

## Data logger and Heat Flux meter system

### Technical Specifications

Data Logger and Heat flux meters system for logging the radiative heat flux, measurement of temperature profiles, Velocities at different locations in the fire experiments to be conducted in experimental fire building as per specifications given below		
Data Logger – 01 No		
Heat Flux meter – 02 No		
SL. No	Parameter	Specifications
<b>Data logger - 01 No</b>		
1.	No of channels	270 or more
2.	Temperature Range of K type thermocouple for measurement.	0 to 1000(±100) °C
3.	Scan rate	20 Channel/s or more
4.	Minimum scan interval	Less than or equal to 1 s
5.	Operating Temperature range	-45 ° C to +70 ° C
6.	Data Communication	USB,ETHERNET, RS232,RS485 and MODBUS Communication should have.
7.	Software	Easy Configurable Windows Based Software
8.	Power	230V/50Hz on mains
9.	Battery Backup	Rechargeable battery backup for minimum four hours continuous operation or more
10.	Storage	128 MB or more
11.	Memory	Minimum 10 million continuous real time data logging or more
12.	Data logging features	Should be capable to log input signal from all types of thermocouples, RTDs, Thermistors, Monolithic Temperature sensors, strain gage and bridge sensors and able to accept input from. It should have capability to measure voltage, current, resistance, frequency and all the measurements derived from it as input.
13.	Resolution	0.25 μV, 2.5 nA and 1.5 mΩ
14.	Accuracy	0.1%
15.	Real Time Clock	Resolution 200 μs accuracy +/- 1 min /year
16.	Display and resolution	Digital LCD display with backlight 18 bit resolution and key pad
17.	Channel expansion	Provision for upgrading number of channel up to 600 more by adding channel expansion module in future
18.	Channel feature	Dual channel isolation technology
19.	File transfer Protocol FTP	FTP automatic data transfer in logger as well as in PC.
20.	Digital Channels	12 or more digital channels
21.	Input and output	8 or more Bi directional channels should be there.
22.	Alarm	Alarms with high, low, within range and outside range conditions, delays can be provided.
23.	Enclosure	Data logger and channel expansion modules should be enclosed in a weather protection chamber.

<b>Heat Flux meter – 02 No</b>		
24.	Range	0 - 50 ( $\pm 15\%$ ) kW/m <sup>2</sup>
25.	Sensor technology	Both Gardon and Schmidt-Boelter
26.	Temperature range	0 to 600° C
27.	Cooling	Water based cooling
28.	Cooling water flow rate range	10 liter/hr to 30 liter/hr
29.	Response time	< 250 x 10 <sup>-3</sup> s or better
30.	Operation time	Continuous measurement of 1 hr.
31.	View angle	150° or more
32.	Window Attachment	Sapphire or any other material with removable attachment
33.	Amplification Unit	If required suitable amplification unit should be connected to avoid signal loss, leading to measurement error due to long transportation of the signal transferred to data logging device placed in data logger room at a distance of about 15 meters.
34.	Mounting and Fixing	Sensor should be mounted in flange for fixing wall and floor in experimental room.
35.	Cables	Insulated cables for connecting sensors to data logger placed in data logger room (15 m Distance) and insulated conduit, fittings etc for cables. The cables and fitting should be able to remain undamaged in the high temperature environment of 600° C $\pm$ 10%.
36.	Conduits and Fixing Kit	Conduits/Pipes and standard fixing kit including threads/nuts/ fasteners as to withstand the high temperature (600° C $\pm$ 10%) environment.
37.	Signal Transmission	Proper Shielding of Signal Transmission against any electromagnetic interference / earth leakage.
38.	Compatibility	Data logger and Heat flux meter should be integrated for data logging in PC(PC is in CBRI scope) with minimum 1 sec interval.
39.	The following document should be provided (i) Instruction manual for operation both soft and hard copy (ii) Instruction manual for software (iii) Proper calibration certificates for the instruments	
40.	Complete installation, demonstration, commissioning and technical training of all the instruments (including installation of the sensors on walls or floor and water cooling arrangement; and installation of amplification unit etc) along with insulated wiring and underground insulated conduit fitting for connecting the sensors to data logging device placed in data logger room should be done by the supplier at experimental facility at site at CBRI, Roorkee. The fabrication work, if any, for installation should be done by the supplier. All the facilities for fabrication work, etc, if required, should be provided by the supplier	
41.	Two year Warranty for the system from the date of installation and successful commissioning	