

OPERATION MANUAL

JENCO MODEL 6350M
MICROCOMPUTER BASED
pH/mV/Conductivity/
Salinity/Temperature
PORTABLE METER

JENCO ELECTRONICS,LTD.
MANUFACTURER OF PRECISION INSTRUMENTS

CONTENTS

	Page
I. INITIAL INSPECTION	2
II. GENERAL INTRODUCTION	2
III. USING THE JENCO MODEL 6350M	3
A. PRECAUTIONS	3
B. THE KEYPAD	4
C. SPECIAL KEY COMBINATION	6
D. THE DISPLAY	6
E. CONNECTORS	7
F. REPLACING THE BATTERIES	8
G. TURNING OFF/ON THE INSTRUMENT	8
IV. MODEL 6350M MODES	9
V. AUTO/MANUAL RANGING IN CONDUCTIVITY	11
A. AUTORANGING	11
B. MANUAL RANGING	12
VI. AUTOMATIC AND MANUAL TEMPERATURE	12
A. AUTOMATIC TEMPERATURE COMPENSATION	12
B. MANUAL TEMPERATURE COMPENSATION	13
VII. CALIBRATION SET-UP	13
A. STAND AND SLOPE CALIBRATION	13
B. TEMPERATURE COEFFICIENT	15
C. TEMPERATURE REFERENCE	15
D. CELL CONSTANT CALIBRATION	16
VIII. SAVING AND RECALLING DATA	17
A. SAVINGS READINGS TO MEMORY	17
B. RECALLING READINGS FROM MEMORY	18
C. ERASING DATA	18
IX. RS232C INTERFACE OPERATION	19
A. INTRODUCTION	19
B. PREPARING THE METER	19
C. SOFTWARE	19
X. ERROR DISPLAYS AND TROUBLESHOOTING	20
XI. SPECIFICATIONS	22
XII. pH BUFFERS	24
XIII. PREPARING STANDARD SOLUTIONS	25
XIV. WARRANTY	26

I. INITIAL INSPECTION

Carefully unpack the instrument and accessories. Inspect for damages made in shipment. If any damage is found, notify your Jenco representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

II. GENERAL INTRODUCTION

The Jenco Model **6350M** Handheld *pH, mV, Conductivity, Salinity* and *Temperature* System, is a rugged microprocessor based instrument designed for use in field laboratories and process control applications. Using a four-electrode cell for conductivity and a glass electrode for the pH probe, it becomes an essential tool for precise measurements of conductivity, pH, salinity, mV and temperature.

The model 6350M microprocessor allows the user to easily recalibrate the parameters for the probe. A few keystrokes will adjust all the parameters for compensated, uncompensated conductivity and pH and will also give the user the option to select two types of probe cell constant for a better selection of available probes and applications. The microprocessor also performs a self-diagnostic routine every time you turn on the unit providing you with basic information about the current cell constant and stability of the instrument.

The system simultaneously displays temperature in °C along with either Compensated Conductivity, Uncompensated Conductivity, Salinity, pH or mV. The user can switch back and forth from all these displays by just pushing a single key.

The model 6350M is also equipped with a non-volatile memory allowing the user to store 50 different sets of readings. This model

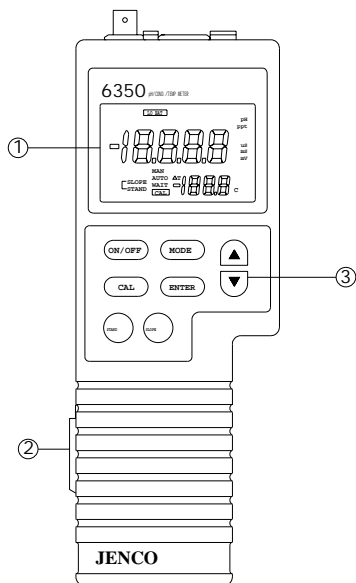
6350M will also assign a site number for each set of readings to let the user an easy review of the data.

This instrument is powered by six AAA-size alkaline batteries or a UL/CE approved AC adapter. The instrument also displays a "LO BAT" message when the batteries are in need of replacement.

The model 6350M comes with a RS232C interface which can easily let the user log all data simultaneously or download the stored 50 sites in a RS232 equipped personal computer.

This instrument is also splash proof and CE approved making it a versatile tool for conductivity/salinity/pH/mV and temperature applications.

III. USING THE JENCO MODEL 6350M



A. PRECAUTIONS

The Model 6350M case is **SPLASH PROOF** in a watertight case. But the instrument should not be used under water since the instrument and the whole cable of the probes are not **WATERPROOF**. The **SPLASH PROOF** feature is to prevent permanent damage to the instrument when accidentally splashed with non-corrosive solutions.

- (1) - LCD
- (2) - RS232 connector
- (3) - Keypad

Figure 1- (front view)

Take the following measures immediately in the event that the instrument is dampened in any kind of solution.

1. Place all the rubber caps tightly in all the instrument's connector holes then carefully rinse the instrument with distilled water.

After rinsing and drying, the connectors should be inspected and cleaned to remove all contaminants that might affect the probe connections.

2. Wait for the instrument and probe to be completely dry before resuming operation.
3. If unsatisfactory results are gained after doing the above, notify your Jenco representative for possible repair or replacement (See WARRANTY).

B. THE KEYPAD

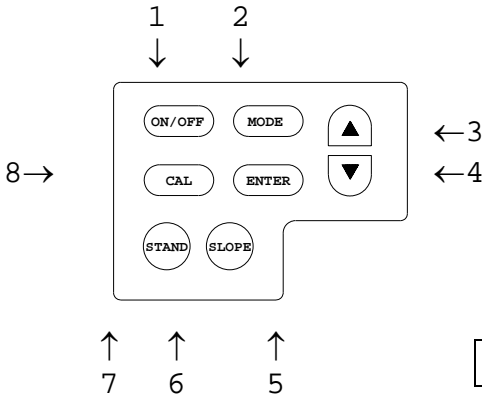


Figure 2

1. The [**ON/OFF**] key.

This key will turn on or turn off the instrument. The last display mode will be saved, except during calibration, recall and erase mode where it will default to pH display.

2. The [**MODE**] key.

2a. In normal operation this key will change the display to pH, mV, Conductivity, compensated Conductivity, Salinity, Recall and Erase mode.

2b. In Calibration mode this key will exit the current calibration and go to the next calibration parameter.

3. The [**CAL**] key.

3a. During any conductivity mode this key will enable CELL CONSTANT Calibration.

3b. In pH mode this key will enable pH calibration. See CALIBRATION SET-UP.

4. The [Δ] key.

4a. During pH readings (**ONLY**) this key will increment the temperature in the event the unit detects no temperature input. (see MANUAL TEMPERATURE COMPENSATION)

4b. This key is used to increment/change the Conductivity calibration, Temperature coefficient and Temperature Reference.

4c. During Conductivity and compensated Conductivity operation this key will change the display from auto ranging to manual ranging. (see AUTO/MANUAL RANGING IN CONDUCTIVITY)

4d. In Recall mode this will move to a lower (older) site number.

5. The [∇] key.

5a. During pH readings (**ONLY**) this key will decrement the temperature in the event the unit detects no temperature input. (see MANUAL TEMPERATURE COMPENSATION)

5b. This key is used to decrement/change the Conductivity calibration, Temperature coefficient and Temperature Reference.

5c. In Recall mode this will move to higher (newer) site number. Moving the site number will in no way change in which site the next data will be saved. It will always save in the next open site number.

6. The [**ENTER**] key.

6a. During normal operation pressing this key for about 2 seconds will save all the readings in the next available site number.

6b. During RECALL mode this key will display the saved data in the current site. Pressing this key again will display the 2nd data on the current site and so on.

6c. During CONDUCTIVITY CALIBRATION or PARAMETER setting mode this key will save the current value of the displayed parameter.

7. The [**SLOPE**] key.

Pressing this key at normal pH display for about 5 sec. will toggle the buffer set for calibration. The unit will acknowledge by displaying “7.00” for (7.00,4.01,10.01) and “6.86” for (6.86,4.00 & 9.18).

During pH calibration this key will initiate the calibration of the pH slope only if the STAND is calibrated.

8. The [**STAND**] key.

During pH calibration this key will initiate the calibration of the OFFSET of the pH electrode.

C. SPECIAL KEY COMBINATIONS

A. [**▽**] and [**MODE**] keys.

Pressing this combination in any conductivity mode will enable Temperature coefficient and Temperature reference set-up. (See CALIBRATION SET-UP.)

B. [**▽**] and [**ENTER**] keys.

Pressing this combination during Erase mode for about 5 seconds will erase ALL data in the non-volatile memory. Data in all 50 sites will be erased completely. Do not use the erase function until all recorded data has been reviewed or transcribed/downloaded outside the model 6350M. (SEE SAVING AND RECALLING DATA.)

D. THE DISPLAY

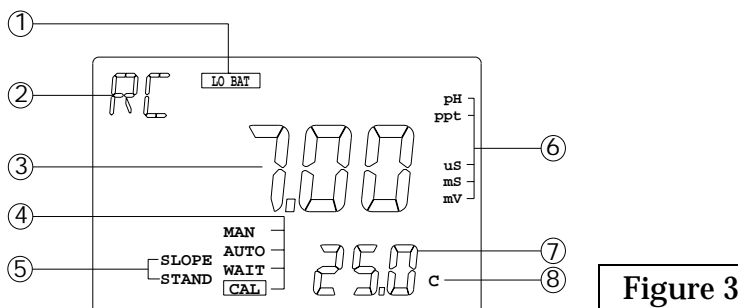


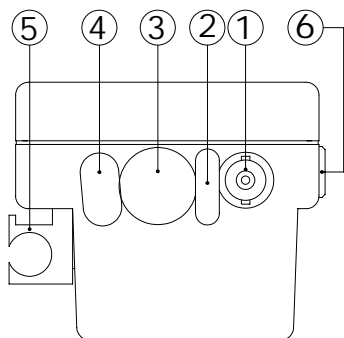
Figure 3

1. "**LO BAT**" -Low battery indicator.
2. "**RC**"- to indicate that the unit is in recall mode and actively displaying saved data.
3. MAIN DISPLAY (pH, mV, Conductivity & Salinity)
4. "**MAN**" - used to indicate that a temperature sensor is not attached and the pH temperature compensation is manual.
"**AUTO**" - used to indicate that a temperature sensor is attached.
"**WAIT**" -used when in pH calibration to indicate that the reading is not yet stable.
"**CAL**" - used to indicate that unit is in calibration mode.
5. "**STAND**" & "**SLOPE**" ANNUNCIATORS - during calibration this will indicate which part of pH is being calibrated, in normal operation this will indicate (blinking) which part of pH is not yet calibrated.
6. MAIN (MODE) DISPLAY UNITS -mS/uS units will blink if you are in manual range. (see AUTO/MANUAL RANGING)
7. SECONDARY DISPLAY (Temperature and Site number)
8. TEMPERATURE UNIT

In Uncompensated Conductivity mode, the **temperature unit** will not blink.

In Compensated Conductivity mode, **the temperature unit** will blink.

E. CONNECTORS



1. pH electrode input
2. pH REF. input
3. COND/TEMP probe input
4. AC adaptor input
5. Probe holder
6. RS232 connector

Figure 4- (top view)

F. REPLACING THE BATTERIES

1. Position the meter so that the bottom part of the meter is facing up . (Refer to figure 5.) Insert a coin in the side closure slot. Tilt the coin and thrust it upward to open the battery compartment and lift the closure up.
2. Remove all of the old batteries and insert a new set of batteries ensuring the polarities are correct.

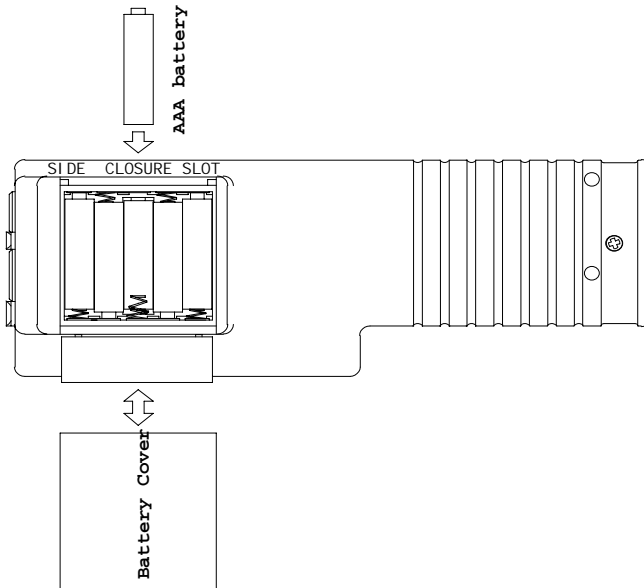


Figure 5

G. TURNING ON/OFF THE INSTRUMENT

Once the batteries are installed correctly and/or an AC adapter is installed and plugged in the unit will turn ON at once. Pressing the [ON/OFF] key will turn on or turn off the instrument. When the unit is not in use the user should turn off the instrument to save battery life. By just unplugging the AC adapter will not turn off the instrument if batteries are present. It would automatically switch to battery power and will continue to operate.

After the unit is turned on the unit will display all segments for a few seconds then it will display the current cell constant. If the instrument detects an internal problem it will display an error message for a few seconds. You can learn about these error messages by consulting the **ERROR DISPLAYS** of this manual.

After the self-diagnostic is complete the temperature will be displayed in the lower right of the display and the instrument is ready to make a measurement. Just immerse the probe half-way to the liquid. If possible do not allow the probe to touch any solid object in the solution. There should be no air bubbles around the probe either. Shaking or moving the probe vigorously before recording any measurement will dislodge any bubbles formed in the probes.

IF THE PROBE /INSTRUMENT IS NEW, **A CELL CONSTANT CALIBRATION** MUST BE PERFORMED BEFORE USE, SINCE THE CELL CONSTANT IS SLIGHTLY DIFFERENT FOR EACH CONDUCTIVITY PROBE. REFER TO **CALIBRATION SET-UP** FOR PROCEDURES.

IV. MODEL 6350M MODES

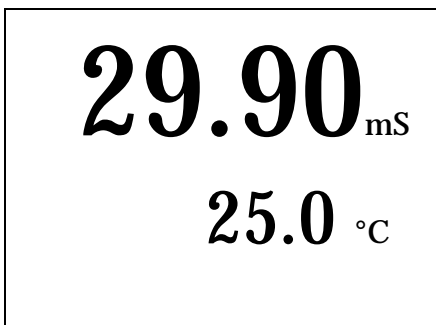
This instrument is designed to provide 6 distinct measurements and 2 special modes:

1. Temperature - current temperature of the solution which is always displayed. If the temperature probe is not available then a user selectable temperature will be used.
2. pH - the current degree of acidity or alkalinity of the solution with automatic temperature compensation. If a temperature probe is not attached a user selectable temperature will be used.
3. mV - the millivolt value of the pH electrode.

4. Conductivity (mS/uS) - a measurement of the conductive material in the solution with no regard to temperature.
5. Compensated conductivity (mS/uS)- also known as **specific conductance** which automatically adjusts to a calculated value which would have been read if the sample had been at $T_{ref}=25^{\circ}C$ & $T_{coeff}=1.91\%$ (or another T_{ref} & T_{coeff} which the user can choose). The equation used for Compensated conductivity is

$$\text{Compensated Conductivity } (T_{ref}) = \text{Conductivity} / (1 + T_{coeff} * (T_{sol} - T_{ref})).$$
 Using the default T_{ref} & T_{coeff} values will be somewhat inaccurate, unless the solution being measured consists of pure KCl in water, but this will provide a close approximation for solutions of many common salts such as NaCl and NH_4Cl and for seawater.
6. Salinity (ppt)- a calculation based on the Conductivity and Temperature.
7. Recall [rcl] - this is a special mode where you can display the data you saved during normal operation.
8. Erase [EraS]- this is a special mode where you can delete ALL saved data.

Note : Every time the unit is turned OFF the last mode is saved so that when you turn the instrument ON again it will return to this mode. Turning OFF at Recall or Erase mode will set the mode back to pH mode.



To choose any measurement mode (temperature is always included) simply press and release the [MODE] key . Carefully observe the annunciators units at the right side of the LCD.

For compensated conductivity mode the °C will **blink** indicating your in temperature compensated

conductance.

If in Conductivity mode the °C will **not blink**.

If in Salinity mode the unit will be **ppt**.

12.00_{pH}
STAND AUTO
SLOPE 25.0 °C

For pH readings the "STAND" annunciator will not blink if the unit is STAND calibrated, it is the same with the SLOPE annunciator. The "AUTO" will also be displayed if a temperature sensor is available, or "MAN" if no temperature sensor is attached.

rcl
01

This is recall form.

← This is the site number.

EraS

This is Erase mode.

V. AUTO/MANUAL RANGING IN CONDUCTIVITY

A. AUTO RANGING

This model is auto ranging in conductivity measurements. This means whatever the conductivity (with in the specifications of the instrument) of the solution all you need to do is immerse the probe into the solution. The **conductivity unit will not blink** if you are in

any of the conductivity readings and if the instrument is in auto ranging display.

After immersing the probe into the solution, the instrument will be placed in a search routine to find the right range for the solution, this auto ranging will take as long as 5 seconds. During this search the instrument will display "RANG" on the LCD to indicate it is searching for the right range.

B. MANUAL RANGING

If you choose to disable the auto ranging feature and choose your own range/resolution, just press and release the [Δ] key while in any conductivity mode. You will be switching to the four ranges of the model 6350M then back to auto ranging again. During MANUAL RANGING the **CONDUCTIVITY UNIT (mS & uS) will blink** to signify you are in MANUAL RANGE. Every time you turn off the unit it will return to auto ranging again.

Note : You may see an error message "rErr" in some manual ranges if the manual range selected is not adequate for the sample you are measuring. If this happens, simply press the [Δ] key again until a range is selected that is suitable for your sample. Also note that the conductivity units will blink while you are in manual range. The instrument will always default in auto ranging when first turned on.

VI. AUTOMATIC AND MANUAL TEMPERATURE

A. AUTOMATIC TEMPERATURE COMPENSATION (ATC)

If the probes you are using have a built-in thermistor then all temperature readings will be automatic. The "AUTO" annunciator will also be displayed as long as the thermistor is available

In a strong acid/base solution, we recommend not using the Conductivity/ATC combination probe to measure the temperature

and the conductivity value for that matter. Use a combination pH/ATC probe or use a separate glass ATC probe.

B. MANUAL TEMPERATURE COMPENSATION

In such a case where the probes you are using contains no thermistor or if the thermistor is not connected then the model 6350M provides a way to get pH/mV readings by incorporating a manual setting for the temperature. As soon as the unit detects no temperature reading it will automatically use the last user temperature setting to compensate the pH readings. You can only use and change this temperature in pH mode since conductivity and salinity readings depend strictly on automatic temperature compensation. While in pH mode press the [Δ] and [▽] keys to increment and decrement the manual temperature respectively . The "MAN" annunciator will be displayed every time the unit is in **Manual Temperature Compensation.**

VII. CALIBRATION SET-UP

A. STAND AND SLOPE CALIBRATION (pH mode)

BUFFER SETTING

The buffer setting is factory selected according to user preference, but the user can change this setting by going to normal pH reading and pressing the [SLOPE] key for 5 sec. The 6350M will acknowledge by displaying "7.00" (7.00,4.01 & 10.01) or "6.86" (6.86,4.00 & 9.18) and the text "buf" at the secondary display then returns to normal pH operation.

To calibrate the stand and/or slope follow these steps:

1. Go to pH mode. Press the [CAL] key, the "CAL" annunciator will appear in the lower middle of the display. At this point the unit will display the current buffer set 7.00 for buffer set #1 (7.00,4.01 & 10.01) or 6.86 for buffer set #2 (6.86, 4.00 & 9.18). The "STAND" annunciator will start to flash indicating that the first buffer to be used is 7.00 or 6.86.

7.00 pH

STAND

CAL 25.0 °C

2. Place the probe in a standard buffer solution (7.00 or 6.86 buffer depending on what model you are using). Press the [STAND] key.
3. The "STAND" annunciator will stop flashing and stay ON. The display will change to the pH

value of the current temperature (if a temperature probe is available the "AUTO" annunciator will turn on. If the offset mV of the solution is greater or less than ± 100 mV (for buffer 7.00) or 108.3 mV/ -91.7 mV (for buffer 6.86) then an error display will occur, you can clean the probe and change the solution or you can press [MODE] key to exit the calibration. If no error occurs the unit will wait for the reading to stabilize for about ten seconds (during this wait the "WAIT" annunciator will blink) then it will lock the value of the display, if during stabilization period and the reading changes by more than 0.01 pH then this wait time (about 10 seconds) will restart (In this case : A. you can change the solution. B. just abort by pressing the [MODE] key. or C. wait it out until the electrode stabilizes). Once the display is locked (the "WAIT" annunciator will disappear) changing the input or temperature will not change the pH display.

4. The "SLOPE" annunciator will start to flash indicating that the instrument is ready for the second buffer calibration. You can press the [MODE] key to exit for a one-point pH calibration.
5. If you are doing a two-point calibration change the solution now. Press the [SLOPE] key . The "SLOPE" annunciator will stop flashing and stay ON. If the mV input is greater than 30% or less than -30% of the ideal slope of this buffer then an error display will occur. You can change solution now or you can press the [MODE] key to abort the SLOPE Calibration. If no error occurs the unit will wait for the reading to stabilize (during this wait the

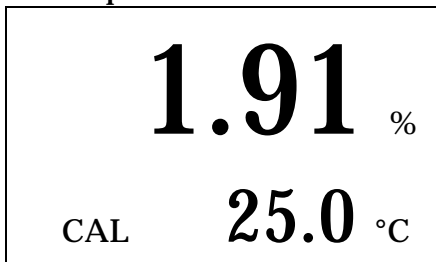
"**WAIT**" annunciator will blink) then it will lock the value of the display, if during stabilization period and the reading changes more than 0.01 pH then this wait time (about 10 seconds) will restart (In this case : A. you can change the solution. B. just abort by pressing the [**MODE**] key. or C. wait it out until the electrode stabilizes). Once the display is locked (the "**WAIT**" annunciator will disappear) changing the input or temperature will not change the pH display.

6. You just finished a two-point pH calibration. Press the [**MODE**] key to return you to normal operation. The instrument is now ready for pH measurements.

B. TEMPERATURE COEFFICIENT (conductivity mode)

To change the temperature coefficient follow these steps:

1. After the power-on diagnostics, go to any conductivity mode and press the [∇] and the [**MODE**] keys simultaneously, the CAL annunciator will appear on the lower middle of the display. The large portion will display **1.91 %** or a value set previously using this procedure.



2. Using the [Δ] and [∇] keys you can now change the temperature coefficient to the desired value.

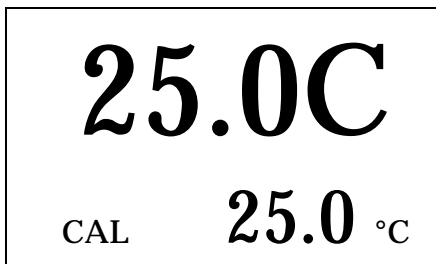
3. To save the new value you can press the [**ENTER**] key or press [**MODE**] to exit (and go to the) next calibration parameter). If

you press the [**ENTER**] key, the word "**SAVE**" will be displayed to indicate that a new temperature coefficient is accepted and then will switch to Temperature Reference set-up.

C. TEMPERATURE REFERENCE (conductivity mode)

To change the temperature reference follow these steps:

1. After the power-on diagnostics, go to any conductivity mode and press the [▽] and [MODE] keys simultaneously, the CAL annunciator will appear on the lower left of the display. The large portion will display **1.91 %** or a value set previously using this procedure.
2. Press the [MODE] key. The large portion will display **25.0 C** or a value set previously using this procedure.



3. Using the [Δ] and [▽] keys you can now change the temperature reference to the desired value.
4. To save the new value you can press the [ENTER] key or press to [MODE] to exit (and go to the next calibration parameter). If

you press [ENTER] the word "SAVE" will be displayed to indicate that a new temperature reference is accepted return to normal operation.

D. CELL CONSTANT CALIBRATION (conductivity mode)

To calibrate the cell constant follow these steps:

1. After the power-on diagnostics, immerse the probe to a known standard conductivity solution (Refer to **PREPARING STANDARD SOLUTIONS.**) which is chosen to calibrate your probe. Wait for the temperature to stabilize for a few seconds. Press the [MODE] key to go to any conductivity display.
2. Press the [CAL] key, the CAL annunciator will appear on the lower left of the display. The large portion of the LCD will display the rough conductivity value of the standard solution, depending how far the current saved cell constant to the true cell constant of the probe. The temperature unit will also **blink** indicating that you are in compensated conductivity mode. During cell constant calibration the following parameters are

over-ridden : temperature reference fixed to 25°C and temperature coefficient fixed to 1.91%.



3. Using the [Δ] and [∇] keys you can now change the display to reflect the known standard conductivity solution at 25°C.
4. To save the new value you can press [ENTER] or the [MODE] key to exit. If you press

[ENTER] the word "SAVE" will be displayed to indicate that a new probe cell constant is accepted and return to normal operation. If the new Cell Constant is greater than 1.3 or less than 0.7, the unit will display an "Over" or "Undr" text respectively. The old Cell Constant will be retained and the unit will return to normal operation.

VIII. SAVING AND RECALLING DATA

The Model 6350M is equipped with a non-volatile memory than can store up to 50 different sets of readings. Non-volatile memory will be retained even if power is lost.

A. SAVING READINGS TO MEMORY

1. While in pH, mV, conductivity, salinity modes press the [ENTER] key for about 2 seconds. The unit will display "SAVE" and the site no. for a brief moment to indicate a successful save.
2. When all 50 sites are used up, the LCD will display "FULL". This message will remain on the LCD (even after power down) until a key (except for the [ON/OFF] key) is pressed.
3. Once you have acknowledged that the memory is full, any subsequent saving of data will begin overwriting the existing data starting at site #1.

B. RECALLING READINGS FROM MEMORY

You can recall the saved data manually by following the procedure below or you can download the data by using an RS232 equipped computer. See chapter **IX. RS232C INTERFACE OPERATION** for more information.

1. Press the [MODE] key repeatedly until Recall mode ("rcI" see MODEL 6350M modes) is displayed on the screen along with the site number on lower right corner.

2. Press the [ENTER] key to display the last set of data that was saved. The model 6350M will display pH and temperature and the letters "RC" on the upper left corner to indicate you are in Recall mode. Press the [ENTER] key again to display the mV and temperature.

RC
7.90 pH
24.8 °C

Press the [ENTER] key again and again to display conductivity, compensated conductivity and

salinity. All of which are displayed with the temperature.

3. Press the [Δ] key to move to a lower (older) site number.

4. Press the [∇] key to move to a higher (newer) site number.

Here is an example of the model 6350M memory.

Site #1 (oldest data)

Site #2

Site #3 ← for example if you are displaying site #3, then if you press the [Δ] key the model 6350M will display site #2.

Site #4

Site #5 (newest data)

C. ERASING DATA


1. To erase *ALL* the data stored in memory, press the [MODE] key repeatedly until the unit displays Erase mode ("EraS" see MODEL 6350M modes).

2. Press the [▽] and [ENTER] keys simultaneously for about 5 seconds. The LCD will display "dONE" to indicate successful erasure and return to pH mode.

CAUTION : All data will be erased, so be sure you have reviewed them thoroughly or transcribed/downloaded to an archive before using this function.

IX. RS232C INTERFACE OPERATION

A. INTRODUCTION

This section assumes you are familiar with the basics of data communication, the RS232 interface, a rudimentary knowledge and a copy of the more popular Windows®  95+ computer languages capable of using an RS232 port.

A simple program must be written in order to send your command and receive data from the meter.

B. PREPARING THE METER

This meter comes equipped with an RS232C interface. This meter communicates with a PC computer (100% IBM PC/AT compatibles) through a DB-9 interface connector. A standard RS232C cable used for interconnecting two IBM PC/ATs can also be used for this operation.

After you have connected the cable and turned on both the meter and the computer, you are now ready for the software preparation.

C. SOFTWARE

A demo program written in Visual Basic® 6.0 and the source are included in the accompanying disk. Read the "*Model 6350M RS232 protocol.doc*" to understand the procedure used inside the demo program.

X. ERROR DISPLAYS AND TROUBLESHOOTING

MAIN LCD display	SECONDARY LCD display	MODE	Possible cause(s) [Action(s)]
"OVer"	"ovr"	a. pH b. pH-Cal	Temperature > 100.0°C. [Bring buffer/solution to a lower temperature.] [Replace temperature probe.]
"OVer"	"ovr"	a. Conductivity b. Salinity c. Cond-Cal	a. Temperature > 100.0°C. [Bring solution to a lower temperature.] b. No temperature sensor.. [Use a temperature probe.]
"OVer"	"udr"	a. pH b. pH-Cal	Temperature < -5.0°C. [Bring buffer/solution to a higher temperature.]
"OVer"	"udr"	a. Conductivity b. Cond-Cal c. Salinity	a. Temperature < -5.0°C [Bring solution to a higher temperature.] b. No temperature sensor. [Use a temperature probe.]
"OVer"	-5.0~ 100.0°C	pH	pH>16.00 . [Recalibrate.]
"OVer"	0.0 ~ 60.0°C	pH-Cal	pH>16.00. [Use a new buffer solution.] [Replace the electrode.]
"OVer"	0.0 ~ 60.0°C	a.pH-Cal-STAND b.pH-Cal-SLOPE	a.Offset mV> 30% of ideal offset. b.Slope mV> 30% of ideal slope. [Use a new buffer solution.] [Replace electrode.]
"OVer"	> 60.0°C	pH-Cal	Buffer temperature>60.0°C. [Bring buffer to a lower temperature.]
"OVer"	-5.0~ 100.0°C	a. Conductivity b. Cond-Cal	Conductivity > 30.00 mS (k=1.0). [Check calibration.] [Check temperature reference, and temperature.]

MAIN LCD display	SECONDARY LCD display	MODE	Possible cause(s) [Action(s)]
"Over"	any reading	mV	mV input > 1500 mV
"Over"	-5.0~ 100.0°C	Salinity	Conductivity > 30.00 mS (k=1.0). Salinity > 80.0 ppt. [Check calibration.] [Check temperature reference and temperature coefficient.]
"Over"	-5.0~ 100.0°C	Cond-Cal - after pressing [ENTER]	New cell constant > 1.3 (k=1.0). [Use a new standard solution.] [Clean/replace probe.]
"Undr"	-5.0 ~ 100°C	pH	pH < -2.00. [Recalibrate.]
"Undr"	0.0 ~ 60.0°C	pH-Cal	pH < -2.00. [Use a new buffer solution.] [Replace the electrode.]
"Undr"	0.0 ~ 60.0°C	a.pH-Cal-STAND b.pH-Cal-SLOPE	a.Offset mV < 30% of ideal offset. b.Slope mV < 30% of ideal slope. [Use a new buffer solution.] [Replace electrode.]
"Undr"	< 0.0°C	pH-Cal	Buffer temperature < 0.0°C. [Bring buffer to a higher temperature.] [Replace temperature probe.]
"Undr"	-5.0~ 100.0°C	Cond-Cal - after pressing [ENTER]	New cell constant < 0.7 (k=1.0). [Use a new standard solution.] [Clean/replace probe.]
"Undr"	any reading	mV	mV input < -1500 mV
"rErr"	-5.0~ 100.0°C	Conductivity	Reading exceeds user selected manual range. [Use auto-ranging or select a higher range.]
"Perr"	-5.0~ 100.0°C	Cond-Cal - after pressing [ENTER]	Conductivity reading = 0.0 uS. [Replace the standard solution.] [Clean/replace the probe.]

MAIN LCD display	SECONDARY LCD display	MODE	Possible cause(s) [Action(s)]
"Lerr"	-5.0~ 100.0°C	a. Compensated Conductivity b. Cond-Cal	Temperature exceeds the values computed using user defined temperature coefficient and/or reference temperature. [Adjust temperature reference and/or temperature coefficient.] [Bring temperature to a suitable range.]
"Err"	"ra_"	Power-on	Unit has failed its RAM test. [Turn instrument OFF and back to ON again.] [Return for service. (see Warranty)]
"Err"	"ro_"	Power-on	Unit has failed its ROM test. [Turn instrument OFF and back to ON again.] [Return for service. (see Warranty)]
"FAIL"	"EEP"	Any mode Reading	Saving to EEPROM has failed. [Turn instrument OFF and back to ON again.] [Return for service. (see Warranty)]
"FULL"	blank	Any mode Reading	EEPROM is full. [See Saving and Recalling data.]

XI. SPECIFICATIONS

Conductivity with 1 cm⁻¹ cell constant probe

Range	Resolution	Accuracy
0 to 99.99 µS/cm	0.01 µS/cm	± 0.5% FS
0 to 999.9 µS/cm	0.1 µS/cm	± 0.5% FS
0 to 9.999 mS/cm	0.001 mS/cm	± 0.5% FS
0 to 30.00 mS/cm	0.01 mS/cm	± 0.5% FS

pH

Range	Resolution	Accuracy
-2.00 to 16.00 pH	0.01 pH	±0.01 pH ± 1 LSD

mV

Range	Resolution	Accuracy
-1500 to 1500 mV	1 mV	±0.1% of reading ± 1 LSD

Salinity

Range	Resolution	Accuracy
0.0 to 50.0 ppt	0.1 ppt	± 1% FS

Temperature

Range	Resolution	Accuracy
-5.0 to 100.0 °C	0.1 °C	±0.1 °C ± 1 LSD

pH

pH buffer recognition	pH 7.00, 4.00, 10.01 or pH 6.86, 4.01, 9.18 (user selectable)
pH Temperature compensation	AUTO / MANual -5.0 to 100.0°C
pH Buffer Temperature range	0.0 to 60.0°C
pH Electrode Offset recognition	±100 mV at pH 7.00 +108.3 mV / -91.7 mV at pH 6.86
pH Electrode Slope recognition	±30% at pH 4.00, 4.01, 9.18 and 10.01
Input impedance	>10 ¹² Ω

CONDUCTIVITY

Conductivity Reference temperature	15.0 to 25.0°C (key selectable)
Conductivity Temperature coefficient	0.0 to 4.0% (key selectable)
Cell Constant	1 cm ⁻¹

GENERAL

Keys	Audio feedback in all keys
Communication	RS232C compatible DB9 connector

Battery Life	>10 hours Alkaline (continuous operation)
Power: Batteries/Adaptor	6AAA/9V AC (230/115V) adaptor
ATC probe	Thermistor, 10KΩ at 25°C
Ambient Temperature range	0.0 to 50.0 °C
Display: (Cond/Sal/mV/pH : Temp)	15mm High : 8.7 mm High LCD
Dimensions (LxWxH)	241 mm x 83 mm x 71 mm
Weight	470g (batteries included)

XII. pH BUFFERS

BUFFER SETTING

The buffer setting is factory selected according to user preference, but the user can change this setting by going to normal pH reading and pressing the [SLOPE] key for 5 sec. The 6350M will acknowledge by displaying “7.00” (7.00,4.01 & 10.01) or “6.86” (6.86,4.00 & 9.18) and the text “buf” at the secondary display then returns to normal pH operation.

The temperature characteristics of pH calibration buffers 4.00, 4.01, 6.86, 7.00, 9.18 and 10.01 are stored inside the instrument. The buffers used to calibrate the instrument must exhibit the same temperature characteristics as the stored values.

TABLE 1.

°C	4.00	6.86	9.18	4.01	7.00	10.01
0	4.01	6.98	9.46	4.01	7.11	10.32
5	4.00	6.95	9.39	4.01	7.08	10.25
10	4.00	6.92	9.33	4.00	7.06	10.18
15	4.00	6.90	9.28	4.00	7.03	10.12
20	4.00	6.88	9.23	4.00	7.01	10.06
25	4.00	6.86	9.18	4.01	7.00	10.01
30	4.01	6.85	9.14	4.01	6.98	9.97
35	4.02	6.84	9.10	4.02	6.98	9.93
40	4.03	6.84	9.07	4.03	6.97	9.89

45	4.04	6.83	9.04	4.04	6.97	9.86
50	4.06	6.83	9.02	4.06	6.97	9.83
55	4.07	6.83	8.99	4.08	6.97	9.80
60	4.09	6.84	8.97	4.10	6.98	9.78

Note : The actual reading of the instrument can differ from the values shown by ± 0.01 pH.

XIII. PREPARING STANDARD SOLUTIONS

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents.

Here are some standard solutions the user can prepare to calibrate the conductivity probe of the model 6350M.

1. Standard solution of 1413 μS at 25°C: accurately weight out 0.746 grams of research grade dried Potassium Chloride (KCl). Dissolve in 1000ml of deionized water
2. Standard solution of 12.90 mS at 25°C : accurately weight out 7.4365 grams of research grade dried Potassium Chloride (KCl). Dissolve in 1000ml of deionized water
3. Standard solution of 111.0 mS at 25°C: accurately weight out 74.2640 grams of research grade dried Potassium Chloride (KCl). Dissolve in 1000ml of deionized water

STORAGE

You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. The storage life can be increased by storing the solution below 4°C. If you have any doubt of the accuracy of the stored solution, a fresh batch should be prepared.

XIV. WARRANTY

Jenco Instruments, Ltd. warrants this product to be free from significant deviations in material and workmanship for a period of 3 years from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our Jenco distributors and it is under warranty, please contact them to notify us of the situation. Jenco Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

RETURN OF ITEMS

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Jenco will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all authorized returns.

NOTE: Jenco reserves the right to make improvements in design, construction and appearance of our products without notice.

JENCO INSTRUMENTS, INC.

7968 Arjons Drive, SUITE C
SAN DIEGO, CA 92126 USA

TEL: (858)578-2828

FAX: (858)578-2886

E-MAIL: jencosales@jencoi.com

[Http://www.jencoi.com](http://www.jencoi.com)

JENCO ELECTRONICS, LTD.

P.O. BOX 117, JHONG JHENG RD,
LINKOU SHIANG, TAPEI HSIEN,
TAIWAN. R.O.C.

TEL: (886-2)2601-6191

FAX: (886-2)2601-7206

E-MAIL: jencoe@ms2.hinet.net

SHANGHAI JENCO ELECTRONICS, LTD.

18 Wang Dong Zhong Road

Sijing Town, Songjiang

SHANGHAI, CHINA

TEL: 86-21-5761-9599

FAX: 86-21-5761-9598

<http://www.jenco.com.cn>

E-MAIL: jencos@jenco.com.cn

		文件名称	使用说明书（英文）		
机型	6350M	编制人	罗多福	编制日期	2003/4/29
文件编号	K6350M02	修改人	张潘潘	修改日期	2008/08/14
版本号	02	核准人		核准日期	

修改记录：内容、原因及版次

2005-2-25:

P26:修改保修期为3 YEARS.

2007-7-26 :

P27 : JENCOI E-MAIL地址有变动。JENCOE POBOX地址修改。

2008-8-14:

P23: 修改盐度范围为”0.0 to 50.0 ppt”

P27: 修改上海电子邮件地址为”jencos@jenco.com.cn”