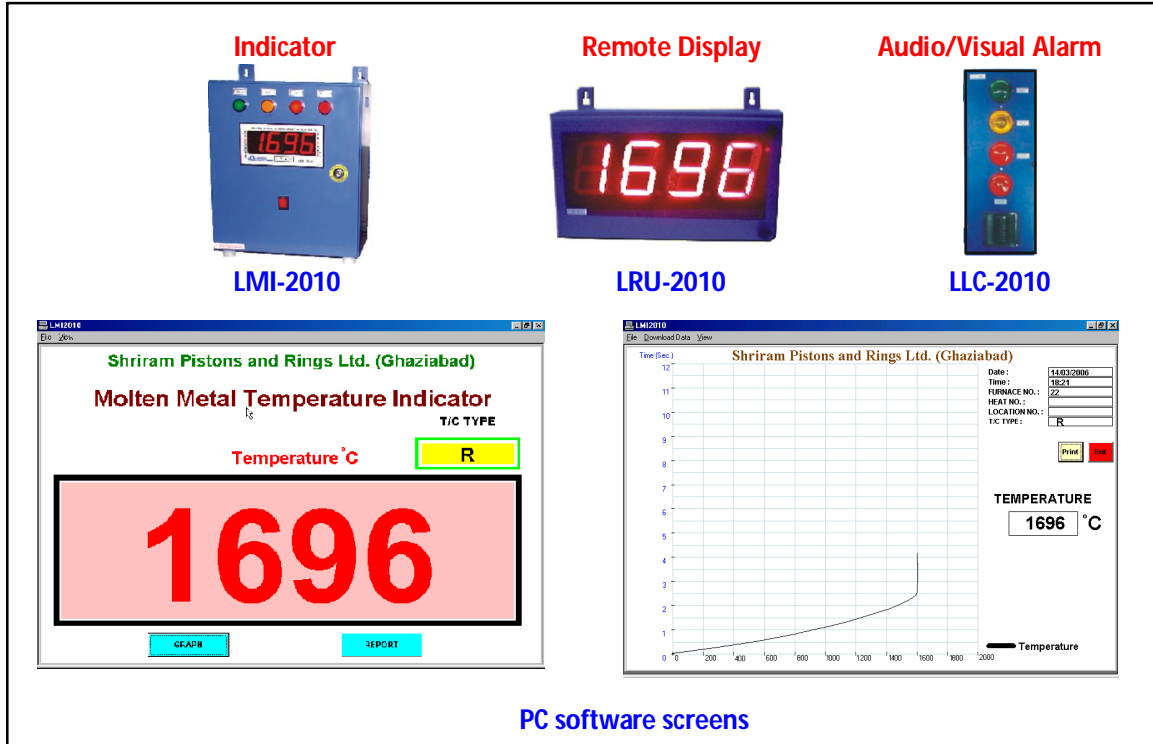


Molten Metal Temperature Indicator with Remote Display And Computer Interface (Product Code 20)



Description:

Molten metal Temperature Indicator (LMI-2010): Libratherm offers micro controller based Molten Metal Temperature Indicator model LMI-2010, which is designed to measure accurately the temperature of ferrous and non ferrous molten metals. The measurement of this temperature is a critical process, since the expendable thermocouple is dipped for merely 3 to 4 seconds and then withdrawn. In this short measurement time, the operator is guided through the measurement cycle by audio/visual alarms for thermocouple continuity, measurement in progress and measurement over.

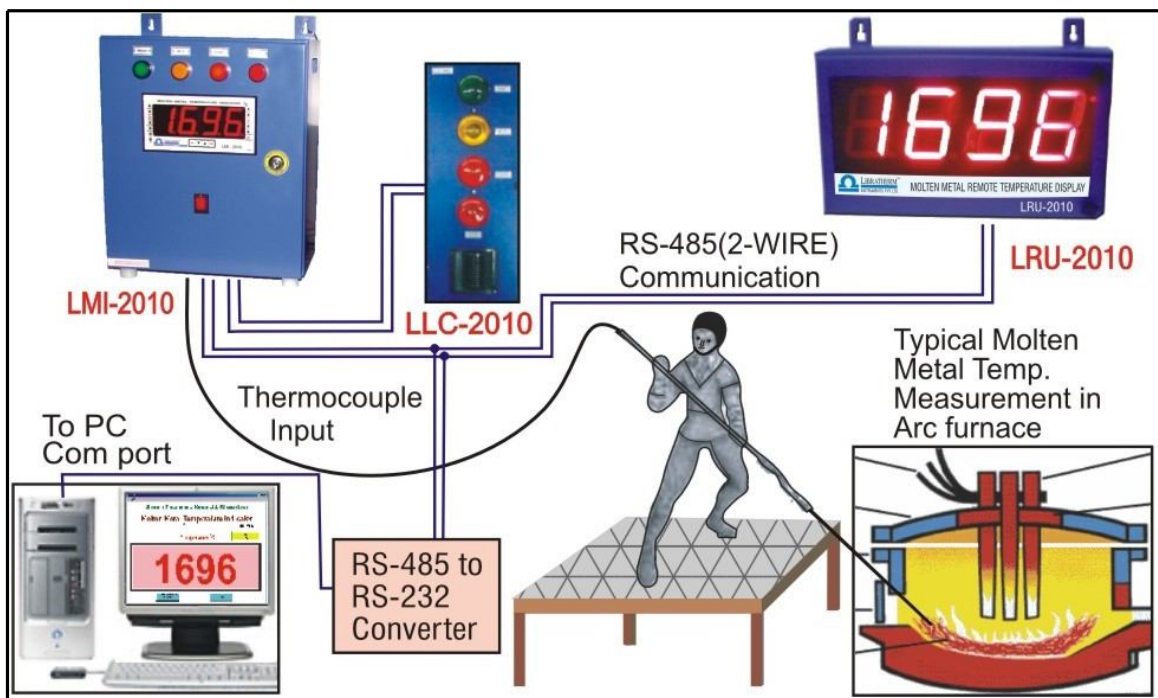
Any error in measurement due to thermocouple open condition is immediately detected and informed by activating the audio/visual alarm.

LMI-2010 is indigenously designed to measure and display the molten metal temperature in very short time interval. The indicator is rugged, reliable, field proven and very easy to operate. User can select the desired type of thermocouple and also set other parameters using front panel key board. During measurement, the indicator ignores the slag temperature and the Average or Plateau reading is determined using the advanced algorithm and the same is latched and displayed on the bright 7 segment 2" red Led display. The latched readings are transmitted on two wire RS485 bus for remote display and computer interface.

Large or Remote Display (LRU-2010) : Libratherm also offers micro controller based remote display to be used in association with LMI-2010. The reading available from LMI-2010 on RS485 2 wire bus is captured by this remote display model LRU-2010, which indicates the latched reading on 4" large red 7 segment LED display.

With single LMI-2010, maximum 1 node of computer and 5 LRU-2010 can be connected in serial multi-drop configuration. This display works on 230VAC and can be mounted at a suitable height for distant viewing.

Lamp and Hooter Compartment (LLC-2010): For remote audio/visual indications – Libratherm offers this unit – which can be driven from the potential free contacts available from LMI-2010.



Technical Specifications (LMI - 2010):

Input	K, R, S and B type thermocouple (user selectable through front panel)
Range	Full positive range of the selected input K type : 0 to 1372 oC , R and S type : 0 to 1768 oC
Accuracy	Within +/-0.1% of the range
Resolution	1 °C
Cold Junction Compensation	Automatic using built in sensor from 10°C to 60°C.
Display	4 digit – 2" red seven segment LED display
Measurement Time	2 to 9 seconds (user programmable)
Plateau Detection	1 to 99 °C (user programmable)
LED indication	13 front panel LEDs for various functions
Audio / Visual Alarm Indication	Provided for Thermocouple continuity, Measurement in progress and Measurement Over using the built in lamps and speaker.

Partners In Measurement And Control

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Retransmission Current Output	4-20mA proportional to the measured temperature, RLmax = 400 ohms
Relay Output	Potential free relay changeover contacts for driving remote audio/visual indicator - LLC-2010. Relay contacts are rated for 5A @ 230VAC.
Serial Communication	RS485 – 2 wire for remote display and computer interface (Using MODBUS RTU protocol)
Supply	110 or 230VAC +/-15%, 50/60 Hz
Enclosure	Dust free - Metallic powder coated.
Size	350 (w) x 400 (h) x 200 (d) mm.
Weight	8.5 Kg (approx)
Mounting	Wall mounting key holes or Can be placed on a flat platform.

Technical Specifications (LRU – 2010):

Signal Input	2 wire RS485 serial output from LMI-2010 in MODBUS RTU protocol
Display	4 digit – 4" red seven segment LED display
LED indication	2 front panel LEDs for RXD and TXD (
Supply	110 or 230VAC +/-15%, 50/60 Hz
Enclosure	Dust free – Metallic powder coated
Size	500(w) x 250(h) x 150(d)mm.
Weight	10.0 Kg (approx)
Mounting	Wall mounting key holes or can be placed on a flat platform.

Note: Due to continuous improvement – the specifications are subject to change without notice.

Technical Specifications (LLC – 2010):

Contact Inputs	4 nos. of C-NO potential free contacts from LMI-2010
Audio/Visual Indication.	4 nos. of 100Watt lamps (Red, Amber and Green colour) for visual indication of Measurement in Progress, Measurement Over, Thermocouple Continuity and a Hooter at the END of Measurement.
Supply	110 or 230VAC +/-15%, 50/60 Hz
Enclosure	Dust free – Metallic powder coated
Size	185(w) x 500(h) x 125(d)mm.
Weight	10.0 Kg (approx)
Mounting	Wall mounting key .

Ordering Information for Model LMI-2010, LRU-2010 AND LLC-2010:

The LMI-2010 can be ordered with or without LRU-2010 and LLC-2010. With single LMI-2010 maximum 4 LRU-2010 and one LLC-2010 can be connected. User will have to specify the models and quantity of LRU, LLC and requirement of standard PC software and supply voltage.

Basic Model	A- No. of LRU-2010	B- No. of LLC-2010	C- Standard PC software	D- Supply Voltage
LMI-2010	A1- (One) A2- (Two) A3- (Three) A4- (Four) 00- (None)	B1- (One) 00- (None)	C1- (Yes) 00- (None)	D1- (230VAC) 00- (None)

Example:

Example	Basic Model	A- No. of LRU-2010	B- No. of LLC-2010	C- Standard PC software	D- Supply Voltage
1	LMI-2010	00	00	00	D1
2	LMI-2010	A2	B1	C1	D1
3	LMI-2010	A3	B1	00	D2

Example	Ordering Code	Description
1	LMI-2010-00-00-00-D1	Model LMI-2010 without any additional accessories and operating on 230VAC supply.
2	LMI-2010-A2-B1-C1-D1	Model LMI-2010 with 2 nos. of remote display units LRU-2010, 1 no. of Lamp Compartment LLC-2010, all operating on 230VAC supply with standard PC software.
3	LMI-2010-A3-B1-00-D2	Model LMI-2010 with 3 nos. of remote display units LRU-2010, 1 no. of Lamp compartment LLC-2010 and all operating on 110VAC supply.