

# REED



## Model SD-9300 Environment Meter/ Datalogger



## Instruction Manual

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**REED Instruments**

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## Features

- Meter functions as a Type K/J Thermometer, Humidity/Temperature Meter, Anemometer, Light Meter, and a Sound Level Meter (with the optional adapter)
- Humidity measurements shown in both %RH and Temp
- Anemometer can default the display unit to m/S, FPM, Km/h, mph, knot
- Light meter can display LUX or Ft-cd
- Real time SD memory card datalogger with a built-in clock and calendar
- Meter can switch to a Manual Datalogging
- No extra software needed, just plug the SD card into the computer and it downloads directly to EXCEL
- SD card capacity: 1 GB to 16 GB
- Easy to read LCD with backlight
- Auto power off or manual power off
- Data hold, record max. and min. reading
- Power by UM3/AA (1.5 V) x 6 batteries
- USB/RS232 Computer interface

## Specifications

Circuit:	Custom microprocessor LSI circuit
Display:	52mm x 38mm LCD with backlight
Auto Sampling Time:	1, 2, 5, 10, 30, 60, 120, 300, 600, 1800, 3600 seconds
Memory Card:	SD memory card, 1 GB to 16 GB
Sampling Time:	Approx. 1 second
Data Output:	USB/RS232 PC computer interface
Temperature Range:	0-50°C (0-122°F)
Resolution:	0.1°C/0.1°F

Accuracy:	± 0.8°C/1.5°F
Operating Temperature:	0-50°C (0-122°F)
Operating Humidity:	Less than 85% R.H.
Power Supply:	UM3/AA (1.5 V) x 6 batteries
Weight:	515g/1.13lb
Dimensions:	Main instrument: 135 x 60 x 33mm Probe: 105 x 46 x 29mm
Includes:	Multi-function Probe, hard carrying case, & batteries
Optional accessories:	4G SD Card (SD-4GB) Type K thermocouple probe (TP-01) Sound Adapter (SL-417) USB cable (USB-01) Power adapter (AP-9VA-110V) Data Acquisition Software (SW-U801-WIN) Tripod (BS-6)

Visit us at [www.reedinstruments.com](http://www.reedinstruments.com) for more information on our Optional Accessories, or e-mail us at [info@reedinstruments.com](mailto:info@reedinstruments.com)

### Air velocity

Measurement	Range	Resolution	Accuracy
m/S	0.4-30.0m/S	0.1m/S	±(2%+0.2 m/S)
Km/h	1.4-126.0Km/h	0.1Km/h	±(2%+0.8 Km/h)
Mph	0.9-78.3mph	0.1mph	±(2%+0.4 mph)
Knots	0.8-68.0 knots	0.1 Knots	±(2%+0.4 Knots)
FPM	79-6890 FPM	1 FPM	±(2%+40 FPM)

### Air Temperature

Measuring Range:	0 to 50°C (32 to 122°F)
Resolution:	0.1
Accuracy:	±0.8°C (±1.5°F)

*continued...*

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## Humidity

Measuring Range:	0% to 95%RH
Resolution:	0.1%RH
Accuracy:	70%RH: $\pm(3\% \text{ reading} + 1\% \text{ RH})$ ; < 70% RH: $\pm 3\% \text{ RH}$

## Light meter

Measuring Range:	0-20,000 LUX, 0-1,860 Ft-cd
Resolution:	1 LUX, 0.1 Ft-cd
Accuracy:	$\pm(5\% \text{ rdg} \pm 8 \text{ dgt})$

## Type K/J thermometer

Sensor Type	Resolution	Range	Accuracy
Type K	0.1°C	-50.0 to 1300.0°C	$\pm (0.4\% + 0.5^\circ\text{C})$
		-50.1 to -100.0°C	$\pm (0.4\% + 1^\circ\text{C})$
	0.1°F	-58.0 to 2372.0°F	$\pm (0.4\% + 1^\circ\text{F})$
		-58.1 to -148.0°F	$\pm (0.4\% + 1.8^\circ\text{F})$
Type J	0.1°C	-50.0 to 1200.0°C	$\pm (0.4\% + 0.5^\circ\text{C})$
		-50.1 to -100.0°C	$\pm (0.4\% + 1^\circ\text{C})$
	0.1°F	-58.0 to 2192.0°F	$\pm (0.4\% + 1^\circ\text{F})$
		-58.1 to -148.0°F	$\pm (0.4\% + 1.8^\circ\text{F})$

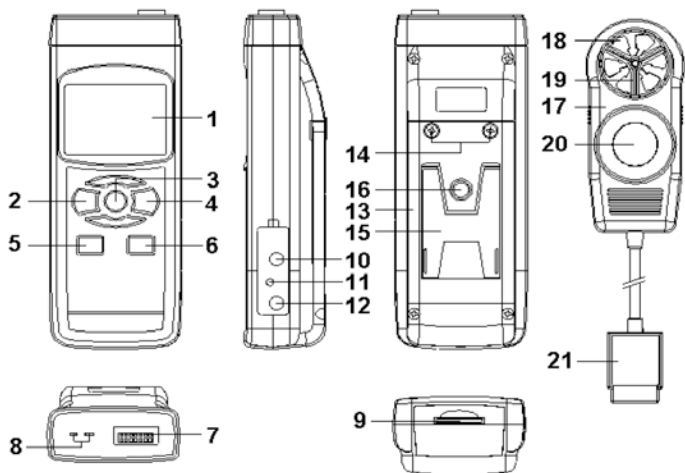
Above specification tests under the environment RF Field Strength less than 3 V/M & frequency less than 30 MHz only

For service on this or any other REED product or information on other REED products, contact REED Instruments at [info@reedinstruments.com](mailto:info@reedinstruments.com)

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# Instrument Description



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|---|---|
| 1. Display                                  | 12. AC/DC 9V Power Adapter Input Socket |
| 2. Power, ESC, & Backlight Button           | 13. Battery Compartment/Cover           |
| 3. Hold, Function, & Next Button            | 14. Battery Cover Screws                |
| 4. REC, Enter, & Unit Button                | 15. Stand                               |
| 5. SET, Down, & Time Check Button           | 16. Tripod Fix Nut                      |
| 6. Logger, Up, & Sampling Time Check Button | 17. Probe Head                          |
| 7. Probe input socket                       | 18. Anemometer vane                     |
| 8. Type K/J thermometer socket              | 19. Humidity/Temperature Sensor         |
| 9. SD card slot                             | 20. Light Sensor                        |
| 10. USB/RS232 Output                        | 21. Probe Plug                          |
| 11. Reset Button                            |   |

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# Operating Instructions

## *Function selection*

- 1) Turn on the meter by pressing the Power Button. To turn the meter, hold the Power Button for over 2 seconds.
- 2) The meter has 4 measuring functions to choose from: Air velocity/Temp, Humidity/Temp, Type K/J Thermometer, or Light Meter measurements. When the meter is on, press and hold the Function Button. The display will flash “An”, for Air velocity/Temperature measurement, “rH” for Humidity/Temperature measurement, “tP” for Type K/J Thermometer measurement, and “Llght” for Light measurements. Release the Function Button to choose the displayed function.

## *Air velocity/Temperature measurement*

- 1) Select the “An” function (see Function Select).
- 2) When the meter is off, plug the Probe Plug into the Probe Input Socket, then power on the meter by pressing the Power Button.
- 3) Hold the Probe Handle and face the Anemometer Head against the measuring airflow source. The top part of the Display will show the air velocity, and the lower part of the Display will show the air temperature value.

## *Changing the Air velocity unit*

To change the Air velocity unit, press and hold the Unit Button, while in the Air Measuring Function. The display will flash the units m/S, Km/h, mph, Knot, & FPM. Release the Unit Button to select the displayed unit. The selected unit will be saved as the default.

## *Humidity/Temperature measurement*

- 1) Select the “rH” function (see Function Select)
- 2) When the meter is off, plug the Probe Plug into the Probe Input Socket, then power on the meter by pressing the Power Button.
- 3) The top part of the Display will show the %RH value, and the lower part of the Display will show the temperature value.

## *Type K/J Thermometer measurement*

- 1) Select the “tP” function (see Function Select).
- 2) Plug the optional Type K or J Thermocouple Probe into the Type K/J Probe Input Socket. Be sure the Air Velocity Probe is not plugged in.
- 3) The screen will display a “K”, meaning it is configured for a Type K thermometer probe. The measured temperature will now be displayed on the display screen. To change the meter to accept a Type J Probe, please see the Advanced Settings section.

## *Light Meter measurement*

- 1) Select the “LigHt” function (see Function Select).
- 2) When the meter is off, plug the Probe Plug into the Probe Input Socket, then power on the meter by pressing the Power Button.
- 3) Hold the Probe Handle and face the Light Sensor against the measuring light source. The top part of the Display will show the light measurement value.

## *Changing the Light Meter unit*

To change the Light Meter unit, press and hold the Unit Button, while in the Light Meter Function. The display will flash the units LUX and Ft-cd. Release the Unit Button to select the displayed unit. The selected unit will be saved as the default.



## *Zero Adjustment*

While taking a Light Measurement, completely cover the light sensor. If the Display does not show value of zero, press and hold the Logger Button until the Display shows a zero value.

## *Sound Level measurement (optional probe required)*

- 1) Power off the meter.
- 2) Plug the optional Sound Adapter Plug into the Probe Input Socket and power on the Sound Adapter (for detailed operation procedures, please refer to its operation manual).
- 3) Power on the meter by pressing the Power Button. The meter's Display will show the symbol "Sound", then return to the normal measuring screen with the Display Unit dB. Now the meter is ready to take sound level measurements. The display will show the measuring sound value with unit "dB".

## *Data Hold*

While taking a measurement, press the Hold Button once and the measured value will hold on the screen, and a HOLD symbol will appear. Press the Hold Button once again will release the data hold function.

## *Data Record (Max., Min. reading)*

The data record function records the maximum and minimum readings. Press the REC Button once to start the Data Record function and a "REC" symbol will appear on the display. With the "REC" symbol on the display:

- 1) Press the REC Button once, and a "REC. MAX." symbol along with the maximum value will appear on the display. To delete the maximum value, press the Hold Button once and the display will show a "REC." symbol only and execute the memory function continuously.
- 2) Press the REC Button again, and a "REC. MIN." symbol along with the minimum value will appear on the display.

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To delete the minimum value, press the Hold Button once, and the display will show a “REC.” symbol only and execute the memory function continuously.

- 3) To exit the memory record function, press the REC button for 2 seconds. The display will revert to the current reading.

## *Backlight ON/OFF*

After powering the meter ON, the LCD Backlight will turn on automatically. While taking measurements, press the Backlight Button and the LCD Backlight will turn off. Press the Backlight Button once again to turn the LCD Backlight back ON.

## *Datalogger*

Preparation Before Executing the Datalogger Function:

- 1) Insert the optional SD card into the SD card socket.
- 2) Before you use an SD card with this meter for the first time, it is recommend to format the SD card. See Advanced Settings section of this manual for instructions.
- 3) If this is the first time the meter is used you need to adjust the clock. See Advanced Settings section of this manual for instructions.
- 4) Now you need to set the decimal format. The numerical data structure downloaded to the SD card is defaulted used the “.” as the decimal, for example “20.6” “1000.53”. But in certain countries the “,” is used as the decimal point, for example “20,6” “1000,53”. See Advanced Settings section of this manual for instructions on how to change the Decimal Character.

## *Auto Datalogger (Set sampling time $\geq 1$ second)*

- 1) Start Datalogging; press the REC Button, and the “REC” symbol will appear on the LCD screen, then press the Logger Button, the “REC” symbol will flash while the measuring data and time information is being saved in memory.

*continued...*

To set the sampling time, and to toggle the beeper sound on or off, refer to the Advanced Settings section of this manual.

- 2) Pause the Datalogging; while Datalogging, if press the Logger Button once. While paused, the “REC” symbol will stop flashing. Press the Logger Button again to resume Datalogging, and the “REC” symbol will begin to flash again.
- 3) Stop Datalogging; while the Datalogger function is paused, press the REC Button for 2 seconds. The “REC” symbol will disappear indicating the Datalogging function has stopped.

### *Manual Datalogger (Set sampling time = 0 seconds)*

- 1) Set sampling time is to 0 second; Press the REC Button, and the “REC” symbol will appear on the LCD screen. Press the Logger Button, and the “REC” symbol will flash once and one Beep will sound, at the same time the measuring data along the time information will be saved in memory. The lower Display will show the Position (record) number, which is saved as well.
- 2) To Change the Position Number; press the Down Button and the lower position number will flash on the display. Press the Up or Down Buttons to set the Position Number (1 to 99) to help identify the measurement location. The lower Display will show P x (x = 1 to 99). After the position number is selected, press the Enter Button to confirm.
- 3) Stop Datalogging; press the REC Button for 2 seconds, and the “REC” symbol will disappear indicating the Datalogging function has stopped.

### *Checking the Time*

During normal functions (not Datalogging), press the Time Check Button and the lower LCD display will show the Year, Month/Date, Hour/Minute.

### *Check Sampling Time Information*

During normal functions (not Datalogging), press the Sampling Button and the lower LCD display will show the Sampling Time Information.

## *SD Card Data Structure*

- 1) The first time the SD card is used in the meter, the SD card will generate a folder: EMA01
- 2) The first time you use the Datalogger, in the folder EMA01, a new file name EMA01001.XLS will be created. The Datalogger will use this file until the Data has reached to 30,000 rows. The meter will then will generate a new file with a subsequent number, for example EMA01002.XLS.
- 3) The folder EMA01 can hold 99.XLS files. When that number has been reached, the meter will then will generate a new folder with a subsequent number, for example EMA02. Max number of EMA-- folders is 10.

## *Data Transfer from SD card to Computer (EXCEL Software)*

- 1) After Datalogging, remove the SD card from the SD card slot.
- 2) Plug in the SD card into the Computer's SD card slot or insert the SD card into the optional SD card adapter and connect to your Computer. Turn your computer on and a folder will appear on your desktop representing you SD card.
- 3) Open "Microsoft EXCEL". Download the EXCEL files from the SD Card to the computer by opening up the SD folder and selecting the desired EXCEL files, and drag-and-drop them onto your Computer. Open the files with EXCEL (File – Open).
- 4) The EXCEL file will have the following column headers in this order: Place (Position Number), Date (Year/Month/Day), Time (in 24h clock), Value, and Unit.

# Advanced Settings

During normal functions (not Datalogging), press and hold the SET Button for 2 seconds to enter the “Advanced Setting” mode. Press the Next Button scroll through eight main functions, shown on the lower display:

**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

**tYPE** Select the Thermometer to Type K or Type J

**t-CF** Select the temperature unit to °C or °F

**SP-t** Set sampling time (Hour/Minute/Second)

**Sd F** SD memory card Format

While in the “Advanced Setting” function, press the Esc Button to exit and to return to normal functioning.

## *Set Clock Time*

- 1) When the lower display shows “dAtE”, press the Enter Button. Use the Up and Down Buttons to adjust the Year. After the desired value is set, press the Enter Button to adjust the Month, Date, Hour, Minute, and Second values.
- 2) After all the time values have been set the screen will jump to “SD card Decimal character” setting screen. To exit “Advanced Settings”, press the Esc Button.

**Note:** After the time value is set, the internal clock will run even when the power is off, if the battery is under normal conditions.

## *Setting the Decimal point on the SD Card*

- 1) When the lower display shows “dEC”, use the Up or Down Buttons to toggle between “bASIC” (“.” Decimal Point) or “Euro” (“,” Decimal Point).
- 2) After the Decimal point character has been selected, press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *Auto power OFF management*

- 1) When the lower display shows “PoFF”, use the Up or Down Buttons to select the value “yES” (Enable Auto Power Off) or “no” (Disable Auto Power Off).
- 2) After selecting “yES” or “no”, press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *Set Beeper Sound ON/OFF*

- 1) When the lower display shows “bEEP”, use the Up or Down Buttons to select “yES” (Beeper Sound is ON) or “no” (Beeper Sound is OFF).
- 2) After selecting “yES” or “no”, press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *Select the Thermometer to Type K or Type J*

- 1) When the lower display shows “tYPE”, use the Up or Down Buttons to select “K” (for Type K Thermometer) or “J” (for Type J Thermometer).
- 2) After selecting “K” or “J”, press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *Select the Temperature unit to °C or °F*

- 1) When the lower display shows “t-CF”, use the Up or Down Buttons to select “C” (for °C) or “F” (for °F).
- 2) After selecting “C” or “F”, press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *Set sampling time*

- 1) When the lower display shows “SP-t”, use the Up or Down Buttons to adjust the value to either 0, 1, 2, 5, 10, 30,60, 120, 300, 600, 1800, or 3600 seconds.
- 2) After the Sampling value is selected, press the press the Enter Button to save the setting as the default. To exit “Advanced Settings”, press the Esc Button.

## *SD memory card Format*

**Please Note:** Formatting the SD card erases all data from that SD card.

- 1) When the lower display shows “Sd F”, use the Up or Down Buttons to select “yES” (format the SD card) or “no” (do not format the SD card).
- 2) To format your SD card, select “yES” and press the Enter Button. The Display will show “yES Enter”, to confirm. Press the Enter Button to confirm.

## PC Serial Interface

The instrument features an PC output via 3.5 mm terminal. The connector output is a 16 digit data stream which can be utilized to the user's specific application. An USB RS232 lead with the following connection will be required to link the instrument with the PC serial input.

Meter (3.5mm Jack Plug)	PC (9W "D" Connector)
Center Pin	Pin 2
Ground/Shield	Pin 5

The 16 digit 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


D0	End Word
D1 to D4	Upper Display reading, D1= LSD, D4= MSB
D5 to D8	D5=? D6=? D7=? D8=?
D9	Decimal Point ( DP) for display 0 = No DP, 1 = 1 DP, 2 = 2 DP, 3 = 3 DP
D10	D10 = 0
D11	D11 = 0
D12	D12 = 0
D13	D13 = 0
D14	D14 = 0
D15	Start Word



## System Reset

If an error occurs, press the Reset Button with a Pin. If the Reset Button does not fix the error, please send in the unit to our Calibration Lab for repair. E-mail [info@reedinstruments.com](mailto:info@reedinstruments.com) for more information.

## Battery Replacement

- 1) When the left corner of LCD display shows , it is necessary to replace the battery
- 2) Loosen the screws of the Battery Cover and remove
- 3) Remove the batteries and replace with Six DC 1.5 V batteries (UM3, AA, Alkaline/heavy duty)
- 4) Make sure the battery cover is properly secured after changing the battery

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## Notes

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