OM-60-TE SERVICE LOGGER
WITH TEMPERATURE/EVENT ADAPTER

The OM-60-TE is a Service Logger with a temperature/event adapter. The field inter-changeable temperature sensor and the event adapter are available as part # OM-60-MOD-TE. The OM-60-MOD-TE option consists of a temperature sensor, an interface box with a built in voltage detector and a cable which connects to the Service Logger. The OM-60-TE allows for independent temperature measurement and voltage detection. This is commonly described as event detection.

The temperature sensor is enclosed with a 4 inch long stainless steel jacket which may be immersed in any solid or liquid and is compatible with type 300 series stainless steel. Refer to the product specifications for the environmental limits of the temperature sensors. The TP series temperature sensors are inter-changeable and replacement sensors are available. Each temperature sensor has 6 feet of cable.

Immersion of the entire sensor body and cable, and/or cutting or splicing of the OM-60-MOD-TE cables by the user is not recommended and will void the sensor warranty.

The voltage detector is connected by two coiled clip leads available at the interface box. The voltage detector will operate on any voltage source in the range of 24 VAC to 270 VAC or 24 VDC to 180 VDC. Note that exceeding the voltage range of the voltage detector can cause permanent damage to the adapter.

CAUTION!
Electrical connection to any type of operating equipment is __dangerous__. The voltage detector leads should only be connected when it has been determined that the power is off and the equipment is safe to touch!

GETTING STARTED

Connect the interface cable from the interface unit to the Service Logger. Plug the temperature sensor into the interface unit. Note that the interface box is labeled to indicate where the temperature sensor connects to. The clip leads are permanently attached to the interface box. **Make sure the equipment power is OFF before connecting the leads!**

If portable use or battery backup is desired, place a fresh 9V alkaline battery into the Service Logger. Any other type of battery will result in unsatisfactory performance and may cause damage to the instrument. Plug in the power adapter if a 110 (220) Volt outlet is accessible.

Press the "ON" button on the front panel. The display will show the instrument name. If no display is visible, or if the display is all black, adjust the display control until the lettering is visible.

```
SERVICE LOGGER
   VER 2.0
```

If no adapter is connected or if the adapter has become defective, the display will show this message. The Service Logger will recognize when an interface unit is plugged in and auto-matically set up the correct menus and displays for that interface.

```
     PLEASE
CONNECT SENSORS
```

This is the **Operating Mode** display for the OM-60-MOD-TE Sensor. The temperature of the sensor and the presence of voltage at the detector leads are continuously measured and displayed. This is the mode the Service Logger will go to after it is turned on.

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TEMP   EVENT
 74°F    OFF
```

If the temperature sensor is not connected or has become defective, the display will indicate that the sensor is not responding.

Temperature sensor is not responding.

```
TEMP     EVENT
****       OFF
```

CHANGING SETTINGS

Every function of the Service Logger can be set through a series of menus. Settings are stored in memory and remain there even without the main and backup power source until altered by the user. Each sensor will have settings unique to its function and the Service Logger will select and display the correct menus for each sensor that is plugged in.

Changing Recording Time and Sampling Rate

Press and hold the [MENU / ENTER] button until the display changes to the Recording Rate menu. The user may select the sampling rate and

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RECORDING RATE
15HR EVERY 15SEC
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recording time for the Service Logger. Use the [∧ STATUS] or [∨ RECORD] buttons to change the recording time and sampling rate according to the table listed below

Recording Time	Sampling Rate
40 Days	15 Minutes
2 Weeks	5 Minutes
60 Hours	1 Minute
30 Hours	30 Seconds
15 Hours	15 Seconds
On Event Change	On to Off or, Off to On

__Note that recording on event change is not a time related recording function.__ The Service Logger will monitor the Event Detector and only make a data recording when the status of the event detector changes from ON to OFF or from OFF to ON. **There is also a maximum time limit between events.** If the Service Logger does not detect a change in state for more than 45 hours the Service Logger will assume no events are occurring and the recording will be automatically terminated. As in the time related recording functions the display will continuously show the status of the temperature sensor and event detector but will only record data on a change in the state of the event detector.

When the [MENU ENTER] button is pressed 3 more times (to cycle through the remaining functions), the recording time and the sampling rate will be saved into memory and the Service Logger will return to the operating mode. Otherwise the unit will return to the operating mode after approximately 1 minute and changes will be saved into memory.

Changing Scale to °F or °C

Press the [MENU ENTER] button until the display reads:

TEMPERATURE SET TO FAHRENHEIT

or

TEMPERATURE SET TO CELSIUS

Use the [∧ STATUS] or [∨ RECORD] buttons to change the setting to the desired scale.

When the [MENU ENTER] button is pressed twice more (to cycle through the remaining functions), the temperature scale setting will be saved into memory, and the Service Logger will return to the operating mode. Otherwise the unit will return to the operating mode after approximately 1 minute and changes will be saved into memory.

RECORDING DATA

One of the most important functions of the Service Logger is to record information over a period of time. This function is like a chart recorder except that the information is stored in memory rather than being printed on paper. The user can choose to print the information, transfer the information to a computer for advanced analysis or long term storage, or review the information on the Service Logger's display.

In the case of the OM-60-MOD-TE sensor, the temperature and presence or absence of voltage will be recorded. Different sensors will, of course, record different information depending on the function of that sensor. The Service Logger has a memory capacity to record up to 4000 samples of data. It is the option of the user to record data to the maximum capacity of the Service Logger or to terminate a recording when sufficient information has been gathered.

<u>IMPORTANT !</u>
Each new recording will erase any previously recorded information. It is the responsibility of the user to either print or store a previous recording prior to starting a new recording.

The first step in making a recording is to select the proper recording time and sample rate. If a sampling rate of 15 seconds is being used, then every 15 seconds the temperature and presence or absence of voltage will be measured and stored into digital memory. No record of information is made between each sample even though the display will continuously show the environment the OM-60-MOD-TE sensors are exposed to.

If the Service Logger is set to record on event change, then only when the state of the voltage detector goes from ON to OFF or from OFF to ON will a data recording be stored in memory.

For a recording to accurately reflect a series of events, it is up to the user to select a recording interval that best suits the particular application. In some situations maximum recording time may be sacrificed so that more frequent sampling may be accomplished. Long term monitoring will require less frequent sampling in favor of longer recording times. The record on event change will usually be used when the data of interest occurs only under a specific condition.

The next step is to select how the Service Logger will record the information from the OM-60-MOD-TE sensor. There are 3 possible ways to record information.

Press and hold the [∨ RECORD] button until the record display appears. The four

recording modes can be scrolled and changed by using [∧ STATUS] button:

1. **Record information to memory only.** This option stores information into the Service Logger memory. No printer or computer connection is required for this function.

RECORD ON, REAL TIME PRINT OFF

2. **Record information to a printer.** This option does not store information into memory but does print each sample as it is *recorded* to a printer. This is referred to as REAL TIME PRINTING. **A printer must be connected for this function!** If no printer is connected, or if the printer is *off-line*, or if the printer is out of paper an error message will be displayed to alert the user to a problem. Switching to this option will **terminate recording** if the Service Logger was set to record previously.

RECORD OFF, REAL TIME PRINT ON

3. **Record information to memory and to a printer.** This is a combination of options 1 and 2. Information is stored in memory and at the same time each sample is *recorded* to a printer. As in option 2 a **printer must be connected** and functioning or an error message will be displayed.

RECORD ON, REAL TIME PRINT ON

4. If a recording is in progress, this option will **terminate all recording functions**. This option may also be used if the user decides to terminate a recording session and return to the operating mode. In order to terminate a recording press the [MENU ENTER] button again at this time.

RECORD OFF, REAL TIME PRINT OFF

Press the [∨ RECORD] button after selecting the recording mode. This will display the starting time of the recording. The display will show the starting time of the last recording and allow the

DAY HOUR MIN FRI 15 16

user to enter a new starting time. The [△ STATUS] button will advance the item

that is flashing. Press and hold the [△ STATUS] button to scroll this item. Press

the [▽ RECORD] button to change to the next item which will then start to flash. This will set the starting time of the recording which will appear on the display or printout after a recording has been made. Note that the previous starting time is always displayed when a new recording is started.

When the Service Logger is in the recording mode, it will prevent the user from changing the settings. The user will only be allowed to check the recording rate

when they press the [MENU ENTER] button.

Press the [MENU ENTER] button to return to the operating mode and begin the recording.

If option 1 or 3 is selected, an "R" will be displayed in the upper right hand corner of the display. The "R" indicates recording is in progress.

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TEMP    EVENT    R
74°F     OFF
```

While you are recording it is possible to check how much memory has been used. Press and

```
MON:15:35
78% MEM. LEFT
```

hold the [△ STATUS] button until the display
shows the starting time of the recording and the percent of available remaining memory. As the recording continues this number will decrease. The Service Logger will continue to record until the recording is terminated manually or when all of the available memory has been used. When *0% Memory Left* is displayed, this will indicate that almost all of the available memory has been used and the Service Logger will shortly terminate the recording automatically.

Sample of a typical printout at the beginning of recording:
The time is specified using the format D(ays):H(ours):M(inutes):S(econds).
This convention is used in the printout and the display.

Service Logger

Temp (F)	EVENT	Time (D:H:M:S)
72	ON	MON:12:15:00
72	OFF	MON:12:15:05
72	OFF	MON:12:15:10
72	OFF	MON:12:15:15

        72   ON   MON:12:15:20

PRINTING RECORDED DATA

After a recording has been made the user will probably want some way to view
and analyze the recorded information. This is most easily accomplished by
printing out the data samples. The printed data can be analyzed or stored for
future reference. Several print options are available.

Filtering Printed Record

If the user were to print a recording which used all of the memory capacity of
the Service Logger this would be a very long record of 4000 data samples. To
print this out line by line on a standard computer printer would use over 60
sheets of paper! Obviously this would be a cumbersome and time consuming
process. In most cases, the information required from the record is only when
the temp-erature or status of the event detector changes. If the temperature or
event detector remains the same, it is not necessary to print line after line of the
same information.

The Service Logger allows the user to select from 1° to 10° of temperature
change or change in the state of the event detector (on to off or off to on) to
print on. What this means is that data samples that are less than the selected
temp-erature change, or if the state of the event detector stays the same, no
samples will be printed until the conditions that are programmed in the filter are
satisfied. That temperature or state of the event detector becomes the new value
to compare to and the temperature or the state of the event detector will have to
change again before another sample is printed.

One important point to remember is that even if a data sample is not printed,
the Service Logger still has to recall it from memory and compare it to the filter
selection. Therefore, a printout may take up to 10 minutes for a scan of all 4000
data samples. This may sound complicated, but is easy to understand by using
an example recording.

Example:
A recording has been made in a room of a building over a 30 hour period to
determine whether or not the ventilation fan is turning on when the heat goes
on. This means that a one data sample is recorded every 30 seconds. For the
printout the user has selected a change of 2°. Shown below would be a typical
printout of the data using the above selections. In a real printout there would be
no spaces between the lines of printing, but in our example these were added
to allow room for comments to be inserted.

                    Service Logger

Temp(F)   Event   Time(D:H:M:S)

70	OFF	MON:08:00:00	This is the first data record and the starting time is Monday, 8:00 a.m.
72	ON	MON:10:10:00	The temperature has warmed up 2° at 10:10 a.m. on the same day.
74	ON	MON:15:10:30	The temperature continued to increase by 2° at 15:10 (3:10 p.m.) on the same day while the fan runs.
72	OFF	MON:23:22:30	The temperature has decreased 2° and the fan is OFF at 23:22 (11:23 p.m.) on the same day.
70 additional a.m.	OFF	TUE:00:54:30	The temperature decreased an 2° while the fan remains OFF at 0:54 on the Tuesday of the same week.
68	OFF	TUE:05:32:30	The temperature continued to decrease with the fan OFF at 5:32 a.m. on the Tuesday of the same week.
End of Data			This indicates the end of the recording and shows that the temperature remained within 2° of 68°F for the remainder of the recording period.

The above example shows that by using the filtering function the user can take a printout that would consume over 60 pages of paper and condense it into a single page.

How to Send Recorded Data to a Printer

Press [MENU ENTER] several times until this display appears. This is where the print function is accessed.

> **PUSH MENU TO RUN OTHERS TO PRINT**

Press [⌃ STATUS] or [⌄ RECORD] to scroll through the print options until this display appears.

> **SEND RECORDED DATA TO PRINTER**

Press [MENU ENTER] to advance to the next print selection.

This is the first filter option. Selecting this will print every data sample that has recorded data.

SEND OUT ALL OF THE TEMP DATA

Press [⌃ STATUS] to select a temperature filter function, you can select from 1° to 10° of temperature change, or press [⌄ RECORD] to select an event detector filter function.

SEND TEMP ON X DEGREE CHANGE

SEND OUT ALL OF THE EVENT CHANGES

Note that this selection will print every data sample regardless of the state of the event detector, or press [MENU ENTER] to continue.

SEND OUT DATA ON EVENT CHANGES

If [MENU ENTER] is pushed, the Service logger will return to the operating mode.

PUSH ^ START PRT PUSH MENU QUIT

If [⌃ STATUS] is pushed, the printing will begin and the flashing dots indicate printing functions.

PRINTING PLEASE WAIT…

When the Service Logger is finished printing, it will return to the Operating Mode.

Printer Error Messages

If a printer is not connected and set to operate, an error message will be displayed to alert the user to a printer problem.

There are several possible problems that may occur if the printer is not ready. The Service Logger will alert the user to a problem with the printer. As each printer has its own set of controls and settings the user is recommended to consult the owners manual supplied with the printer.

This is an error message that appears when the printer is not connected or turned off. Make sure the printer cable is attached to both the printer and the Service Logger and that power is supplied to the printer.

PLEASE CONNECT THE PRINTER

This is an error message to alert the user that the printer has run out of paper. Refer to the owners manual of the printer for instructions

PRINTER IS OUT OF PAPER

on paper replacement.

This is an error message which indicates that the printer has not been set to ON LINE. Refer to the owners manual for specific instructions on setting the printer controls.

> **PRINTER IS NOT**
> **ON LINE**

VIEWING RECORDED DATA

One of the features of the Service Logger is that recorded information may be directly read on the display. The same filter functions that are available for printing data are also available for reading data on the display. This allows the user to let the Service Logger scan the recorded data and display only the information that is of interest to the user. Without this function the user would have to manually scan a potential 4000 data samples to find the information of interest.

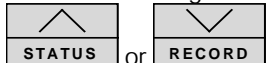Press and hold [MENU ENTER] until this display appears. The actual recording rate is unimportant.

> **RECORDING RATE**
> **XXHR EVERY XXSEC**

Press [MENU ENTER] again to cycle to the next screen. As before, the scale does not pertain to the viewing function.

> **TEMPERATURE**
> **TO FAHRENHEIT**

This is where the viewing function is accessed.

Press [STATUS] or [RECORD] to access this menu.

> **PUSH MENU TO RUN**
> **OTHERS TO PRINT**

Press the [RECORD] button once to scroll to this function.

> **READ RECORDED**
> **DATA FROM SCREEN**

Press [MENU ENTER] to advance to the next print selection.

This is the first filter option. Selecting this will display every data sample that has been recorded.

> **SEND OUT ALL OF**
> **THE TEMP DATA**

Press [STATUS] to select a temperature filter

function, otherwise press [MENU ENTER] to continue.

Use the [STATUS] button to select 1° to 10° of

temperature change, then press [MENU ENTER] to

continue, or press [RECORD] to select an event
detector filter function.

| SEND TEMP1 ON |
| X DEGREE CHANGE |

| SEND OUT ALL OF |
| THE EVENT DATA |

Press [RECORD] again to select alternate event
detector filter functions.

| SEND OUT DATA |
| ON EVENT CHANGES |

Then press [MENU ENTER] to continue.

This is the first data sample. Press [STATUS] to
advance forward through the data samples.

| TUE:15:30:50 |
| 73°F   OFF |

Press [RECORD] to go backwards through the
data samples.

This indicates the end of a data recording. Press

| REACHED THE END |
| OF RECORDED DATA |

[STATUS] to return to the beginning of the data

recording or [RECORD] to go to the last previous data sample.

Press [MENU ENTER] at any time to return to the Operating Mode.

TRANSFERRING DATA TO A COMPUTER

After a recording has been made, the user may download the data to any PC
compatible computer. The advantage of doing this is that it allows the use of
more sophisticated analysis tools as well as a long term storage. Unlike the Print
and View functions no filtering options are available in this mode. The entire
recording is sent to the computer. The supplied software will convert the data
recording to an ASCII file which can then be imported into a variety of data

analysis software, word processing, and data base programs. It is suggested that if the user plans to download recorded data on a regular basis to copy the transfer program to the users hard disk.

To start the transfer program, insert the supplied diskette in drive A. Type "A:SUPCO" and follow the instructions on the computer screen. A README file is also included on the floppy diskette which has detailed instructions on the use of the transfer program and reflects the latest information that is not included in this manual.

IMPORTANT!
To use this function the 25 pin cable (DB25 Male-Male) must be connected to the Service Logger and the PC compatible computer printer port. If you are unsure of which connector is the printer port, consult the owners manual which was supplied with the computer.

The computer transfer cable can be purchased from OMEGA as part # OM-CC6.