INSTRUCTION MANUAL

MICROPROCESSER BASED VIBRATING WIRE
READOUT UNIT MODEL SME 2460 – S (NEW VERSON)

SENSORS & MEASUREMENTS ENTERPRISES

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Technical Specification

Model SME 2460 - S Vibrating Wire Readout Unit / Data Logger

Excitation Range		:	400 Hz to 6000 HZ, 5V square wave.
Measurement resolution		:	0.5 ms
Memory		:	62 K. EPROM
Reading storage		:	Approx 2500 data in engineering mode with time & date.
Real time clock		:	A real time clock is provided and data will be stored with time & date. RTC is battery backed and will keep the record even if the indicator is kept off. RTC time keeping accuracy is ±1 min per month
Display		:	LCD dot matrix alphanumeric display 16 character x 2 lines.
Temperature range		:	0-45°C
Battery		:	1.2 Vx 1000 mah rechargeable Nickel Cadmium AA size cells 8 nos.
Operating time		:	20 hours when fully charged cells.
Connection	(a)	:	One 4 pins circular connector is provided on indicator. Pin no. 1 & 3 for sensor measurement.
	(b)	:	One 5 pin connector is provided for RS-232C interface.
	(c)	:	One single pin connector is provided for battery charging.
Measurement parameter		:	Basic measurement is time period (in m.sec.), frequency (Hz) & frequency square can be seen directly . For engineering unit display programming of indicator is needed. In engineering unit mode data can be seen in Strain, ksc,°C. tonns, mm & cms.
Key board		:	16 key sealed membrane key pad. Keys are multiple function.
Dimensions		:	235mm (L) x 165mm (W) x 100mm (H) plastic housing
Weight		:	1.5 kg. approx.

Introduction:-

The SME 2460 - S Vibrating wire indicator provides precise measurements of vibrating wire type instruments. An important feature of SME 2460-S is its ability to allow the user to customize most of the required aspect of the instruments measurement & display function. The user can:-

(a) Enter any value for the parameters used for calculating the vibrating wire reading (calibration factor) (K.Fac), initial value or any off set value.

(b) Enter an ID no. (identification number) up to 4 characters for each vibrating wire sensors.

(c) Enter the units for data in direct engineering unit.

CONTROL:-

I. LCD Dot matrix alphanumeric display 16 character x 2 lines. .

II. 16 key sealed membrane key pad.

III. 4 pin round connector for data measurement.

IV. 5 pin round connector for RS-232C interface.

V. On-off switch.

VI. Charging LED marked CHG, full charge LED marked FC and low battery indicator marked LB are showing on the panel.

KEYPAD FUNCTION OF V.W. READOUT UNIT MODEL SME 2460-S

Start from left top to right (Top row)

1. DISPLAY LIGHT

This key is provided when display meter required backlit light in darken area to see the data. It will glow till the push button is pressed.

2. **APPEND:-**

This key is basically for adding programming of new sensors, when one sensors is already Programmed through PGM mode and another sensors require to programmed then this APEND key will be used to program further sensors.

3. MEAS:-

This key is used while data's are taken in direct engineering unit. This key is functional and useful only after sensors programming. If the unit is already programmed and data's are to be taken in engineering unit, then this key is used.

4. PGM:-

This key is used for initial and fresh programming of readout unit. The function of this key is limited to once. You can program as many sensors as you want.

In programming mode special provision of secret password is provided for safety point of view. It is always advisable that programming of readout unit should be done single handed. Password is of four digit and is brought to the notice of use while supplied.

5. READ:-

This key is used to read the basic programming of any or all sensors if required. This key will be used to erase the 0 or 1 during programming or EDITING.

Second row from left:-

1. 8/TIME :-

This key functions as numeric key for 8 in program mode and works as 24 hours clock in normal mode and display the time.

2. 9/CLEAR/MEM :-

This key also has two functions i.e. it works as 9 in program mode and clear memory in normal mode. For this safety reason in normal mode when it is pressed it will ask for password and display will indicate ENT PASW 0000. Here again it is important that password must not be known to everybody otherwise it can be misused and it will erase all programmed data. This will also erase all past record.

3. ENT :-

This key is also a double function key and actual it is **ENT/BRK** key. In program mode it works as **ENTER** key and in normal mode it works as **BREAK** key and used to break the existing mode to go for other required mode like time period, frequency, frequency square, time etc. One has to always press this key to go for other mode.

4. NEXT :-

This key is also a double function key i.e. it works as **NEXT/RECALL.** In program mode it works as next program and in normal mode it is used to recall memory and used to see the past data's of any programmed sensor starting from first data.

To use in this mode press **NEXT** key. Display will indicate **ENT ID = 0000.** Feed the **ID** of required sensor and press **ENT** key. Display will indicate first stored data of that particular sensor along with date and time.
Press **NEXT** key to see next stored data if any. Go on pressing **NEXT** key until display indicates **NOT PROGRAMMED**. This will flash for few moments and readout will come to its normal mode. To see the past data of any other sensor again press **NEXT** key and feed **ID** of required as earlier and see all past data one by one.

Third row from left to right:-

1. **4/SEND :-**
This key is also a double function key. In program mode this works as numeric key and in normal mode it sends stored data's to computer. This is an optional feature of readout unit.

2. **5/D.SET :-**
This is used as numeric key for numeric 5 and in normal mode it is used to set the date and time.
5/D.SET key. Display will indicate DATE = 00.00.00, here date is to be set like 150819 here 15 is the date 08 indicates the month and 19 indicates year i.e. 2019. So, feed the date if it is not already programmed and press ENT key. Then set the time as 24 hours.

3. **6/T.SET :-**
This is a single function key. In program mode it is used as numeric key 4 only. Time set is not active in this key. Fir time setting you have to go into 5/D. set function. Set the time as 103015 and press enter. The time will set 10 hours 30 minutes and 15 seconds.

4. **7/DATE :-**
This key is also a double function key. In program mode it is used as numeric key for numeral 7 and in normal mode it used to see present date with month and year.

<u>Fourth row from left to right:-</u>

1. **0/FREQ :-**
This is a double function key. In program mode it is used as numeric key 0 (zero) and in normal mode it is used to measure the frequency of the sensor.

2. **1/FRQ2 :-**
This is a double function key. In program mode it is used as numeric key for numeral 1 and in normal mode it is used to measure the frequency square of the sensor and generally useful during calibration of sensor.

3. **2/PER/END :-**
This is a triple function key. In program mode it is used as numeric key 2 and to come out from the program after programming is over and in normal mode it is used to measure the time period of the sensor.

4. **3/STORE :-**
This is a double function key. In program mode it is used as numeric key for numeral 3 and in MEAS mode it is used to STORE the ENGG. unit data of the sensor with date

and time. The temperature of inbuilt thermistor can be measure after connecting the yellow and green crocodial clips to sensors cable white & green wire and then pressing this button. It will show the battery level as well as temperature of inbuilt thermistor.

1.1 Using of Readout Unit:-

SME 2460-S vibrating wire indicator unit is supplied with round female connector for connecting the vibrating wire sensor. One end consist of a 4 pin connector for connecting the socket to readout unit. The other end consist of 4 leads terminated with crocodile clips Red & Black is for sensor and green – yellow is for temperature measurement. Pressing down the on/off switch turns the unit on. The unit will glow and indicate.

VIB. WIRE READOUT
MFG BY SME - LKO

1.2 Reading Display:-

Connect the sensor lead generally red and black to alligator clips with red & black lead. Now switch ON the readout unit. The indicator is ready to show data in basic units like time period micro seconds, frequency in Hz or frequency square. Press **2** for time period, freq. for frequency & freq2 for frequency square on key pad. Please note that after every measurement press **ENT** to go for any other measurement.

1.3 Programming of readout unit to get engineering unit data:-

For programming the indicator we need following parameters.

(I). ID i.e. sl. no. of instrument maximum in 4 digits (0000).
(II). K. Factor maximum in 6 digits (000000) supplied with the instruments test report.
(iii). Units in 2 digits (00) as follows.
00 for strn (Micro strain)
01 for KSC (Kg/cm^2)
02 for Deg.^{0} C (Degree centigrade)
03 for Tonn (Tonns)
04 for mm (Milimeters)
05 for cm (Centimeters)
06 for Deg. (Degrees i.e. for inclination)
(iv). I. Val (Initial frequency in 4 digits (0000).
(v). Sign. (+Ve or -Ve as required) in 2 digits (00)
00 for +ve & 01 for -ve

All the above values are given in test report of particular sensor.

1.4 Please note that for a fresh programming use PGM Key on Key Board and for additional programming i.e. for additional sensors use always APPEND on key pad.

Never use PGM for additional programming otherwise all old programming will erase.
For safety point of view a password is provided which must not be known to every body.

For fresh programming follow the below mentioned procedure:-

a. Switch on the indicator.
b. Press **PGM** it will ask for PASSWORD i.e. password no. in 4 digits (0000).
c. Enter password in 4 digits as given to you & then press **ENT.** Display will ask **ID** no. Enter **ID** as per test report in 4 digit and press **ENT**. Display will ask K. Factor 000000.
d. Enter K. Fac. as per test report and press **ENT**. Now display will ask unit for directly reading in Engineering units 00.
e. Enter units code in number given in 1.3 and press **ENT.** Display will ask for **I. VAL**

(initial value of frequency) in 4 digits 0000.

f. Enter the I. value (present frequency) noted after the installation of sensor and press **ENT**. Display will ask for **SIGN**.

g. Enter 00 or 01 as per test report & press **ENT**. Display will show **END / NEXT**.

h. This indicates the programming of that sensor is completed and indicator is asking whether you want to end your programming here itself or you wants to program more sensors. If you have other sensors to be programmed, press NEXT and similarily go on programming the other sensors.

Once the programming of all sensors is completed press End / 2 no. key to end the programming. Please note once key no. 2 is pressed no further programming is to be done on PGM mode otherwise all the programming will automatically be erased.

Any additional programming if required to be done, press APPEND key. On pressing this button the indicator will not ask for any password but it will directly ask for new ID, K.FAC, UNIT, I.VAL& SIGN. and the same can be fed & programmed as above but for ending the program key no . 2 should be pressed.

1.5 Storage of data:-

For storing data of a particular programmed sensor connect sensor to indicator & press key **MEAS** indicator will ask for its ID (0000). Feed the ID and press **ENT** key. Read out will indicate data of particular sensor in engineering unit. Press key #.3 and DATA STORED will appear momentarily and the data will be stored in memory. Every press of key #.3 will store the data of that particular sensor with time & date.

1.6 For viewing stored data:-

Press **NEXT** key, unit will ask for serial no. of sensor i.e. ID. Feed ID and press **ENT**, unit will display Ist stored data of that particular sensor with date & time. Go on pressing **NEXT** to see its last stored data and finally unit will indicate NO DATA PRESENT. Now press **NEXT** again and feed sl. no. of next required sensor and so on.

1.7 Clear Program or Memory Clearing:

a) In case unit is required clear program or memory clearing then press key no. 9 and enter PASSWORD

b) The display show memory cleared or program clear accordingly.

1.8 Charging the readout unit:-

One 18 volt DC (SMPS) charger is supplied with each readout unit . The charging of unit depends upon how many hours it is being used. However, it is recommended to charge the unit when low battery (LB) indicator start glowing. This LED will glow automatically when voltage level of rechargeable battery goes below certain level, it means the readout unit require full charging for 5-6 hours till the full charge indicator (FC) start glowing. During charging process the charging light marked CHG on the panel of readout unit will glow, which indicates that battery charging is taking place.

Trouble shooting :-

The readout unit may develop some problem due to one OR other reason. Generally, the following problems are noticed.

A) The readout units shows fluctuation in the displayed readings. This may have the following reason.

I) The readout unit is not fully charged. Charge the unit properly and then take the data.

II) The connecting cable of readout unit is loose/ broken from inside 4 pin connector or from crocodial clips. Check it if wire is broken from 4 pin connector then solder the broken lead with pin no. 1 or 3 and rectify the fault .

III) If the above two points are OK, then sensor may have some problem.

B) Readout unit shows NOT PROGRAMMED when you want to measure the data of Programmed sensor.

I) It may be because of wrong programming or wrong operation of the unit. Re-programme that sensor properly by going in PGM mode and then check the sensor again. However, if problem still persist contact H.O. Lucknow or Chennai office with full detail of problem faced by you to take corrective action.

C) Charging not taking place.

I) If the charging of readout battery is not taking place though the charger light in charger is glowing then charger may have some problem. Check the round connector for 18 volt DC power supply, if supply is not coming then replace the charger or contact Lucknow works.

11) If battery level showing full charge with in 20 or 30 minutes and get discharge with 10/20 minutes after using the readout unit then one of the rechargeable cell inside the battery pack may be damaged and you need to replace the battery pack.

Note:- If the problem remains the same then please contact the Lucknow works / Chennai office giving complete detail to the following address.

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