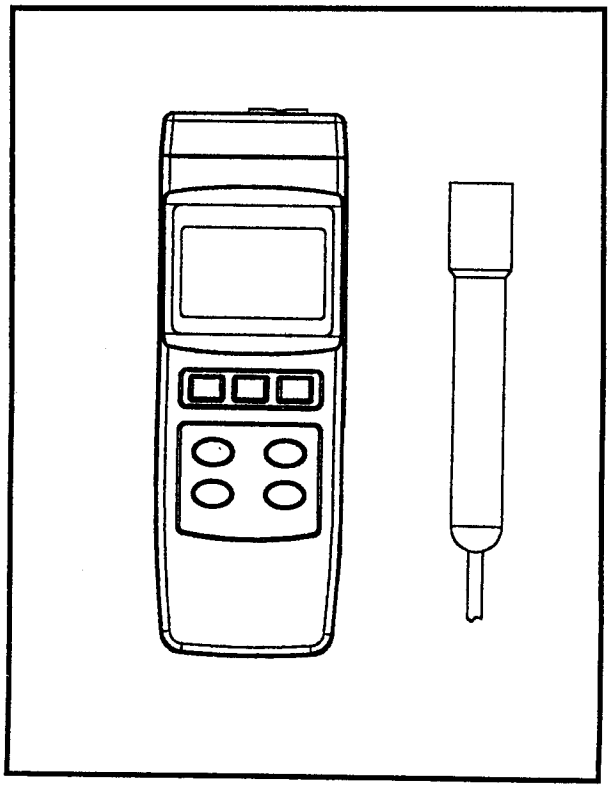
Cond222

CONDUCTIVITY/ TDS METER



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1. FEATURES

* 2 in 1, professional Conductivity and TDS (Total Dissolved Solids) Meter
* Conductivity include 2 ranges : 2 mS, 20 mS.
  TDS has 2 ranges : 2,000 PPM, 20,000 PPM.
  Temperature measurement range from 0 to 60 °C / 32 to 140°F.
* Conductivity/TDS meter build in automatic temperature compensation circuit, adjustable between 0 to 5.0% per °C.
* Conductivity/TDS meter uses carbon rod electrode with long life using separated probe is convenient for remote measurement.
* Microprocessor circuit, intelligent function.
* Records maximum and minimum readings with recall.
* Data hold.
* Auto shut off saves battery life.
* RS 232 PC serial interface.
* Temperature function with °C & °F display unit.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Microprocessor LSI circuit.
Display	51 mm x 32 mm, dual function LCD display, 15 mm (0.6") digit size.
Measurement	* Conductivity * TDS (Total Dissolved Solids) * Temperature (use the CD/TDS probe)

Data hold	Hold the current reading value on the display.
Memory Recall	Maximum and minimum reading values can be saved and retrieved by record function.
Power off	Auto shut off saves battery life, or manual off by push button.
Data Output	RS 232 computer serial interface.
Overload indication	"– – – –" symbol on the display.
Operating Temperature	0 to 50 °C – main instrument. 0 to 60 °C – Conductivity/CT probe only.
Operating Humidity	Max. 80% RH.
Sampling Time	Approx. 0.8 second.
Power Supply	006P DC 9V battery *(Alkaline or Heavy duty type).*
Power Current	Approx. DC 6.0 mA.
Weight	210 g/0.46 LB (meter only). 290 g/0.64 LB (meter and probe).
Size	*Main meter :* 195 x 68 x 30 mm (7.6 x 2.6 x 1.2 inch).
	Conductivity/TDS probe : Round, 22 mm Dia. x 120 mm length.
Accessories included	Conductivity/TDS probe.....1 PC. Operation manual.....1 PC. Carrying case, CA–06.....1 PC.
Optional Accessories	1.413 mS Conductivity Standard Solution.....CD–14
	RS232 cable, UPCB–02.....UPCB–02
	Application Software.....SW–U801–WIN

2–2. Electrical Specifications

A. Conductivity

Range	*Measurement*	*Resolution*	*Accuracy*
2 mS	0.2 to 2.000 mS	0.001 mS	± (3 % F.S. + 1 d)
20 mS	2 to 20.00 mS	0.01 mS	** F.S. – Full scale*
** Temperature Compensation :* *Automatic from 0 to 60 °C (32 – 140 °F), with temperature compensation factor variable between 0 to 5.0% per C.* ** mS – milli Simens* ** @ 23 ± 5°C*			

B. TDS (Total Dissolved Solids)

Range	*Measurement*	*Resolution*	*Accuracy*
2,000 PPM	132 to 1,320 PPM	1 PPM	± (3 % F.S. + 1 d)
20,000 PPM	1,320 to 13,200 PPM	10 PPM	** F.S. – Full scale*
** Temperature Compensation :* *Automatic from 0 to 60 °C (32 – 140 °F), with temperature compensation factor variable between 0 to 5.0% per C.* ** PPM – parts per million* ** @ 23 ± 5°C*			

C. Temperature

Function	*Measuring Range*	*Resolution*	*Accuracy*
°C	*0 °C to 60 °C*	*0.1 °C*	*± 0.8 °C*
°F	*32 °F to 140 °F*	*0.1 °F*	*± 1.5 °F*
* @ 23 ± 5°C			

3. FRONT PANEL DESCRIPTION

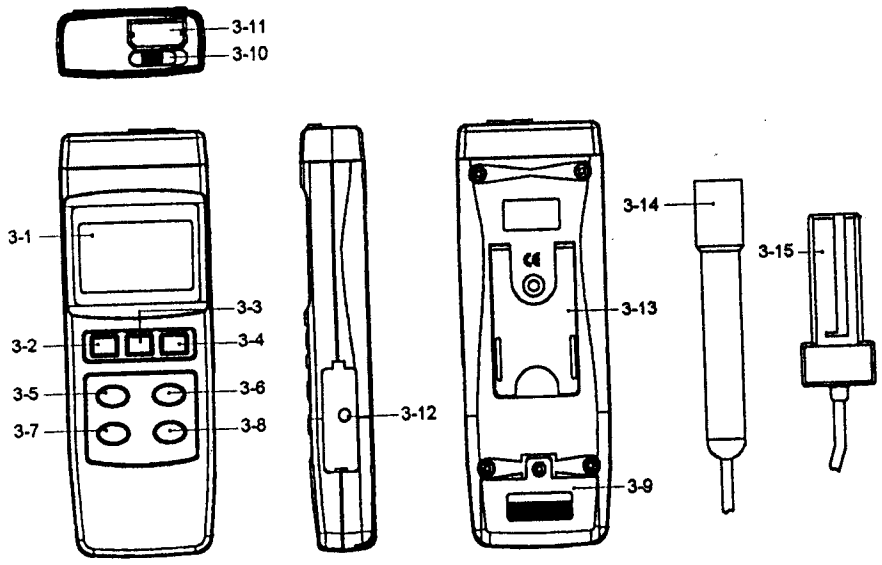


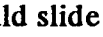
Fig. 1

3-1 Display
3-2 Power Button
3-3 Hold Button
3-4 REC. Button
3-5 °C,°F Button (up Button)
3-6 Range Button (left Button)
3-7 CD/TDS Button (down Button)
3-8 TEMP. C Button
3-9 Battery Compartment/Cover
3-10 Lock Switch
3-11 Probe Input Socket
3-12 RS-232 Out Terminal
3-13 Stand
3-14 Conductivity/TDS Probe
3-15 Probe plug

4. MEASURING PROCEDURE

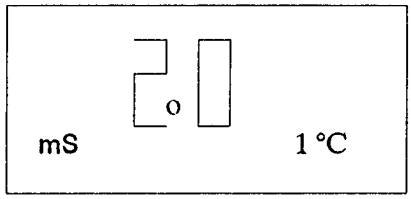
4–1 Conductivity measurement

1) Plug the " Probe plug " (3–15, Fig. 1) into the " Probe Input Socket " (3–11, Fig. 1)

   Make sure that the probe lock switch (3–10, Fig. 1) should slide to the lock position ( **).**

2) Power on the instrument by pushing the " Power Button " (3–2, Fig. 1)
3) Push the " CD/TDS " Button (3–7, Fig. 1), and select the function to the conductivity measurement. The display will show the unit of " mS ".
4) The instrument will default to 2% per °C Temperature Compensation factor. The meter has built–in Automatic Temperature Compensation adjustable between 0 to 5.0 % per °C.
   In order to change the default value carry out the following procedures :

   a. Push the " Temp. C Button " (3–8, Fig. 1), the display will show :



b. Use the
" up Button " (3−5, Fig. 1),
" left Button " (3−6, Fig. 1)
" down Button " (3−7, Fig. 1)
to select the desired value of Temperature Compensation factor.

c. Once the desired value is reached, push the " Temp. C Button " (3−8, Fig. 1) to set the new value.

5) Select the applicable range, by using the " Range Button " (3−6, Fig. 1).
* *If the display shows "− − − −", it indicates an overload condition, select the next higher range.*
* *If the display shows "_ _ _ _", it indicates an out−of−range condition, select the next lower range.*

6) * Immerse the head of " Conductivity/TDS Probe " (3−14, Fig. 1) into the solution, up to the immersion level.
* Shake the probe several times to let the air bubble leave away from the internal probe.
* When the display reach a stable reading, it is the measured conductivity value.

7) During the measurement, the lower LCD Display will show the temperature of the solution.

* Push the " °C/°F Button " (3−5, Fig. 1) to change the temperature display unit from " °C to °F " or " °F to °C ".

4−2 TDS measurement

The operation procedures are same as the above 4−1, except that push the " CD/TDS " Button (C Button) (3 −7, Fig. 1), and select the function to the TDS measurement. The lower display will show the text of " P ".

4–3 Other functions (Hold, Memory)

Data Hold

Press the " Hold Button " (3–3, Fig. 1) will hold the measured value & the LCD will indicate a " HOLD " symbol on the display during the measuring.

* Press the " Hold Button " again to exit the data hold function.

Data Record (Max., Min. reading)

* The data record function records the maximum and minimum readings. Press the " REC. Button " (3–4, Fig. 1) to start the Data Record function and there will be a " REC " symbol on the display.
* With the " REC " symbol on the display :
  a) Press the " REC. Button " (3–4, Fig. 1) once, the " REC Max " symbol along with the maximum value will appear on the display.

     If intend to delete the maximum value, just press the " Hold Button " (3–3, Fig. 1) for a while, and then the display will show the " REC " symbol only & execute the memory function continuously.

  b) Press the " REC. Button " (3–4, Fig. 1) again, the " REC Min " symbol along with the minimum value will appear on the display.

     If intend to delete the minimum value, just press the " Hold Button " (3–3, Fig. 1) for a while, and then the display will show the " REC " symbol only & execute the memory function continuously.

  c) To exit the memory record function, just press the " REC " button for 2 seconds at least. The display will revert to the current reading.

5. CALIBRATION PROCEDURES

The meter has been calibrated during manufacture. However, it may be necessary to re−calibrate periodically. Particularly when the instrument is used for a long period or when the conductivity electrode is changed.
To re−calibrate the instrument, follow the procedures shown below :

Range 2 (20 mS range) calibration

1) Prepare a " 12.88 mS Calibration Solution ".
2) Immerse the head of " Conductivity Probe " (3−14, Fig. 1) into the 12.88 mS solution up to the immersion level.
3) Select the range to the " 20 mS " position.
4) Set the temperature coefficient factor value to " 2.0% per °C "
5) At the same time push the following buttons together :

   a. REC.(MAX./MIN.) Button (3−4, Fig. 1)
   b. HOLD Button (3−3, Fig. 1)

   The upper display will show the flashing text of " CAL ".
   The low display will show the flashing text of " 12.88 "

6) Please release the two buttons when the display shows as above and start flashing and then when the text stop flashing, the range 2 will be calibrated to 12.88 mS (There maybe a little deviation, and it is normal).

   * *After released two buttons but before the text (CAL, 12.88) stop flashing, if push the " HOLD Button " will cancel the calibration procedures, the meter will return to previous calibration value.*

Range 1 (2 mS range) calibration

1) Prepare a " 1.413 mS Calibration Solution ".
2) Immerse the head of " Conductivity Probe " (3−14, Fig. 1) into the 1,413 mS solution up to the immersion level.
3) Select the range to the " 2 mS " position.
4) Set the temperature coefficient factor value to " 2.0% per °C "
5) At the same time push the following buttons together :

   a. REC.(MAX./MIN.) Button (3−4, Fig. 1)
   b. HOLD Button (3−3, Fig. 1)

   The upper display will show the flashing text of " CAL ".
   The low display will show the flashing text of " 1.413 ".

6) Please release the two buttons when the display shows as above and start flashing and then when the text stop flashing, the range 1 will be calibrated to 1.413 mS (There maybe a little deviation, and it is normal).

   * *After released two buttons but before the text (CAL, 1.413) stop flashing, if push the " HOLD Button " will cancel the calibration procedures, the meter will return to previous calibration value.*

Calbration consideration :

If intend to calibrate both two ranges (20 mS range and 2 mS) at the same time, then it should calibrate the Range 2 (20 mS) first, then calibrate Range 1 (2 mS) following.

6. AUTO POWER OFF DISABLE

The instrument has " Auto Power Off " function in order to prolong battery life. The meter will shut off automatically if none of the buttons are pressed in approx. 10 min.

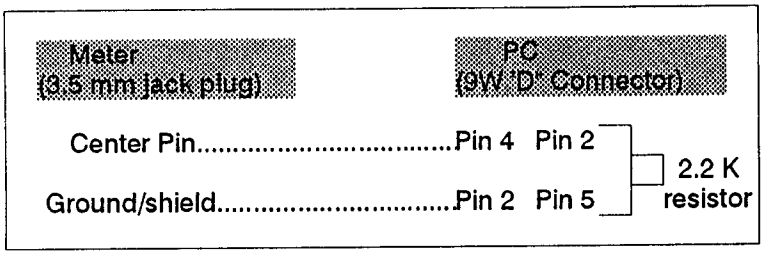
To disable this function, Select the memory record function during the measurement by pressing the " REC. Button " (3−4, Fig. 1).

7. RS232 PC SERIAL INTERFACE

The instrument features RS232 output via 3.5 mm Terminal (3−12, Fig. 1).

The signal output is a 16 digits data stream which can be utilized for user's specific application.

A RS232 lead with the following connection will be required to link the instrument with the PC serial interface.



The 16 digits data stream will be displayed in the following format :

D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0

Each digit indicates the following status :

D0	End Word	
D1 & D8	Display reading, D1 = LSD, D8 = MSD *For example :* *If the display reading is 1234, then D8 to D1 is :* *00001234*	
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP	
D10	Polarity 0 = Positive 1 = Negative	
D11 & D12	Annunciator for Display	
	°C = 01	°F = 02
	mS = 14	PPM = 19
D13	When send the upper display data = 1 When send the lower display data = 2	
D14	4	
D15	Start Word	

RS232 FORMAT : 9600, N, 8, 1

8. BATTERY REPLACEMENT

1) When the left corner of LCD display show "  ", it is necessary to replace the battery. However, in−spec. measurement may still be made for several hours after low battery indicator appears.
2) Slide the " Battery Cover " (3−9, Fig. 1) away from the instrument and remove the battery.
3) Replace with 9V battery (Alkaline or Heavy duty type) and reinstate the cover.
4) Make sure the battery cover is secured after changing the battery.

9. OPTIONAL ACCESSORIES

Conductivity Standard Solution CD−14	1.413 mS Conductivity Standard Calibration Solution

RS232 cable UPCB−02	RS232 cable for connecting between the meter & the computer.

SOFTWARE SW−U801−WIN	Windows version application software applies as the performance of data logging system & data recorder...