CA900
Alkalinity Analyzer

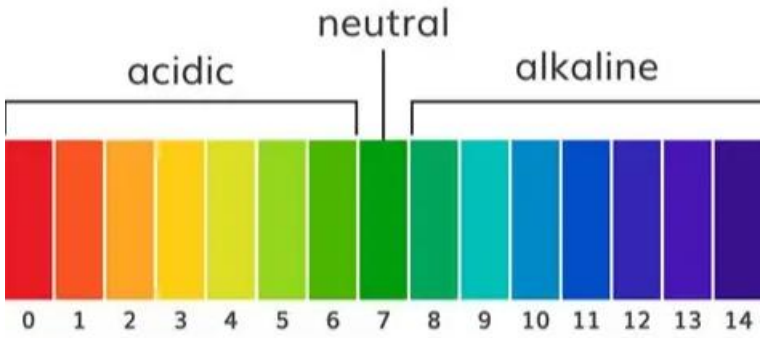
ELECTRO-CHEMICAL DEVICES

What is the Alkalinity ?

- **Alkalinity** is a chemical measurement of a water's ability to neutralize acids. Alkalinity is also a measure of a water's buffering capacity or its ability to resist changes in pH upon the addition of acids or bases.

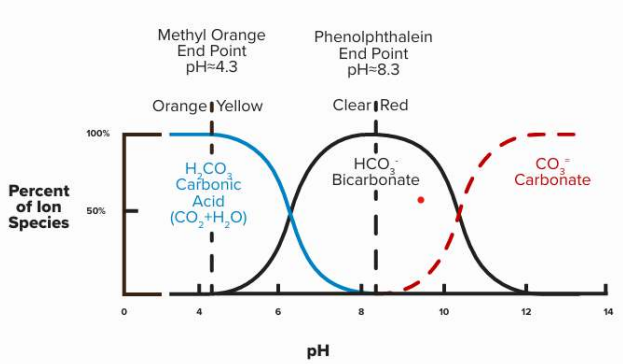
pH vs Alkalinity

- Understanding the relationship between pH and alkalinity is important to developing and maintaining a successful water treatment program.



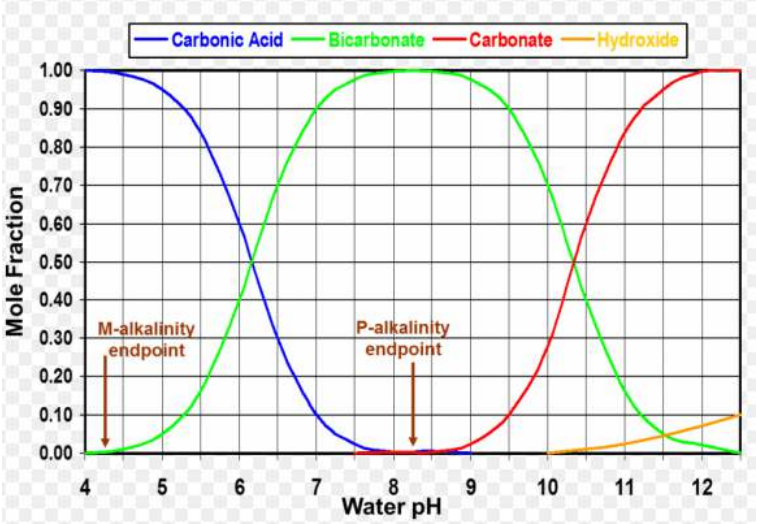
Bicarbonate and Carbonate Alkalinity vs pH

- pH measures the concentration of hydrogen ions in water on a 0-14 scale
- pH defines relative acidity or alkalinity
- Alkalinity is the acid-neutralizing capacity of water
- Bicarbonates, carbonates and hydroxides are typical alkalinity components plus non-carbonate sources
- Alkalinity can moderate or “buffer” pH changes
- Low alkalinity water tends to have a lower pH and be corrosive
- High alkalinity water tends to have a higher pH and can be scale forming



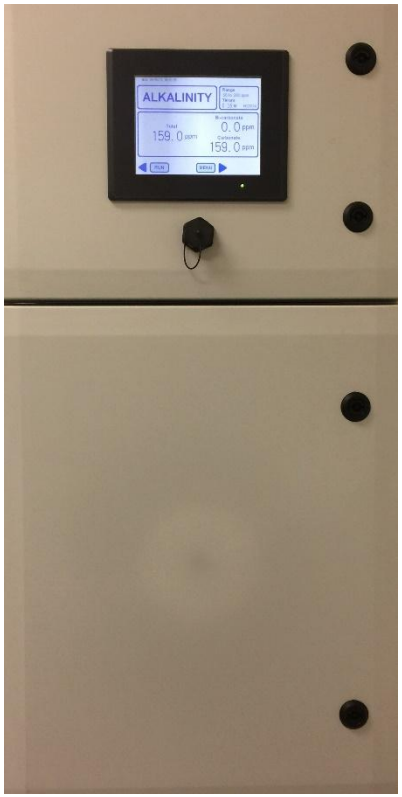
How Are They Measured

- pH is measured using a pH probe or liquid indicators with a color comparator
- Alkalinity is measured by titrating with acid until a specific pH is achieved
- pH endpoints are typically determined by using indicator reagents
- Measuring for different values can determine the bicarbonate, carbonate, and hydroxide alkalinity



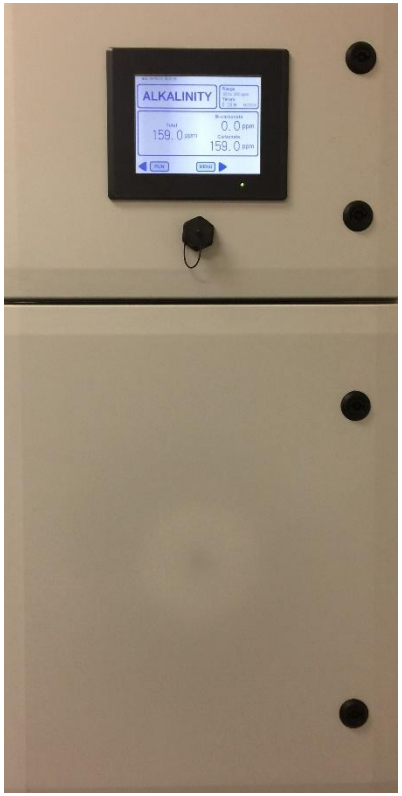
Why choose the CA900 Alkalinity Analyzer?

- Simple
  - Easy Installation
  - Touch Screen Interface
  - User Friendly Menu Structure
  - Easy Process Configuration
- Reliable
  - Rugged Polycarbonate Cabinet
  - Separate Liquid and Electronics compartments
  - Low Reagent Alarms
- Cost Effective
  - Low Maintenance
  - Easily Adjustable cycle times to minimize reagent use.



What is the CA900 Alkalinity Analyzer?

- An On-Line Sequential sampling analyzer.
- Using pH measurement to perform the Alkalinity Analysis.
- Easily adapted to automate most any Laboratory titration analysis using up 2 reagents. (ECD Ca900 Alkalinity Analyzer uses 1 reagent. pH sensor eliminates the need for color indicator reagent)

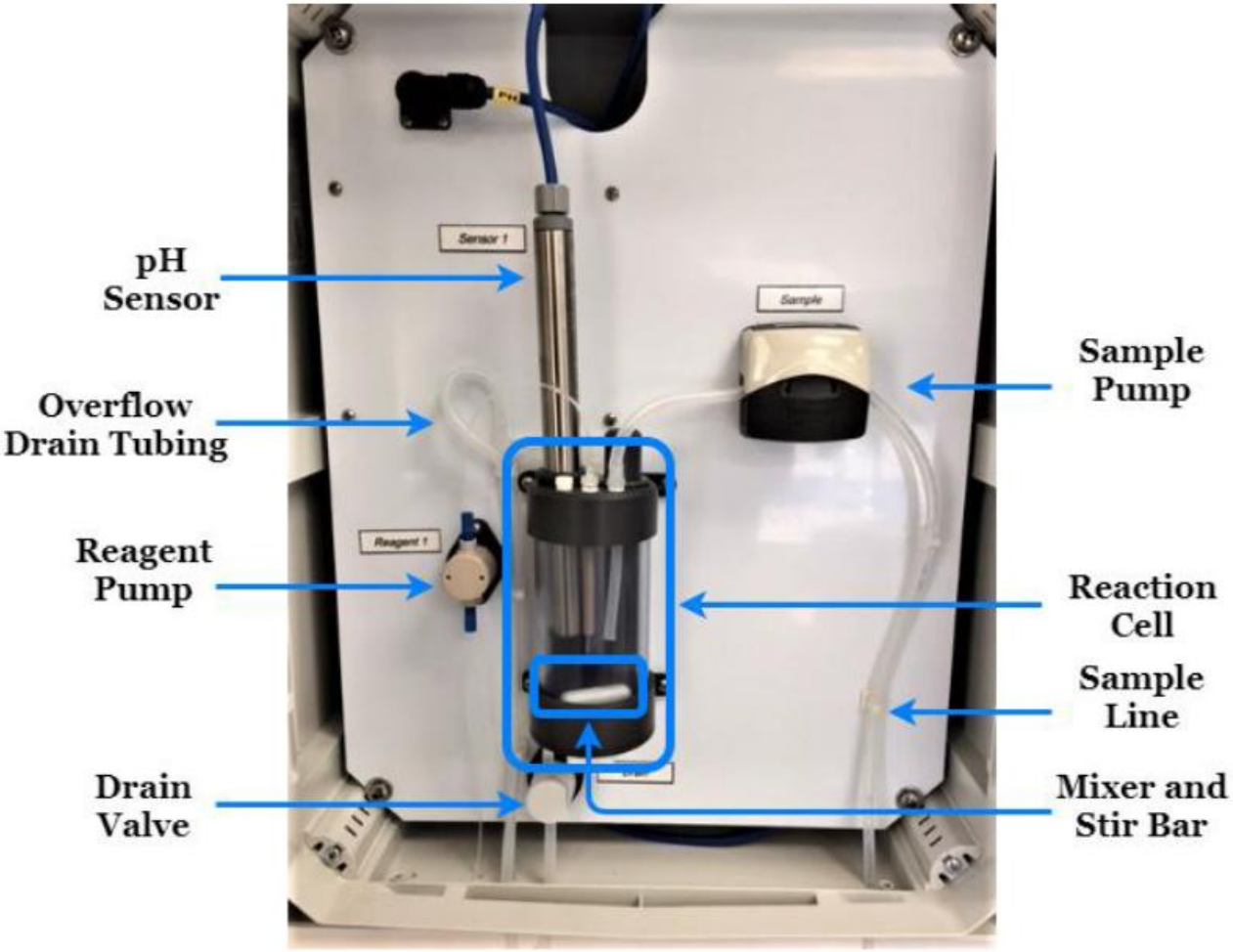


How does it Work?

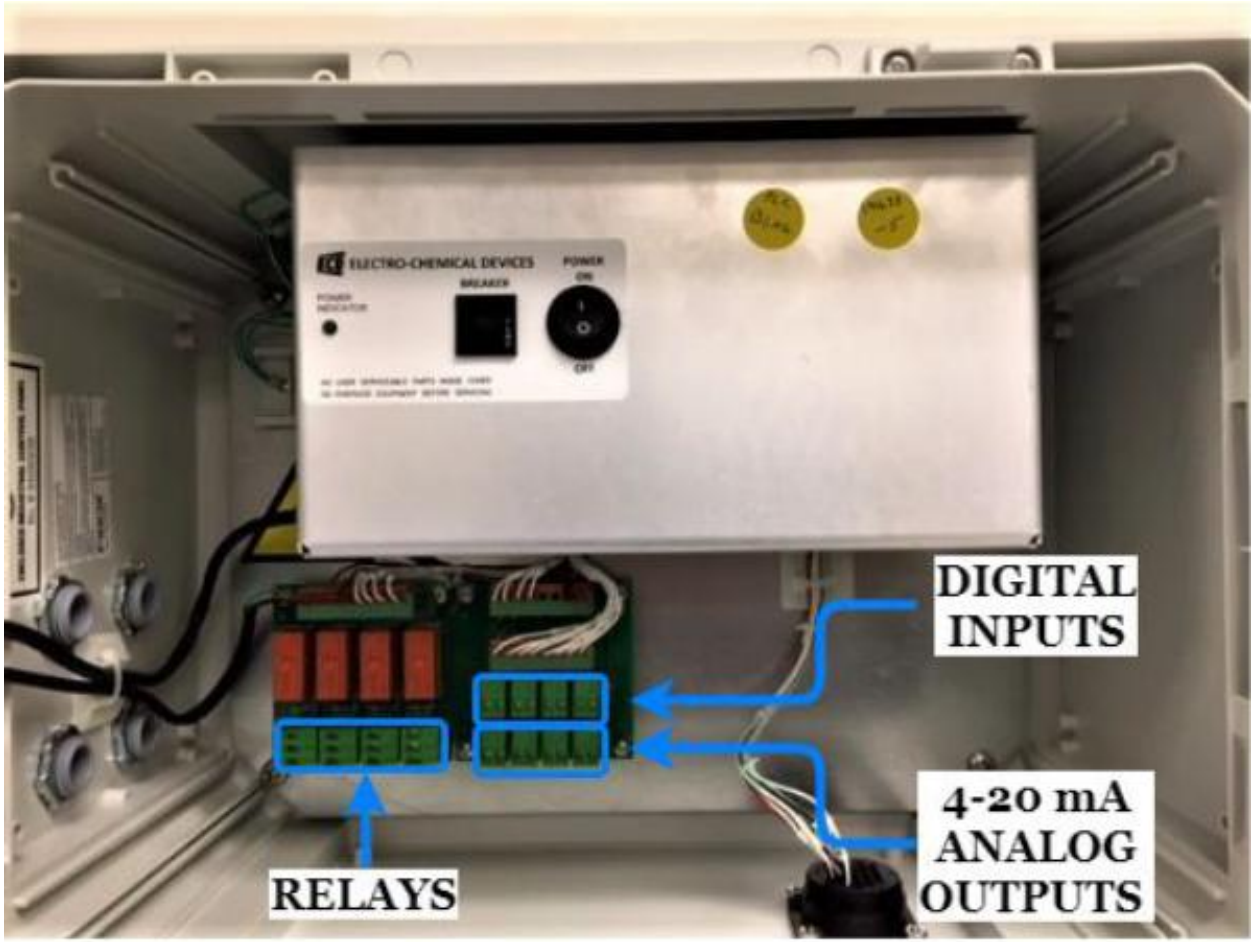
- Working principle: Titration using pH Electrode
  - To determine and maintain water quality, accurately measuring the alkalinity of the water is critical to assess its relationship and impact on pH levels. Titration analysis with the CA900 Analyzer calculates alkalinity by dispensing known doses of a titrant fluid into a reaction cell while monitoring the pH level. The analyzer then uses the titrant concentration and amount dispensed to calculate the Carbonate and bi-carbonate alkalinity measurement

- Calculation of Alkalinity
  - $Al(meq/L) = B(mL) \times Ca(meq/mL) \times CF \,/\, Vs(mL) \times (1\ L \,/\, 1000\ mL) = (1000 \text{ x } (B) \text{ x } (Ca) \text{ x } (CF)) \,/\, Vs$ and
  - $Al(meq/L) = B(mL) \times Ca(meq/mL) \times CF \,/\, Vs(mL) \times (1\ L \,/\, 1000\ mL) = (1000 \text{ x } (B) \text{ x } (Ca) \text{ x } (CF)) \,/\, Vs$
  - *Al*= $(50044 \text{ x } (B) \text{ x } (Ca) \text{ x } (CF)) \,/\, Vs$
    - ***Al*** is the alkalinity or ANC of the sample.
    - ***B*** is the volume of acid titrant added from the initial pH to the bicarbonate equivalence point (near pH 4.5), in milliliters.
    - ***Ca*** is the concentration of acid titrant, in milliequivalents (meq) per milliliter (same as equivalents per liter, or normality N).
    - ***CF*** is a correction factor (see below).
    - ***Vs*** is the volume of sample, in milliliters. mmol is millimoles, in this case for calcium carbonate.

Ca900 Liquids Section

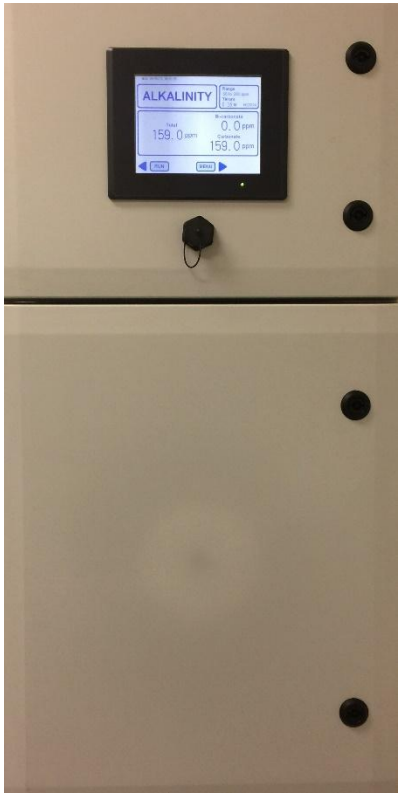


Ca900 Electronics Section



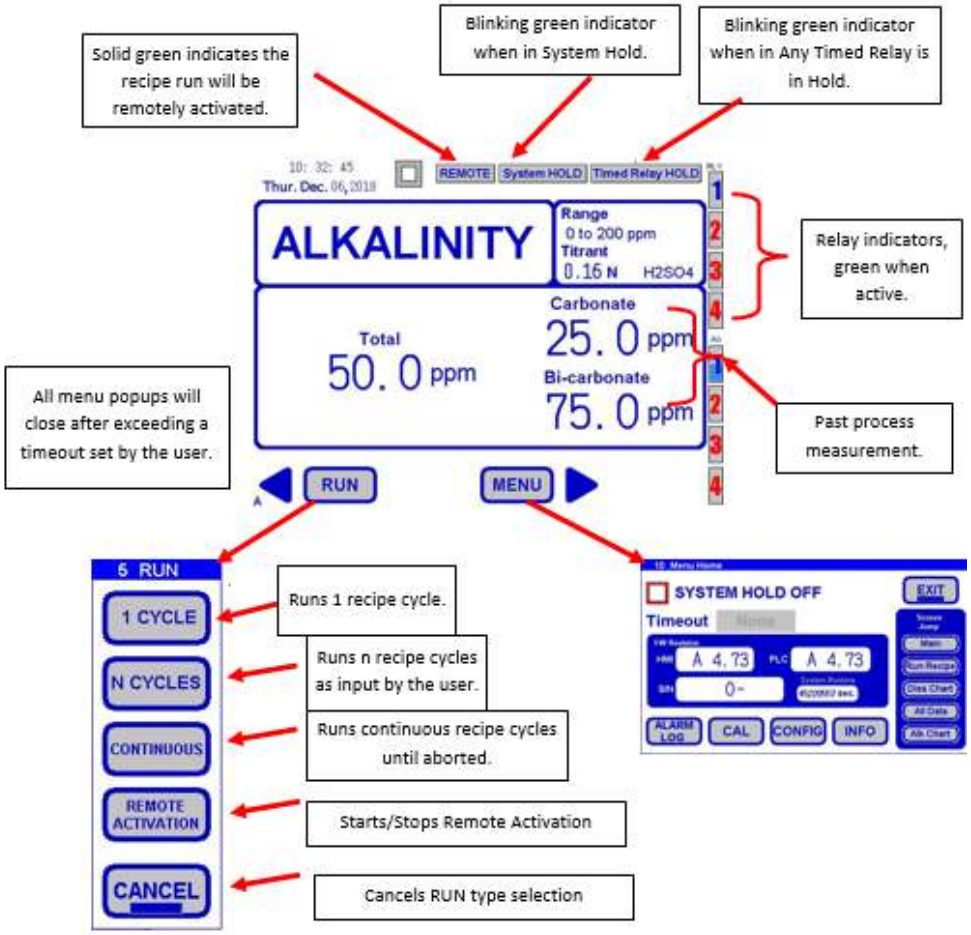
Specifications

- Method
  - Titration using pH sensor
- Measuring Range
  - Alkalinity, 0-200ppm (other range are available)
- Response Time
  - 10 minute cycle plus any user enter wait time
- Repeatability
  - +/- 2 %
- Drift
  - +/- 2% per month
- Operating Temperature
  - -5° - 50 ° C (20 ° - 120 ° F)
- Outputs
  - (4) 4-20 mA
  - (4) Alarm Relays
  - Data logger (USB download)

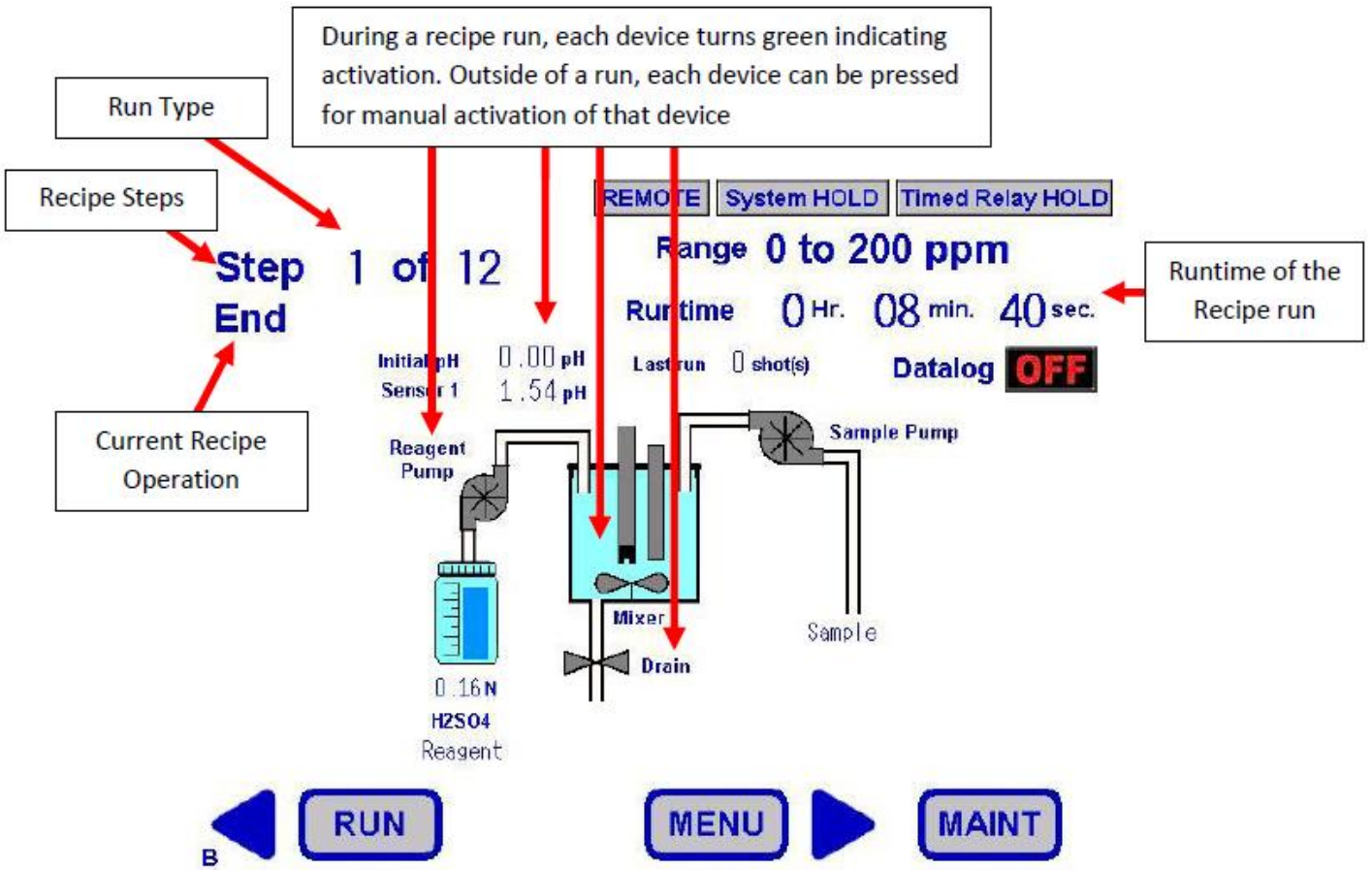


Main Screen

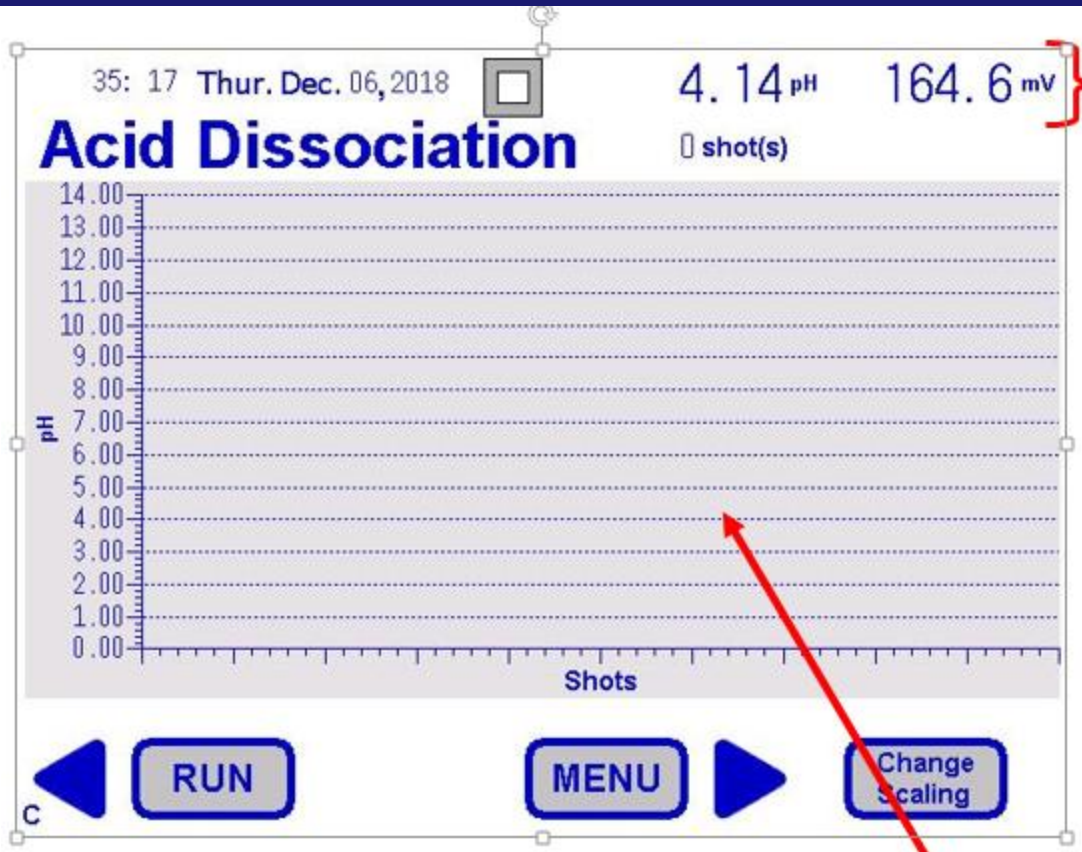
6.3 Main Screen



Run Recipe Screen



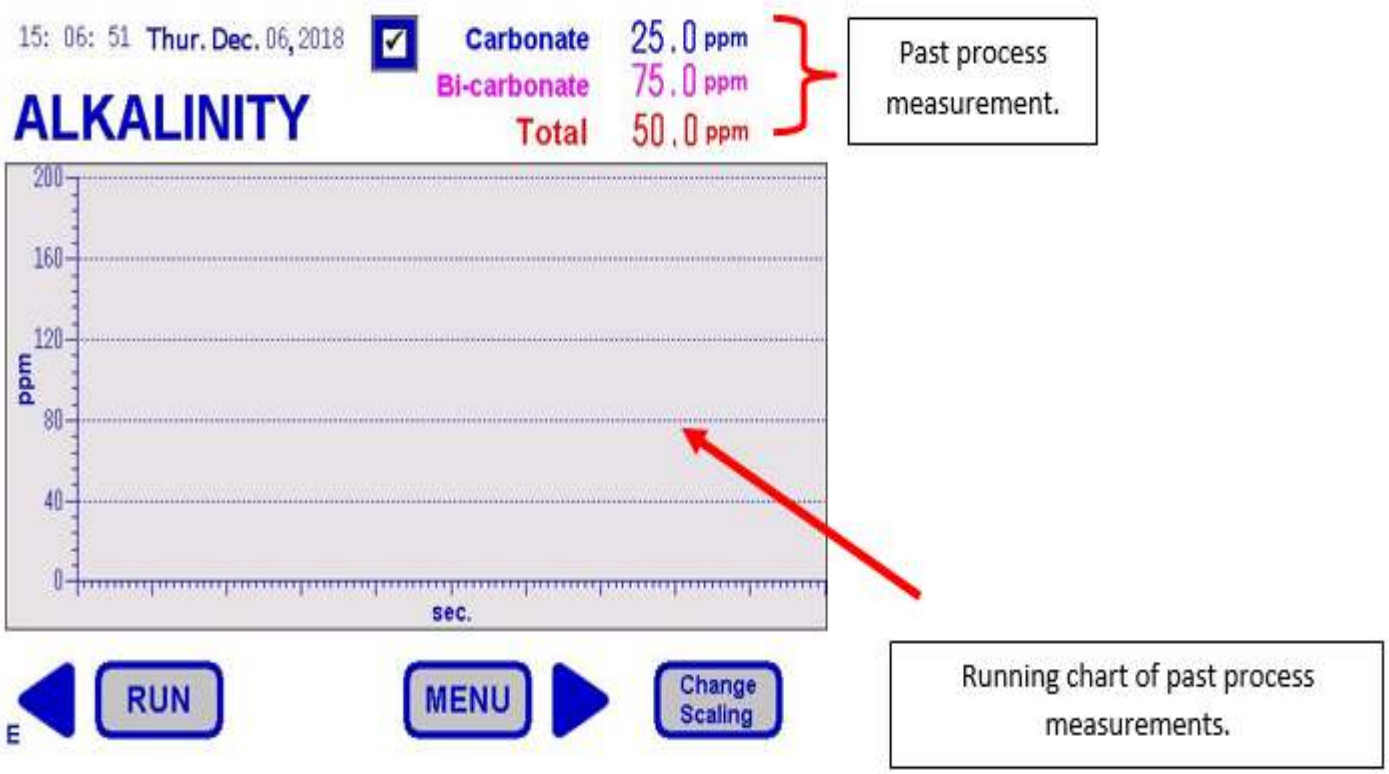
Acid Dissociation Chart



Sensor's current response.

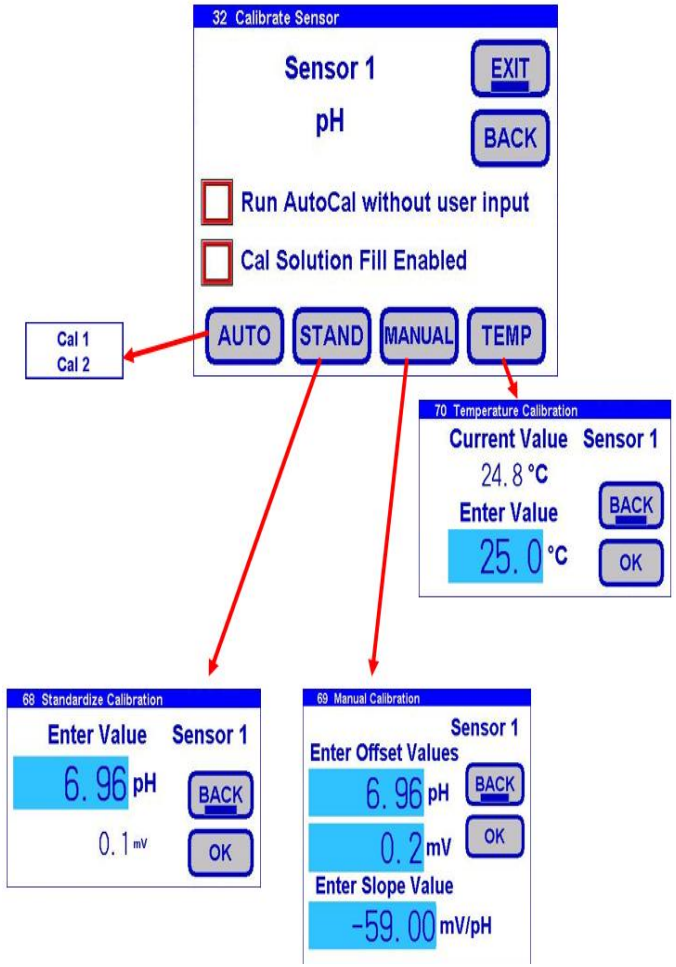
Running chart of past pH readings and inflections.

Alkalinity Concentration Chart



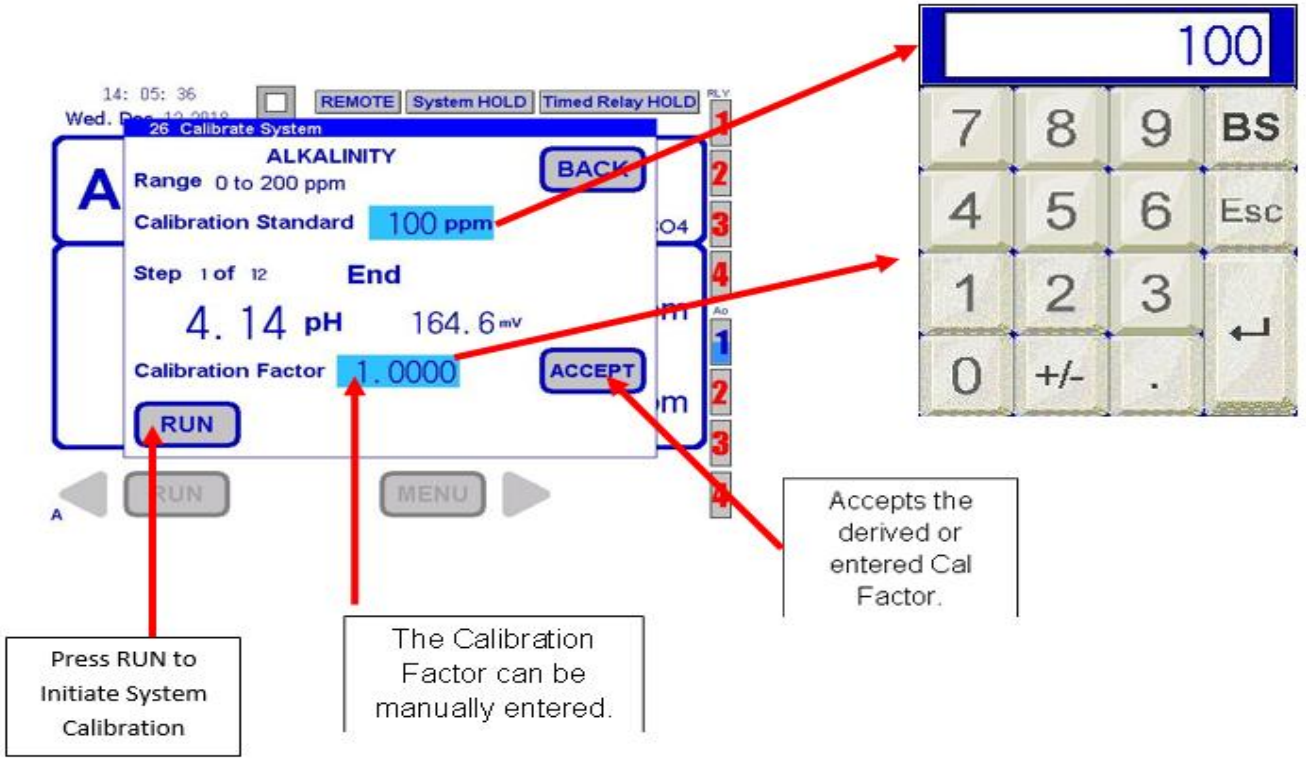
pH Sensor Calibration

- Two Point Calibration pH Sensor
  - Using standard pH calibration solution (7 and 4)
  - Same calibration option as ECD T80 transmitter (Auto, Stand, and Manual, Temp)
  - Available with AutoCal Function



Alkalinity Calibration

- One Point Alkalinity Calibration
  - Standard Alkalinity Calibration Solution
  - Known Sample Calibration



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