User's Guide

ΩE OMEGA®

T1 44.6 T3 K 44.8
T2 44.7 T4 44.6
°C
L R

POWER ESC HOLD NEXT REC ENTER

L R

Type ▲   T1-T2 ▼

SET Time Check   LOGGER OFFSET   Sampling check

SD Card Data Logger
THERMOMETER
4 channels , Type K/J/R/E/T/S , Pt 100 ohm

RDXL4SD

RDXL4SD
4-Channel
Datalogger Thermometer

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Section   **Page**

1. FEATURES

- Type K/J/T/E/R/S, Pt 100 ohm, measurement with 4 channel display.
- Simultaneously shows 4 channel display on the LCD.
- Type K : -100 to 1300 °C.
- Type J : -100 to 1200 °C.
- Pt 100 ohm : -199.9 to 850.0 °C.
- °C/°F, 0.1 degree/1 degree.
- 4 channels (T1, T2, T3, T4), T1-T2.
- Microcomputer circuit provides intelligent function and high accuracy.
- Offset adjustment for the Type K/J/T/E/R/S measurement.
- Offset adjustment for the Pt 100 measurement.
- Measuring unit can select to   or   .
- Real time SD memory card Datalogger, Built-in Clock and Calendar, real time data recorder, sampling time set from 1 second to 3600 seconds.
- Manual datalogger is available (set the sampling time to 0 second), during execute the manual datalogger function, can be set at different positions (location) (position 1 to position 99).
- Easy operation, computer is not needed to setup with software; After execute datalogger just take the SD card from the meter and plug in the SD card into a computer. It will down load all the measured values with the time information (year/month/date/ hour/minute/second) to Excel directly; then the user can make further data or graphic analysis.
- SD card capacity : 1 GB to 16 GB.
- LCD with green light backlight, easy reading.
- Can default auto power off or manual power off.
- Data hold, record max. and min. reading.
- Microcomputer circuit, high accuracy.
- Powered by 6-AA batteries or 9 Vdc adapter.
- RS232/USB PC COMPUTER interface.
- Heavy duty & compact housing case.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.
Display	LCD size: 52 mm x 38 mm LCD with green backlight (ON/OFF).
Channels	T1, T2, T3, T4, T1-T2.
Sensor type	Type K thermocouple probe. Type J/T/E/R/S thermocouple probe. PT 100 ohm probe * Cooperate with an 0.00385 alpha coefficient, meet DIN IEC 751.
Resolution	0.1°C/1°C, 0.1°F/1°F.
Datalogger Sampling Time Setting range	Auto: 1 second to 3600 seconds @ Sampling time can set to 1 second, but memory data may loss. Manual: Push the data logger button once will save data one time. @ Set the sampling time to 0 second. @ Manual mode, can also select the 1 to 99 position (Location) no.
Memory Card	SD memory card. 1 GB to 16 GB.
Advanced setting	* Set clock time (Year/Month/Date, Hour/Minute/ Second) * Decimal point of SD card setting * Auto power OFF management * Set beep Sound ON/OFF * Set temperature unit to °C or °F * Set sampling time * SD memory card Format

Temperature Compensation	Automatic temp. compensation for the type K/J/T/E/R/S thermometer.
Linear Compensation	Linear Compensation for the full range.
Offset Adjustment	Available for Type K/J/T/E/R/S and Pt 100 ohm.
Probe Input Socket	Type K/J/T/E/R/S 2 pin thermocouple socket. Pt 100 ohm : Ear phone socket.
Over Indication	Show " - - - - ".
Data Hold	Freeze the display reading.
Memory Recall	Maximum & Minimum value.
Sampling Time of Display	Approx. 1 second.
Data Output	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug. * Connect the optional USB cable USB-01 will get the USB plug.
Power off	Auto shut off saves battery life or manual off by push button.
Operating Temperature	0 to 50°C.
Operating Humidity	Less than 85% R.H.
Power Supply	* 6-AA alkaline batteries * DC 9V adapter input. (AC/DC power adapter is optional).

Power Current	Normal operation (w/o SD card save data and LCD Backlight is OFF) : *Approx. DC 8.5 mA.*
	When SD card save the data but and LCD Backlight is OFF) : *Approx. DC 30 mA.*
	* If LCD backlight on, the power consumption will increase approx. 14 mA.*
Weight	489 g/1.08 LB.
Dimension	177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch)
Accessories Included	*Instruction Manual *4 Type K Thermocouples *6-AA Alkaline Batteries *2 GB-SD (2 GB SD Card)
Optional Accessories	* USB cable, USB-01. * RS232 cable, UPCB-02. * Data Acquisition software, SW-U801-WIN. * AC to DC 9V adapter. * Hard carrying case, CA-06. * Soft carrying case, CA-05A.

2-2 Electrical Specifications (23± 5°C)

PT 100 ohm

Resolution	Range	Accuracy
0.1	-199.9 to 850.0°C	± (0.4 % + 1°C)
0.1	-327.0 to 999.9°F	± (0.4 % + 1.8°F)
1	1000 to 1562°F	± (0.4 % + 2°F)
* Pt 100 ohm probe TP-101 is the optional accessory.		

Type K/J/T/E/R/S

Sensor Type	Resolution	Range	Accuracy
Type K	0.1°C	-50.1 to -100.0°C	± (0.4 % + 1°C)
		-50.0 to 999.9°C	± (0.4 % + 0.5°C)
	1°C	1000 to 1300°C	± (0.4 % + 1°C)
	0.1°F	-58.1 to -148.0°F	± (0.4 % + 1.8°F)
		-58.0 to 999.9°F	± (0.4 % + 1°F)
	1°F	1000 to 2372°F	± (0.4 % + 2°F)
Type J	0.1°C	-50.1 to -100.0°C	± (0.4 % + 1°C)
		-50.0 to 999.9°C	± (0.4 % + 0.5°C)
	1°C	1000 to 1150°C	± (0.4 % + 1°C)
	0.1°F	-58.1 to -148.0°F	± (0.4 % + 1.8°F)
		-58.0 to 999.9°F	± (0.4 % + 1°F)
	1°F	1000 to 2102°F	± (0.4 % + 2°F)
Type T	0.1°C	-50.1 to -100.0°C	± (0.4 % + 1°C)
		-50.0 to 400.0°C	± (0.4 % + 0.5°C)
	0.1°F	-58.1 to -148.0°F	± (0.4 % + 1.8°F)
		-58.0 to 752.0°F	± (0.4 % + 1°F)
Type E	0.1°C	-50.1 to -100.0°C	± (0.4 % + 1°C)
		-50.0 to 900.0°C	± (0.4 % + 0.5°C)
	0.1°F	-58.1 to -148.0°F	± (0.4 % + 1.8°F)
		-58.0 to 999.9°F	± (0.4 % + 1°F)
	1°F	1000 to 1652°F	± (0.4 % + 2°F)
Type R	1°C	0 to 600°C	± (0.5 % + 1°C)
		601 to 1700°C	± (0.5 % + 1°C)
	1°F	32 to 1112°F	± (0.5 % + 2°F)
		1113 to 3092°F	± (0.5 % + 2°F)
Type S	1°C	0 to 600°C	± (0.5 % + 1°C)
		601 to 1500°C	± (0.5 % + 1°C)
	1°F	32 to 1112°F	± (0.5 % + 2°F)
		1113 to 2732°F	± (0.5 % + 2°F)

Remark :
  a. Accuracy value is specified for the meter only.
  b. Accuracy is tested under the meter's environment temperature within 23 ± 5°C.
  c. Linearity Correction :
     Memorize the thermocouple's curve into the intelligent CPU circuit,

@ Above specification tests under the environment RF Field Strength less than 3 V/M & frequency less than 30 MHz only.

3. FRONT PANEL DESCRIPTION
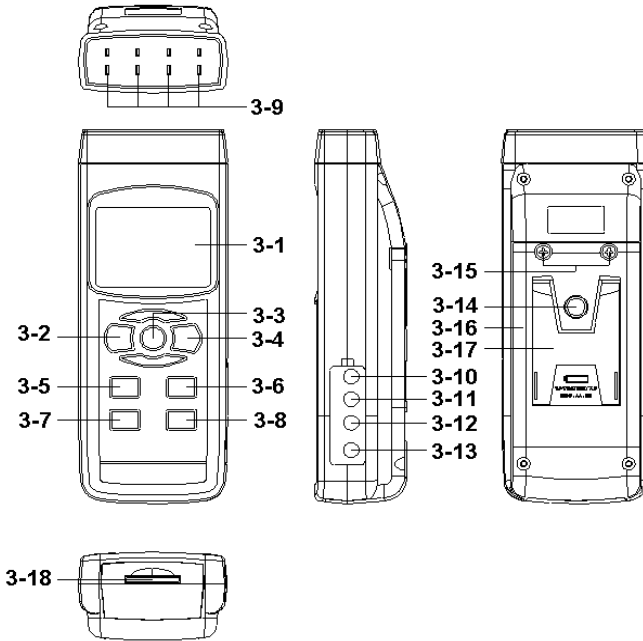
Fig. 1

3-1 Display.

3-2 Power Button (ESC, Backlight Button)

3-3 Hold Button (Next Button)

3-4 REC Button (Enter Button)

3-5 Type Button (▲ Button, L Button)

3-6 T1-T2 Button (▼ Button, R Button)

3-7 SET Button (Time check Button)

3-8 Logger Button (OFFSET Button, Sampling time check Button)

3-9 T1,T2,T3,T4 input socket (Type K, Type J)

3-10 PT1 input socket (Pt 100 ohm)

3-11 PT2 input socket (Pt 100 ohm)

3-12 RS-232 output terminal

3-13 DC 9V adapter socket

3-14 Tripod Fix Nut

3-15 Battery Cover Screws

3-16 Battery compartment/Cover

3-17 Stand

3-18 SD card socket

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4. MEASURING PROCEDURE

4-1 Type K measurement

1) Power on the meter by pressing the "Power button"
(3-2, Fig. 1) once.

   * *After the meter is on, pressing the*
   "Power button" once (> 2 sec) will turn off
   the meter.

2) Meter default Temp. sensor type is Type K, the display
will show "K" indicator.
The default temperature unit is °C (°F), the method
to change the Temp. unit from °C to °F or °F to °C,
please refer to Chapter 7-5, page 18.

3) Insert the Type K probes into the "T1, T2, T3, T4 input
socket" (3-9, Fig. 1).
The LCD will show the 4 channels (T1, T2, T3, T4)
temperature value at the same time.

   * *If the certain channels do not insert the temperature*
   probes, the relative channel display will show over
   range " - - - - - ".

4-2 Type J/T/E/R/S measurement

All the measuring procedures are same as the Type K
(section 4-1) except to select the Temp. Sensor type to
" Type J/K/T/E/R/S" by pressing the "Type Button" (3-5,
Fig. 1) once in sequence until the up LCD display shows the
"J/T/E/R/S" indicator.

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4-3 Pt 100 ohm measurement

1) All the measuring procedures are same as the Type K
   (section 4-1) except to select the Temp. Sensor type to
   "Pt" by pressing the "Type Button" (3-5, Fig. 1)
   once in sequence
   until the right down LCD display shows "Pt" text as :

```
┌─────────────────────────────┐
│                             │
│                             │
│                    Pt       │
│                             │
└─────────────────────────────┘
```

2) Insert a Pt 100 ohm probe to

   PT1 input socket (3-10, Fig. 1)
   PT2 input socket (3-11, Fig. 1)

   * *The Pt 100 ohm measurement only allow*
     max. two channels (two probes) input.

4-4 T1-T2 measurement

When the meter has two installed probes :
   Type K/J/T/E/R/S : T1, T2 input socket
   Pt 100 ohm : PT1, PT2 input socket

Pressing the "T1-T2 button" (3-6, Fig. 1), display will
show the difference temperature value between T1, T2
(PT1, PT2) as :

```
        ┌───────────────────────────┐
  T1 °C │                      °C   │
T1 ───▶ │ 26.2                 1-2  │
  T2  °C│                      °C   │
T2 ───▶ │ 26.6                -0.4 ◀│─── T1-T2 value
        └───────────────────────────┘
```
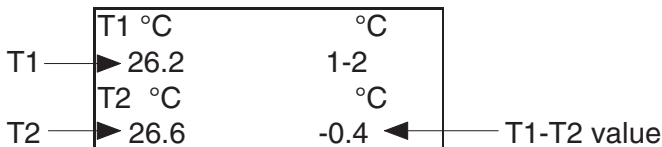
4-5 Data Hold

During measurement mode, press the "Hold Button" (3-3, Fig. 1) once will hold the measured value & the LCD will display a "HOLD" symbol.

Pressing the "Hold Button" once again will release the data hold function.

4-6 Data Record (Max., Min. reading)

1) The data record function records the maximum and minimum readings. Press the "REC Button" (3-4, Fig. 1) once to start the Data Record function and there will be a "REC" symbol on the display.

2) 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 you wish to delete the maximum value, just press the "Hold Button" (3-3, Fig. 1) once, 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 you wish to delete the minimum value, just press the "Hold Button" (3-3, Fig. 1) once, 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 > 2 seconds. The display will revert to the current reading.

4-7 LCD Backlight ON/OFF

After power ON, the "LCD Backlight" will light automatically. While in measurement mode, press the "Backlight Button" (3-2, Fig.1) once will turn OFF the "LCD Backlight".
Press the "Backlight Button" once again will turn ON the "LCD Backlight".

5. DATALOGGER

5-1 Preparation before executing datalogger function

a. Insert the SD card
Prepare a " SD memory card " (1 GB to 16 GB, optional), insert the SD card into the " SD card socket " (3-18, Fig. 1). The front panel of the SD card should face against the down case.

b. SD card Format
If using the SD card for the first time, it is recommended to make the "SD card Format" first. Please refer to chapter 7-7 (page 19).

c. Time setting
If using the meter for the first time, you should adjust the clock time exactly, please refer chapter 7-1 (page 16).

d. Decimal format setting

The numerical data structure of the SD card is defaulted " . " as the decimal. For example "20.6" "1000.53". In certain countries (Europe) the default is " , " as the decimal point. For example "20, 6" "1000,53". Under such situation, you should change the Decimal character at first, details of setting the Decimal point, refer to Chapter 7-2, page 17.

5-2 Auto Datalogger (Set sampling time ≥ 1 second)

a. Start the datalogger

Press the "REC Button (3-4, Fig. 1) once , the LCD will show the text "REC", then press the "Logger Button" (3-8, Fig. 1), the "REC" will flash and the beeper will sound at the same time the measuring data along with the time information will be saved into the memory circuit.

Remark :
  * How to set the sampling time, refer to Chapter 7-6, page 19.
  * How to enable the beeper sound, refer to Chapter 7-4, page 18.

b. Pause the datalogger

During execute the Datalogger function, press the "Logger Button" (3-8, Fig. 1) once will pause the Datalogger function (stop to save the measuring data into the memory circuit temporally). At the same time the text of " REC " will stop flashing.

Remark :
If you press the "Logger Button" (3-8, Fig. 1) once again, it will execute the Datalogger again, the text of "REC" will be flashing .

c.. Finish the Datalogger

To pause the Datalogger, press the "REC Button" (3-4, Fig. 1) continuously for at least two seconds, the "REC" indicator will disappear and stop the Datalogger.

5-3 Manual Datalogger (Set sampling time = 0 second)

a. Set sampling time is to 0 second

Press the "REC Button" (3-4, Fig. 1) once , the LCD will show the text "REC", then press the "Logger Button" (3-8, Fig. 1) once, the "REC" will flash once and the Beeper will sound once, at the same time the measuring data along the time information and the Position no. will be saved into the memory circuit.

Remark :
* *For the 4 channels measurement, the right lower Display will show the Position/Location no. (P1, P2... P99) and the T4 measurement value alternately.*
* *During execute the Manual Datalogger, use the "▲" Button (3-5, Fig. 1) or "▼" Button (3-6, Fig.1) to set the measuring position (1 to 99, for example room 1 to room 99) to identify the measurement location.*

b. Finish the Datalogger

Press the "REC Button" (3-4, Fig. 1) continuously at least two seconds, the "REC" indication will be disappear and stop the Datalogger.

5-4 Check time information

During the normal measurement (not execute the Datalogger). If you press "Time check Button" (3-7, Fig. 1) once, the lower LCD display will present the time information of Year/Month, Date/Hour, Minute/Second.

5-5 Check sampling time information

During the normal measurement mode (not execute the Datalogger), If you press "Sampling Button" (3-8, Fig. 1) once, the lower LCD display will present the Sampling time information in seconds.

5-6 SD Card Data structure

1) When using for the first time, the SD card will generate a folder:

   TMA01

2) When using for the first time, to execute the Datalogger, under the route TMA01\, will generate a new file name TMA01001.XLS.
   After this the Datalogger will save the data to the file TMA01001.XLS until the data column reaches 30,000 columns, then it will generate a new file. For example TMA01002.XLS

3) Under the folder TMA01\, if the total files are greater than 99 files, it will generate a new route, such as TMA02\ ....

4) The file's route structure :
   TMA01\
      TMA01001.XLS
      TMA01002.XLS

      ....
      TMA01099.XLS
   TMA02\
      TMA02001.XLS
      TMA02002.XLS

      ....
      TMA02099.XLS
   TMAXX\

      ....
      ....
      Remark : XX : Max. value is 10.

6. Saving data from the SD card to the computer (EXCEL software)

1) After executing the Data Logger function, remove the SD card from the "SD card socket" (3-18, Fig. 1).
2) Plug in the SD card into the Computer's SD card slot or insert the SD card into the "SD card adapter", then connect the "SD card adapter" into the computer.
3) Power ON the computer and run the " EXCEL software ". Down load the saving data file (for example the file name : TMA01001.XLS, TMA01002.XLS) from the SD card to the computer. The saved data will be displayed onto the EXCEL software screen (for example as the below EXCEL data screen). The user can use EXCEL data to make further Data or Graphic analysis.

EXCEL data screen (for example)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	A1			fx	Place									
1	Place	Date	Time	Value	Unit	Value	Unit	Value	Unit	Value	Unit			
2	1	2009/6/19	11:02:10	27.6	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
3	2	2009/6/19	11:02:11	27.6	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
4	3	2009/6/19	11:02:12	27.6	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
5	4	2009/6/19	11:02:13	27.6	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
6	5	2009/6/19	11:02:14	27.6	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
7	6	2009/6/19	11:02:15	27.7	T1 KTemp	27.7	T2 KTemp	27.7	T3 KTemp	27.7	T4 KTemp C			
8	7	2009/6/19	11:02:16	27.7	T1 KTemp	27.7	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
9	8	2009/6/19	11:02:17	27.7	T1 KTemp	27.7	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
10	9	2009/6/19	11:02:18	27.7	T1 KTemp	27.8	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
11	10	2009/6/19	11:02:19	27.7	T1 KTemp	27.8	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
12	11	2009/6/19	11:02:20	27.7	T1 KTemp	27.8	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
13	12	2009/6/19	11:02:21	27.7	T1 KTemp	27.8	T2 KTemp	27.8	T3 KTemp	27.8	T4 KTemp C			
14	13	2009/6/19	11:02:22	27.7	T1 KTemp	27.8	T2 KTemp	27.9	T3 KTemp	27.8	T4 KTemp C			
15	14	2009/6/19	11:02:23	27.7	T1 KTemp	27.8	T2 KTemp	27.9	T3 KTemp	27.8	T4 KTemp C			
16	15	2009/6/19	11:02:24	27.7	T1 KTemp	27.8	T2 KTemp	27.9	T3 KTemp	27.8	T4 KTemp C			
17	16	2009/6/19	11:02:25	27.7	T1 KTemp	27.8	T2 KTemp	27.9	T3 KTemp	27.8	T4 KTemp C			
18	17	2009/6/19	11:02:26	27.7	T1 KTemp	27.8	T2 KTemp	27.9	T3 KTemp	27.8	T4 KTemp C			
19	18	2009/6/19	11:02:27	27.7	T1 KTemp	27.9	T2 KTemp	27.9	T3 KTemp	27.9	T4 KTemp C			
20	19	2009/6/19	11:02:28	27.8	T1 KTemp	27.9	T2 KTemp	27.9	T3 KTemp	27.9	T4 KTemp C			
21	20	2009/6/19	11:02:29	29.3	T1 KTemp	27.9	T2 KTemp	27.9	T3 KTemp	27.9	T4 KTemp C			
22	21	2009/6/19	11:02:30	32.3	T1 KTemp	27.9	T2 KTemp	27.9	T3 KTemp	27.9	T4 KTemp C			
23	22	2009/6/19	11:02:31	32.3	T1 KTemp	30.1	T2 KTemp	27.9	T3 KTemp	27.9	T4 KTemp C			
24	23	2009/6/19	11:02:32	30.8	T1 KTemp	30.1	T2 KTemp	29.2	T3 KTemp	27.9	T4 KTemp C			

EXCEL graphic screen (for example)

7. ADVANCED SETTING

Under do not execute the Datalogger function,
press the "SET Button" (3-7, Fig. 1) for at least two
seconds will enter the "Advanced Setting" mode.
Pressing the "Next" Button (3-3, Fig. 1) will in
sequence select the seven main functions, the lower
display will show:

dAtE..... Set clock time (Year/Month/Date, Hour/Minute/
Second)
dEC...... Set SD card Decimal character
PoFF..... Auto power OFF management
bEEP..... Set beeper sound ON/OFF
t-CF...... Select the Temp. unit to °Cor °F
SP-t...... Set sampling time (Hour/Minute/Second)
Sd F..... SD memory card Format

Remark :
While executing the "Advanced Setting" function,
if you press the "ESC" Button (3-2, Fig. 1) once,
you will exit the "Advanced Setting" function,
the LCD will return to the normal screen.

7-1 Set clock time (Year/Month/Date,
Hour/Minute/Second)

When the lower display show " dAtE "

1) Press the "Enter" Button (3-4, Fig. 1) once,
   Use the "▲" Button (3-5, Fig. 1) or "▼" Button
   (3-6, Fig. 1) to adjust the value (Setting start from
   Year value). After the desired value is set, press the
   "Enter" Button (3-4, Fig. 1) once will go to the
   next value adjustment (for example, first setting
   value is Year then next to adjust Month, Date, Hour,
   Minute, Second value).

2) After setting all the time value (Year, Month, Date, Hour,
   Minute, Second),
   the screen will jump to " SD card Decimal character "
   setting screen (Chapter 7-2).

   Remark :
   After the time value is setting, the internal clock will
   run even when the Power is off.

7-2 Decimal point of SD card setting

The numerical data structure default is " . "
as the decimal. For example "20.6" "1000.53".
In certain countries (Europe) the " , " is used as
the decimal point. For example "20,6" "1000,53".

When the lower display shows "dEC"

1) Use the "▲" Button (3-5, Fig. 1) or "▲" Button
   (3-6, Fig. 1) to select the upper value to " bASI " or
   " Euro ".

   bASI - Use " . " as the Decimal point with default.
   Euro - Use " , " as the Decimal point with default.

2) After selecting the upper text to "bASI" or "Euro",
   pressing the "Enter" Button (3-4, Fig. 1) will save the
   setting function with default.

7-3 Auto power OFF management

When the lower display shows "PoFF"

1) Use the "▲" Button (3-5, Fig. 1) or "▲" Button
   (3-6, Fig. 1) to select the upper value to "yES" or "no".

   yES - Auto Power Off management will enable.
   no - Auto Power Off management will disable.

2) After selecting the upper text to "yES" or "no", pressing
   the "Enter" Button (3-4, Fig. 1) will save the setting
   function with default.

7-4 Set beeper sound ON/OFF

When the lower display shows "bEEP"

1) Use the "▲" Button " (3-5, Fig. 1) or "▼" Button "
   (3-6, Fig. 1) to select the upper value to " yES " or
   " no ".

   yES - Meter's beep sound will be ON with default.
   no - Meter's beep sound will be OFF with default.

2) After selecting the upper text to "yES" or "no", press the
   "Enter Button" (3-4, Fig. 1) will save the setting
   function with default.

7-5 Select the Temp. unit to °C or °F

When the lower display shows "t-CF"

1) Use the "▲" Button " (3-5, Fig. 1) or "▼" Button
   (3-6, Fig. 1) to select the upper Display text to "C" or
   "F".

   C - Temperature unit is °C
   F - Temperature unit is °F

2) After Display unit is selected to "C" or "F", press the
   "Enter" Button (3-4, Fig. 1) will save the setting
   function with default.

7-6 Set sampling time (SecondS)

When the lower display shows "SP-t"

1) Use the "▲" Button (3-5, Fig. 1) or "▼" Button
   (3-6, Fig. 1) to adjust the value (0, 1, 2, 5, 10, 30,60,
   120, 300, 600, 1800,3600 seconds).

   Remark :
   If selecting the sampling time to "0 second", the
   RDXL4SD will be ready for manual Datalogging.

2) After the Sampling value is selected, press the
   "Enter" Button (3-4, Fig. 1) will save the setting
   function with default.

7-7 SD memory card Format

When the lower display shows "Sd F"

1) Use the "▲" Button " (3-5, Fig. 1) or "▼" Button
   (3-6, Fig. 1) to select the upper value to "yES" or
   "no".

   yES - Intend to format the SD memory card
   no - Not execute the SD memory card format

2) If selecting the upper to "yES", press the "Enter" Button
   (3-4, Fig. 1), the display will show text "yES Ent".
   To confirm again, pressing the "Enter" button once
   will format the SD memory, clearing all existing
   data that was already saved on the SD card.

8. POWER SUPPLY from DC ADAPTER

The meter can be powered by the DC 9V Power Adapter (optional). Insert the plug of Power Adapter into "DC 9V Power Adapter Input Socket" (3-13, Fig. 1). The meter will power ON (The power Button function is disabled).
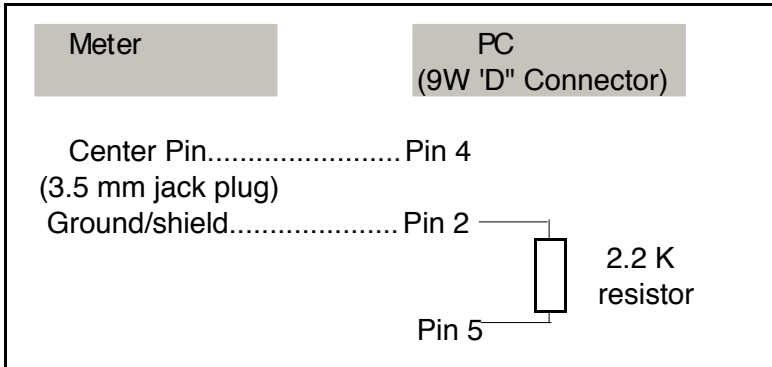
9. BATTERY REPLACEMENT

1) When the left corner of LCD display shows " ▭⊠ ", it is necessary to replace the batteries. However, in-spec. measurement may still be made for several hours after the low battery indicator appears before the instrument becomes inaccurate.
2) Remove the battery cover screws (3-15, Fig. 1) and remove the battery cover (3-16, Fig. 1) from the instrument and remove the battery.
3) Replace with DC 1.5 V battery (6-AA, Alkaline/heavy duty) and replace the cover.
4) Make sure the battery cover is secured after changing the batteries.

10. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-12, Fig. 1).

The data output is a 16 digit 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 port.

Meter	PC
	(9W 'D" Connector)

```
      Center Pin........................Pin 4
   (3.5 mm jack plug)
    Ground/shield.....................Pin 2 ─┐
                                            │  2.2 K
                                            │  resistor
                                     Pin 5 ─┘
```

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 :

| D15	Start Word	
D14	4	
D13	When send the upper display data = 1 When send the lower display data = 2	
D12, D11	Annunciator for Display	
	°C = 01	°F = 02	
D10	Polarity 0 = Positive 1 = Negative	
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP	

D8 to D1	Display reading, D1 = LSD, D8 = MSD
	For example :
	  If the display reading is 1234, then D8 to
	  D1 is : 00001234	

D0	End Word	

RS232 FORMAT : 9600, N, 8, 1

Baud rate	9600
Parity	No parity
Data bit no.	8 Data bits
Stop bit	1 Stop bit

11. OFFSET ADJUSTMENT

11-1 Type K/J/T/E/R/S offset adjustment
1) Set the function to Type K (or other type J/E/R/T/S).
2) Insert the probe to the T1 input socket (3-9, Fig. 1)
3) Pressing "Offset button" (3-8, Fig. 1) for at least
   two seconds then release, the display will show:

```
  SEt        oFS
  23.7       23.7
   ▲          ▲
measuring   adjust
value       value
```
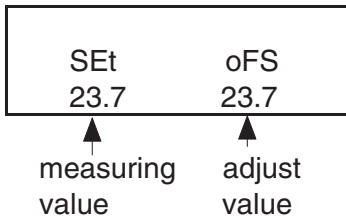
* If no probe is inserted into T1, the meter will display "Err"

* Use the " ▲ button "(3-5, Fig. 1) " ▼ button " (3-6 Fig. 1) to adjust the desired value on right bottom display.
* Pressing " Enter button " (3-4, Fig. 1) once, the adjustment value will be saved into memory, then return to normal measuring screen to finish the offset adjustment procedures.
* *The above offset adjustment for Type K/J/T/E/R/S is valid for T1, T2, T3, T4 at the same time.*

7-2 Pt 100 ohm offset adjustment
1) Set the function to Pt 100 ohm.
2) Insert a Pt 100 ohm probe to the PT1 (PT2) input socket.

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3) Pressing "Offset" button (3-8, Fig. 1)
   for at least two seconds then release, the
   display will show :

```
 ┌─────────────────────────┐
 │                         │
 │   SEt        oFS        │
 │   Pt 1       Pt 2       │
 └─────────────────────────┘
```

4) If you wish to make the offset adjustment for Pt 1, please
   insert the probe to PT1 input socket. Press the "L" button
   (3-5, Fig. 1) once, the display will show example as following.

   If you wish to make the offset adjustment for Pt 2, please
   insert the probe to PT2 input socket. Press the "R" button
   (3-6, Fig. 1) once, the display will show example as
   following.

```
 ┌─────────────────────────┐
 │                         │
 │   SEt        oFS        │
 │   23.7       23.7       │
 └─────────────────────────┘
      ▲          ▲
  measuring    adjust
    value      value
```

*If no probe is inserted
 into PT1, PT2 input
 socket, the meter
  will show "Err"*

* Use the "▲" button (3-5, Fig. 1) "▼" button (3-6,
  Fig. 1) to adjust the desired value on right bottom
  display.
* Pressing "Enter" button (3-4, Fig. 1) once, the
  adjustment value will be saved into the memory
  then return to normal measuring screen to finish
  the offset adjustment procedures.
 * *The above offset adjustment for Pt 100 ohm is
   valid for PT1, PT2 individually.*

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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

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1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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