Elitech

DR−210A
Temperature and Humidity
Data Logger Operation Instruction

1. Product Overview:

DR–210A is a temperature and humidity data logger, with a wide temperature range, high accuracy, and large recording capacity. Dot–matrix LCD screen can simultaneously display system clock, current work status, recording capacity and temperature and humidity data. The logger has USB interface and RS485 interface. It has two alarming output: buzzer, and alarming relay.

DR–210A data–processing software has the functions of real–time transmission, historical data uploading, data saving and printing, etc.

This series of products are widely used in industries of foodstuff, medicine, cold–chain transportation and other industries accordant with HACCP system certification. It could also be used in laboratory where needs temperature and humidity supervision.

2. Product Features:

- Monitor and record temperature and humidity.
- Temperature and humidity recording cycle could be flexibly adjusted.
- Large recording capacity. If record every 15 minutes, it could last recording for half a year.
- Big LCD screen can simultaneously display system clock, current work status, recording capacity, temperature and humidity data.
- The upper/lower temperature and humidity alarming values could be separately set. It will alarm when the temperature/humidity exceeds the upper or lower limit.
- Internal clock rechargeable battery and charging circuit. When the external power is cut off and the clock battery is fully charged, the clock could keep running for over half a year.
- Several kinds of data interfaces for your convenient data uploading and printing.
- Form a Local Area Network by RS–485 interface to monitor several data loggers'temperature at the same time.
- It is matched with our DR–210A data processing software which could real–time monitor, print and manage the data.
- It has two alarming output: buzzer, and alarming relay.
- It has the standby rechargeable battery, which could run up to ten days without the external power.

3. Specification:

Mounting Size: Length: 131.5mm   Width: 131.5mm

Product Size: Length: 144mm   Width: 144mm   Depth: 83mm

4. Technical parameters:

◇ Power Supply: 12V AC / DC ~ 24V AC / DC,

  power supply 90 ~ 264VAC, 50/60HZ is available by connecting external power adaptor

◇ Temperature Measuring Range: –50.0℃ ~ 120.0℃

◇ Temperature Accuracy: ±0.5℃ for the range –30℃ ~ +20℃ ;

            ±1℃ for –40℃ <the temperature<–30℃ and 20℃ <the temperature<70℃;

              +2℃ for other range (If sensor wire is longer than 50meter, accuracy deviation 1%)

◇ Temperature Sensor Type: NTC (sensor wire length five meters)

◇ Humidity Measuring Range: 0 ~ 95%RH

◇ Humidity Accuracy: (@25℃) : ±5%RH ;

            (@10 ~ 40℃) : 0 ~ 59%RH: ± 6%RH(max)

                  60 ~ 95%RH: ± 8%RH (max)

◇ Temperature Sensor Type: Honeywell

◇ Display Resolution: 0.1

◇ Recording Cycle: 1 minute to 24 hours continuously set

◇ Recording Capacity: each 13,000 points (MAX)

            (When the data record is full, the new record will overwrite the original data)

◇ Ambient Environment: Temperature –35 ℃ ~ 70 ℃; Humidity 0% ~ 95%

◇ Alarming Output: buzzer, and alarming relay

◇ Communication Interface: USB interface and RS–485 interface

◇ Standby battery: 3.6V 2200mAh NI–MH Battery

5. Wiring Terminal Description:
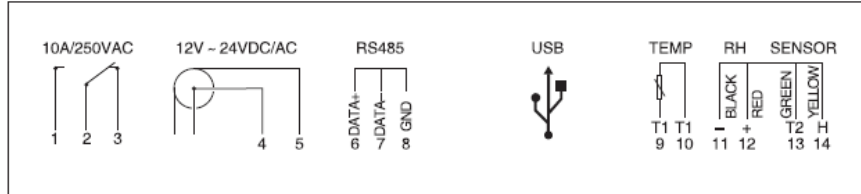
DR—210A Wiring Terminal Diagram, see Figure5.1

Figure 5.1 DR—210A Wiring Terminal Diagram

DR—210A Wiring Terminal Description:

Relay Output: 1,2 N.O. 2,3 N.C. 10A/250VAC

Power Input: 4,5 12V AC / DC ~ 24V AC / DC

Note: When power adaptor is connected, round socket is available.

Temperature Sensor Input: 9,10

Humidity Sensor Input: 11 (black) , 12 (red) , 13(green) , 14 (yellow)

Data transmission interface:

USB interface

RS485 interface: 6 (DATA+)

7 (DATA—)

8 (GND)

Note: (1) USB interface and RS—485 interface are alternative, but they can't be used simultaneously.

It is selected by waved switch, the default is USB interface.

(2) RS—485 converter is needed when connect to PC by RS—232/RS—485 interface.

(3) USB data cable is needed when connect to PC by USB interfac.

6. Parameter Setting List:

Menu Items	Function	Setting Range	Default
Address	Data logger address	01 ~ 80	01
Clock	Data logger system clock	Format: Year Month Date Hour Minute	Current time
Recording	Recording Cycle	1 Minute to 24 Hours	10 Minutes
Probe1 H—Limit	Temperature upper limit	−50℃ ~ 120℃	120℃
Probe1 L—Limit	Temperature lower limit	−50℃ ~ 120℃	−50℃
Probe2 H—Limit	Humidity upper limit	0 ~ 100%	100%
Probe2 L—Limit	Humidity lower limit	0 ~ 100%	0%
Printing Modes 1.On Line Report 2.Historical Report 3.Daily Report	Print Mode Selection 1.On Line Report 2.Historical Report 3.Daily Report	1~3	2
Begin Print	Printing start—up time in the historical report	Year Month Date Hour Minute	2010.01.01 10:00
End Print	Printing end time in the historical report	Year Month Date Hour Minute	2010.01.01 11:00
Print Hour	The daily report print hour	00 ~ 23 O'clock	10
Default1	Default setting 1	−10.0 ~ 10.0	0
Default2	Default setting 2	−10.0 ~ 10.0	0
Baud Rate	Baud Rate Setting	9600 ~ 38400	9600
Clear Data	Clear all the data		Password: 2010

7. Operation Instruction:

DR–210A mainly has four working state:

1、 Normal working state
2、 System parameter setting state
3、 Recorded data query state
4、 Data printing state

Note: When DR–210A is electrified, it enters normal working state.

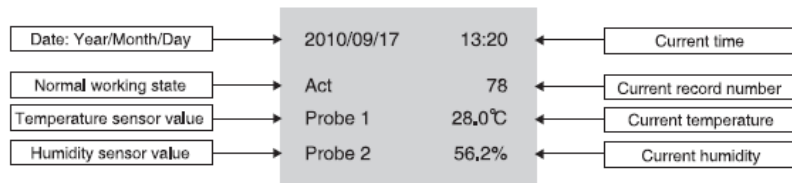### 7.1 The interface description of normal working state:

Date: Year/Month/Day →	2010/09/17	13:20	← Current time
Normal working state →	Act	78	← Current record number
Temperature sensor value →	Probe 1	28.0℃	← Current temperature
Humidity sensor value →	Probe 2	56.2%	← Current humidity

Figure7.1 Scheme of normal working interface

When the external power is cut off, battery information will show in LCD, as Figure 7.2. In this battery mode, LCD backlight will be off and printer does not work at the same time.
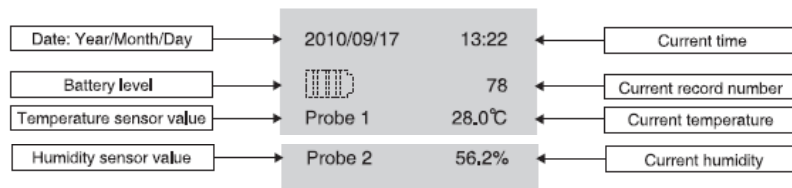
Date: Year/Month/Day →	2010/09/17	13:22	← Current time
Battery level →	▯▯▯▯	78	← Current record number
Temperature sensor value →	Probe 1	28.0℃	← Current temperature
Humidity sensor value →	Probe 2	56.2%	← Current humidity

Figure 7.2 Battery information interface

Sensor in break/short circuit interface:

Date: Year/Month/Day →	2010/09/17	13:20	
Normal working state →	Act	78	
Temperature sensor value →	Probe 1	error	← Short/ break circuit alarming
Humidity sensor value →	Probe 2	56.2%	
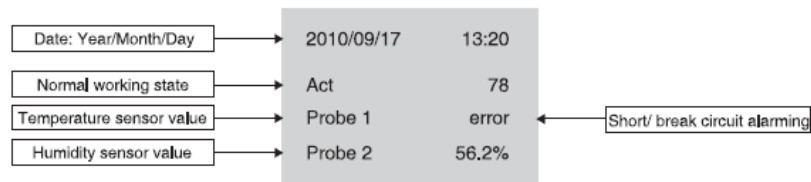
Figure 7.3 Alarming information when sensor in break/short circuit

Sensor alarming interface:

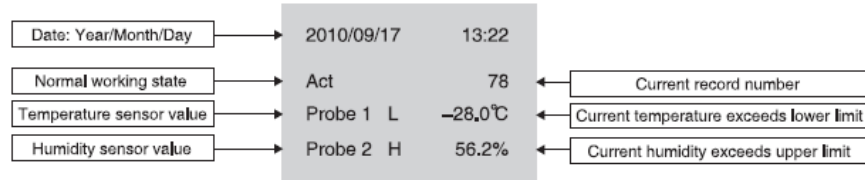| Date: Year/Month/Day →	2010/09/17	13:22	
Normal working state →	Act	78	← Current record number
Temperature sensor value →	Probe 1 L	−28.0℃	← Current temperature exceeds lower limit
Humidity sensor value →	Probe 2 H	56.2%	← Current humidity exceeds upper limit

Figure 7.4 Alarming interface

Note: Alarming information description:

  1. when the sensor is in break/short circuit, display "error".

  2. When the temperature/humidity exceeds the upper limit, display H before the measuring value, exceeds the lower limit, display L.When above alarming information happens, the buzzer alarms and the alarming relay picks in.

  3. When it is in the state of alarming, press any key to cancel the buzzer alarming.

7.2 The interface description of system parameter setting state:

Under the normal working state, press ► to enter the state of system parameter setting, Press ▼ and ▲ to select the parameter you would like to modify, and the parameter pointed by the arrow head is the one selected.

1、when select the parameter you would like to modify, press the key ► and the cursor will flash at the corresponding value, press ▲ key or ▼ key to adjust parameter value.

2、Press ► key, the cursor will cycle shift among the setting parameters, you could select the parameter you want to modify.

3、When finish new parameter setting, press SET key to save parameters.

4、If other parameters need modified, press ▼ and ▲ to select that parameter.

5、If you want to exit from the system parameter setting state, press SET to exit from this state and back to its normal working state.

Note: System parameter setting pages could be turned over by pressing the key ▼ and▲. The setting methods are all the same, the setting interface is as shown in Figure 7.5—7.11.

The detailed system parameter items please see "system parameter setting list" in Chapter Six.
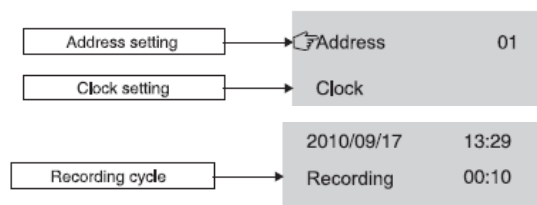
1、Address、Time、Recording cycle setting interface:

Address setting	→ ☞Address 01
Clock setting	→ Clock
	2010/09/17 13:29
Recording cycle	→ Recording 00:10

Figure 7.5 System parameter setting interface 1

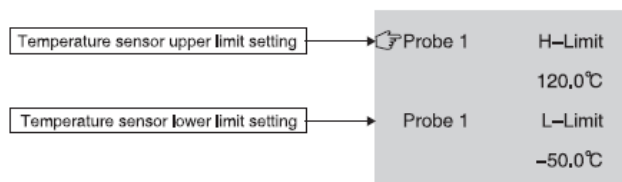2、Temperature sensor alarming upper and lower limit setting interface:

Temperature sensor upper limit setting	→ ☞Probe 1 H—Limit
	120.0℃
Temperature sensor lower limit setting	→ Probe 1 L—Limit
	−50.0℃

Figure 7.6 System parameter setting interface 2

3、Humidity sensor upper and lower limit setting interface:

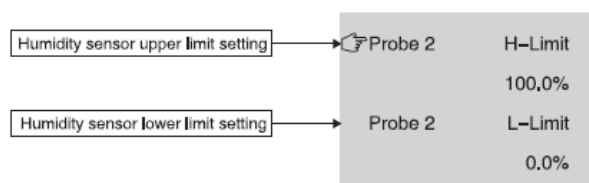| Humidity sensor upper limit setting | → ☞Probe 2   H—Limit |
	100.0%
Humidity sensor lower limit setting	→ Probe 2 L—Limit
	0.0%

Figure 7.7 System parameter setting interface 3

4、 Printer parameter setting interface:

Printing Modes

1). On Line Report

On—line Report: In this mode, the printer will automatically print the recorded data in certain interval, that is, once it records a set of data, it will print it out.

2). Historical Report

Historical Report: In Begin Print parameter entry, set the printing start—up time of the historical report, in the End Print parameter entry, set the printing end time of the historical report.

3). Daily Report

Daily Report: In this mode, the printer will automatically print the data, in the parameter entry "Print Hour" , set the daily report print hour, it will print all the data recorded 24 hours ago .
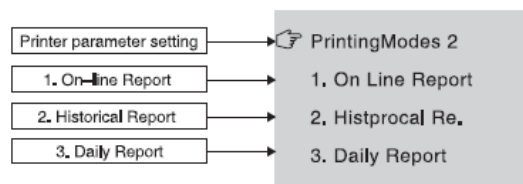
Figure 7.8 System parameter setting interface 4

5、 Begin print and End print setting interface:
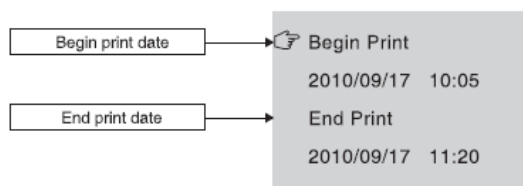
Figure 7.9 System parameter setting interface 5

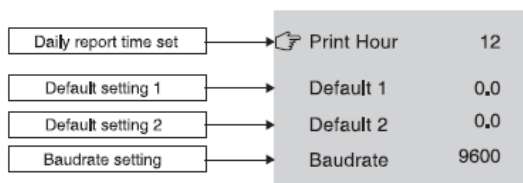6、 Daily report printing setting、 temperature/humidity calibration、 baudrate setting interface:

Figure 7.10 System parameter setting interface 6

7、Clear data interface:

Clear data:

Note: In the state of "Clear Data", press ▶ to enter the state of parameter setting, press ▲ or ▼ to choose the password parameters, input the password "2010", press SET to clear data, it is in the interface of "Clearing", the data clear time is about one minute, and after that it is back to its normal working state.
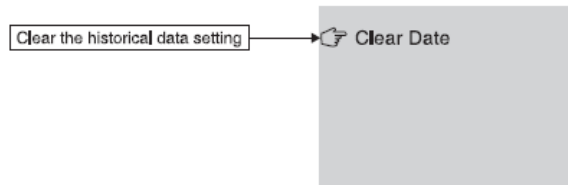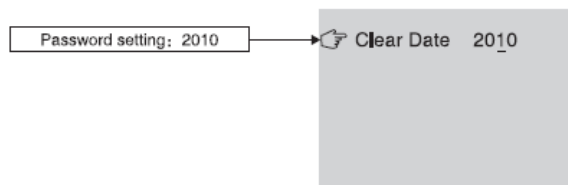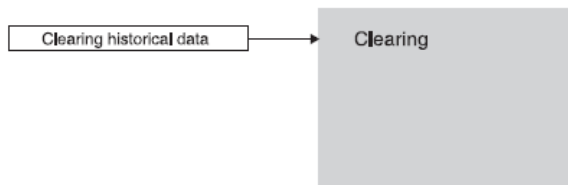
Clear the historical data setting ——→ ☞ Clear Date

Figure 7.11 System parameter setting interface 7

Password setting：2010 ——→ ☞ Clear Date   2010

7.12 password setting interface

Clearing historical data ——→ Clearing

7.13 Data clearing interface

7.3 The description of recorded data query interface:

Under the normal working state, press the key ▼ to enter the state of recorded data query, the interface of the recorded data query is as below:

Date: Year/Month/Day ——→ 2010/09/17   13:20

In the State of data query ——→ Log   78

Temperature sensor value ——→ Probe 1   28.0℃

Humidity sensor value ——→ Probe 2   56.2%

Figure 7.14 Scheme of recorded data query interface

When it is in the state of recorded data query, the inquired recorded data is the latest one.

Press ▼ key to query the historical data backward, press ▲ key to query the historical data forward; long press ▲ key or ▼ key to speed up the query, press SET key to exit the query and back to its normal working state.

7.4 The interface description of data printing state:

Under the normal working state, when the printing mode is set as 2(Historical Report), press ▲ to print the data, it displays "YES" and "NO", press ▶ to select, press SET to confirm. During printing, press ▼ to stop printing and press ▲ again to continue printing, and print SET to exit from printing.
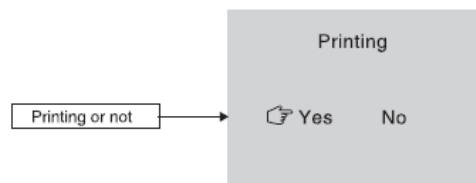
```
                              Printing

  ┌──────────────────┐
  │ Printing or not  │─────────▶   ☞ Yes      No
  └──────────────────┘
```

Figure 7.15 the scheme of historical report printing interface

Note: If the printer is set as On Line Report or Daily Report, printer will automatically print according to the set parameters.

When the printer is offline or it is in batteries, Printing historical report printing interface will not be shown.

8 .Communication Means Selection:

8.1 Multiple DR–210A form LAN

Multiple DR–210A devices can form a Local Area Network by connecting to the RS–232/RS–485 converter at the computer terminal via RS–485 bus. It could assign different addresses for each DR–210A in the LAN by setting parameter entry "Address" with the address range from 1 to 80. All data of the units in LAN can be monitored, uploaded by the computer software and be saved and printed in graphic or table forms. Baud rate could be selected in parameter entry "Baud rate". The higher baud rate can increase transmission speed but with shorter communication distance, and the lower baud rate is applicable to long distance communications, but with slower speed. Recommend choosing the baud rate 9600. Note: The baud rate setting for all the units in the LAN should be the same. Figure 8.1 is the diagram of DR–210A connection via LAN.

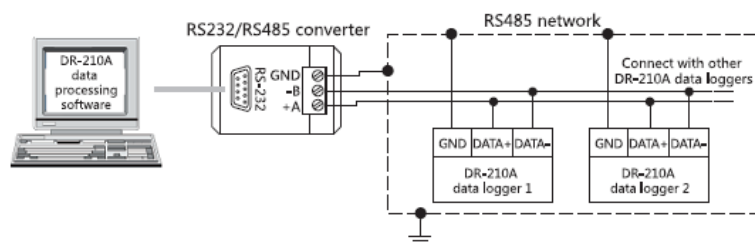Note: In LAN, the address parameter for DR–210A could not be set as the same.

Figure 8.1 DR–210A connect to PC via RS–485 LAN

8.2 Communicate with PC via USB

Single DR–210A device can be connected to a computer serial port for data transmission via USB serial extension cable. Please see Figure 8.2
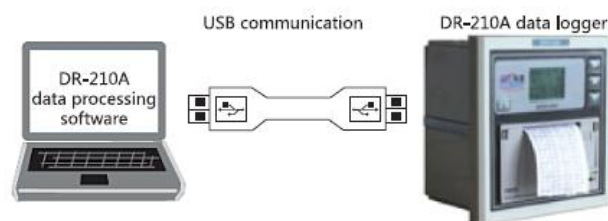
Figure 8.2 DR—210A connect to PC through USB

9. The Operation for Micro—Stylus Printer 24SH:

9.1 Printer indicator light, Buttons and Self—test description:

Once the printer is electrified, it is online, the light POW is on; press S/L, there will be an idling paper feeding, and light is off at the same time. Press S/L again, the printer stops feeding paper, and light POW is on.

Self—test method: Cut of the power, and press S/L and turn on the power, the printer will print out the testing paper.

When the device is under its normal working, the printer should be online and the light POW is on. During printing, please do not press the button S/F in the printer.

9.2. Ribbon Installation:

The instrument is well equipped with Ribbon Cassette in default. Ribbon Cassette needs to be replaced if the printing quality obviously decreases. The procedures of replacing Ribbon Cassette are as following:

A Cut off the power of the printer, push the clip out of the slot according to the arrowhead's direction as shows in Figure 9.1, make sure to push out one side of the clip first and then the other side. Take down the front board.

B After taking down the front board, you could see the paper roller, the printer head, and the plate (see Figure 9.2). Press down the printer head and the plate, (see Figure 9.3), gently press the left—side of the Ribbon Cassette, its right—side will bounce, at this time, lift up the cassette's left—side and take down the cassette(see Figure 9.4).
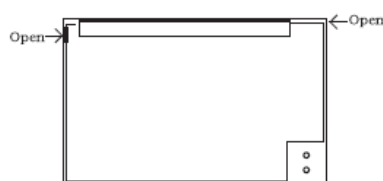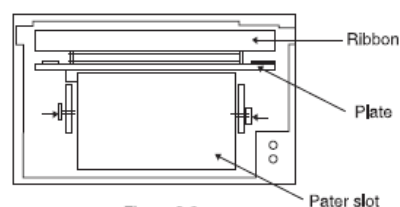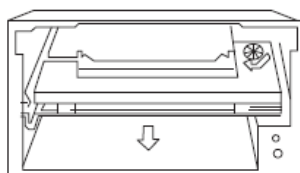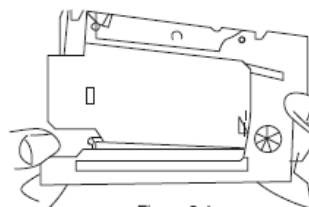

Figure9.1

Figure 9.2

Figure 9.3

Figure 9.4