



bluelab[®] combo meter

Care and use guide

 www.getbluelab.com

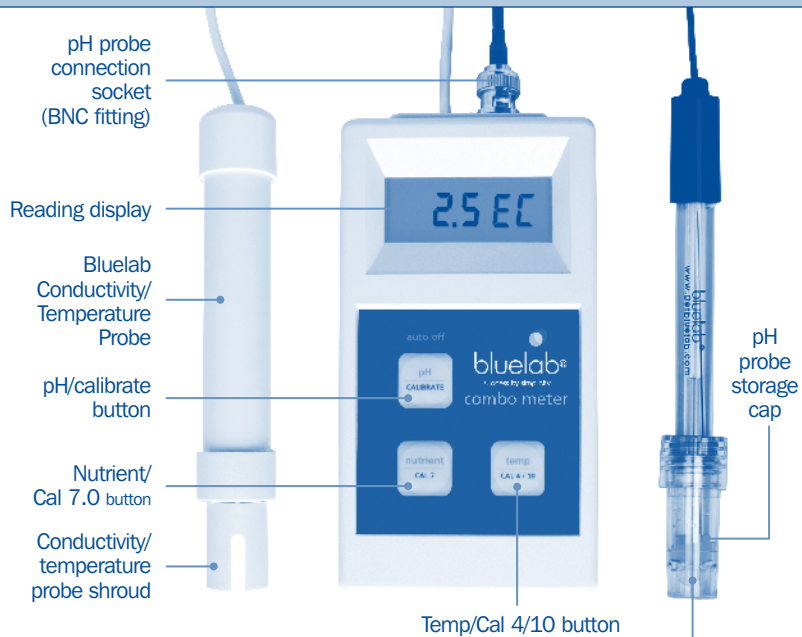
WARNING!

**Keep your pH probe tip wet
at all times to avoid permanent damage**



Bluelab Combo Meter

The battery operated Bluelab Combo Meter measures nutrient, temperature and pH levels by using the Bluelab Conductivity/Temperature Probe and/or the Bluelab pH Probe connected to the electronic meter.



ATTENTION
If it dries, it dies!

Bluelab pH Probe
The pH probe tip must not be allowed to dry out. Always place the storage cap back onto the pH probe after each use and ensure it contains either Bluelab pH Probe Storage Solution, fresh water or pH4.0 calibration solution.

Features	
Measures EC/CF/ppm 500/°C/°F	Selectable unit for conductivity and temperature
Temperature at the push of a button	Replaceable pH probe
Low battery indicator	Over range and under range indicators
Calibration instructions on the back of the Bluelab Combo Meter	Fully guaranteed for 5 years *6 months for the Bluelab pH Probe
Lightweight and portable	Large easy to read LCD display
Auto off	Batteries included (2 x AAA)

1.0 Introduction to the Bluelab Combo Meter

The Bluelab Combo Meter has three press buttons; 'pH / CALIBRATE', 'nutrient / CAL 7' and 'temp / CAL 4/10'. The buttons have a short press and long press function. A short press means a button is released in about one second. The long press is a button being held for at least three seconds and released when the display starts flashing.

Turning the Combo Meter on and off

- To turn the Combo Meter on:**
A short press of any button turns the Combo Meter on. The Combo Meter automatically turns off after four minutes if no buttons are pressed. If the Combo Meter turns off before the reading is taken, a short press of any button will turn the Combo Meter on again.
- To turn the Combo Meter off:**
The Combo Meter is manually turned off by holding the pH button down until the display starts flashing. Press the pH button again while the display is flashing, and 'OFF' will display.

ppm scale

- The ppm scale that the Combo Meter measures in is the 500 ppm scale.
500 ppm = 1.0 EC / 10 CF.

2.0 Preparing for use

The following tasks must be performed before the Bluelab Combo Meter is used for the first time.

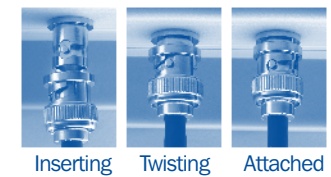
- Hydrate pH probe**
 - Remove the pH probe storage cap by gripping the top of the cap and gently twisting the base one rotation clockwise to loosen slightly. Next slowly slide the cap off the pH probe. **DO NOT** completely remove the base of the cap from the top of the cap.
 - Soak the pH probe tip in fresh water for at least one hour. Soaking the pH probe tip for 24 hours will improve the pH probe's activity and is recommended if the pH probe tip has been allowed to dry.

CAUTION: Do not use de-ionized or distilled water. When the pH probe is not in use, place a small amount of Bluelab pH Probe Storage Solution, fresh water or pH4.0 calibration solution into the storage cap. Then replace the cap and store in a secure place.



- Insert batteries.** See section 6.

- Connect pH probe**
Connect the pH probe to the Combo Meter by lining up the lugs of the BNC fittings. Fasten securely by pushing the pH probe connector on and twisting one quarter turn.



- Calibrate the pH**
Calibrate the Combo Meter by following the instructions in section 3 of this manual. **This must be done before the Combo Meter is used for the first time.**

3.0 Calibration

pH calibration is required before first use to ensure that the first reading is accurate.

- The BlueLab Conductivity/Temperature Probe DOES NOT require calibration.
- The pH of the BlueLab Combo Meter DOES require calibration.

For accurate pH readings the pH probe is cleaned and recalibrated when:

- The reading is different to what you were expecting.
- The pH probe is replaced with a new one.
- It has been one month since the last successful calibration.
- Typically more than 30 readings have taken place.
- The Combo Meter is reset after an error message.

When calibrating the pH after first use, the pH probe needs to be cleaned. See pH probe cleaning in section 7.

The pH calibration involves cleaning the pH probe tip and then calibrating in TWO SOLUTIONS.

If a reading below pH 7.0 is expected, use pH7.0 and pH4.0 calibration solutions.
If a reading above pH 7.0 is expected, use pH7.0 and pH10.0 calibration solutions.
Follow the steps below for Combo Meter pH calibration.

Storage and use of calibration solutions

- Always place the lid back onto the bottle after use.
- Store in a cool place.
- DO NOT measure directly into the bottle. Tip a small amount into a clean container and discard after use.
- Never add water to solutions.

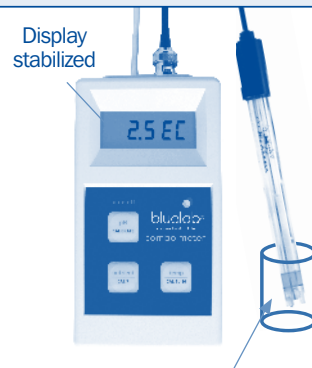
pH reading accuracy is dependant on the accuracy and age of the calibration solutions used, and use and cleanliness of the pH probe tip.

To calibrate the pH

- 1 **Clean pH probe tip**
See section 7.

- 2 **pH 7.0 calibration**

- a) Turn Combo Meter on. Rinse pH probe tip in fresh water, shake off excess water and place in a pH7.0 calibration solution. Wait at least one minute for reading to stabilize.
- b) Long press the CALIBRATE button. When the display starts flashing, release the button and short press the CAL 7.0 button once. '7.0pH' is displayed.
- c) If a message appears during the calibration process, such as 'E2: PH' then calibration was unreliable. See section 10.



pH7.0 calibration solution
Reading stabilized

- 3 **pH 4.0/10.0 calibration**

- a) Rinse the pH probe tip in fresh water, shake off excess water and place the pH probe tip in either pH4.0 or pH10.0 calibration solution.
- b) Wait for at least one minute for reading to stabilize.
- c) Long press the CALIBRATE button until the display starts flashing. Release the button and short press CAL 4/10 button once. '4.0pH' or '10.0pH' is displayed.
- d) The Combo Meter is now calibrated and ready for use.

3.0 Calibration cont.

For best pH calibration

pH reading accuracy is dependant on the accuracy and age of the calibration solutions used, and use and cleanliness of the pH probe tip.

- Ensure pH probe is clean and rinse with clean water to reduce contamination of the pH calibration solutions.
- Only fresh uncontaminated solutions should be used.
- Calibrate the pH at the same temperature as the solution to be measured.
- ALWAYS calibrate the pH probe with pH 7.0 then pH 4.0 or pH 10.0.

NOTE: The conductivity/temperature probe does not need to be calibrated, but must be cleaned to remove any build up of nutrient salts. See section 7.

4.0 Changing nutrient and temperature display units

Nutrient and temperature can be displayed in different units. The units available are shown in the tables below.

Changing nutrient units displayed

- 1 **To select unit**

- a) Press and hold the NUTRIENT button until the display starts flashing. Release, then short button press to change units between EC, CF or P. Release when the selected unit is displayed.
- b) The display flashes four times after the last button press then returns back to a normal display, showing the selected unit.

Display	Nutrient units
-- E C	EC (electrical conductivity)
-- C F	CF (conductivity factor)
--- P	ppm (parts per million) TDS (total dissolved solids)



Changing temperature units displayed

- 2 **To select unit**

- a) Press and hold the TEMP button until the display starts flashing. Release, then short button press to change units between °C and °F. Release when the selected unit is displayed.
- b) The display flashes four times after the last button press then returns back to a normal display, showing the selected unit.

Display	Temperature units
-- C	°C (degrees Celsius)
-- F	°F (degrees Fahrenheit)

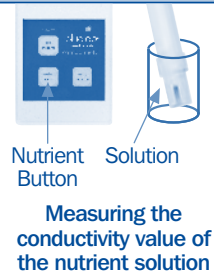


5.0 Measuring hydroponic elements

The values measured in a hydroponic solution by the Bluelab Combo Meter include nutrient (conductivity), temperature and pH levels.

Taking a conductivity reading

- 1 Short press the 'nutrient' button to select conductivity.
- 2 Insert the conductivity/temperature probe into solution where there is strong movement of the solution, or stir the solution with the conductivity/temperature probe.
- 3 Wait 1-2 minutes for the conductivity/temperature probe to reach solution temperature. The conductivity reading is displayed.



NOTE: The conductivity/temperature probe tip should be cleaned at least once a month to remove salt build-up ensuring accurate readings. If oily additives are being used the conductivity/temperature probe tip should be cleaned after each use. See section 7.

Taking a temperature reading

- 1 Short press the 'temp' button to select temperature.
- 2 Insert conductivity/temperature probe into solution.
- 3 Wait 1-2 minutes for conductivity/temperature probe to reach solution temperature. The temperature reading is displayed.

NOTE: For very cold or very hot temperatures it will take 4-5 minutes for the conductivity/temperature probe to reach solution temperature. To help decrease time taken to reach the solution temperature, place the conductivity/temperature probe in an area where there is strong movement of solution, or stir solution with the conductivity/temperature probe.

Taking a pH reading

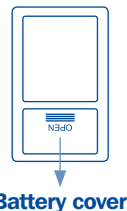
- 1 Short press the 'pH' button to select pH.
- 2 Place the pH probe into the solution.
- 3 Wait 1-2 minutes for reading to stabilize. The pH reading is displayed.

NOTE: If taking readings of more than one solution, rinse the pH probe tip thoroughly in fresh water between solutions to avoid cross contamination. To decrease time taken to reach the solution temperature, place pH probe in an area where there is strong movement of solution, or stir the solution gently with the pH probe.

6.0 Battery replacement

Batteries are replaced in the Bluelab Combo Meter when the message 'LO BAT' appears in the top left-hand corner of the LCD display.

- 1 Open battery compartment by sliding the back cover down and insert 2 x AAA batteries as shown on the battery holder. Slide cover back on. NOTE: Alkaline batteries are recommended.
- 2 **IMPORTANT: Check the batteries at least once every six months for signs of deterioration, rusting or swelling.** If signs of deterioration are found, clean battery holder contacts and replace batteries.

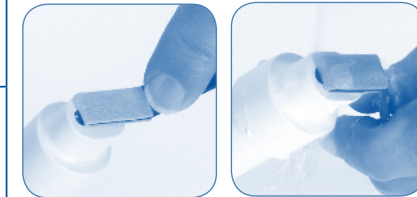
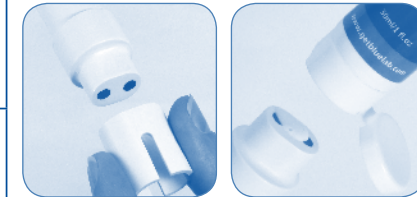


7.0 Cleaning and maintenance

Cleaning the Bluelab Conductivity/Temperature Probe

Cleaning the conductivity/temperature probe periodically ensures accurate readings. The conductivity/temperature probe is cleaned using the Bluelab Conductivity Probe Cleaner, or "Jif" a trade name for a liquid scourer cream used in home bathrooms and kitchens. Similar products are called "Liquid Vim", "Soft Scrub", "Cif cream", or "Viss". Never use scented varieties as they contain oils that contaminate the conductivity/temperature probe. Follow the steps below to clean the conductivity/temperature probe.

- 1 **Remove shroud**
Hold the body and pull the shroud off. Holding your hand around the shroud for a few seconds will warm the shroud and help with removal.
- 2 **Clean conductivity/temperature probe face**
Place one or two drops of Bluelab Conductivity Probe Cleaner onto the conductivity/temperature probe face and rub with your finger or Bluelab Chamois firmly and vigorously.
- 3 **Rinse conductivity/temperature probe face**
Rinse off all traces of cleaner under running water using the same finger or other side of Bluelab Chamois.
- 4 **Check that the water forms a film on the conductivity/temperature probe face with no "beads" of water.**
If beading is present repeat the cleaning process.
- 5 **Refit the shroud firmly and test to ensure the conductivity/temperature probe has been adequately cleaned.**
See following instructions on how to test.



Clean, smooth film Contaminated, uneven film Oily, beading visible

Testing the Bluelab Conductivity/Temperature Probe

The conductivity/temperature probe is tested in 2.77EC/27.7CF/1385 ppm solution.

Use the standard solutions in the table to the right. Bluelab solutions are recommended.

EC	CF	ppm 500
2.77	27.7	1385 ppm

NOTE: The shroud **MUST** be left on the probe when taking readings.

- 1 Place a small amount of the correct standard solution into a clean container.
- 2 Place the conductivity/temperature probe into the solution; ensuring that it is adequately submerged.
- 3 Wait until the conductivity reading stabilizes. The conductivity reading should be within 0.1 EC, 1 CF, or 50 ppm of the values in the table above.



7.0 Cleaning and maintenance cont.

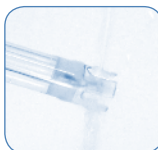
If after testing, the reading is lower than 2.77 EC;

- 1 Ensure that the 2.77 EC standard solution is fresh and uncontaminated and of a qualified brand; if you are unsure, use new solution. NEVER add water to solutions.
- 2 Wait 1 – 2 minutes for the conductivity/temperature probe to reach the solution temperature. In extreme temperatures 5 – 10 minutes may be necessary.
NOTE: Conductivity/temperature probes that read low will usually only require cleaning to achieve an accurate result.
- 3 If the reading remains higher than 2.9 EC after testing all of the above, evaporation may have occurred during storage causing the solution to increase in concentration.

Cleaning the Bluelab pH Probe

To ensure accurate readings the pH probe tip needs to be rinsed in water after each use and cleaned regularly using the following instructions. The storage cap must always be put back on after cleaning.

- 1 Rinse pH probe tip under fresh water.



- 2 Fill small container with clean water.
Add a small amount of Bluelab pH Probe Cleaner or mild detergent (dish washing liquid).



- 3 Gently stir the pH probe in the mixture.
Ensure that you do not 'knock' the pH probe on the side of the container as this may cause damage to the glass of the pH probe. Rinse well under fresh running water to remove all traces of the detergent mixture.



- 4 If the pH probe tip requires removal of heavy contamination:
Gently brush around the glassware with a few drops of Bluelab pH Probe Cleaner or mild detergent (dishwashing liquid) and a soft toothbrush.



- 5 Rinse pH probe tip well under fresh running water to remove all traces of the detergent mixture.



- 6 Calibration of the pH probe is required after every clean.
See the pH calibration in section 3. When finished, always place the storage cap back onto the pH probe.



8.0 Storing the Bluelab Combo Meter

- 1 Store the Combo Meter in a cool, dry and clean place when not in use.
- 2 Keep out of direct sunlight.
Keep Combo Meter out of direct sunlight to prevent irreparable damage to the LCD reading display.
- 3 The Combo Meter is not waterproof but will withstand occasional water splashes.
If the Combo Meter is splashed, wipe dry as soon as possible.
- 4 Remove batteries if the Combo Meter is to be stored for a prolonged period.
- 5 Remove pH probe if storing the Combo Meter without use for longer than two to three weeks and check regularly that the pH probe tip has not dried out.
When storing the pH probe the pH probe tip must be kept moist.
To prepare the pH probe for storage, place a small amount of Bluelab pH Probe Storage Solution, fresh water (never distilled or deionised water) or pH4.0 calibration solution into the storage cap. Then replace the cap and store in a secure place.

9.0 Bluelab pH Probe replacement

The Bluelab pH Probe is the only part of the Bluelab Combo Meter (except batteries) that requires replacing.

pH probes do not last forever. They age through normal use and will eventually fail. To ensure you receive a long life from your pH probe please read the instructions provided with it.

When the time comes to replace your Bluelab pH Probe all you have to do is order a replacement from your supplier!



10.0 Error messages

Error messages will only appear following pH calibration failure. The following table describes error messages, the reason and cause for an error message.

To clear an error message press any button once. The BlueLab Combo Meter will reset to the factory set calibration and will need to be recalibrated successfully before use.

Error display	Indicates	Possible causes
E1 : PH	Not enough difference between pH 7.0 and pH 4.0 readings.	pH4.0 calibration solution contaminated or wrong solution used. pH probe contaminated, not properly attached, worn out or damaged.
E2 : PH	Not enough difference between pH 7.0 and pH 10.0 readings.	pH10.0 calibration solution contaminated or wrong solution used. pH probe contaminated, not properly attached, worn out or damaged.
E3 : PH	Not enough difference between the readings.	Calibrate pH 7.0 FIRST then to pH 4.0/10.0.
E4 : PH	pH7.0 calibration unreliable.	pH7.0 calibration solution contaminated or wrong solution used. pH probe contaminated, not properly attached, worn out or damaged.

11.0 Technical specifications

	pH	Nutrient	Temperature
Range	0.0 - 14.0 pH	0 - 9.9 EC 0 - 99 CF 0 - 1990 ppm	0 - 50 °C 32 - 122 °F
Resolution	0.1 pH	0.1 EC 1 CF 10 ppm	1 °C 1 °F
Accuracy (at 25 °C/77 °F)	±0.1 pH	±0.1 EC ±1 CF ±50 ppm	±1 °C ±2 °F
Calibration	Manual calibration	Not required (factory calibrated)	Not required (factory calibrated)
Temperature compensation	Not applicable	Automatic temperature compensation	Not applicable
Operating environment	0 - 45 °C 32 - 113 °F		
Power source	2 x AAA alkaline batteries		
Other features	Low battery warning Auto turn off function Over range and under range indicators		

12.0 Troubleshooting guide

Trouble	Reason	Correction
Nutrient reading low	Contaminated conductivity/temperature probe.	Clean conductivity/temperature probe (see section 7).
	Solution temperature low/high.	Wait 5 to 10 minutes for reading to stabilize.
Temperature reading inaccurate	Temperature of conductivity/temperature probe different to solution temperature.	Wait 5 to 10 minutes for conductivity/temperature probe to reach solution temperature.
pH reading inaccurate	Contaminated pH probe.	Clean pH probe (see section 7).
	Incorrect calibration.	Ensure calibration solutions are accurate. Replace if in doubt. Wait longer for readings to stabilize before calibrating.
	Calibration old.	Calibrate pH probe (see section 3).
	Broken glass bulb, tube or connector.	Check pH probe for damage.
	pH probe damaged or old.	Replace pH probe.
Display shows LO BAT in top left hand corner	Insufficient power to take a reliable reading.	Replace the batteries. DO NOT use rechargeable batteries.
No display	Batteries dead or inserted incorrectly.	Check batteries are inserted correctly. Replace if necessary.
Display shows 'E2 : PH' or similar	Problem with pH calibration or the Combo Meter is damaged.	See error message descriptions section 10 of this document.
orPH urPH	Over range pH. Under range pH.	Solution > 14.0 pH. Solution < 0.0 pH. Check pH probe connection. pH probe could be faulty. Combo Meter could be wet inside.
or °C / or °F ur °C / ur °F	Over range temperature. Under range temperature.	Solution >51 °C / 122 °F. Solution <0 °C / 32 °F. Conductivity/temperature probe or Combo Meter faulty.
orEC / orCF / or P	Over range conductivity/nutrient.	Over range conductivity >9.9 EC, 99 CF, 1990 ppm. Conductivity/temperature probe or Combo Meter faulty.

Contact details

BlueLab Corporation Limited, 8 Whiore Avenue, Tauriko Industrial Park, Tauranga 3110, New Zealand, Ph +64 7 578 0849, Fax +64 7 578 0847
Email support@getbluelab.com www.getbluelab.com

Limitation of liability

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Product guarantee

Bluelab Combo Meter

Bluelab Corporation Limited guarantees this product for a period of **5 years (60 months)** from the date of sale to the original purchaser. (This guarantee does not cover the Bluelab pH Probe. The Bluelab pH Probe is covered by a separate 6 month guarantee.)

The product will be repaired or replaced should it be found faulty due to component failure, or faulty workmanship. The faulty product should be returned to the point of purchase.

The guarantee is null and void should any internal parts or fixed external parts be tampered with or altered in any way, or should the unit have been incorrectly operated, or in any way be maltreated. This guarantee does not cover reported faults which are shown to be caused by any or all of the following: Contaminated measuring tip (see instruction manual for cleaning instructions), flat or damaged batteries or batteries that have been incorrectly inserted, or damaged battery contacts or connections caused by incorrect battery replacement, or ingress of moisture into the meter case.

NO RESPONSIBILITY will be accepted by Bluelab or any of its agents or resellers should any damage or unfavourable conditions result from the use of this product, should it be faulty or incorrectly operated.



Please register your guarantee online at:
www.getbluelab.com

Or fill out the form below and post, email or fax to:

Bluelab Corporation Limited
8 Whiore Avenue, Tauriko Industrial Park,
Tauranga 3110, New Zealand

Phone +64 7 578 0849

Fax: +64 7 578 0847

Email: support@getbluelab.com

Product details

Product name	
Serial number	
Date purchased	

Purchaser details

Purchaser's name	
Address	
City	
Country	
Email (optional)	

Purchased from (Dealers details)

Purchased from	
Address	
City	
Country	
Phone number (optional)	

Bluelab pH Probe replacement

The Bluelab pH Probe is the only part of the Bluelab Guardian Monitor that requires replacing.

pH probes do not last forever. They age through normal use and will eventually fail. To ensure you receive a long life from your pH probe, please read the instructions provided with it.

When the time comes to replace your Bluelab pH Probe all you have to do is order a replacement from your supplier!



The instrument is only as accurate as the probe is clean!

Bluelab cleaning kits

Probe cleaning is one of the most important parts of owning and operating any Bluelab meter, monitor or controller. If the probe is contaminated (dirty) it affects the accuracy of the reading displayed.

The probe surface is where the instrument takes the reading of the solution. The information is sent back from the probe to the electronic brain of the instrument.

A calculation is then done in the instrument's brain or micro computer and a reading is then displayed. If the information sent back from the probe is inaccurate due to probe surface contamination then the reading will be inaccurate. Cleaning the probes is a very easy task and will prolong the life of the probes.

The Bluelab cleaning kits have it all there for you:

Bluelab pH Cleaning and Calibration Kit:

- Full colour instructions
- Calibration solutions
- Decanter vessels
- Bluelab pH Probe Cleaner
- Toothbrush



Bluelab Conductivity Probe Cleaning Kit:

- Full colour instructions
- Bluelab Conductivity Standard Solution
- Decanter vessel
- Bluelab Conductivity Probe Cleaner
- Bluelab Chamois (probe cleaning instrument)





Bluelab Combo Meter



guarantee.

The Bluelab product range all come with a free repair or replacement guarantee for your added benefit.



If you need assistance or advice - we're here to help you.

Phone: **+64 7 578 0849** Fax: **+64 7 578 0847**

Email: **support@getbluelab.com**



Looking for specifications or technical advice?

Visit us online @ **www.getbluelab.com**



Bluelab Corporation Limited

8 Whiore Avenue, Tauriko Industrial Park, Tauranga 3110, New Zealand

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Instruction Manual, Version 01: 151211/00770_0711

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