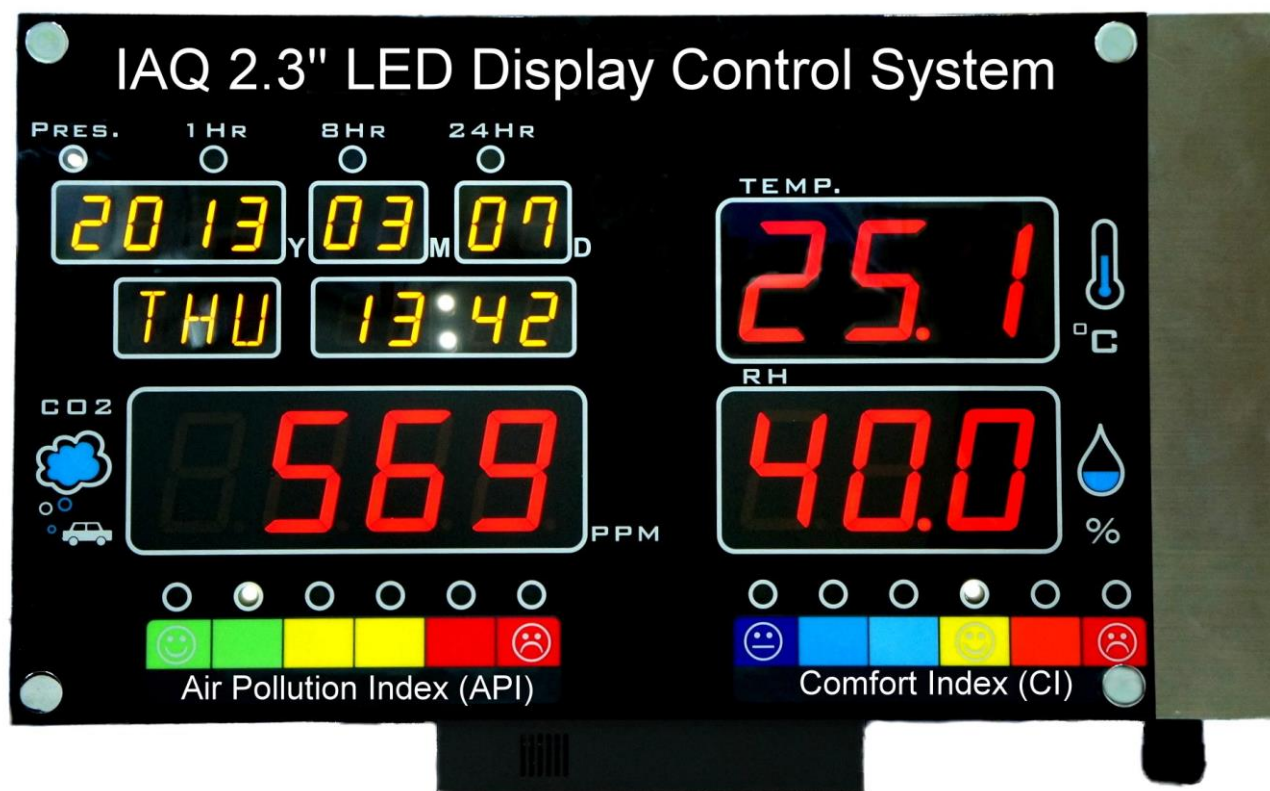


IAQ 2.3" LED Display Control System Manual

Model: JNC-IAQ-CTR230



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v 1.00



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1. Precautions

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- (1) Do not use the product where there is high vibration, or high magnetic field, this could cause damage or error of measurement.
- (2) All maintenance or repairs should be carried out with power disconnected, to avoid personal injury, or damage to the unit.
- (3) In areas with conductive pollution, adequate ventilation, filtering and sealing need to be installed.
- (4) Do not operate the product if any part has been removed or disassembled. Consult your nearest dealer at once.
- (5) The product may be impaired if it is used in a manner inconsistent with its intended purpose, or in an environment that exceeds the specifications of it. JNC Technology Co., Ltd. is not liable for customer's failure to comply with these requirements.

2. Specifications

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Sensor		
(CO2)	Operating Principle	Non-dispersive infrared (NDIR)
	Sampling Response Time	≤ 20 sec
	Range	0~10,000ppms show to 9,999ppm
	Accuracy	±30ppm ±2%Of Reading
(Temp)	Range	-40 ~ 100℃
	Accuracy	±0.3℃
	Repeatability	±0.1℃
(RH)	Range	0 ~ 100%
	Accuracy	±3%
	Repeatability	±0.1%
Response Time	≤ 60sec. It should estimate the area of environment to balance time	
System Specification		
Power	110/220VAC 50~60HZ , with power adaptor	
Environment	Operating temperature	-20~60℃ / 0 ~ 95%RH Non-condensing
	Storage temperature	-30~70℃
Control Output	Control point	3 channels
	Relay contact capacity	90~250VAC≥ 1A
Communication	Ethernet Interface	RJ-45 with Ethernet Web Service; Protocol Modbus TCP
	Character String interface	RS-232/485 Protocol Modbus RTU
Analog Output	Output channel	3 channels
	Current signal	4-20mA (Setting with AO 、PID or output control)
Display	Value display	2.3” LED (red light)
	Date/Week/Time Display	1.0” LED (yellow light)
	Comfort index	6-segment LED indicator light (Reference environmental enactment)or program
	Air Pollution index	6-segment LED indicator light (Reference environmental enactment)or program
Physical	Dimension (mm)	590x 333x 30.2 (WxHxD)
	Weight	≤ 3kg
	Material	Stainless steel 、Acrylic
Record(Optional)	USB record, Max of Support 64G	
Software	Data log and USB of Reading	
Approval	CE / FCC	

3. Web Service

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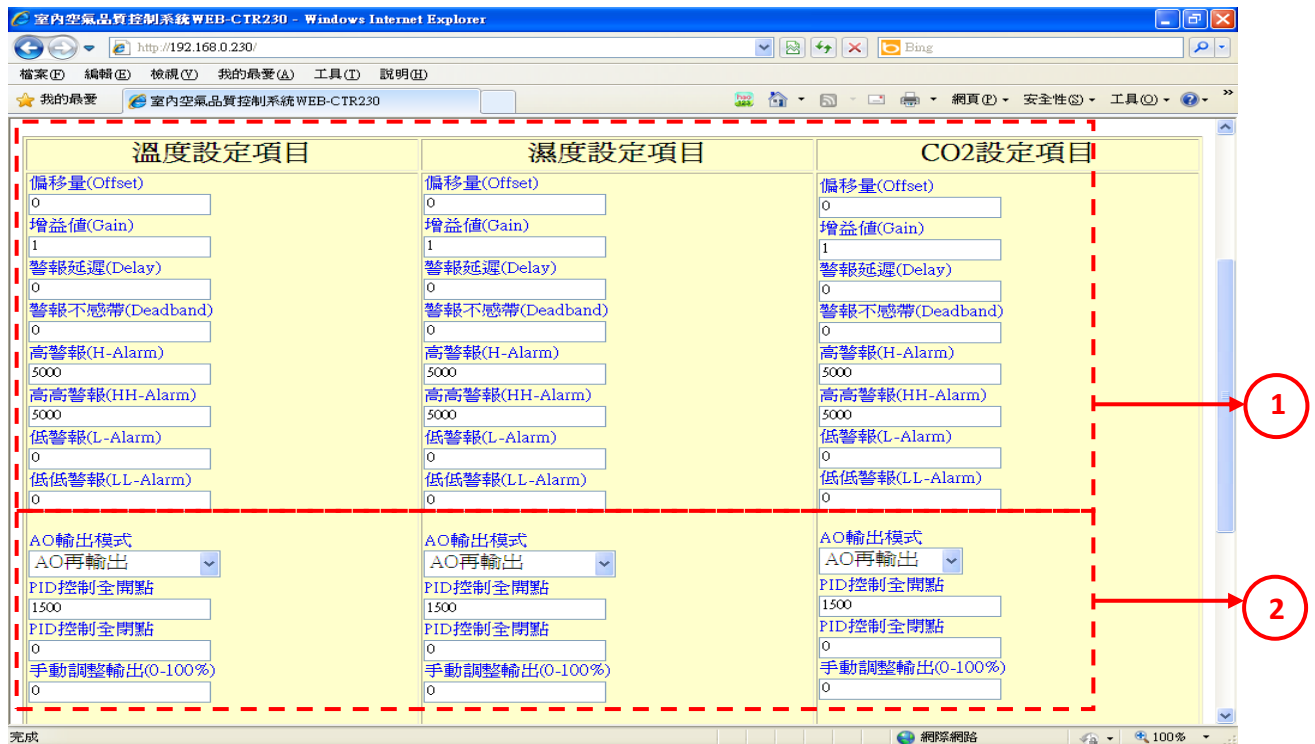
1. Main : Display value and states



No.	Name	Description
1	Web	IP Address (Preset IP:192.168.0.230)
2	Internet	When connect with the hardware, it will show the six photos to update.  If the photo couldn't update. It means abnormal connect. Please check the internet status. (Preset Code:1234)
3	User status	 Administer: It can change of the setting authority.  Use: It can only view the interface and setup interface.
4	Present Value	sequence: Line 1:Temp Line 2:RH Line 3: CO2

2. Channel:

2.1 Setting



No.	Name	Description
1	Channel	Offset : For calibration by using addition / subtraction Gain : For calibration by using multiplication Delay Time : The alarm will only be activated when the abnormal state continues for seconds . Deadband : The alarm will only recover when the value is lower than deadband(%) LO Alarm : First stage of alarm for low point , auto choose Relay LL Alarm : Second stage of alarm for low point , auto choose Relay HI Alarm : First stage of alarm for high point , auto choose Relay HH Alarm : Second stage of alarm for high point , auto choose Relay

※Post Scriptum :

1. (Delay):

Abnormal value continued for N seconds (Setting Sec.) that mean abnormal state.

2. (Deanband):

Remove Abnormal State: When the abnormal value return normal area range. Example: Setting Range 0~200, HI 100, DB 1%. If the value over 100 that start HI Alarm. Remove Alarm: When the value low than HI Alarm 1% (200*1%) 98 value.

2.2 AO Setting

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AO設定

AO輸出模式

PID控制全開點

PID控制全閉點

手動調整輸出(0-100%)

AO輸出對應最大值(20mA)

AO輸出對應最小值(4mA)

AO輸出調整偏移量(AO-Offset)mA

AO輸出調整增益值(AO-Gain)mA

AO設定

AO輸出模式

PID控制全開點

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手動調整輸出(0-100%)

AO輸出對應最大值(20mA)

AO輸出對應最小值(4mA)

AO輸出調整偏移量(AO-Offset)mA

AO輸出調整增益值(AO-Gain)mA

No.	Name	Description
1	AO	AO Mode: (1)Analog Output : Order display mode (Present, 1HR, 8HR, 24HR) output value (2)PID Control : Output present value (3)Manual : Auto set output value PID Full Control: AO output 20mA PID Full Close Control: AO output 4mA Manual Output(0-100%) : Setting AO output range value AO Output Correspond Maximum (mA) : Auto set AO output maximum range AO Output Correspond Minimum (mA) : Auto set AO output minimum range AO Revise Output Offset : 4-20mA with addition and subtraction to adjust AO Revise Output Gain Value : 4-20mA with multiply to adjust

3. System-IP

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No.	Name	Description
1	Present IP	Display present IP address / Subnet mask/ GateWay, auto manual

4. System-Time

※ IAQ Server time is simultaneous with the PC that also with several CTR230

No.	Name	Description
1	Time	Change Year Month: Jan. ~ Dec. Date: First ~ Thirty-first Hour: 00~23 Minute:00~59 Second:00~59 Week: Monday ~ Sunday

5. System - API

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API設定

API設定點: 預設模式

第1段: 200 第4段: 900 第5段: 1200 第6段: 1500

1

2

No.	Name	Description
1	API Setting State	Preset State/ Manual State
2	6 channel Setting	Input 6 channel to Manual State

6. System- Change State

系統設定

模式切換: 即時數據

1

管理者登入

No.	Name	Description
1	Change State	Present average value an / Eight / Twenty-four hour

7. System - Secret Code Input/ Change

密碼修改:

舊密碼: 新密碼: 新密碼確認: 設定

1

No.	Name	Description
1	Change Code	Change Code

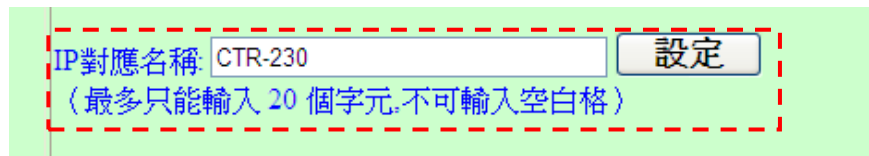
8. System –Display to change mode

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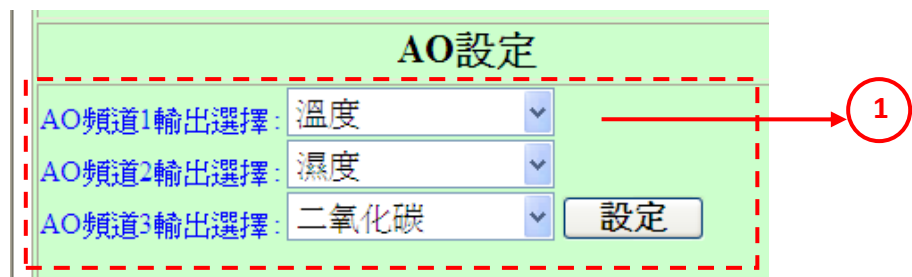
No.	Name	Description
1	Display	CI and API LED Display: Twinkle Mode / Radiate Mode

9. System-IP correspond name



No.	Name	Description
1	IP correspond name	Only enter twenty words at most, can not enter the specebar

10. System-AO channel select

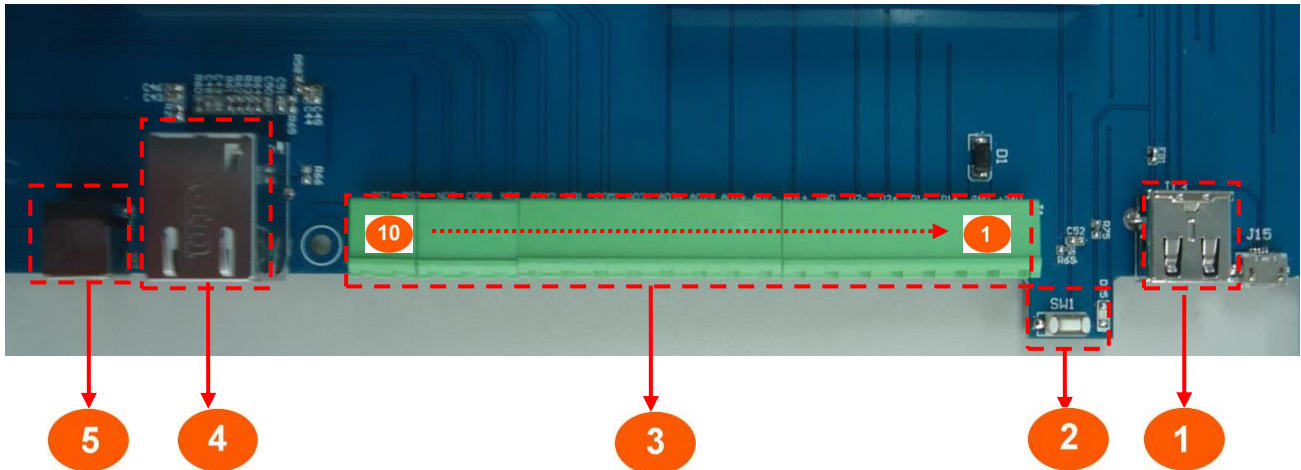


No.	Name	Description
1	AO channel 1~3output select	Auto select AO channel: Temp/ RH/ CO2

4. Wiring

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1. Hardware of IO



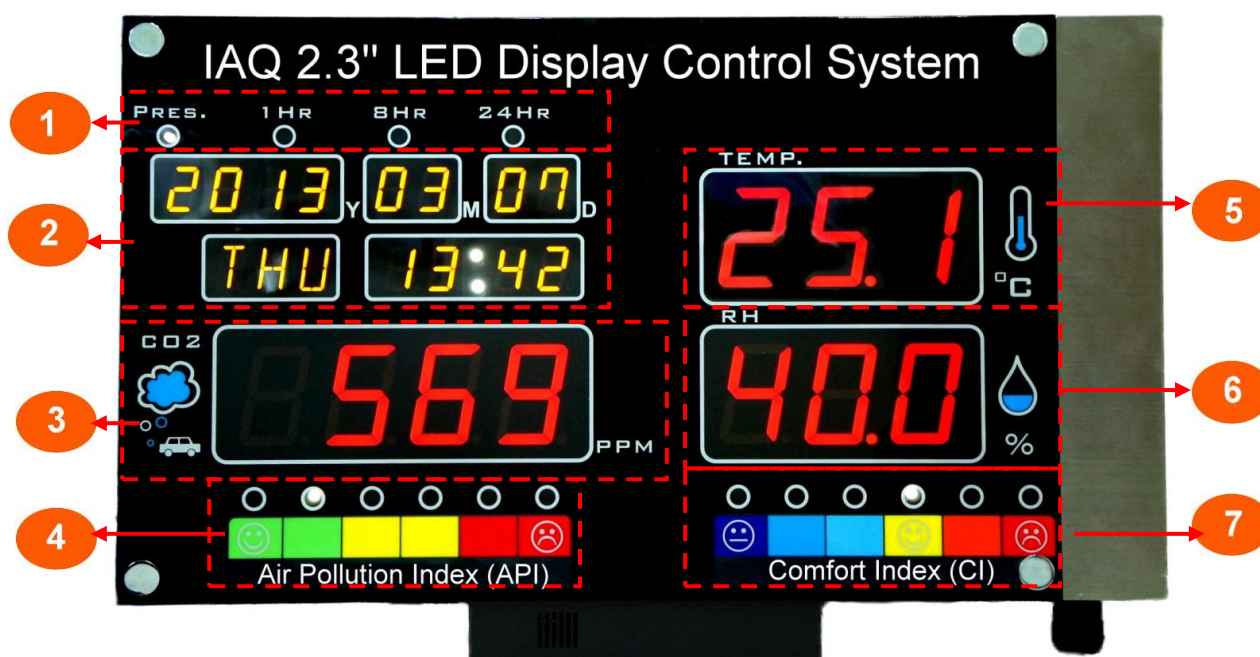
No.	Name	Description
1	USB Record Jack	Using with memory storage (Option)
2	RST Key	Continue push 10sec, reset system
3	Terminal block	Refer " Terminal block "
4	RJ45	Using Ethernet
5	Plug	Power adaptor I/P:110~240VAC , O/P:24VDC

2. Terminal block

10		9		8		7		6		5		4		3		2		1		
RST-	RST+	COM3	NO3	COM2	NO2	COM1	NO1	AO3-	AO3+	AO2-	AO2+	AO1-	AO1+	GND	D2-	D2+	D1-	D1+	GND	+24V

No	Name	Description	No	Name	Description
1	+24V/GND	Power	6	Ao3+ / Ao3-	4-20mA CO2 Output (Range:0~10,000ppm)
2	D1+ / D1-	RS-485	7	COM1 / NO1	Temp Alarm Relay 1
3	D2+ / D2-	RS-485 / RS-232	8	COM2 / NO2	RH Alarm Relay 2
4	Ao1+ / Ao1-	4-20mA Temp Output (Range:-40~100℃)	9	COM3 / NO3	CO2 Alarm Relay 3
5	Ao2+ / Ao2-	4-20mA RH Output (Range:0~100%)	10	RST+ / RST-	External reset contact

5. Facilities



No	Name	Description
1	Display	PRES.: Present 1HR: 1hour average 8HR: 8hour average 24HR: 24hour average
2	Date/Time	Array: year / month /day week/hour/minute
3	CO2 display	Display: 0~9999
4	Air Pollution Index LED	Description next item 1
5	Temp Display	Display: 0.0~99.9
6	RH Display	Display: 0.0~99.9
7	Comfort Index LED	Description next item 2

※Glossary :

1.PRES .(Present):

Getting real-time value

2.1HR (1 hour average):

Every minute of an hour to take a data, average of 60 records that getting 1 hour average

3.8HR (8 hour average):

Getting present hour average and every 7 hours ago, average 8 records of an hour, then average operation of 8 records

4.24HR (24 小時平均):

Getting average of 24 records to make average operation then getting 24 hours average value

5.1 Air Pollution Index :

(1)Reset Mode:

Refer CO2 value formula that counted API value, as the formula:

$$S_i = \frac{P_i - P_0}{Q_i - Q_0} * (C - Q_0) + P_0$$

C: Density of the Pollution values

Q_i: Density ≥ C

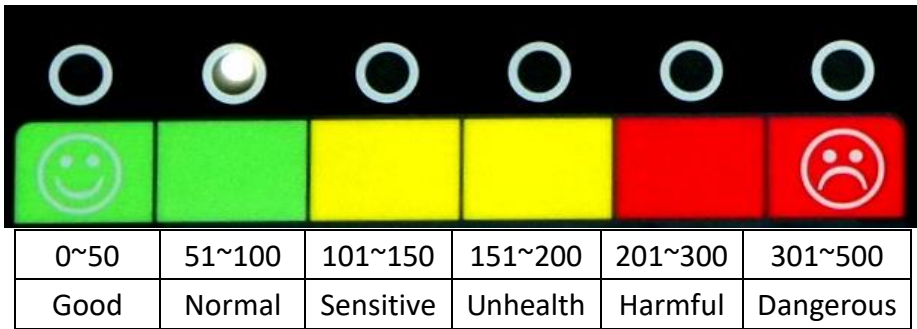
Q₀: Density ≥ C

P_i: IAQI ≥ C

P₀: IAQI ≥ C

After counted the API value correspond comfort that distribute the 6 level, as the Photo 1:

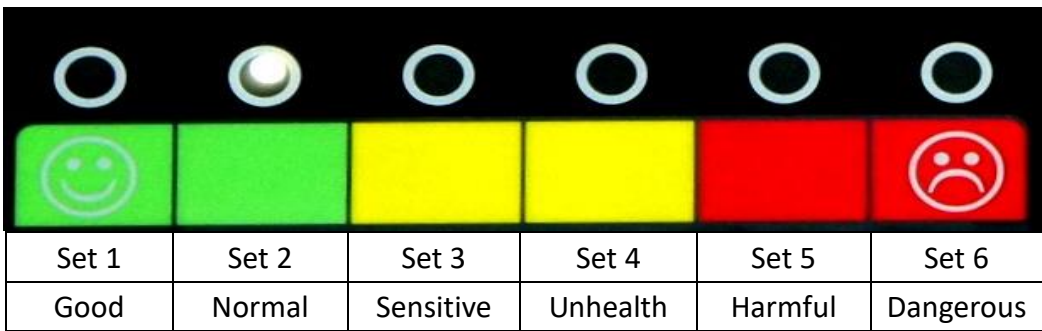
Photo 1



(2)Auto Mode:

Refer CO2 value, user set correspond 6 states, as the Photo 2:

Photo 2



5.2 Comfort Index:

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Refer with Central Weather Bureau Comfort Index. Mean normal Temperature Humidity Index. Refer Temp, Dew Point Temp, Relative RH are counted the CI value

CI correspond the 6 comfort level, as the Photo 3:

Photo 3



< 10	11~15	16~19	20~26	27~30	> 31
Very cold	cold	Chill	Comfort	Hot	Heatstroke

6. USB Record Description



No.	Name	Description
1	YYYYMMDD.csv (File name as the date)	Each day and an hour Record
2	Data.csv	Each Minute Record
3	Event.csv	Event Record

※1 Without USB record then will write inside memory.

※2 when full of the inside memory, it will delete the oldest one record.

In other word, it will save the newest data.

※3 Inside memory description

※3-1 Every hour record with 32 records to inside buffer memory. It recorded 32 hours at most.

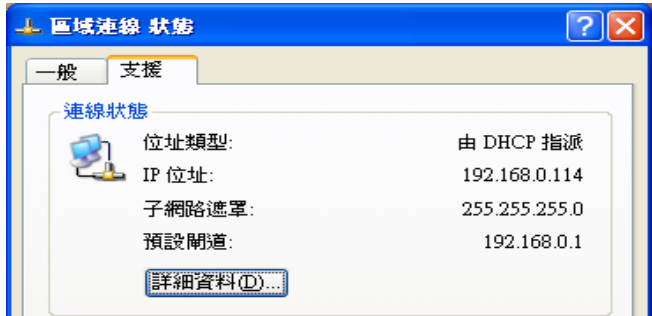
※3-2 Every minute record with 1000 records to inside buffer memory. It recorded 16 hours at most.

※3-3 Alarm record with 100 records to inside buffer memory. Alarm state and recovery state are occupied a record. In other word, when happened alarm and recovery that would have occupied two records.

1. ※ If you un-used USB for a long time that would need some time to write into the memory when you used it. It needed 2 minute at most. It won't effect on the record and measure.

7. TROUBLE SHOOTING

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No	Question	Solve
1	Internet can not connect	Please check whether the RJ45 bright light and flash and confirm the Net cable
2	Un-normal day and time	It can set at Web Service to reset the day and time. If you disconnected for a while then re-electric supply and still error. The battery is out of electricity.
3	Un-normal Seven-segment display	Please open the acrylic sheet and press the seven-segment display.
4	Forget the IP address	Reset the system , please refer the 4-1 IO Description No.2 (RST Key)(Reset IP:192.168.0.230)
5	Web garbage characters	Please select the Web Browser code →Unicode(UTF-8)
6	Un-normal Apple-Safari display	Please download form AppStore Chrome
7	Un-normal Android-safari display	Please download form PLAY store Chrome, Firefox
8	WIFI option with IAQ-HUB, and online error	Please check whether the HUB contacted the plug. Restart electric to the HUB or restart to search the mobile Wi-Fi.
9	Whether contacted the Broadband Internet with CTR230 at home? (With WiFi) Hub	It can be work to contact Hub at home. But it will display your WiFi name not IAQ-HUB
10	It can not open the Web surfing that used by LAN	Please check whether the LAN and CTR230 IP address is the same. (Preset CTR230IP : 192.168.0.1) For example : As the Photo 1 . Photo 1 

8.Modbus Protocol

CTR-230 Modbus Form (Firmware V1.14)

2013/05/28

Location	HEX	Character	Name	Description
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FUNCTION (04H)				
0	0	1	Temp	(Value) / 10
1	1	1	RH	(Value) / 10
2	2	1	CO2	(Value)

FUNCTION (03H)Read/(10H)Write/(06H)Write				
4	4	1	Version	(Value)
5	5	1	Hardware Name	ASCII
6	6	1	Hardware Name	ASCII
7	7	1	Hardware Name	ASCII
12	C	1	Communication station D1 (ID)	(Value) (Need return the Computer)
13	D	1	Communication D1 (BaudRate)	0x01: 9600 0x02: 19200 0x03: 38400 0x04: 57600 0x05: 115200 (Need return the Computer)
14	E	1	Communication station D2 (ID)	(Value) (Need return the Computer)
15	F	1	Communication D2 (BaudRate)	0x01: 9600 0x02: 19200 0x03: 38400 0x04: 57600 0x05: 115200 (Need to return the Computer)
16	10	1	Temp (Offset)	(Value) /10
17	11	1	RH (Offset)	(Value) /10
18	12	1	CO2 (Offset)	(Value) /10
19	13	1	Temp (Gain)	(Value) /10
20	14	1	RH (Gain)	(Value) /10
21	15	1	CO2 (Gain)	(Value) /10
22	16	1	Temp (Alarm Delay)	(Value)

23	17	1	RH (Alarm Delay)	(Value)
24	18	1	CO2 (Alarm Delay)	(Value)
25	19	1	Temp (Alarm Deadband)	(Value)
26	1A	1	RH (Alarm Deadband)	(Value)
27	1B	1	CO2 (Alarm Deadband)	(Value)
28	1C	1	Temp (H-Alarm)	(Value) /10
29	1D	1	RH (H-Alarm)	(Value) /10
30	1E	1	CO2 (H-Alarm)	(Value)
31	1F	1	Temp (HH-Alarm)	(Value) /10
32	20	1	RH (HH-Alarm)	(Value) /10
33	21	1	CO2 (HH-Alarm)	(Value)
34	22	1	Temp (L-Alarm)	(Value) /10
35	23	1	RH (L-Alarm)	(Value) /10
36	24	1	CO2 (L-Alarm)	(Value)
37	25	1	Temp (LL-Alarm)	(Value) /10
38	26	1	RH (LL-Alarm)	(Value) /10
39	27	1	CO2 (LL-Alarm)	(Value)
40	28	1	Temp AO Output Mode	0x00: AO Output 0x01: PID control 0x02:Auto Manual
41	29	1	RH AO Output Mode	0x00: AO Output 0x01: PID control 0x02:Auto Manual
42	2A	1	CO2 AO Output Mode	0x00: AO Output 0x01: PID control 0x02:Auto Manual
43	2B	1	Temp PID Full Control	(Value)
44	2C	1	RH PID Full Control	(Value)
45	2D	1	CO2 PID Full Control	(Value)
46	2E	1	Temp PID Full Close Control	(Value)
47	2F	1	RH PID Full Close Control	(Value)
48	30	1	CO2 PID Full Close Control	(Value)
49	31	1	API Set Mode	0xFF: Auto Manual Mode 0x00: Preset Mode
50	32	1	API Set 1	(Value)
51	33	1	API Set 2	(Value)
52	34	1	API Set 3	(Value)
53	35	1	API Set 4	(Value)

54	36	1	API Set 5	(Value)
55	37	1	API Set 6	(Value)
56	38	1	Temp Manual Output (0-100%)	(Value)
57	39	1	RH Manual Output (0-100%)	(Value)
58	3A	1	CO2 Manual Output 0-100%)	(Value)
59	3B	1	IP Address1	(Value) Annotation A
60	3C	1	IP Address2	(Value) Annotation A
61	3D	1	IP Address3	(Value) Annotation A
62	3E	1	IP Address4	(Value) Annotation A
63	3F	1	Subnet Mask1	(Value) Annotation A
64	40	1	Subnet Mask2	(Value) Annotation A
65	41	1	Subnet Mask3	(Value) Annotation A
66	42	1	Subnet Mask4	(Value) Annotation A
67	43	1	Preset Gateway1	(Value) Annotation A
68	44	1	Preset Gateway2	(Value) Annotation A
69	45	1	Preset Gateway3	(Value) Annotation A
70	46	1	Preset Gateway4	(Value) Annotation A
71	47	1	Setting update IP	Any value (Need return the Computer)
72	48	1	Light Display Mode	0xFF: Twinkle Mode 0x00: Radiate Mode
73	49	1	IP Correspond name (Alphanumeric)	ASCII
74	4A	1	IP Correspond name (Alphanumeric)	ASCII
75	4B	1	IP Correspond name (Alphanumeric)	ASCII
76	4C	1	IP Correspond name (Alphanumeric)	ASCII
77	4D	1	IP Correspond name (Alphanumeric)	ASCII
78	4E	1	IP Correspond name (Alphanumeric)	ASCII
79	4F	1	IP Correspond name (Alphanumeric)	ASCII
80	50	1	IP Correspond name (Alphanumeric)	ASCII
81	51	1	IP Correspond name (Alphanumeric)	ASCII
82	52	1	IP Correspond name (Alphanumeric)	ASCII
83	53	1	API Correspond Light	(Value)= 1~6
84	54	1	CI Correspond Light	(Value)= 1~6

Post scriptum A: IP Address Description

IP Address	Address1.Address2.Address3.Address4	EX:(192.168.0.230)
Subnet Mask	Mask1.Mask2.Mask3.Mask4	EX:(255.255.255.0)
Default Gateway	Gateway1.Gateway2.Gateway3.Gateway4	EX:(192.168.0.1)

