the protocol has been changed, the new numbers are automatically saved even when power to the unit is removed, and will be applied to all future calculations unless changed following the steps above.

The display should now read:

```
Ship Vol(xxx)
*=Calc #=Chg Mot
```

Press the '*' key to calculate the extension volumes with the new variables.

Calibration

The Quick Check comes pre-calibrated to measure undiluted equine semen, and normally no additional calibration is required. However, calibration for other animals or dilution ratios is possible. Up to four user customizable calibrations can be stored in the unit.

The Quick Check uses an interpolated lookup table to enable accuracy over a wide range of semen concentrations without dilution. A linear or quadratic model can be made relatively accurate for low concentrations, however at high concentrations, both optical density and turbidity readings deviate from these models. A table lookup approach gives a very accurate response despite these non-linearities.

Lookup Table Principles

Before attempting to calibrate the Quick Check, please take a few moments to familiarize yourself with the principles behind table look up values.

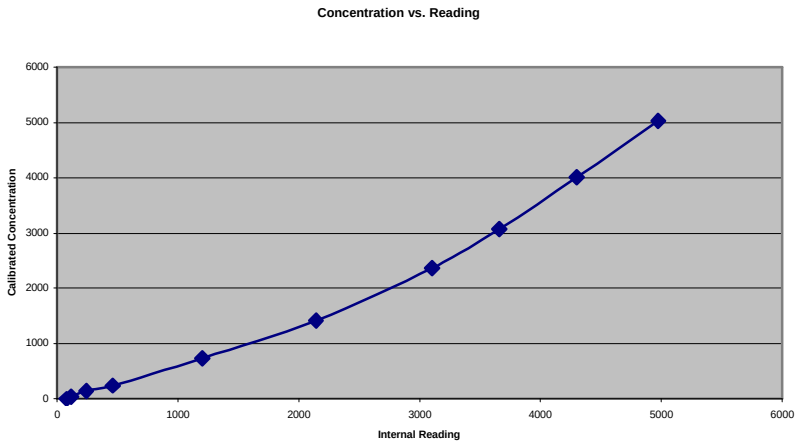


Figure 3: Example Calibration Curve

The graph depicted in Figure 3 shows the non-linear relationship between Turbidity and actual concentration. The points on the graph represent the table look-up values. Each table value consists of two values: the internal reading, and the corresponding calibrated measurement for that reading.

Table 1: Representative Lookup Table

Internal Reading	Calibrated Concentration
80	0
120	41
242	142
462	240
1203	735
2141	1417
3104	2373
3658	3075
4300	4003
4973	5023

Each value pair is selected so that a straight line drawn between two points in the table can be correlated to a calibrated concentration with very high accuracy. Each table in the Quick Check can include up to 15 distinct points. A representative table is shown in Table 1.

For internal readings that fall between the points on the table, the concentration is determined by interpolation.

The first value in the table must represent a zero reading.

The four customizable tables remain in memory even if the batteries and power are disconnected and can be used for several purposes:

- Calibration curves for up to four other species could be saved.
- Calibration curves for up to four dilution ratios could be saved.
- Or, the four calibration tables could be individually calibrated to portions of the full range of measurement, thereby creating effectively a single table with 60 calibration points.

Loading Calibration Tables

Only one calibration table is active at any one time. To switch between calibration tables, simply load the desired calibration table from memory.

Note: any changes which have been made to the current calibration table will be lost if a new table is loaded. If you want to save the changes to the current table, save the current table to one of the four available memory locations.

You can load a new calibration table whenever the unit is in the "ready to read" state. The display will have the text "*=Read" when the unit is in the ready to read state. The Quick Check goes directly to the ready to read state on power up.

To load a calibration table, press the "C" (**C**alibrate) key. The Quick Check will display:

```
Enter Table No.
to load. *=Exit
```

Enter a number between 0 and 4 (inclusive) to select a new calibration table. Calibration table 0 contains the factory-calibrated table for each unit, and cannot be changed by the user.

If for some reason your calibration table has been corrupted (by inadvertently loading or deleting the current table), you can always re-load the factory calibration by loading table 0. Table 0 cannot be overwritten by the user.

If you pressed the "C" key inadvertently and entered the table load routine, you can exit by pressing the '*' key.

Saving the Current Calibration Table

Once you have a set of calibration points that you are satisfied with, you can save them to one of four user calibration tables to be recalled later. Even though the current calibration is retained when power is removed, any changes made to the current calibration are lost if one of the new calibration tables is loaded.

To save the current calibration table, press the "B" (**B**ackup) key. The Quick Check will display:

```
Enter Table No.
to store. *=Exit
```

Enter a number between 1 and 4 (inclusive) to select the calibration table to save to. You cannot save to calibration table 0, as it contains the factory-calibrated table for the unit.

Note: Saving the current calibration table to a memory location will completely erase any current calibration information in the selected calibration table. **This cannot be undone.**

Displaying the Contents of the Current Calibration Table

You can review the contents of the current calibration table by pressing the "D" (**D**isplay) key. The Display will now read:

```
Calibr. Table
#=Next *=End
```

You can return to "ready to read" mode at any time by pressing the "*" key. Pressing the '#' key will show each calibration pair value in the current table. If no table values are present, you will get the following display:

```
No Table Values.
```

This will occur if all table entries have been deleted. If table values exist, you will see the following display:

```
xxxx, yyyy D=Del
#=Next *=End
```

The value represented by xxxx is represents the internal reading units, the value represented by yyyy is the corresponding calibrated concentration value for that particular internal reading. To increase precision, the value represented by yyyy is in 100,000 spermatozoa. For example, a value of 3473 represents 347.3 Million Sperm.

While the table entry is displayed, if the "D" key is pressed the current table value will be **D**eleted. Since the deletion of a table entry cannot be undone, you will see a confirmation screen:

```
Delete Entry?
#=Yes *=No
```

Pressing '#' will delete the current entry and display the next entry. Pressing '*' will exit the table display routine without deleting the current table entry. Any table values which were deleted by pressing the '#' key on prior table entries will remain deleted even if the display routine is exited at this point with the '*' key.

It is not possible delete the first entry (zero point) in the table. It is possible to delete all other table entries in the current calibration table. This is often the first step when building a custom table. To change the zero point, use the "0" key whenever the "*=Read" message is displayed.

Adding Points to the Current Calibration Table

To add new points into the current calibration table, read the concentration of a known sample following the directions in the section: Reading Sperm Concentration. If the sample falls within the bounds of the current table, you will see the normal concentration and extender displays. Press the '*' key to return to the ready-to-read display (*=Read). At this point, press the '#' key. You will see the following display:

```
Sample Count?
```

Enter the known semen concentration in Millions of sperm per ml using the keypad. To enter a number after the decimal place, use the '*' key to enter the decimal. End your entry using the '#' key. For example the number 234.5 (234,500,000 sperm/ml) would be entered by pressing the following key sequence: 2, 3, 4, *, 5, #.

If you entered the calibration routine in error, or wish to exit without changing the calibration scale, press the '#' key without entering a sample count. The display will read:

```
Calib. Cancelled
Scale=xxx
```

Note: Entering a value of zero is interpreted the same as pressing the # key without entering a sample value. To change the zero reference, follow the directions below.

If the table already has 15 points, you will not be able to add another point without first deleting an existing table entry. If you attempt to save more than 15 points you will get the following error message:

```
Table Full. Del
entry first.
```

Use the Display routine ("D" key) to delete a table entry, then you can add the new calibration point into the table.

The points in the Calibration table must be monotonically increasing. If you attempt to add a point to the calibration table that causes the table to be non-monotonic you will get the following error message:

```
Not Monotonic!
```

If this occurs, the table value will not be stored. If you believe that the current sample count is accurate, then the current table values that occur near this reading may not be accurate. Review your table values using the Display routine ("D" key) to identify and delete the inaccurate entries.

Changing the Zero Point

1. Zero the unit by reading seminal plasma pipetted from a completely centrifuged semen sample. Alternately, a sample of straight formalin or distilled water gives a reasonable baseline reading.

2. Once the reading is complete, press the "*" key to obtain the extender calculations. Ignore these values for calibration.

3. When the display shows the extender dilution amounts, along with the "*=Read", press the "0" key.

4. The display will now read:

```
Set Zero pt=xx
#=Y *=N
```

5. The number actually displayed in the place of xx above is the internal value read for a sperm free sample. Note that this number is not generally zero due to the sensitive nature of this equipment. To accept the new Zero point, press the '#' key. To reject the new zero point, press the '*' key.

Quick Check PC Software:

The Quick Check software requires Quick Check firmware v2.3 or higher. Please see the section below on Firmware Upgrades for details on upgrading your firmware.

The PC software has been tested on several machines, however due to differences between hardware configurations and operating systems, you may find compatibility problems. If this is the case for your system, please contact me at admin@primoponies.com with the problem you have experienced and details of your system configuration. I will attempt to update the software to resolve any issues found.

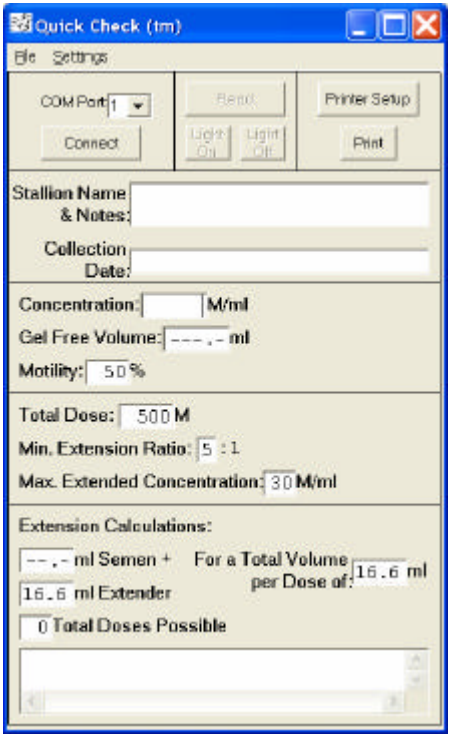
To use the PC software, load the CD-ROM in your CD drive.

1. Connect the Quick Check to an RS-232 port on your computer using the cable supplied.

2. Turn on the Quick Check. On a few computers, the Quick Check display will not come on while connected to the computer until the software is started. This is normal.

3. In Explorer, explore the CD Drive. The Quick Check program should install automatically.

The Quick Check program will be installed in the Start -> Program Files -> Exodus Breeders directory. The Quick Check window should appear:



4. Set the COM port using the pull down menu, and press the Connect button. When the Quick Check unit is identified, the firmware version will be displayed in the bottom box, and the Read button will be enabled.

5. The light can be turned on with the "Light On" button, and turned off with the "Light Off" button.

6. To read the sample, click the "Read" Button. While the unit is reading (the Quick Check will indicate that it is reading), do not click any buttons or change any fields.

7. After the reading is complete, the software will calculate the proper extender ratio based on the minimum ratio specified. Any time you change the minimum ratio, the semen to extender ratio is recalculated.

8. If you enter the Gel Free Volume, the total number of Doses possible will be automatically calculated. As with the extender ratio, any time you modify the Gel Free Volume, the total number of doses will change.

9. To change the printer settings, click on the Printer Setup button. To print the data to your printer, click on the print button. A summary of the collected semen data will be sent to the printer you select. Any data entered in the box next to the Stallion Name and Notes will also be printed.

Specifications

Principle of Operation:	Four beam nephelometric, 90? / forward scatter. Thermal and ambient light compensation.
Range:	0 – 800 M/ml (factory calibration – the unit is capable of reading higher with custom calibration)
Wavelength:	940nm
Sensitivity:	<0.2 M/ml
Calibration	15 point Calibration Tables: 1 Factory Calibration, 4 User Defined Calibrations.
Ambient Conditions:	32 – 120ºF (0 – 50ºC), 0 – 100% relative humidity, non-condensing
PC Connection:	9 pin D-sub female RS-232
Power:	9v battery or 6-12VDC 2.1mm positive center plug
Housing:	6.88" x 4.88" x 2.48" (174.8mm x 124mm x 63mm)
Display:	16x2 character backlit LCD
Weight:	2 lb./4.4 kg
Front Panel Instructions:	English, German, Dutch, French, and other languages (per customer request).

Warranty

What your warranty covers:

1. Defects in materials or workmanship.

For how long after your purchase:

2. One year from date of purchase.

What we will do:

3. Provide you with a new, or at our option, a refurbished unit.

4. The exchange unit is under warranty for the remainder of the original product's warranty period.

How to make a warranty claim:

1. Properly pack your unit. Include any cables, etc., which were originally provided with the product. We recommend using the original carton and packing materials.
2. "Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the product is within the warranty period, must be presented to obtain warranty service." Also print your name and address and a description of the defect. Send via standard UPS or its equivalent to:

Primo Ponies and Sporthorses
4808 East China Hill Road
El Dorado, CA 95623

1. Pay any charges billed to you by the Exchange Center for service not covered by the warranty.
2. Insure your shipment for loss or damage. Primo Ponies and Sporthorses accepts no liability in case of damage or loss en route to Primo Ponies.
3. A new or refurbished unit will be shipped to you freight prepaid.

What your warranty does not cover:

1. Installation and calibration.

2. Batteries.

3. Damage from misuse or neglect.

4. Products that have been modified or incorporated into other products.

5. Acts of nature, such as but not limited to lightning damage.

Limitation of Warranty:

1. THE WARRANTY STATED ABOVE IS THE ONLY WARRANTY APPLICABLE TO THIS PRODUCT. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE) ARE HEREBY DISCLAIMED. NO VERBAL OR WRITTEN INFORMATION GIVEN BY PRIMO PONIES, IT'S AGENTS, OR IT'S EMPLOYEES SHALL CREATE A GUARANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY.
2. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. PRIMO PONIES SHALL NOT BE LIABLE FOR INCEDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT OR ARISING OUT OF ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. THIS DISCLAIMER OF WARRANTIES AND LIMITED WARRANTIES ARE GOVERNED BY THE STATE OF CALIFORNIA. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRENTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.

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