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SOLOMAT DATA LOGGER FOR USE WITH THE MPM 2000

Introduction

The Solomat Data Logger is a unique storage device designed to work with the MPM 2000 system. The Data Logger will store the MPM 2000 measurements, at time intervals of either 1, 5, 15 or 60 (minutes or seconds). Additionally, the data logger can store multiple readings to allow monitoring of more than one parameter simultaneously. The data logger contains a built-in RS 232 interface for easy connection to most computers. The logger output can be read, filed and plotted using the new Solomat Analyst Software packages now available.

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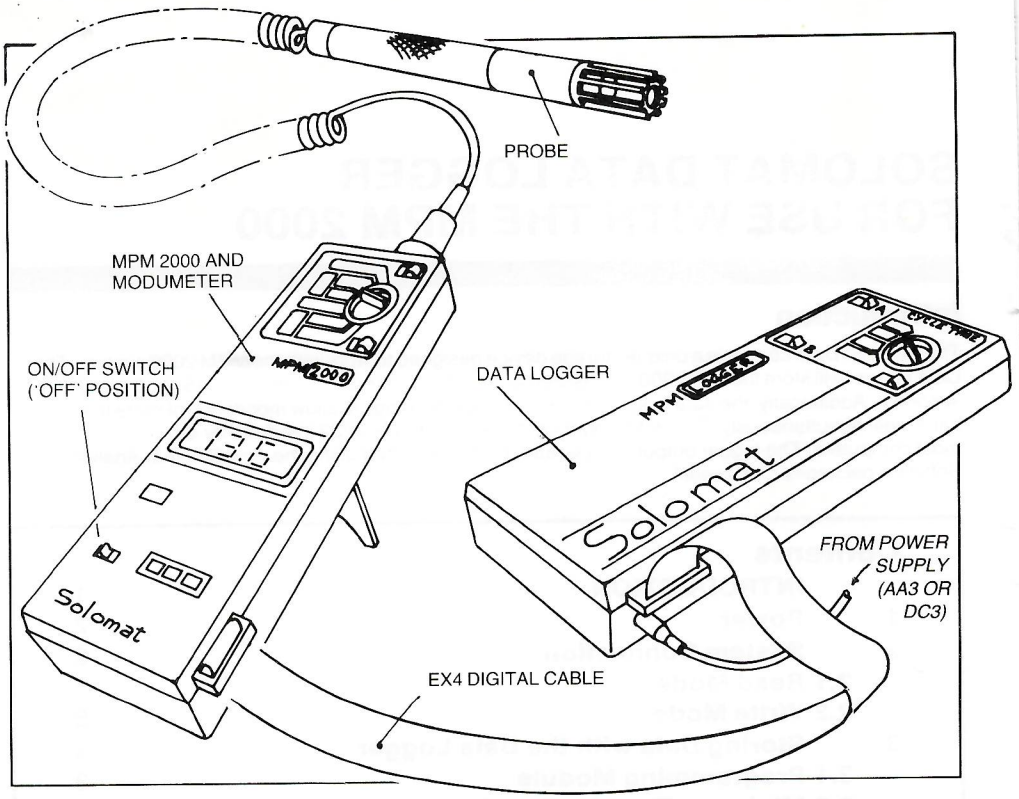


FIGURE 1. CORRECT CONNECTION FOR USING THE MPM 2000 & DATA LOGGER (READ MODE)

1 POWER

Power to the Data Logger is supplied via a 2.1mm DC jack socket. The DC socket is used with either the AA3 adaptor or DC3 battery. The Logger supplies power to the MPM 2000; therefore, it is not necessary to have any batteries in the MPM 2000 when using it with the Data Logger. The MPM 2000 power switch should be in the OFF position when being used with the Logger; the Logger supplies the power. Figures 3, 4 and 5 illustrate the use of the AA3 and DC3 for AC and battery powering, as well as recharging.

Figure 1 shows a typical layout of the connection of the MPM 2000 to the Data Logger while recording data, and Figure 2 shows the layout when writing data into a computer. The RS 232 cable is necessary only during the 'Write' mode. The MPM 2000 need not be connected to the Logger when the Logger is writing to the computer.

Operating current is typically 300 mA and standby current is approximately 3.5 mA.

A green LED flashes when the Logger is actively recording data, or writing to a computer/printer.

A push button is included for turning ON/OFF the Data Logger. This switch is located next to the DC IN socket. The Logger is ON when the switch is IN, the Logger is OFF when the switch is OUT. Every time this switch is turned OFF, then ON (in the Read Mode), a new Data Block is created. An ON/OFF switch is also fitted to some 1000 reading Loggers.

2 SYSTEM CONNECTION

The logger must be correctly set up for use in the 'Read' mode and for use in the 'Write' mode.

2.1 Read Mode

When reading information from the MPM 2000, the data logger requires:

EX4 (or EX14) cable for connection from the MPM 2000 to Data Logger
MPM 2000 with Modumeter and probes
Data Logger (with programming module attached)
Power supply—either AA3 for AC powering or DC3 (sealed lead acid battery) for battery powering.

2.2 Write Mode

When writing information into a computer or printer, the MPM 2000 is not required. The only items which are required are:

Data Logger
Power supply—either AA3 or DC3
RS 232 cable (either EX8, EX12, EX13, EX15 or EX17L)

3 STORING DATA WITH THE DATA LOGGER

Readings are recorded into the Data Logger as soon as power is applied to the Data Logger. Therefore, to turn on the Data Logger, merely apply power through the DC socket. The Data Logger can store up to 5000 readings.

3.1 Programming Module

SWITCHES A AND B

Switches A and B are used to select the number of readings that are taken during each reading interval. Normally the user makes only one measurement per interval. However, there are two occasions when you may wish to make multiple readings:

1. Readings are noisy, and multiple readings are taken to average out the noise.

2. The MPM is connected to a 'Switching' Modumeter which makes alternately 2, 3 or 4 different types of readings.

SEC/MIN

Select either minutes or seconds for the time interval between readings.

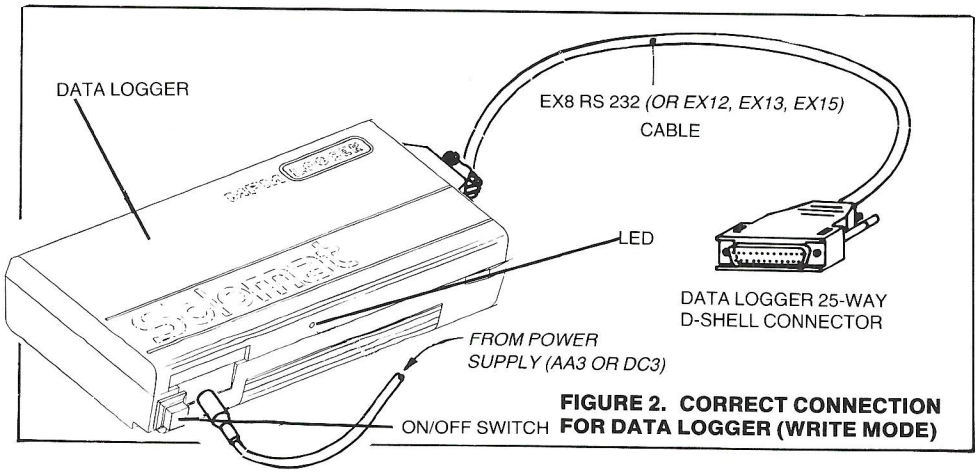


FIGURE 2. CORRECT CONNECTION FOR DATA LOGGER (WRITE MODE)

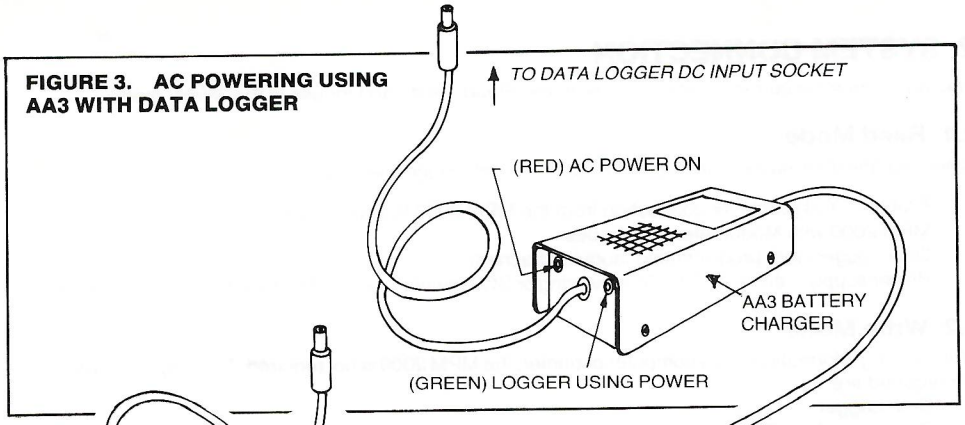


FIGURE 3. AC POWERING USING AA3 WITH DATA LOGGER

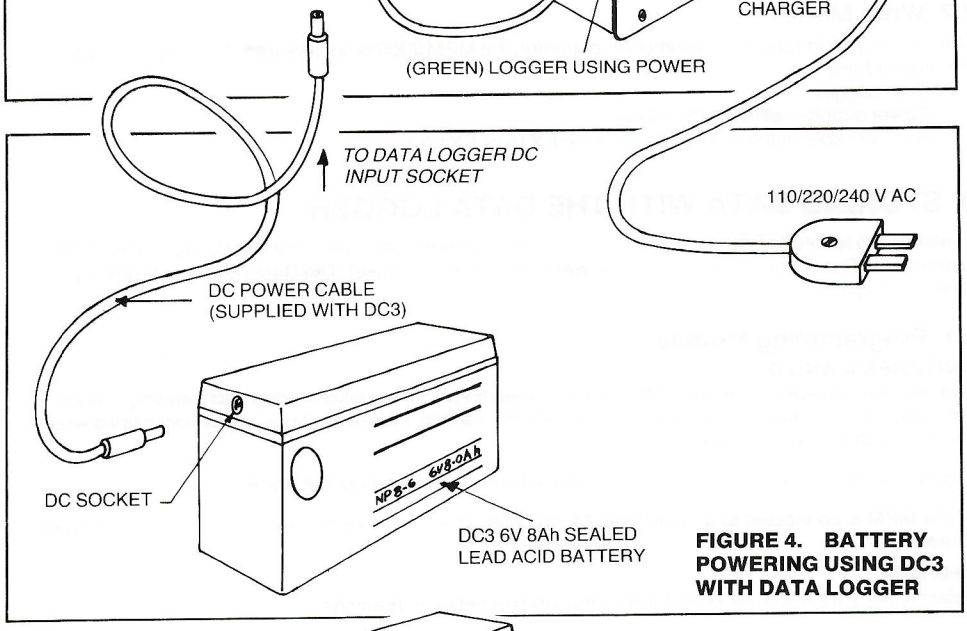


FIGURE 4. BATTERY POWERING USING DC3 WITH DATA LOGGER

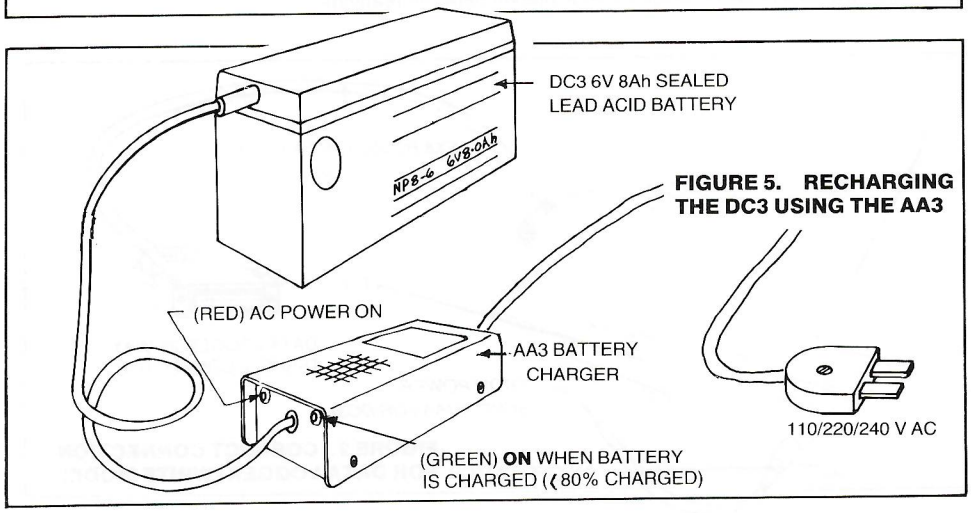


FIGURE 5. RECHARGING THE DC3 USING THE AA3

ROTARY SWITCH
You can select up to seven different time intervals between data records, by selecting 1, 5, 15 or 60 secs/mins. Alternatively, data can be manually logged using the trigger facility.

3.2 Minimum Time for Reading Intervals

Spurious data will result if you try to extract data from the MPM 2000 faster than it can update. The list below specifies the minimum time between readings that will ensure correct data storage.

1 second:	mV, RPM, °C, °F, bar, PSI, Ohm, volt, mA and ppm
2 seconds:	pH, ft/min, %, microSiemen, meter/second, % RH
seconds:	All multiple readings (e.g. pH *and* °C)

It may be possible to collect data at shorter intervals than the list above, but the quality of the data should be carefully checked, especially when making multiple readings.

3.3 Data Blocks

Every time the power is removed from the Data Logger in the 'Read' mode, the Data Logger closes a block of data. The power must be removed for at least one second between data blocks. The next time power is applied to the Data Logger, the Data Logger will create a new data block. Appendix 7.3 shows a typical example of the Data Logger output, showing this feature of data blocks. After every data block, you can change the switches that control the number of readings per interval and the time interval, and these parameters will be stored in the new data block the next time the power is applied. The Data Logger can store a maximum of 50 Data Blocks.

NOTE: Allow at least 3 seconds after turn OFF before turning ON to create a new Data Block.

3.4 Sleep Function

In the 'Read' mode, if the time interval is greater than 5 seconds, then the logic of the Data Logger shuts down the power to itself and the MPM 2000 after each reading. This facility greatly increases the useful battery life and in the standby mode with the system consumes only 3.5 mA.

3.5 Manual Logging

The Data Logger will also log data on demand. A 3.5mm jack socket is situated next to the DC input socket. Plug the (optional) trigger (LT/1) into this socket, and every time you press the switch, data will be stored. To operate this facility correctly, please follow the instructions below:

1. When powering the Data Logger ON to start a new Data Block, hold down the trigger until the MPM displays 18888. This puts the Logger in Manual mode, and the Logger will ignore the time interval set by the programming module (although the time interval (set by the programming module) will still momentarily power ON the MPM 2000, the Logger ignores this). DO NOT keep the trigger switch pressed. If you do, the Logger will go ahead and start measuring using the MPM.

2. To record data, press the trigger button and the MPM will be switched ON, and record data, and then shut down. There are two exceptions to this situation:

2a. PREVIEW: LED will stay ON during Preview. It will then turn OFF when reading the MPM, turning ON momentarily to show that readings were stored. The MPM is then shut off. If the time on the programming module is set to 60 MINUTES, the Logger allows you to 'preview' the data. The first time you press the trigger button, the MPM will turn ON and display the readings. The MPM will continue to remain ON. The second time you press the trigger button, data will be logged. Data is not logged when you are previewing. There is no time limit between Preview and Record. Once you have pressed for PREVIEW, you MUST press trigger again before turning the logger OFF (using ON/OFF switch). Closing the data block without taking the reading (for which the logger is waiting) may corrupt the logger data.

2b. PERMANENT ON: The LED will stay ON until the trigger is pressed. It will then go OFF while reading, flashing ON/OFF to show readings are stored. The LED then turns back ON. If programming module has selected 15 MINUTES, the MPM 2000 will remain permanently switched ON, but the Logger

will only record when the trigger button is pressed. In these two modes (PREVIEW, or PERMANENT ON), the logger will synchronise with previous readings. Therefore, if measuring 4 channels, the MPM may take up to 7 measurements to make 4 synchronised measurements. In other words, don't worry if you think the Logger is taking too long.

HELPFUL HINTS

1. The MPM will momentarily turn ON at the time interval set by the programming module. 18888 will be displayed, then the MPM will switch OFF. The Logger does not store this data; it only stores data when the trigger button is pressed. For least disturbance due to this timed turn-on, set the time to 5 minutes for standard (NO Preview, power down) manual logging.

2. The Data Logger in manual mode will print; READ INTERVAL 0 Secs. (or Min, depending on the switch position of the programming module).

3. To revert to automatic data logging, simply switch the Logger OFF then ON again. This also begins a new data block.

4. We do not recommend use of the manual trigger when 1, 5 or 15 seconds has been selected on the programming module.

5. BEWARE: The manual mode is easy to use if you remember that the Logger looks for first switch closure, then release of the trigger switch. Never keep the trigger switch closed for long times. Get used to closing the switch for 1 to 3 seconds. If you press the trigger switch too quickly, the MPM turns ON momentarily then shuts down without taking a reading.

3.6 Full Memory

The Data Logger informs the user when the memory is full. If the read interval is 1 or 5 seconds, the Data Logger will turn off the MPM 2000 when the memory is full. If the read interval is greater than 5 seconds, the Logger signals that the memory is full by turning on the MPM 2000 momentarily. The MPM 2000 will display 18888, then shut down without making any measurements. This power ON/OFF will occur at the interval set by the programming module.

4 WRITING DATA FROM THE DATA LOGGER

The MPM automatically switches to WRITE mode when the programming module is disconnected and cable connected. To ensure that the Logger microprocessor is properly reset when switched to the write mode, momentarily turn the logger OFF, then (wait 3 seconds), turn ON if you are going directly from collecting data to writing it to printer or computer.

4.1 Writing to a Computer

The Data Logger outputs its Data in standard ASCII (upper and lower case) format. The Solomat Analyst software packages (for Apple or IBM computers) automatically interface with the Logger and read the data without user intervention. At the end of reading the data, if you wish to clear the memory (RAM), then either use the re-set function in the software, or press the button labelled RAM RESET in the battery compartment of the Data Logger (Figure 7). Additionally, a small subroutine can be written for interfacing to IBM compatibles, etc. An example is shown in the Appendix.

4.2 Writing to a Printer

The Data Logger is also designed to handshake with printers or other DCEs (Data Communication Equipment) . This means that a simple printer can provide hard copy from the Data Logger. If you are using a printer, Solomat can supply the EX15; an RS 232 cable wired for use with

the Brother portable HR-5 printer (serial RS 232 Interface) or the EX17L for use with the EPSON P40 printer. These printers are available from Solomat, and are shipped with the correct switch positions selected. Alternatively, you can use your own printer with the EX15 cable. To clear the memory after printing, you must press the RAM RESET switch in the battery compartment.

Ensure that the RS 232 switches are correctly set for your printer; with the HR5, set the Logger to: 1200 Baud/8 bits/Even parity/1 stop. For the P40, set the Logger switches to: 300 Baud/7 bits/Even parity/2 stops.

NOTE: The Data Logger will begin transmitting data as soon as power is applied. To avoid losing data, DO NOT apply power until the printer is ready to receive the data.

4.3 Data Transmission Format (Computer Only)

The data transmission format is explained below:

When the Logger is switched to the 'write' mode, it will finish the current reading before transmitting the data.

The heading SOLOMAT DATA LOGGER is transmitted first; then the data block number, followed by the time interval between readings and the number of readings taken during each logging period. The MPM 2000 readings then follow, with data blocks being transmitted in increasing order (Block 2 follows Block 1, etc.). The title 'END OF DATA' is sent after the last reading. This is followed by a carriage return, and ASCII character 04 (END OF TRANSMISSION). The Logger memory can be reset and cleared if the word 'RESET' is received via the RS 232 cable, or if the push button is pressed. If an X (ASCII 58) is received the Logger will return to the begining of the first Data Block (without erasing the memory).

The listing below shows the exact data format for the Logger. The ASCII codes used for the different symbols are listed in Appendix 7.4.

SOLOMAT DATA LOGGER (CR)
DATA BLOCK No. 1 (CR)
READ INTERVAL 15 Secs. (CR)
2 READINGS EACH INTERVAL (CR)
(CR)

1	7.66 pH	(CR)
	22.3 Deg.C	(CR)
2	7.65 pH	(CR)
	22.4 Deg.C	(CR)

ETX (CR)
DATA BLOCK No. 2 (CR)
READ INTERVAL 60 Secs. (CR)
2 READINGS EACH INTERVAL (CR)
(CR)

1	7.65 pH	(CR)
	22.3 Deg.C	(CR)
2	7.66 pH	(CR)
	22.4 Deg.C	(CR)

(ETX) (CR)
END OF DATA (CR)
(EOT)

(CR): Carriage Return (ASCII 13)
(There is NO line feed character)
ETX: End of Text (ASCII 03)
EOT: End of Transmission (ASCII 04)

4.4 RS 232 Options (See Figure 7)

Switches 1–6 (in the battery compartment) control the RS 232 protocol.
Switch 1: Select either 'Even' (Position 1) or 'Odd' (Position 0) Polarity
Switch 2: Select either 1 (Position 0) or 2 (Position 1) Stop bits
Switch 3: Word length can be selected as either 8 bits (Position 1) or 7 bits (Position 0).

Finally, *switches 4, 5, and 6* select either 300, 1K2 or 4K8 baud rate. This baud rate selects the speed at which the data is transferred. Please ensure that all switches are set in the correct position for interfacing with your computer system before attempting to transmit data. The logger examines the switches only at the beginning of a 'Write' session, and if you change switches while the unit is writing it will ignore the change.

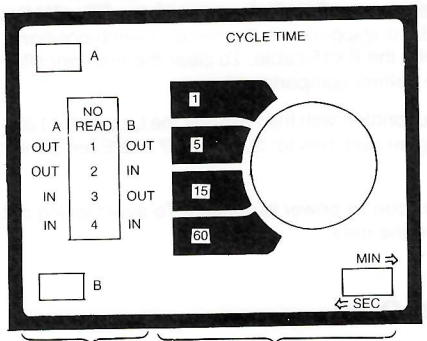


FIGURE 6. LOGGER PROGRAMMING MODULE

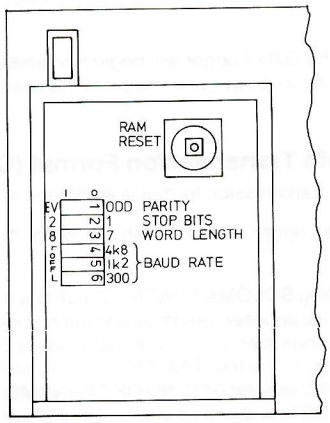


FIGURE 7. RS 232 CONFIGURATION SWITCHES

TABLE 1 COMPUTERS THAT CONFORM TO TABLE 2 CABLE CONNECTION

MAKE	MODEL	PORT
Apple	Serial Interface Card	Serial (Data on PIN 2, 4 and 5 linked)
Apple	Super Serial (Terminal)	Serial (Data on PIN 2)
Commodore	Super Pet 9000	Serial
Commodore	VIC 20	RS 232
DEC	Rainbow PC-100	Communications
EPSON	MX 20	RS 232 (8 pin DIN CONN)
H P	H P 125	2
H P	Series 80	82939 (STD Cable or Option 001)
IBM	PC	ASYNCHRONOUS COMMS ADAPTOR
Osbourne	Osbourne 1	Serial RS 232
Radio Shack	TRS 80 Model I	EIA
Radio Shack	TRS 80 Model II	Channel A & B
Radio Shack	TRS 80 Model III	P1
Texas	Business System 200	EIA
Texas	99/4	(Data on PIN 2, PIN 4 ignored)
Toshiba	T100/200/250	Serial

TABLE 2. RS232 C STANDARD INTERFACE AND COMPUTER SOCKET CONNECTION

DATA LOGGER DESIGNATION	ABBREV.	INTERFACE PIN NO. (15-WAY)	COMPUTER PIN NO. (25-WAY)	DIRECTION
Transmitted Data	TXD	3	2	To Interface
Received Data	RXD	2	3	To Computer
Clear to Send	CTS	4	5	To Computer
Request to Send	RTS	5	4	To Interface
Signal Common	GND	7	7	N/A

5 CABLES

SOLOMAT stocks several types of RS 232 cables. Please specify your type of computer and type of serial interface card you are using when specifying cable. Since each computer has its unique connector system for the RS 232, you may have to contact your local computer dealer for RS 232 cable adaptors. Standard cables are wired as DTE-DCE cables. For printers, the EX15 and EX17L cables are wired as DCE-DCE.

WARNING: The equipment generates, uses and is capable of radiating radio frequency energy that may cause interference to radio communications; improper installation or modification of this equipment may increase interference. It has been tested and found to comply with the limits for a Class A computing device pursuant to Sub part J of Part 15 of F.C.C. Rules, which are designed to provide a reasonable protection against such interference when operated in a commercial environment.

Should this equipment be operated in a residential area, this may cause interference in which case, the user, at his own expense will be required to take whatever measures may be required to correct the interference.

6 APPENDIX

6.1 Reading the Logger: Typical BASIC Program (IBM)

```
200     'INITIALISE USART'
220     OUT PORTAD+3,130
230     OUT PORTAD,LOW
240     OUT PORTAD+1,HIGH
250     OUT PORTAD+3,26
255     OUT PORTAD+4,2
260     OUT PORTAD+1,0
270     RETURN
280     'INPUT FILE NAME ROUTINE
281     PRINT:INPUT "FILE NAME ";F$
285     IF F$="" THEN GOTO 281
286     I=INSTR(F$,":"):IF I=0 THEN F$=VOL$+F$
290     I=INSTR(F$,"."):IF I=0 THEN GOTO 310
300     EXT$=RIGHT$(F$,LEN(F$)-I+1):EXT$=LEFT$(F$,I-1):RETURN
310     EXT$=".SOL":RETURN
339     'READ STRING
340     AA$=""
341     IF (INP(PORTAD+5) AND 32)=32 THEN GOTO 344
342     GOTO 341
344     COUNT=0
345     OUT PORTAD,48
346     IF (INP(PORTAD+5) AND 1)=1 THEN GOTO 370
347     IF (INP(PORTAD+5) AND 96)=96 THEN GOTO 360
350     GOTO 346
360     COUNT=COUNT+1
362     IF COUNT>100 THEN GOTO 341
363     GOTO 346
370     A$=CHR$(INP(PORTAD))
380     IF A$=CHR$(13) OR A$=CHR$(4) OR A$=CHR$(3) THEN RETURN
390     IF A$=CHR$(10) THEN GOTO 341
400     IF LEN (AA$)< 250 THEN AA$=AA$+A$
410     GOTO 341
460     'WRITE STRING TO DATALOGGER
470     GOSUB 200
480     FOR III=1 TO LEN(OUTST$)
490     OUT PORTAD,ASC(MID$(OUTST$,III,1))
500     IF (INP(XXX+5) AND 96)<>96 THEN GOTO 500
510     NEXT III
520     RETURN
530     'PROMPT ROUTINE
540     LOCATE CLN,1: PRINT SPC(39)
550     LOCATE CLN,1
560     RETURN
570     'RESET DATA LOGGER
580     INPUT "ENTER C)LEAR LOGGER MEMORY,R)E-TRANSMIT OR Q)UIT ";P$
590     IF P$="C" THEN GOTO 620
595     IF P$="R" THEN GOTO 721
600     IF P$="Q" THEN GOTO 80
610     GOTO 580
620     RESTORE
630     FOR T=1 TO 13:READ X:NEXT T
640     OUTST$="RESET"
680     GOSUB 460
690     GOSUB 1720
700     PRINT "LOGGER MEMORY CLEARED"
710     PRINT AA$
720     GOTO 580
721      'RE-TRANSMIT DATA
722      OUTST$="X"
723      GOSUB 460
724      GOSUB 340
725      GOTO 80

1720    'READ DATA LOGGER
1730    AA$=""
1740    GOSUB 200
1760    GOSUB 340
1780    RETURN
```

6.2 Examples of Data Outputted to Printer

```
SOLOMAT DATA LOGGER
DATA BLOCK No.1
READ INTERVAL 15 Secs.
2 READINGS EACH INTERVAL

   1     6.87 pH
         21.9 Deg.C
   2     6.87 pH
         21.9 Deg.C
   3     6.87 pH
         21.9 Deg.C


DATA BLOCK No.2
READ INTERVAL 15 Secs.
2 READINGS EACH INTERVAL

   1     6.87 pH
         21.9 Deg.C
   2     6.87 pH
         21.9 Deg.C
   3     6.87 pH
         21.9 Deg.C

END OF DATA
```

```
▯@▒SOLOMAT DATA LOGGER
DATA BLOCK No.1
READ INTERVAL 60 Secs.
3 READINGS EACH INTERVAL

   1     24.9 Deg.C
         6.94 pH
          484 uS
   2     24.9 Deg.C
         6.94 pH
          486 uS
   3     25.1 Deg.C
         6.94 pH
          481 uS

END OF DATA
```

6.3 Data Transmission Format (Printer Only)

After powering up, there is a delay of approximately 800ms. Eight null characters are transmitted, then a 'NEW LINE' command. This comprises a 'Carriage Return character (ASCII OD) followed by a delay of 260ms. The 'Line Feed' character (ASCII OA) completes the 'NEW LINE' command. NOTE: All Solomat RS 232 cables are wired for 260ms delay during data transmission. If you do not want the 260ms delay, then cut the link between pins 7 and 9.

TABLE 3. ASCII SYMBOLS

					SYMBOL						SYMBOL
20	20	20	20	20	(Blank)	75	53	20	20	20	µS
6D	56	20	20	20	mV	70	70	6D	20	20	ppm
70	48	20	20	20	pH	67	72	20	20	20	gr
52	50	4D	20	20	RPM	6D	6D	20	20	20	mm
44	65	67	2E	43	Deg. C	44	65	67	2E	46	Deg. F
66	74	2F	6D	6E	ft/min	25	52	48	20	20	% RH
62	61	72	20	20	bar	6D	2F	73	20	20	m/s
25	20	20	20	20	%	50	53	49	20	20	PSI

After 400ms, the 'Start of Text' (STX—ASCII 02) character is sent, followed by the heading 'SOLOMAT DATA LOGGER'. The following titles are transmitted, separated by a new line command: 'DATABLOCK NO. X', 'READ INTERVAL T SEC (S)', and 'NO. READINGS EACH INTERVAL'. After two newline commands, the MPM readings are each sent as a string of 18 characters in the following form:

The reading number is four characters in length with leading zeros blanked (ASCII 20) followed by a space (ASCI 20). The numerical reading occupies a total of seven characters. Leading zeros are suppressed (ASCII 20) and the polarity symbol (ASCII 21 if negative, or ASCII 20 if positive), immediately precedes the first digit. A space (ASCII 20) is printed before the five ASCII characters for the symbol word (if the word is less then five characters, trailing spaces (ASCII 20) are added). A new line command separates the readings. After the last reading has been sent, an extra newline is transmitted followed by the title 'END OF DATA', then two more lines. The 'END OF TEXT' (ETX, ASCII 03) is sent followed by newline and the 'END OF TRANSMISSION' (EOT, ASCII 04) character, then one null character. After a delay of 800ms, the logger is ready to return to the logging mode, in which case a new block will be set or if the ASCII string 'RESET' (upper case only) is received, the RAM will be reset and cleared, ready for new data.

NOTE: Read out of the RAM is non-destructive and will only be reset if the word 'RESET' is received or the 'RAM RESET' push switch is pressed. After receiving the RESET command, the RAM is cleared and after a delay of approximately 1.6 seconds, eight null characters are sent followed by 'NEW LINE'. After the newline command, 'End of Text' (ETX) is sent, then newline followed by 'End of Transmission' (EOT) and one null character. The logger can be returned to the logging mode by removing the interface cable and plugging in the Logger programming module.

6.4 Using the Epson P40 Printer

The Epson P40 is an excellent printer for hard copy printouts of your data. The P40 must be used with the EX17L cable supplied by Solomat. Because the P40 uses an unusual data transmission control format, you must transmit data at 300 baud and not 1200 or 4800 baud. The P40 must have a serial, and not a Centronics interface. If you purchased the P40 from Solomat then the switches should be correctly set. Figure 9 shows the correct switch settings at the back of the P40.

The Epson P40 has its own internal nickel cadmium batteries, and does not use power from the MPM/Interface. Please read the Epson Manual for correct operation of the printer. The P40 must be turned ON before the Logger.

SWITCH	1	2	3	4	5	6	7	8
POSITION	OFF	ON	ON	ON	ON	OFF	ON	OFF

FIGURE 9. EPSON P40 SWITCH POSITIONS

7 SPECIFICATIONS

Memory:	CAPACITY: 5000 readings BATTERY BACK-UP: Up to 4 weeks of memory back-up before transfer to computer. The battery is charged whenever power is applied to the Data Logger. INFORMATION: Number, symbol, decimal point and negative sign are all stored. Data stored in Data Blocks (up to 50) Maximum 4 readings at each read interval.
Read Interval:	1, 5, 15, 60 (secs/mins) switch selectable. Also acepts manual triggering
Clock Accuracy:	Better than 0.004% accuracy
Output:	RS232 (RS432) Format with CTS, RTS active
Dimensions:	225 × 94 × 40mm (10 × 3.7 × 1.5 inches) (with Programming Module)
Weight:	490g (17.2oz) (with Programming Module)
Temperature Range:	STORAGE: −30°/70°C (−22°/160°F) (<80% RH) USAGE: 0°/55°C (32°/130°F) (<80% RH)
Power Requirement:	300mA (max), 6.3V DC (±1V) when active 3.5mA quiescent

8 Warranty and Service

Warranty

Solomat warrants each Data Logger to be free from defects in workmanship, materials and components for one year from the date of purchase. Any Data Logger found to be defective by Solomat within the warranty period will be repaired (or replaced at Solomat's discretion) and calibrated without charge, provided that you return the product, shipping prepaid, to Solomat or an authorised Solomat Distributor.

Data Logger failure must not have occured as a result of operation of the instrument other than in accordance with the instructions furnished with the instrument.

This warranty does not cover probes. If the instrument failure is caused by accident, neglect, misuse or abnormal conditions, or includes physical damage to the case, repair will be charged at a nominal cost. If requested, an estimate will be submitted before repair work starts. Any out-of-warranty repairs are warranted 90 days from the date of invoice. The warranty does not apply if any modifications have been made by anyone other than Solomat or an authorised distributor.

The foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to any other implied warranty of merchantability, fitness or adequacy for a specific purpose. Solomat shall not be liable for any incidential, special or consequential damages, whether in contract or otherwise. This warranty does not affect the statutory rights of a consumer. In such transactions, the rights and obligations of the Buyer and Seller shall be determined by statute.

Representations and warranties which are inconsistent with the terms of this warranty are not valid unless approved in writing by an officer of Solomat.

If you have any questions about this warranty, contact Solomat directly.

Service

Products are manufactured to the specifications applicable at that time. Solomat shall have no obligation to update or modify products, once sold.

If an Instrument Failure Occurs

1. Carefully read this manual, ensuring that the problem is not a user fault.
2. Notify Solomat or your nearest distributor, giving full details of the problem, including instrument serial number. You will then be contacted with service data or shipping instructions.
3. Forward the instrument ACCORDING TO SHIPPING INSTRUCTIONS with transportation prepaid. Solomat or your local distributor will repair/replace the insrument, and return the instrument, transportation prepaid. The time for servicing depends on whether the unit must be shipped back to the service centre, or can be repaired locally.

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Solomat shall not be liable for any incidental or consequential damages in connection with any deletions, errors or ommissions in this manual.

Proprietary Notice

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