

## (D1) MICROPROCESSOR BASED DATA LOGGER



### MODEL WISE DESCRIPTIONS :

5.1	Datalog-16/PX	Data Logger with RTC (Real Time Clock) and Printer output port (XX = 04, 08, 12, 16)
5.2	Datalog-16/SX	Data Logger with RTC and RS-485/RS-232 Serial com. Port (XX = 04, 08, 12, 16)
5.3	Datalog-16/AX	Data Logger with RTC, Printer port & RS-485/RS-232 Serial com. port (XX = 04, 08, 12, 16)
5.4	Datalog-16/EX	Data Logger with RTC, Printer output port & RS-485/RS-232 Serial com. port and Extra 128KB memory bank for data storage (XX= 04, 08, 12, 16)

### DESCRIPTION :

Microprocessor based Sixteen Channel Temperature / Process Data Logger model DATALOG-16 are suitable for continuous monitoring and logging of temperature or process at maximum 16 different locations with indicating accuracy of 0.1°C or 1°C. For other process inputs this instrument offers absolute indicating accuracy. Each input has independent amplifier and hence each channel can be different input type. For example out of 16 channels, 8 channels can be thermocouples, 4 can be RTD (PT-100) and rest 4 can be (4-20) mA.

Wherever, in addition to the monitoring of the process parameters, the data logging, memory storage,

common or individual high or low alarm relay outputs, printer or PC interface is also desired, the Model DATALOG-16 offers them all as per the requirement. For this facility the built in Real Time Clock allows real time data logging, parallel printer port allows on line and off line printing of the data and RS232/RS485 serial port allows data logging on to the PC. Necessary data logging Software operating on Windows platform is also offered for both graphical and tabular representation of the data's of all the channels that is logged in. Libratherm offers, standard and customized PC based software to meet user's requirement. The serial communication is based on MODBUS ASCII protocol, which allows Datalog-16 to be interfaced with other master devices working on the same protocol.

**FEATURES :**

- Available in standard sizes.
- Highly accurate and sturdy in operation.
- Accuracy better than  $\pm 0.1\%$  of the full scale.
- Elegant looks, Very easy to operate.
- Accepts standard inputs like thermocouple, RTD - Pt-100 2 or 3-wire input, etc.
- Models with 4, 8, 12 & 16 inputs are available.
- High quality membrane keypad
- Power supply 230 VAC / 110 VAC  $\pm 10\%$ , 60 / 50 Hz
- PC compatible. And much more.

**APPLICATION :**

- ▶ Heat treatment, Furnace / Oven Temperatures at various locations
- ▶ Star / Delta change over of heating coils
- ▶ Police protection with PID/Program controller
- ▶ Constant temp. Bath
- ▶ Environmental chambers
- ▶ Research & Dev. Centers.
- ▶ Cold storage and Chilling plants
- ▶ Laboratory equipment etc.

**TECHNICAL SPECIFICATIONS:**

<b>No. Of channels</b>	4, 8, 12 or 16
<b>Input</b>	J, K, R, S, B, C, D, RTD(PT-100), RTD(PT-1000)/2 or 3 wire, (4-20)mA, (0-1)V etc. (each channel can be of different input type)
<b>Range</b>	-200 to 2000 °C Subject to the specified input
<b>Accuracy</b>	Better than $\pm 0.1^\circ\text{C}$ , $\pm 1^\circ\text{C}$ - Software Linearized.
<b>Resolution</b>	0.1°C, 1°C
<b>CJC</b>	Automatic using built-in temperature sensor
<b>Display</b>	4 digit each 0.5" 7-segment red LED to display process and set values 2 digit 0.5" 7 segment red LED for channel no 6 digit 0.5" 7 segment green LED for real time clock
<b>Open Sensor Indication</b>	Display shows Flt-1 or Flt-2 and relays will be turned OFF
<b>Scan Rate</b>	1 to 99 sec (programmable through front panel keyboard)
<b>Skip/Hold Facility</b>	Available through key board in configuration mode
<b>Key board</b>	6 x 1 soft key membrane keypad for data entry
<b>Relay output</b>	2 nos. potential free change over contact available (1 each for high and low output but common for all the channels)
<b>Alarms Output</b>	2 per channel i.e. 32 open collector outputs to drive external relay card. Can be provided as LL, HH, LH, HL alarm & trip Logic
<b>LED Indication</b>	32 LED's in the front indicating status of each alarm output
<b>Retransmission</b>	(4-20) mA per channel Non isolated
<b>Data Logging</b>	Real Time with Programmable log time and storage time
<b>Serial / Parallel Interface</b>	Parallel Centronics printer output port for Printer and Serial (RS232/RS485) for PC with Window based software on Modbus ASCII Protocol
<b>Data Storage</b>	2K to 128K memory bank
<b>Size</b>	192 x 96 x 200 mm
<b>Panel Cutout</b>	186 x 92 mm., $\pm 0.5$ mm
<b>Supply</b>	230VAC / 110 VAC $\pm 10\%$ (10VA), 50/60Hz or 24VDC @ 500mA
<b>Enclosure</b>	Metallic with ABS bezel and polycarbonate front fascia

**NOTE :**

Software working on window platform will be provided as per the standard format. The Data's will be logged on to a computer on DATE, DAY, and TIME basis, which can be retrieved in the same manner, and the data's will be stored in tabular format or in graphical format. In either case a print out can be taken on a printer. In case of power failure / trip the process will resume from where it has stopped.

**ORDERING INFORMATION :**

MODEL	INPUT		RANGE IN °C		OUTPUTS TYPE C
	A		B		
Datalog-16/PXX	J	(A1)	0 TO 760 °C	(B1)	COM.HI / LO RELAY (C1)
Datalog-16/SXX	K	(A2)	0 TO 1372 °C	(B2)	OPEN COLLECTOR (C2)
Datalog-16/AXX	E	(A3)	0 TO 1000 °C	(B3)	BOTH - (C3)
Datalog-16/EXX	T	(A4)	0 TO 400 °C	(B4)	NONE (C4)
	S	(A5)	0 TO 1768 °C	(B5)	
X= 04, 08, 12, 16	R	(A6)	0 TO 1768 °C	(B6)	
	B	(A7)	200 TO 1820 °C	(B7)	
	Pt-100	(A8)	0 TO 350 °C	(B8)	
	4-20mA	(A9)	SPECIFY	(B9)	

SERIAL PORT (D)			SUPPLY (E)		
RS 485	-	(D1)	230 VAC	-	(E1)
PRINTER O/P	-	(D2)	110 VAC	-	(E2)
BOTH	-	(D3)	24VDC	-	(E3)

When all the channels are not of same type, please specify each required channel in the following format

**EXAMPLE : 1**

MODEL	A		B		C		D		E	
Datalog-16/P4	A	2	B	2	C	1	D	1	E	1

This is 4 Channel Data logger Model Datalog-16/P4 with K type thermocouple input having range (0-1372)°C with relay output as high and low alarm common for all channels, printer port and Operating on 230VAC supply.

When all the channels are not of same type, please specify each required channel in the following format.

Channel No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Input Type	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

**EXAMPLE : 2**

For 16 channel data logger, 1<sup>st</sup> 8 channels are K type, next 9 to 12 channels are RTD(Pt-100) and next 13 to 16 channel are (4-20)mA. The following code is applicable

Channel No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Input Type	A1	A1	A1	A1	A1	A1	A1	A1	A8	A8	A8	A8	A9	A9	A9	A9

For A1 K type the range will be 0 to 1372 oC, For A8 Pt-100 the range will be 0.0 to 400.0 oC and for A9-(4-20)mA user will have to specify the required display range.

## PRINTER INTERFACE:

The data logger provides the printer port, to which external 80 column dot matrix printer can be connected to print the on line data in the tabular format. The user required header can also be pre-programmed, so that it appears on the hard copy. In case the on line printer attachment is not available, the internal memory can dump the data to the printer when connected for offline printing. Maximum 3000 records for 16 channel data logger can be stored in the internal memory. The following screen shows the format of one such hardcopy.

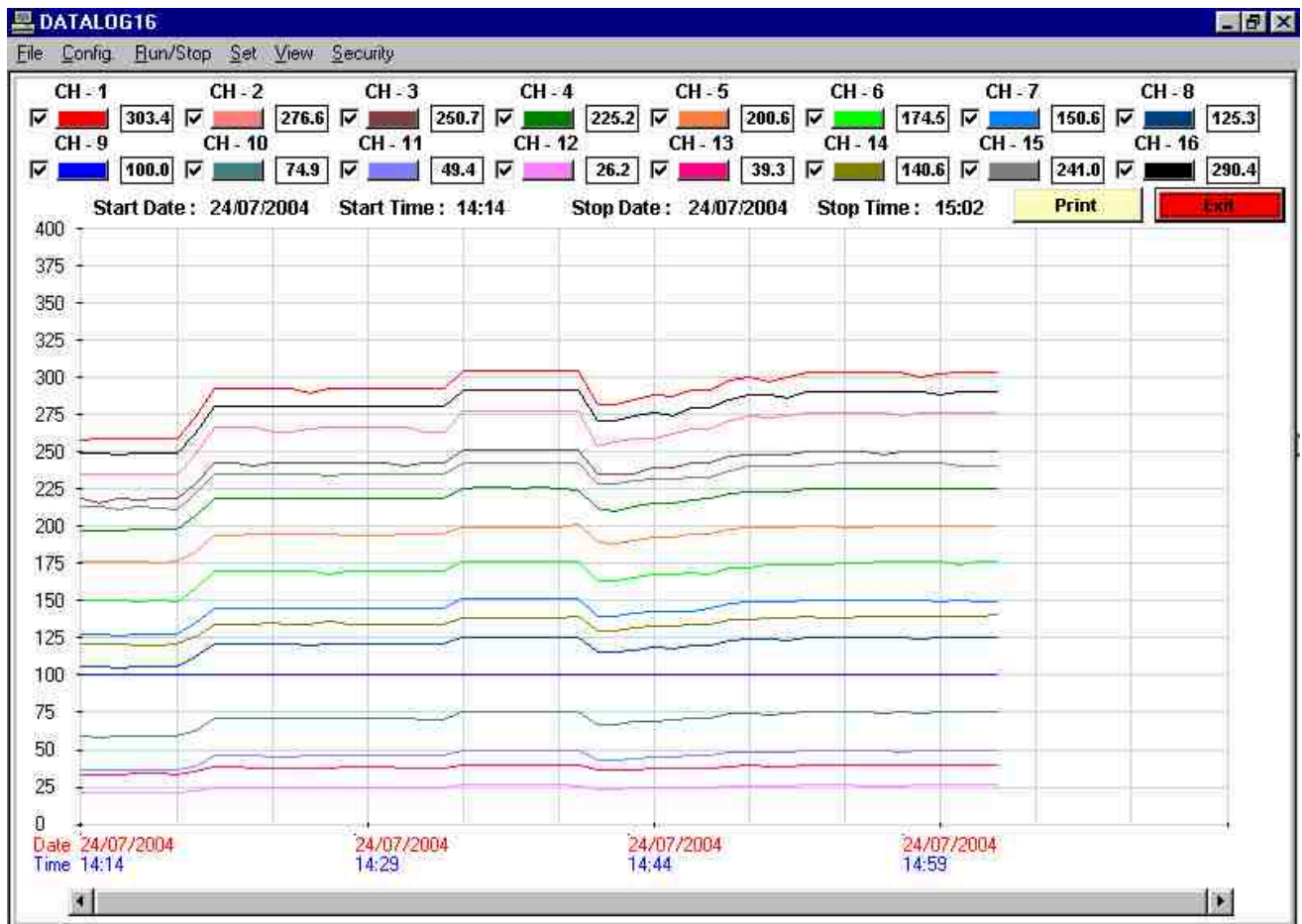
## PC BASED INTERFACING SOFTWARE:

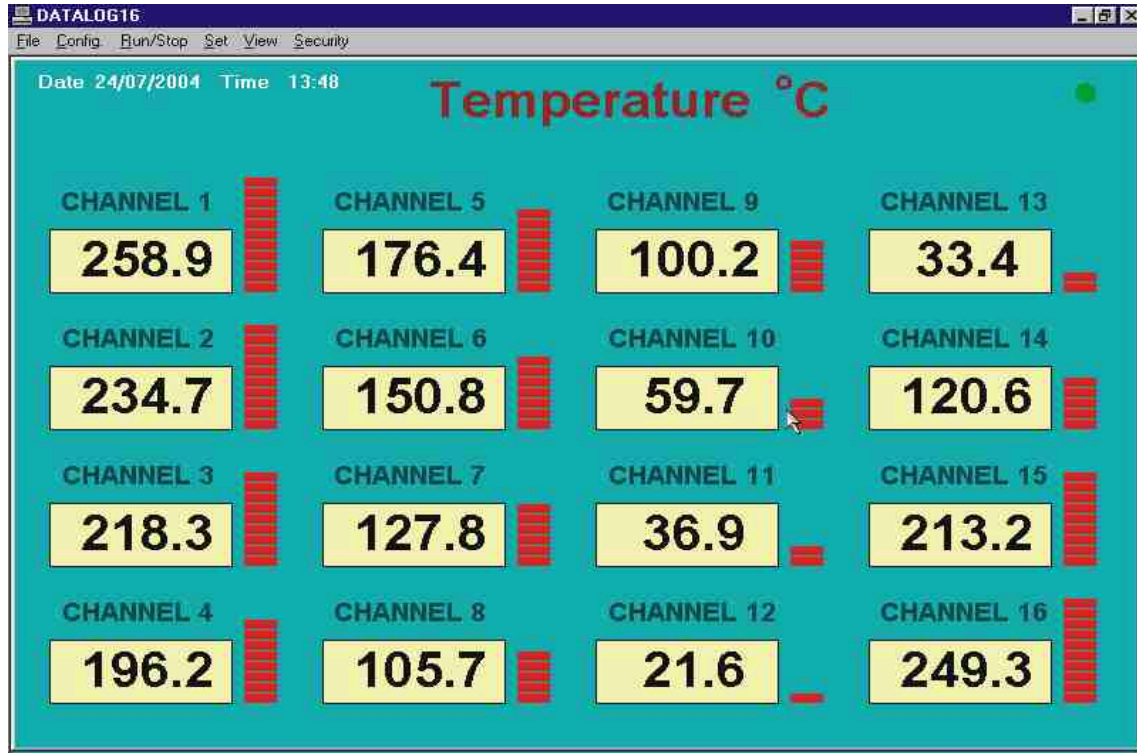
Libratherm offers customized data logging software to meet various application. The communication between the data logger and the PC is established using RS232/RS 485 interfacing bus and the data transfer are based on the MODBUS ASCII protocol. The supporting window based software available on the CD is required to be pre loaded onto the computer.

When the PC is connected to the data logger, the data can be on line transferred to the PC where the PC acts as a master and sends queries to the data logger to send the real time data with date, time, channel number and process values. The pc will process these data to store in the tabular as well as the graphical format, which can be viewed on demand as on line or offline data. The software allows user to store other information, such as, Company name, Batch number, process name, as well as certain customized fields. This makes the software user friendly and dedicated to the requirement.

When the PC is not connected to the data logger, the datas can be stored in the built in internal memory or in the external memory card (LIMEM-128) of the data logger. These stored data can be later on dumped on to the PC for direct display of graph and table.

The following screens shows such software features.





**LIBRATHERM DATALOGGER**

Start Date : 24/07/2004 Start Time : 14:14 Stop Date : 24/07/2004 Stop Time : 15:03

Temperature (Deg. C)

Sr.NO.	DATE	TIME	CH-1	CH-2	CH-3	CH-4	CH-5	CH-6	CH-7	CH-8	CH-9	CH-10	CH-11	CH-12	CH-13	CH-14	CH-15	CH-16
1	24/07/2004	14:14	258.4	234.7	218.2	197.8	176.6	150.8	128.0	105.9	100.2	59.8	36.4	21.3	33.7	120.9	213.4	249.1
2	24/07/2004	14:15	258.9	234.6	218.1	197.6	176.6	150.7	127.6	105.7	100.2	58.7	36.8	21.3	33.6	120.6	213.0	249.1
3	24/07/2004	14:16	258.9	234.7	218.2	197.8	176.6	150.7	126.3	105.5	100.2	58.5	36.9	21.3	33.6	120.6	211.4	248.8
4	24/07/2004	14:17	258.9	234.6	218.1	197.9	176.5	149.2	127.4	105.6	100.2	59.5	36.9	21.3	33.9	119.7	212.9	249.0
5	24/07/2004	14:18	258.9	234.7	218.2	197.9	175.0	150.4	127.6	105.6	100.2	59.6	36.9	21.3	34.0	119.8	212.8	249.1
6	24/07/2004	14:19	258.9	234.6	218.3	197.9	176.6	149.2	127.4	105.7	100.2	59.6	36.9	21.3	33.7	121.8	211.7	249.0
7	24/07/2004	14:20	273.1	247.8	228.6	206.5	182.7	158.4	135.1	112.0	100.2	62.8	38.7	22.1	35.8	125.6	222.3	262.4
8	24/07/2004	14:21	293.0	266.8	243.1	218.9	193.5	169.8	145.3	120.7	100.2	71.3	46.4	25.0	38.3	134.0	235.3	280.9
9	24/07/2004	14:22	293.0	266.7	243.1	218.8	193.4	169.7	145.4	120.7	100.2	71.3	46.4	25.0	38.3	133.9	235.3	280.9
10	24/07/2004	14:23	293.0	266.7	241.0	218.3	195.0	170.0	145.4	120.7	100.2	71.3	46.4	24.8	37.9	134.8	235.5	280.9
11	24/07/2004	14:24	293.0	263.8	242.6	218.8	195.0	170.0	145.4	120.8	100.1	71.4	45.8	25.0	38.0	134.9	235.5	291.0
12	24/07/2004	14:25	292.9	263.7	242.6	218.7	195.0	170.0	145.3	120.7	100.2	71.3	45.8	25.0	37.9	134.8	235.4	280.9
13	24/07/2004	14:26	289.8	266.1	243.0	218.7	195.0	170.0	145.4	119.6	100.1	71.2	46.4	25.0	37.9	134.8	235.4	280.9
14	24/07/2004	14:27	292.7	266.6	243.0	218.7	195.0	168.4	145.1	120.7	100.2	71.3	46.4	25.0	38.0	136.1	234.0	280.5
15	24/07/2004	14:28	292.7	266.6	242.9	218.7	193.4	169.7	145.3	120.7	100.1	71.2	46.4	25.0	38.3	133.9	235.3	280.8
16	24/07/2004	14:29	292.7	266.5	243.0	218.7	193.4	169.7	145.3	120.7	100.2	71.2	46.4	25.0	38.3	133.9	235.2	280.7
17	24/07/2004	14:30	292.6	266.4	242.9	218.6	193.4	169.7	145.2	120.6	100.1	71.2	46.3	25.0	38.3	133.9	235.1	280.6
18	24/07/2004	14:31	292.7	266.5	240.7	218.2	194.9	169.9	145.2	120.6	100.1	71.2	46.4	24.7	37.9	134.8	235.3	280.8
19	24/07/2004	14:32	292.7	263.5	242.3	218.5	194.9	169.9	145.2	120.6	100.1	70.3	46.3	25.0	37.9	134.8	235.3	280.6
20	24/07/2004	14:33	292.6	263.5	242.3	218.5	194.7	169.7	145.2	120.5	100.1	70.3	46.2	25.0	37.9	134.7	235.2	280.5
21	24/07/2004	14:34	304.4	277.6	251.3	225.8	199.6	176.2	151.3	125.7	100.1	75.2	49.7	26.2	39.8	138.8	242.6	291.4
22	24/07/2004	14:35	304.4	277.5	251.3	225.9	199.5	176.2	151.2	125.7	100.1	75.2	49.6	26.2	39.8	138.8	242.6	291.4
23	24/07/2004	14:36	304.4	277.5	251.3	225.9	199.6	176.2	151.4	125.7	100.1	75.2	49.7	26.2	39.7	138.8	242.7	291.5
24	24/07/2004	14:37	304.4	277.6	251.5	225.8	199.6	176.3	151.4	125.8	100.1	75.2	49.7	26.2	39.8	138.8	242.8	291.6
25	24/07/2004	14:38	304.4	277.6	251.4	225.9	199.6	176.2	151.4	125.8	100.1	75.2	49.7	26.3	39.8	138.8	242.7	291.5
26	24/07/2004	14:39	304.4	277.6	251.5	225.8	199.6	176.3	151.4	125.8	100.1	75.2	49.7	26.3	39.8	138.8	242.9	291.6
27	24/07/2004	14:40	304.4	277.7	251.5	224.0	200.9	176.6	151.4	125.9	100.0	75.2	49.7	26.0	39.3	139.7	243.0	291.6