SD card real time data logger
4 in 1 + Photo tach., IR Temp., Type K/J Temp.
Acceleration, Velocity

VIBRATION METER

Model : VB-8227SD

Your purchase of this 4 in 1 Vibration METER with SD CARD DATA LOGGER marks a step forward for you into the field of precision measurement. Although this meter a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MANUAL

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1. FEATURES

* Multi-function ,4 in 1 one meter combine :
  1. Vibration meter, 2. Photo Tachometer,
  3. IR Thermometer, 4. Type K/J Thermometer.
* Applications for industrial vibration monitoring :
  All industrial machinery vibrates. The level of vibration is a useful guide to machine condition. Poor balance, misalignment & looseness of the structure will cause the vibration level increase, it is a sure sign that the maintenance is needed.
* Frequency range 10 Hz - 1 kHz, sensitivity relative meet ISO 2954.
* Professional vibration meter supply with vibration sensor & magnetic base, full set.
* Metric & Imperial display unit.
* Acceleration, Velocity measurement.
* RMS, Max hold, Peak value measurement.
* Max. Hold reset button, Zero button.
* Wide frequency range.
* Data hold button to freeze the desired reading.
* Memory function to record maximum and minimum reading with recall.
* Separate vibration probe with magnetic base, easy operation.
* Real time SD memory card Datalogger, it Built-in Clock and Calendar,real time data recorder , sampling time set from 0 second to 3600 seconds.
* Manual datalogger is available (set the sampling time to 0), during execute the manual datalogger function, it can set the different position (location) No. (position 1 to position 99).
* Innovation and easy operation, computer is not need to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can down load the all the measured value with the time information (year/month/date/ hour/ minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves.

* SD card capacity : 1 GB to 16 GB.
* LCD with white light backlight, easy reading.
* Can default auto power off or manual power off.
* Data hold, record max. and min. reading.
* Microcomputer circuit, high accuracy.
* Power by UM3/AA (1.5 V) x 6 batteries or DC 9V adapter.
* RS232/USB PC COMPUTER interface.

2. SPECIFICATIONS

2-1 General Specifications

<table>
<tr><td>Circuit</td><td colspan="3">Custom one-chip of microprocessor LSI
circuit.</td></tr>
<tr><td>Display</td><td colspan="3">LCD size : 52 mm x 30 mm
LCD with white backlight (ON/OFF).</td></tr>
<tr><td>Measurement</td><td colspan="3">Velocity, Acceleration, Type k/J Thermometer,
IR Thermometer , Photo tachometer.</td></tr>
<tr><td>Function</td><td colspan="3">Acceleration, Velocity : RMS, Peak, Max Hold,
Type k/J Thermometer , IR Thermometer ,
Photo tachometer</td></tr>
<tr><td rowspan="3">Unit</td><td>Measurement</td><td>Metric</td><td>Imperial</td></tr>
<tr><td>Acceleration</td><td>meter/s^2, g</td><td>ft/s^2,</td></tr>
<tr><td>Velocity</td><td>mm/s, cm/s</td><td>inch/s</td></tr>
<tr><td>Vibration Frequency
Frequency range</td><td colspan="3">10 Hz to 1 KHz
* Sensitivity relative during
the frequency range meet ISO 2954
Refer to table 1, page 32</td></tr>
<tr><td>Circuit</td><td colspan="3">Exclusive microcomputer circuit.</td></tr>
<tr><td>Peak
Measurement</td><td colspan="3">Acceleration, Velocity :
To measure and update the peak value.
Displacement :
To measure and update the peak to peak (p-p) value.</td></tr>
</table>

Max Hold Measurement	*Acceleration, Velocity :* To measure and update the max. peak value.	
Zero Button	Under Vibration measurement Function, sensor motionless , press two(▼, ▲)Buttons (3-5, 3-6, Fig. 1) >3 seconds.	
Max. Hold Reset Button	Under Max. hold measurement, press two(▼, ▲) Buttons (3-5, 3-6, Fig. 1) >3 seconds.	
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 vibration unit * Set sampling time * Set Temp. unit * SD memory card Format * Set Thermocouple Type	
Data error no.	≦ 0.1 % no. of total saved data typically.	
Data Hold	Freeze the display reading.	
Memory Recall	Maximum & Minimum value.	

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.*
Sampling Time of Display	Approx. 1 second.
Operating Temperature and Humidity	0 to 50 ℃. Less than 85% R.H.
Power Supply	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent.
	* 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 25 mA.
	When SD card save the data and LCD Backlight is OFF) : Approx. DC 54 mA.
Weight	*Meter :* 258 g/ 0.57 LB.
	Probe with cable and magnetic base : 74g/0.16 LB
Dimension	*Meter :* 189 x 68 x 45 mm *Vibration sensor probe:* Round 16 mm Dia. x 35 mm. Cable length : 1.2 meter.
Accessories Included	* Instruction manual..... 1 PC * Hard carrying case(CA-06)..... 1 PC * Vibration sensor with cable..... 1 PC * Magnetic base..... 1 PC * Photo tachometer reflecting type marke (600mm)..... 1 PC
Optional Accessories	SD Card (4 G) AC to DC 9V adapter. USB cable, USB-01. RS232 cable, UPCB-02. Data Acquisition software,SW-U801-WIN.

2-2 Electrical Specifications (23±5 ℃)

VIBRATION

Acceleration (RMS, Peak, Max Hold)

Unit	m/s^2
Range	0.5 to 199.9 m/s^2
Resolution	0.1 m/s^2
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 m/S^2 (160 Hz)

Unit	g *@ 1 g = 9.8 m/s^2*
Range	0.05 to 20.39 G
Resolution	0.01 G
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 m/S^2 (160 Hz)

Unit	ft/s^2
Range	2 to 656 ft/s^2
Resolution	1 ft/s^2
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 m/S^2 (160 Hz)

Remark :

RMS : To measure the true RMS value.

Peak : To measure and update the peak value.

Max. Hold : To measure and update the max. peak value.

Velocity (RMS, Peak, Max Hold)

Unit	mm/s
Range	0.5 to 199.9 mm/s
Resolution	0. 1 mm/s
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 mm/s (160 Hz)

Unit	cm/s
Range	0.05 to 19.99 cm/s
Resolution	0. 01 cm/s
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 mm/s (160 Hz)

Unit	inch/s
Range	0.02 to 7.87 inch/s
Resolution	0.01 inch/s
Accuracy	±(5 % + 2 d) reading *@ 160 Hz, 80 Hz, 23 ± 5 ℃*
Calibration Point	50 mm/s (160 Hz)

Remark :

RMS : To measure the true RMS value.

Peak : To measure and update the peak value.

Max. Hold : To measure and update the max. peak value.

Type K/J thermometer

Sensor Type	*Resolution*	*Range*	*Accuracy*
Type K	0.1 ℃	-50.0 to 1300.0 ℃	± (0.4 % + 0.5 ℃)
		-50.1 to -100.0 ℃	± (0.4 % + 1 ℃)
	0.1 ℉	-58.0 to 2372.0 ℉	± (0.4 % + 1 ℉)
		-58.1 to -148.0 ℉	± (0.4 % + 1.8 ℉)
Type J	0.1 ℃	-50.0 to 1200.0 ℃	± (0.4 % + 0.5 ℃)
		-50.1 to -100.0 ℃	± (0.4 % + 1 ℃)
	0.1 ℉	-58.0 to 2192.0 ℉	± (0.4 % + 1 ℉)
		-58.1 to -148.0 ℉	± (0.4 % + 1.8 ℉)

IR thermometer

Emissivity	0.95 fixed value
Spectral response	6 to 14 μm (wavelength)
Field of View D/S	D/S =Approx. 6:1 ratio (D = distance, S =spot)

Unit	*Range*	*Resolution*	*Accuracy*
℃	*-30 to 305 ℃*	*0.1 ℃*	*± 3% of reading or ±3 ℃*
℉	-22 to 581 ℉	0.1 ℉	± 3% of reading or ±5 ℉

PHOTO Tachometer

Measurement & Range	*Photo Tachometer :* 5 to 99,999 RPM.
Resolution	RPM: 0.1 RPM (< 1,000 RPM). 1 RPM (≧1,000 RPM).
Accuracy	±(0.05% + 1 digit).
Photo Tachometer detecting distance	80 to 150 mm/2 to 6 inch. (typical max. 300 mm/12 inch, depending upon ambient light). * *Spec. of detecting distance are that under the size of reflecting tape is 10 mm square & the measuring RPM value is 1,800 RPM. The max. & min. detecting distance may change under different environment, different reflecting tape or the measuring RPM beyond 1800 RPM.*

3. FRONT PANEL DESCRIPTION

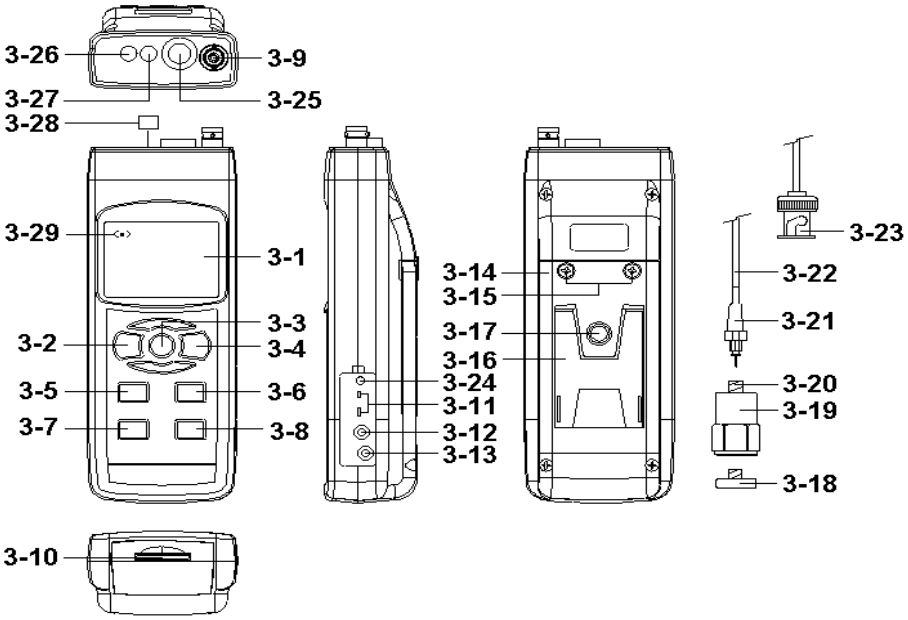


Fig. 1

3-1 Display
3-2 Power Button (Backlight Button)
3-3 Hold Button
3-4 MAX/MIN Button
3-5 UNIT Button (▲ Button)
3-6 FUNCTION Button (▼ Button)
3-7 SET Button (Time Button)
3-8 LOG Button (ENTER Button)
3-9 BNC Input Socket
3-10 SD Card Socket
3-11 Type K/J Input Socket
3-12 RS-232 Output Terminal
3-13 DC 9V Power Adapter Input Socket
3-14 Battery Compartment/Cover
3-15 Battery Cover Screws
3-16 Stand
3-17 Tripod Fix Nut
3-18 Magnetic Base
3-19 Vibration Sensor
3-20 Input Socket of Vibration Sensor
3-21 Mini Plug of Cable
3-22 Sensor Cable
3-23 Cable BNC Plug
3-24 Reset Button
3-25 IR Thermometer Detect
3-26 Photo Tachometer Detect
3-27 Laser light beam Indicator
3-28 Reflecting Mark
3-29 Moniter indicator Mark

4. MEASURING PROCEDURE

During power on, press the " Function button " continuously (not release the button), the Display will show the following text in sequence :

Display text	*Function*
VB	Vibration meter
TYPE	Type K/J Thermometer
IR	IR Thermometer.
PHOTO	Photo Tachometer

Until the Display show the desired function, just release the " Function button " , the meter will execute this function with default.

4-1 Vibration Mesuring Procedure Preparation

A. Preparation

1) Power on the meter by pressing the " Power button " (3-2, Fig. 1) > 2 seconds continuously.
   * *After already power on the meter, pressing the " Power button " > 2 seconds continuously will turn off the meter.*
2) Plug in the " Cable BNC Plug " (3-23, Fig. 1) to the " BNC Input Socket " (3-9, Fig. 1).
3) Plug in the " Mini plug of cable " (3-21, Fig. 1) to the " Input socket of vibration sensor " (3-20, Fig. 1).

   Remark :

   1. *If the surface material of measuring article is not the ferrous material, hold the vibration sensor by hand & touch the sensor to the surface of the measuring article.*

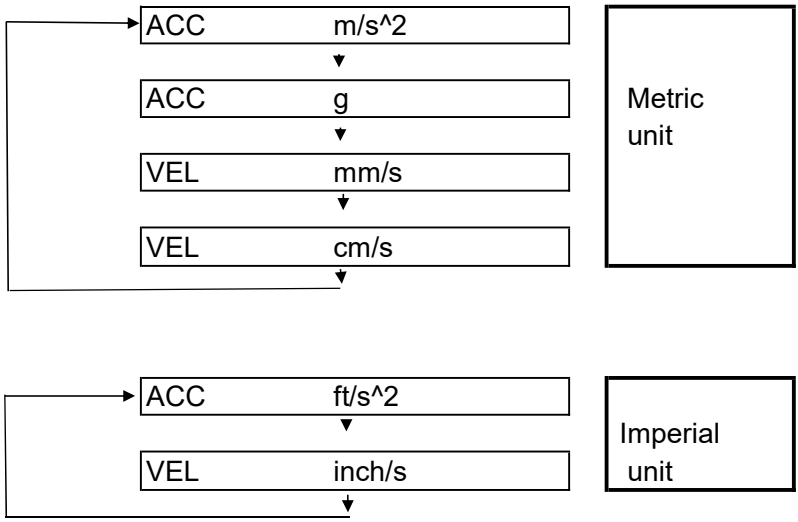
   * *If the surface material of measuring article is the ferrous material, connect " Vibration sensor " (3-19, Fig. 1) with the " Magnetic base " (3-18, Fig. 1) Put the whole unit (Vibration sensor and Magnetic base) to the surface of measuring article.*

* *Please do not use the finger or hand to touch the the " Sensor cable " (3-22, Fig. 1).*

B. Vibration Unit selection (Acc./Velocity selection)

Select the desired display unit by pressing the " UNIT Button " (3-5, Fig. 1) once , the Display will show the following units according Acceleration/Velocity in sequence.

Measurement	***Unit***
Acceleration ** LCD show " ACC "*	m/s^2, g, ft/s^2
Velocity ** LCD show " VEL "*	mm/s, cm/s, inch/s



Remark :

1. *For the Acceleration measurement, the Display will show the indicator " ACC "*
2. *For the Velocity measurement, the Display will show the indicator " VEL "*

3 *For general applications of industrial vibration monitoring, select " Velocity " or " Acceleration " typically.*

4. *After select the unit will be saved into the circuit with default.*

C. Function selection

Select the desired function (RMS, Peak, Max HOLD)
by short push the " FUNCTION Button " (3-6, Fig. 1)
until the Display will show the desiring function (RMS, Max HOLD, Peak) .

Remarks :

1. *RMS measurement is intend to measure and root means square (RMS) value. The Display will show the indicator " RMS ".*
2. *Max HOLD measurement is intend to measure and update the max. peak value. The Display will show the indicator " MAX HOLD ".*

Max hold reset procedures

Under execute the Max Hold function if press the " ▲ Button " (3-5, Fig. 1) and " ▼ Button " (3-6, Fig. 1) together > 3 seconds will clear the existing Max hold value.

3. *Peak measurement is intend to measure the peak vibration value.*
   The Display will show the indicator " PEAK ".
4. *After select the unit will be saved into the circuit with default.*
5. *Acceleration and Velocity measurement can select 3 function : RMS, PEAK, MAX HOLD*
   * *Typically, for Acceleration and Velocity measurement always select to the " RMS " measurement.*

D. Zero adjustment procedures

Due to drift of environment temperature value, battery power change, meter used for a long time or other reasons. The display value may exist not zero value (few digits) in case of no signal into the " Vibration Sensor ". General speaking those not zero value will not effect the measurement typically. However if intend to make the precision measurement, the following zero adjustment procedures should be executed as :

1) Vibration sensor is ready, connect the " Cable BNC Plug " (3-23, Fig. 1) into the "BNC Input socket " (3-9, Fig. 1).
2) Select the measurement to the "Vibration Function "
3) Keep the vibration sensor motionless, no signal into the vibration sensor.
4) Under " Vibration Function" measurement if press the " ▲ Button " (3-5, Fig. 1) and " ▼ Button " (3-6, Fig. 1) together > 3 seconds will let the display reach zero value.
5) The zero adjustment can be execute only the display value show the no. less than 10 digits.

4-2 PHOTO TACHOMETER Mesuring Procedure

1) Power On the meter by pressing and hold the " Power button " (3-2, Fig. 1) > 2 seconds , the LCD will light.
2) Press and hold the " Function button " (3-6, Fig. 1) in sequence until to the " PHOTO " function be selected, in the same time the " Photo light beam " (3-27, Fig. 1) will be generated.
3) Apply a " Reflecting mark " (3-28, Fig. 1) to the object being measured. and align the " Laser light beam " (3-27, Fig. 1) with the applied target. Verify that the " Monitor Indicator " (3-29, Fig. 1) lights when the target pass through the light beam.
4) when test value stable ,press " HOLD " button " (3-3, Fig. 1) once , the test value will be keep in display .

Measuring consideration :
If the measured RPM values is very low (for example less than 50 RPM), recommend to attach more " Reflecting Marks " average to the object. It will get the real RPM with high resolution, precisely & fast sampling time when divided the reading values by the no. of the " Marks ".

4-3 Type K Thermometer Mesuring Procedure

1) Power On the meter by pressing and hold the " Power button " (3-2, Fig. 1) > 2 seconds, the LCD will light.
2) Press and hold the " Function button " (3-6, Fig. 1) in sequence until to the " TYPE K " function be selected.
3) type k probe inserted into the thermocouple probe terminal " thermocouple probe terminal " (3-11, Fig. 1).
4) The display will show type k probe sensing temperature value.

4-4 Infrared Thermometer Mesuring Procedure

NON-CONTACT TEMPERATURE MEASUREMENTS

1) Power On the meter by pressing and hold the "power button " (3-2, Fig. 1) > 2 seconds, the LCD will light.
2) Press and hold the " Function button " (3-6, Fig. 1) in sequence until to the " IR " function be selected.
3) Use the Laser light pointer to identify the exact spot to be measured.
4) The area of the surface to be measured must be larger than the spot size as determined by the distance to spot size specification.
5) when test value stable ,press " HOLD " button " (3-3, Fig. 1) once , the test value will be keep in display .
6) pressing and hold the " HOLD " buttom " (3-3, Fig. 1)" > 1 second laser light point will be on, release the " HOLD " button " (3-3, Fig. 1), the laser light point will be off.

4-5 Data Hold

During the measurement, press the " Hold Button " (3-3, Fig. 1) once will hold the measured value & the LCD will display a " HOLD " symbol.
Press 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 reading. 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.
   b) Press the " REC Button " (3-4, Fig. 1) again, the " REC MIN " symbol along with the minimum value will appear on the display.

c) Press the " REC Button " (3-4, Fig. 1) again, the " MIN " symbol will be disappeared, LCD only show the " REC " symbol, the meter start the Data Record function again.

3) To exit the memory record function, just press the " REC Button " (3-4, Fig. 1) > 3 seconds continuously. The display will revert to the current reading.

4-7 LCD Backlight ON/OFF

1) After power ON, the " LCD Backlight " will light automatically. During the measurement, push the " Backlight Button " (3-2, Fig. 1) once will turn OFF the " LCD Backlight ".
2) Push the " Backlight Button " once will turn ON the " LCD Backlight " again.

5. DATALOGGER

5-1 Preparation before execute datalogger function

a. Insert the SD card
Prepare a " SD memory card " (1 G to 16 G, optional),
insert the SD card into the " SD card socket " (3-10, Fig. 1).
front panel of the SD card should face against the down case.

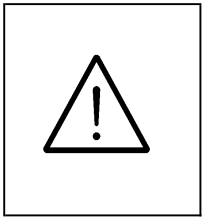
* ***It recommend use memory card's capacity is $\leq$ 4 GB.***

b. SD card Format
If SD card just the first time use into the meter, it
recommend to make the " SD card Format " at first ,
please refer chapter 7 & 7-6 (page 23 & page 26).

* ***It recommend strongly, do not use memory cards that have been formatted by other meter or by other installation (such as camera...). Reformat the memory card with your meter.***
* ***If the SD memory card exist the trouble during format by the meter, use the Computer to reformat again can fix the problem.***

c. Time setting
If the meter is used at first time, it should to adjust the
clock time exactly, please refer chapter 7 & 7-1 (page 23 & page 24).

d. Decimal format



The numerical data structure of SD card is default used the " . " as the decimal, for example "20.6" "1000.53" . But in certain countries (Europe ...) is used the " , " as the decimal point, for example " 20, 6 " "1000,53". Under such situation, it should change the Decimal character at first, details of setting the Decimal point, refer to Chapter 7 & 7-5, page 23 & page 26.

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

a. Start the datalogger

Press the " LOG Button (3-8, Fig. 1) > 3 seconds continuously, the Top LCD will show the " LOGGER " indicator and flashing per sampling time, at the same time the measuring data along the time information will be saved into the memory circuit.

Remark :

* *How to set the sampling time, refer to Chapter 7 & 7-2, (page 23 & page 24).*
* *How to set the beeper sound is enable, refer to Chapter 7 & 7-4, (page 23 & page 25).*

b. Pause the datalogger

During execute the Datalogger function, if press the " LOG Button " (3-8, Fig. 1) once will pause the Datalogger function (stop to save the measuring data into the memory circuit temporally). In the same time the " LOGGER " will be no flashing.

Remark :
If press the " LOG Button " (3-8, Fig. 1) once again will execute the Datalogger again, the top text of " LOGGER " will flashing.

c. Finish the Datalogger

During execute the Datalogger function, press the " LOG Button (3-8, Fig. 1) > 3 seconds continuously again will finish the Datalogger function, the " LOGGER " indicator will be disappeared and finish the Datalogger function.

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

a. Set sampling time is to 0 second

Press and hold the " LOG Button (3-8, Fig. 1) > 3 seconds , the Top LCD will show the indicator " LOGGER ", then press the " LOG Button " (3-8, Fig. 1) once, the top indicator " LOGGER " will flashing once and Beeper will sound once, at the same time the measuring data along the time information will be saved into the memory circuit. The upper Display will show the Position (Location) no. and saved into the SD card too.

During execute the Manual Datalogger, it can 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 , the upper Display will show P = x (x = 1 to 99).

b. Finish the Datalogger

During execute the Datalogger function, press the " LOG Button (3-8, Fig. 1) > 3 seconds continuously again will finish the Datalogger function, the " LOGGER " indicator will be disappeared and finish the Datalogger function.

5-4 Check time information

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

5-5 SD Card Data structure

1) When the SD card is used into the meter, with first time the SD card will generate a folder :

   VBF01

2) If the first time to execute the Datalogger, under the route VBF01\, will generate a new file name VBF01001.XLS.
   After exist the Datalogger, then execute again, the data will save to the VBF01001.XLS until Data column reach to 30,000 columns, then will generate a new file, for example VBF01002.XLS
3) Under the folder VBF01\, if the total files more than 99 files, will generate a new route, such as VBF02\ .....

4) The file's route structure :

VBF01\

VBF01001.XLS
VBF01002.XLS
.....
VBF01099.XLS

VBF02\

VBF02001.XLS
VBF02002.XLS
.....
VBF02099.XLS

VBFXX\

.....
.....

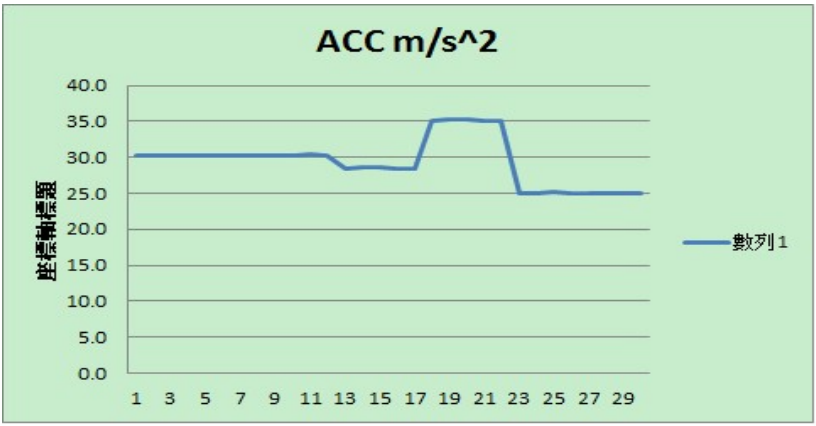
Remark :

XX : Max. value is 10.

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

1) After execute the Data Logger function, take away the SD card from the " SD card socket " (3-10, Fig. 1).
2) Plug in the SD card into the Computer's SD card slot (if your computer build in this installation) 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 : VBF01001.XLS, VBF01002.XLS) from the SD card to the computer. The saving data will present into the EXCEL software screen (for example as following EXCEL data screens) , then user can use those EXCEL data to make the further Data or Graphic analysis usefully.

	A	B	C	D	E	F
14	Place	Date	Time	Value	Unit	
15	1	2015/12/23	14:12:19	30.2	ACC m/S^2	
16	2	2015/12/23	14:12:21	30.3	ACC m/S^2	
17	3	2015/12/23	14:12:23	30.3	ACC m/S^2	
18	4	2015/12/23	14:12:25	30.2	ACC m/S^2	
19	5	2015/12/23	14:12:27	30.2	ACC m/S^2	
20	6	2015/12/23	14:12:29	30.3	ACC m/S^2	
21	7	2015/12/23	14:12:31	30.2	ACC m/S^2	
22	8	2015/12/23	14:12:33	30.2	ACC m/S^2	
23	9	2015/12/23	14:12:35	30.3	ACC m/S^2	
24	10	2015/12/23	14:12:37	30.3	ACC m/S^2	
25	11	2015/12/23	14:12:39	30.4	ACC m/S^2	
26	12	2015/12/23	14:12:41	30.2	ACC m/S^2	
27	13	2015/12/23	14:12:43	28.5	ACC m/S^2	
28	14	2015/12/23	14:12:45	28.6	ACC m/S^2	
29	15	2015/12/23	14:12:47	28.6	ACC m/S^2	



7. ADVANCED SETTING

Under do not execute the Datalogger function, hold the " SET Button " (3-7, Fig. 1) continuously at least 3 seconds will enter the " Advanced Setting " mode, then press the " SET Button " (3-7, Fig. 1) once a while in sequence to select the nine main function, the lower display will show :

DATE.....	Set clock time (Year/Month/Date, Hour/Minute/Second)
SP-T.....	Set sampling time (Second)
POFF.....	Auto power OFF management
BEEP.....	Set beeper sound ON/OFF
DEC.....	Set SD card Decimal character
SD- F.....	SD memory card Format
UNIT.....	Select METRIC or IMPERIAL unit .
t-CF.....	Select the Temp. unit to ℃ or ℉
tYPE.....	Select the Thermometer to Type K or Type J

Remark :
During execute the " Advanced Setting " function, if press " POWER Button " (3-2 , Fig. 1) once will exit the " Advanced Setting " function, the LCD will return to normal screen.

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

When the lower display show " dAtE "

1) Press " Enter button " once ,Then Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to adjust the value (Setting start fromYear value). After the desired value is set, press the " Enter Button " (3-8, Fig. 1) once will going to next value adjustment (for example, first setting value is Year then next to adjust Month, Date, Hour, Minute, Second value).

   Remark :
   The adjusted value will be flashed.

2) After set all the time value (Year, Month, Date, Hour, Minute, Second), press the " ENETER Button " (3-8, Fig. 1) once will save the time value.

   Remark :
   After the time value is setting, the internal clock will run precisely even Power off , if the battery is under normal condition (No low battery power).

7-2 Set sampling time (SecondS)

When the lower display show " 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).
2) After the Sampling value is selected, press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

7-3 Auto power OFF management

When the lower display show " PoFF "

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

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

2) After select the upper text to " yES " or " no ", press the " ENTER Button " (3-8, Fig. 1) will save the setting function with default.

7-4 Set beeper sound ON/OFF

When the lower display show " bEEP "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to select the upper text 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 select the upper text to " yES " or " no ", press the " ENTER Button " (3-8, Fig. 1) will save the setting function with default.

7-5 Decimal point of SD card setting

The numerical data structure of SD card is default used the " . " as the decimal, for example "20.6" "1000.53" . But in certain countries (Europe ...) is used the " , " as the decimal point, for example " 20,6 " "1000,53". Under such situation, it should change the Decimal character at first.

When the lower display show " dEC "

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

   USA - Use " . " as the Decimal point with default.
   EURO - Use " , " as the Decimal point with default.

2) After select the upper text to " USA " or " EURO ", press the " ENTER Button " (3-8, Fig. 1) will save the setting function with default.

7-6 SD memory card Format

When the lower display show " Sd F "

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

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

2) If select the upper to " yES ", press the " Enter Button " (3-8, Fig. 1) once again, the display will show text " yES Enter " to confirm again, if make sure to do the SD memory card format, then press " Enter Button " once will format the SD memory clear all the existing data that already saving into the SD card.

7-7 Select the Vibration unit to Metric or Imperial

When the lower display show " UNIT "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to select the upper Display text to " METRIC " or " IMPERIAL ".
   METRIC - Vibration unit is METRIC.
   IMPERIAL - Vibration unit is IMPERIAL.

2) After Display unit is selected to " METRIC " or " IMPERIAL ", press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

7-8 Select the Temp. unit to ℃ or ℉

When the lower display show " 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 ℃
   F - Temperature unit is ℉

2) After Display unit is selected to " C " or " F ", press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

7-9 Select the Thermometer to Type K or Type J

When the lower display show " tYPE "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to select the Display unit to " K " or " J "

   K - Type K thermometer
   J - Type J thermometer

8. POWER SUPPLY from DC ADAPTER

The meter also can supply the power supply from the DC 9V Power Adapter (optional). Insert the plug of Power Adapter into " DC 9V Power Adapter Input Socket " (3-13, Fig. 1).

9. 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 before the instrument become inaccurate.

2) Loose the screws of the " Battery Cover Screws " (3-15, Fig. 1) and take away the " Battery Cover " (3-14, Fig. 1) from the instrument and remove the battery.

3) Replace with DC 1.5 V battery (UM3, AA, Alkaline/heavy duty) x 6 PCs, and reinstate the cover.

4) Make sure the battery cover is secured after changing the battery.

10. SYSTEM RESET

If the meter happen the troubles such as :

CPU system is hold (for example, the key button can not be operated...).

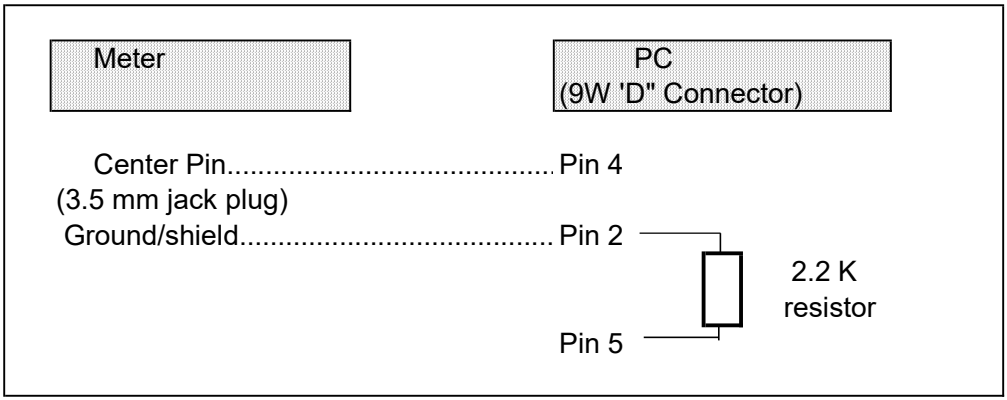
Then make the system RESET will fix the problem.
The system RESET procedures will be either following method :

During the power on, use a pin to press the " Reset Button " (3-24, Fig. 1) once a while will reset the circuit system.

11. 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.



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	1		
D12, D11	Annunciator for Display		
	m/s^2 = 92	ft/s^2 = 97	
	mm/s = 93	cm/s = 95	inch/s = 98
	mm = 94	inch = 96	g = 57
D10	0		
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

12. CLASSIFICATION RANGES

For the valuation of machines and equipment in the ISO 2372 and VDI 2056, four different kinds of machine groups with four classification ranges and their limits for vibration severity (mm/s) are determined.

The classifications for each machine group are specified as follows :

Small machines, especially production electrical motors of up to 15 KW (Group K)

Good	0 to 0.71 mm/s
Acceptable	0.72 to 1.80 mm/s
Still permissible	1.81 to 4.5 mm/s
Dangerous	> 4.5 mm/s

Medium sized machines, especially electrical motors with 15 up to 75 KW output, without special foundations (Group M)

Good	0 to 1.12 mm/s
Acceptable	1.13 to 2.80 mm/s
Still permissible	2.81 to 7.1 mm/s
Dangerous	> 7.1 mm/s

Large machines on heavy foundations (Group G)

Good	0 to 1.80 mm/s
Acceptable	1.81 to 4.50 mm/s
Still permissible	4.51 to 11.2 mm/s
Dangerous	> 11.2 mm/s

Largest machines and turbo machines with a special foundations (Group T).

Good	0 to 2.80 mm/s
Acceptable	2.81 to 7.10 mm/s
Still permissible	7.11 to 18.0 mm/s
Dangerous	> 18 mm/s

13. SENSITIVITY RELATIVE to the reference sensitivity at 80 Hz , according ISO 2954

Frequency	Normal value	Relative sensitivity	
		Minimum value	Maximum value
10 Hz	1.0	0.8	1.1
20 Hz	1.0	0.9	1.1
40 Hz	1.0	0.9	1.1
80 Hz	1.0	1.0	1.0
160 Hz	1.0	0.9	1.1
500 Hz	1.0	0.9	1.1
1000 Hz	1.0	0.8	1.1

Table 1

14. PATENT

The meter (SD card structure) already get patent or patent pending in following countries :

Germany

JAPAN	Nr. 20 2008 016 337.4
TAIWAN	3151214
CHINA	M 358970 M 359043
USA	ZL 2008 2 0189918.5 ZL 2008 2 0189917.0
	Patent pending