Instruction Manual

Model T200

Controller

GENERAL MONITORS

Protection for life.

REV: MAN-T200- A110308
P/N: R301156

WARRANTY

Wuxi General Monitors Co., Ltd.(abbreviated below as WXGM) will be fully responsible for the service work ,such as the use, adjustment , installation, maintenance and instruction of the equipment. WXGM warrants the Model T200 Gas Controller (abbreviated below as controller) to be free from defects in workmanship or material under normal use and service within two years from the date of shipment. All warranties are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without WXGM's approval or which have been subjected to neglect, accident, improper installation or application, or on which the original identification marks have been removed or altered.

IMPORTANT NOTES

1. Please carefully read the instruction manual before using the module.
2. The operation and maintenance of the equipment must be carried out by well-trained and qualified personnel. WXGM can provide such training.
3. Install the equipment strictly according to the requirement in this instruction manual, meantime, to the laws, regulations and standards concerned of the state and enterprises so as to fully guarantee the safety of your instrument and personnel.
4. We recommend the user sign a long-term contract of maintenance service with WXGM so as to keep the optimum operation of the equipment.

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1.0 General Description

T200 gas controller is a microprocessor based intelligent unit with excellent performance and good alarming function. It could be connected with S104, S4000CH, IR2100, TS4000 and FL3100 series combustible, toxic gas and Flame detectors (transmitters) to form a combustible gas detection & alarm system to continuously monitor the combustible & toxic gases and flame. In addition, it could be connected with the graphics control equipment in the fire control room to intuitively display the alarming conditions in graph so that the staff can handle the situation in time to avoid causing damages.

T200 controller consists of the chassis (including the register card), control card and power supply (optional). T200 controller is multi-channel plug-in construction. It is available in 4, 8, 12 and 16 channels (loops).

2.0 Specifications

2.1 Function:	Supply power for the field detector and receives the detector's signal with LED concentration display.
2.2 Connected detector:	S104, S4000CH, IR2100, TS4000, FL3100 etc.
2.3 Measuring Range:	Two-digit "0~99", three-digit "0~999"
2.4 Accuracy:	±0.5%FS ("0~99"), ±1%FS ("0~999")
2.5 Operating Voltage:	20~35VDC (24VDC is recommended); 220VAC used for power supply
2.6 Environmental Temperature:	0～40℃ (MAX－18℃～65℃)
2.7 Environmental Humidity:	5～95%RH (non condensing)
2.8 Analog Output:	4~20mA (≤500Ω)
2.9 Consumption:	200mA@24VDC (for control card only, not include detector)
2.10 Output Contact Rating:	0.3A/125VAC or 1A/30VDC
2.11 Connection:	three-wire system, RVVP3×1.5mm^2 cable (the length is not more than 800m)
2.12 Communicate with Control	Equipment: RS485 Modbus and connect with model TX5Ei graphic display device from Wuxi Lantian Electronics

3.0 Function of Front Panel and Terminal Block of T200 Controller

3.1 Front Panel and Function of T200 Control Card

3.1.1 Function of the front panel of control card (see figure 1 front panel of T200 control card).

3.1.2 Description of the front panel:

3.1.2.1 Mounting Hole: Fix the control card in the T200 controller.

3.1.2.2 Model: Indicate the model.

3.1.2.3 Digital Display Window: Indicate the gas concentration, calibration prompts and fault codes.

3.1.2.4 Alarm Indicator: When there is an alarm, the alarm indicator flashes, then become steady after the alarm is accepted. It turns off when the alarm condition is reset. (when it is latching).

3.1.2.5 Warning Indicator: When there is a warning, the warning indicator flashes, then become steady after the warning is accepted. It turns off when the warning condition is reset. (when it is latching).

3.1.2.6 Calibration Indicator: This indicator flashes when it is in calibration check mode and steady when in calibration mode.

3.1.2.7 Normal Operation Indicator: It turns on when the controller is in normal operation.

3.1.2.8 Fault Indicator: This indicator flashes when the controller fails. After the fault is accepted the indicator becomes steady and turns off when the controller is reset.

3.1.2.9 Setting Indicator: It flashes when the controller is in setup check mode and steady on when in setup mode.

3.1.2.10 Mode/Select Switch: Entering the setup mode or calibration check mode according to the duration of holding this switch.

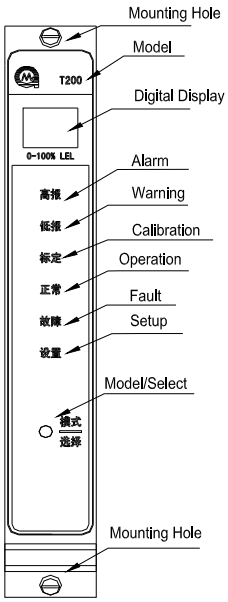


Figure 1: Front Panel of T200 Control Card

3.1.3 Function of T200 control card terminal (see table 1):

Ter.	Sign	Function	Remark
1	COM	24V COM	Supply 24VDC for the detector
2	24V out	+24V out	
3	SIG IN	4~20mA SIG IN	signal input of the detector
4	Blank		
5	AO －	4~20mA signal output (-)	4~20mA analog signal output

6	AO ＋	4~20mA signal output (+)	4~20mA analog signal output
7	A2-COM	Alarm common relay contact output	
8	A2-NO	Alarm NO relay contact output	
9	A1-COM	Warning common relay contact output	
10	A1-NO	Warning NO relay contact output	
11	F-COM	Fault common relay contact output	
12	F-NO	Fault NO relay contact output	
13	B	Detector signal input	
14	R	Detector signal input	
15	W	Detector signal input	
16		Shielded cable grounded	

3.2 Front Panel and Function of T200 Register Card

3.2.1 Function of T200 Register Card Front Panel (see Figure 2 front panel of T200 register card)

3.2.2 Front Panel Function:

3.2.2.1 Mounting Hole: Fix the register card into the T200 chassis

3.2.2.2 Model: Indicate the card model

3.2.2.3 LCD: Display the alarming conditions such as the total alarming location counts, the first alarming location, current alarming information (including the alarming type, alarming location, alarming time and fault codes), alarming records check and setup prompts and values etc.

3.2.2.4 Indicator: Indicate the operating status of the controller. Power supply indicator shows the power conditions. “Alarm” and “fault” indicators show the alarming conditions (reset the alarm to release the condition).

3.2.2.5 Accept/Reset: Accept/Reset button. When there is a sound alarm, press this button to eliminate the sound. Hold this button for 3 seconds, a password is required to enter into the LCD. Enter the password and press the “enter” button to reset the system. After resetting, T200 register card will revert to the normal monitoring state. Now all the current alarming information are cleared and the alarming location counts are reset to zero too. If there still fault or alarm event present, T200 will establish the new information.

3.2.2.6 Function Button: “⇧” is to select the previous option or add the setting value. “⇩” is to select the next option or decrease the setting value. “Enter” is to go to the sub-menu or save the current settings. “EXIT” is to exit the current menu back to the previous menu.

Table 2: Terminal Function of T200 Register Card

Ter.	Sign	Function	Remark
1	CT	Card test Terminal	Card test
2	1A	RS485 1	Power
3	1B		
4	2A	RS485 2	Computer
5	2B		
6	Blank		
7	F-COM	Fault common relay contact output	
8	F-NC	Fault NC relay contact output	
9	F-NO	Fault NO relay contact output	
10	A1-COM	Warning common relay contact output	
11	A1-NC	Warning NC relay contact output	
12	A-NO	Warning NO relay contact output	
13	A2-NO	Alarm NO relay contact output	
14	A2-NC	Alarm NC relay contact output	
15	A2-COM	Alarm common relay contact output	
16		Grounding	

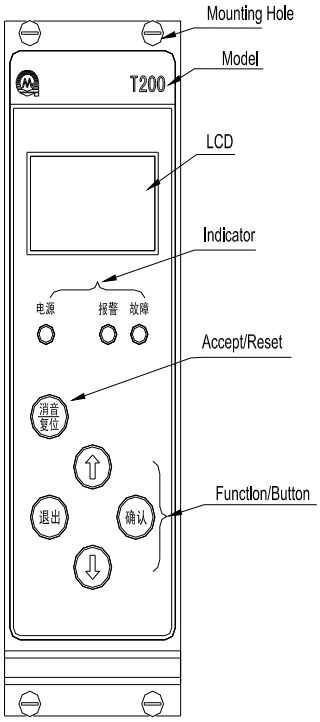


Figure 2: Front Panel of T200 Register Card

4.0 Installation of T200 Controller

4.1 T200 controller should be installed at a safe place. Its operation environment shall conform to the working temperature and humidity stipulated by the technical requirements, and its vibration and shaking should be the minimum. Although the controller has strong anti-interference capability to electromagnetic field, but it shall not be installed at a place near wireless equipment or the similar equipment. It is wall mounted and please see figure 6 for the mounting and outline dimensions.

4.2 Insert control card and register card into the installation seat of connection base channels corresponding to cabinet, and then tighten upper and lower fix screws.

4.3 All wires connected to T200 are led to the terminal board at the back of cabinet. 1.5~2.5mm^2 strand wire or solid wire may be used for connection..

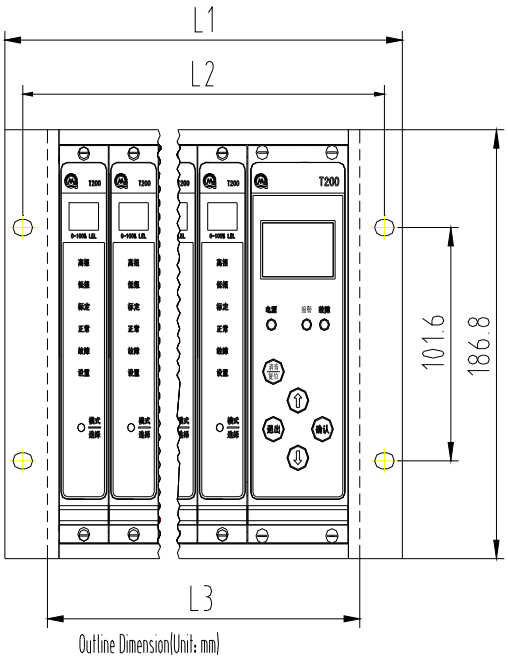
4.4 There is no standard provision to installation site of the detector, because the optimal installation site of detector changes in different application places. Users shall evaluate the application place of the factory and then make a decision. The installation of detector shall be convenient for calibration and inspection. Enough space shall be left for placing calibration equipment. Refer to figure 3 of installation & outline dimensions of controller.

4.5 The inductive load (electric bell, buzzer, and relay etc.) on the small power relay must be restricted. When the voltage on the inductive load exceeds 1,000V, an error alarm may be given and the contactor of relay may be damaged. Relay protection circuit of common AC and DC (refer to figure 4: Relay Output

Protection Circuit for detail).

4.6 The instrument is connected to 24V DC power (figure 5: Power Supply Connection Diagram).

4.7 System connection diagram (see figure 6: T200 Communication Wiring Diagram, figure 7: System Connection Diagram of Three-wire System).



Outline Dimension(Unit: mm)

H	L1	L2	L3
16	512.9	494.7	477
12	411.3	393.1	375.4
8	309.7	291.5	273.8
4	208.1	189.9	172.2

Hole Dimension(Unit: mm)

16Channel	478x178
12Channel	377x178
8Channel	275x178
4Channel	174x178

Figure 3 of installation & outline dimensions of controller

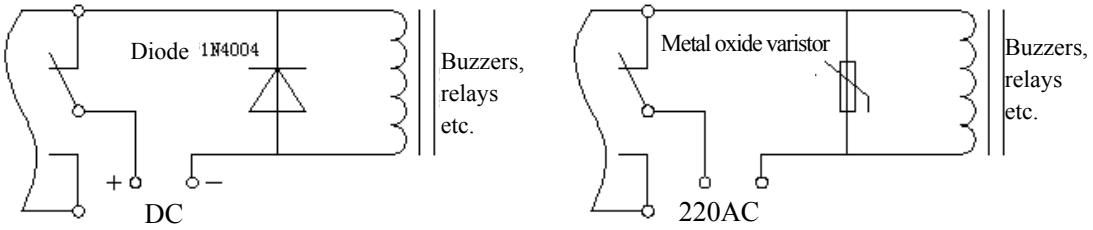


Figure 4: Protection Circuit for Relay Contacts

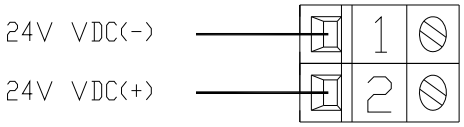


Figure 5: Power Supply Connection Diagram

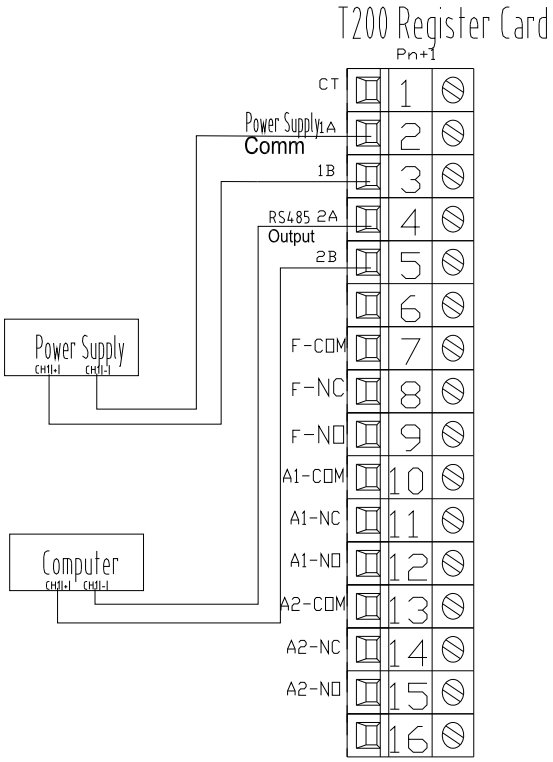


Figure 6: T200 Communication Wiring Diagram

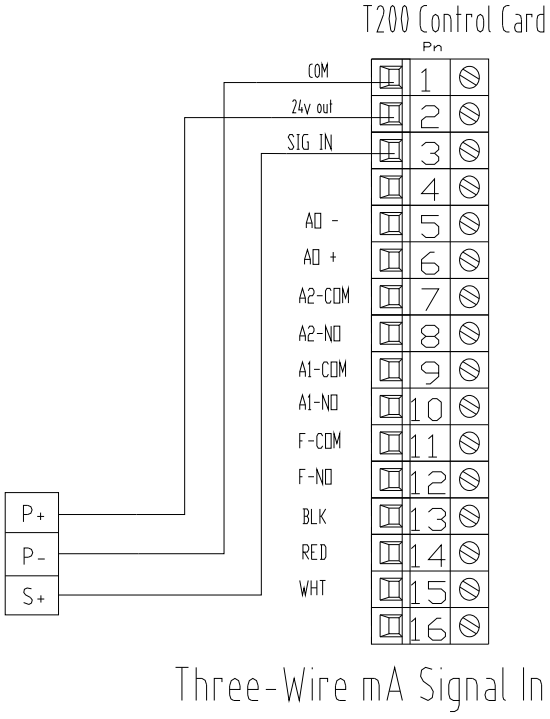


Figure 7: System Connection Diagram of Three-wire System

5.0 Operation

5.1 Operation of T200 Control Card

5.1.1 Operation of T200 control card

The control card displays card address, “UL”, ‘range” and then “SU” after power supply. The oxygen control card displays card address, “UL”, oxygen deficient “o2A”, oxygen rich & deficient “o2b” then “SU”. The input is 4～20mA signal. The jumper pin J1, J2 and J3 should be placed to “2” position. (The voltage type of card displays card address, “EL”, “99” then “SU”.) The display order of flame control card is card address, “UL”, “Ft”, and “SU”, then enters into normal operation. The LED lights up when in normal operation but the digital display is off.)

5.1.2 The character display provides users with field gas concentration, self diagnosis failure symbol, procedure of calibration state, and setting parameter. The state selection switch reminds operators of performing various functions through the display of panel state. Panel display includes digital display, symbol display, and state display. The digital display provides users with the current operation state (such as alarm, warning, fault, calibration and setup).

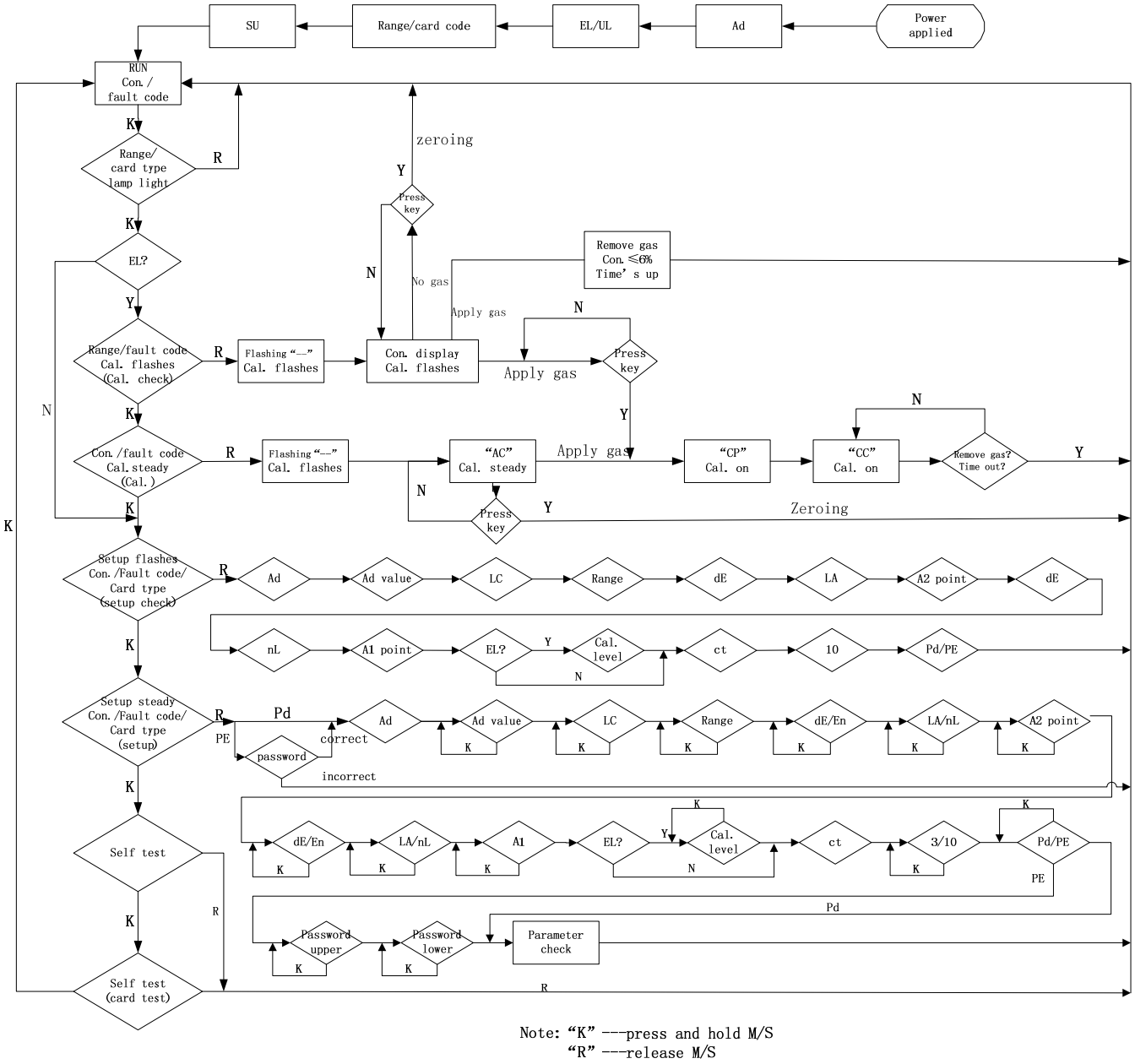
5.1.3 After the system supplies power, enter each procedure according to figure 8: The Flow Chart of T200 Control Card.

5.1.4 Key operations

Press “mode/selection” key, and release it when “setup” lamp flashes, then the card enters setup check procedure; press “mode/selection” key, and release it when “setup” lamp is steady, then the card enters setup procedure. Continue to press “mode/selection” key, then the card enters self-check procedure.

5.1.5 Setup check mode and setup mode

1) When in setup check mode (setup indicator flashes), operators can view relevant setup parameters of the control card without any operation. Once the control card enters such mode, it will display each setup parameters automatically within a short time and return to normal operation state finally. Operation procedures of automatic setup check: press “mode/selection” key and release it when the panel’s “setup” indicator lamp flashes, and then the control card will enter setup check mode.
2) In the setup mode (setup indicator is steady), operators may set parameters of the control card according to relevant requirements. Those parameters are communication address (Ad), range (LC), A2 alarm relay energized/ De-energized (En/dE), latching/ Non-latching (LA/nL), and A2 alarm set point; A1 warning relay Energized/ De-energized (En/dE), latching/ Non-latching (LA/nL), and A1 warning set point; card test time (3S/10S); password selection Enable/Disable (PE/Pd). Follow the figure 8 to set the T200 control card.
3) Operation procedures of setting parameters: press “mode/select” key and release it when the panel’s “setup” indicator lamp is stable, and then the control card will enter parameter setup mode. If the password setting is disabled (Pd), the system will enter the setting mode directly; if the selection is enabled, operators must enter the password of the moment (the value recommended by WUXI GM is 00). If the password is incorrect, users are unable to enter parameter setup mode, and the equipment will return to normal monitoring state. After the parameters are finished setting, the system will enter into setup check mode and then back to normal operation.



Note: "K" ---press and hold M/S
"R" ---release M/S

Figure 8: The Flow Chart of T200 Control Card.

4) While in setting parameters, "Ad" means the slave address of control card in the cabinet during internal communication. The number displayed after "Ad" stand for value of the slave address (1~99). The slave address can't be repeated in T200 controller or the register card will false alarm.

5) "LC" displayed during setup mode means the control card enters the range setting. The LC range for the control card with two-digit display is 10, 20, 30, 40, 50, 100 (99). The LC range for the control card with three-digit display is 1, 3, 10, 20, 30, 40, 50, 100, 200~1000 (17 ranges). The default range is 100. The LC range for oxygen control card is 25 and there are two types of alarm, one is rich & deficient oxygen. The alarm set point is 21%~23% for A2 and 15%～19% for A1 (the default set point is A2=22%、A1=18%) . Another alarm is deficient oxygen. The alarm set point is 17%~19% for A1 and 15%～17% for A2 (the default set point is A1=18%、A2=16%).

6) Users may select "Latching" and "Not-latching" alarm output for A1 and A2 alarm. If the alarm output has been triggered, while the triggering condition doesn't exist, not-latched relay will reset

automatically, while the latched relay output should be reset manually. Reset latched relay should be carried out via T200 register card, refer to 5.2 Operation of T200 Register Card for detail.

7) Refer to Table 3 Factory Parameter Settings for the parameters recommended by WUXI GM. In order to help operators to select states during the setup mode, we recommend operators to fill the selected states in relevant blanks according to Table 3, and then refer to it when setting T200.

8) Press “mode/select” key, and continue to press it after the panel’s “setting” indicator lamp lights up so as to enter the test procedure of LED indicator lamp and numeral tube. After entering the procedure, all numeral tubes of the panel turns off firstly and then on; indicator lamps light up in order from top to bottom. Continue to press “mode/selection” key to enter the card test procedure; the T200 control card increases from “0” to “range” at different speed according to the setting value (3 or 10) of “ct” in the parameter setting procedure. When the value reaches alarm or warn setting point, relevant indicator lamp will light up.

Table 3: Factory Default Settings

Settings	Recommended settings	
A2 alarm relay contact Options	De-energized (dE) Latching (LA) Set point (50%FS)	
A1 Warning relay contact Options	De-energized (dE) Non-Latching (nL) Set point (30%FS)	
Fault/Inhibit Options	nA	
Password Options	Password Disable（Pd）	

9) For the flame control card, the definition of the output is as follows table 4.

Table 4: Definition of the output for flame control card

Input	Function	Display code
≤1mA	Fault	“F4”
1.5mA±0.2mA	Test	“CA”
2.0mA±0.2mA	Path block	“bb”
4mA±0.2mA	Operation (＞2mA，＜8mA)	“ ”
8mA±0.2mA	IR	“Ir”
12mA±0.2mA	UV	“Uu”
16mA±0.2mA	Warn	“A1”
≥20mA±0.2mA	Alarm	“A2”

5.2 Operations of T200 Register Card

5.2.1 Flow Chart of T200 Register Card Operation (see figure 9: Flow Chart of T200 Register Card for details).

5.2.2 Please confirm the address of T200 board card is not repeated before power is applied; otherwise, the board card is unable to work normally. If it’s the first time to supply power, please use manual login function to enter all addresses of board card.

5.2.3 Welcome interface

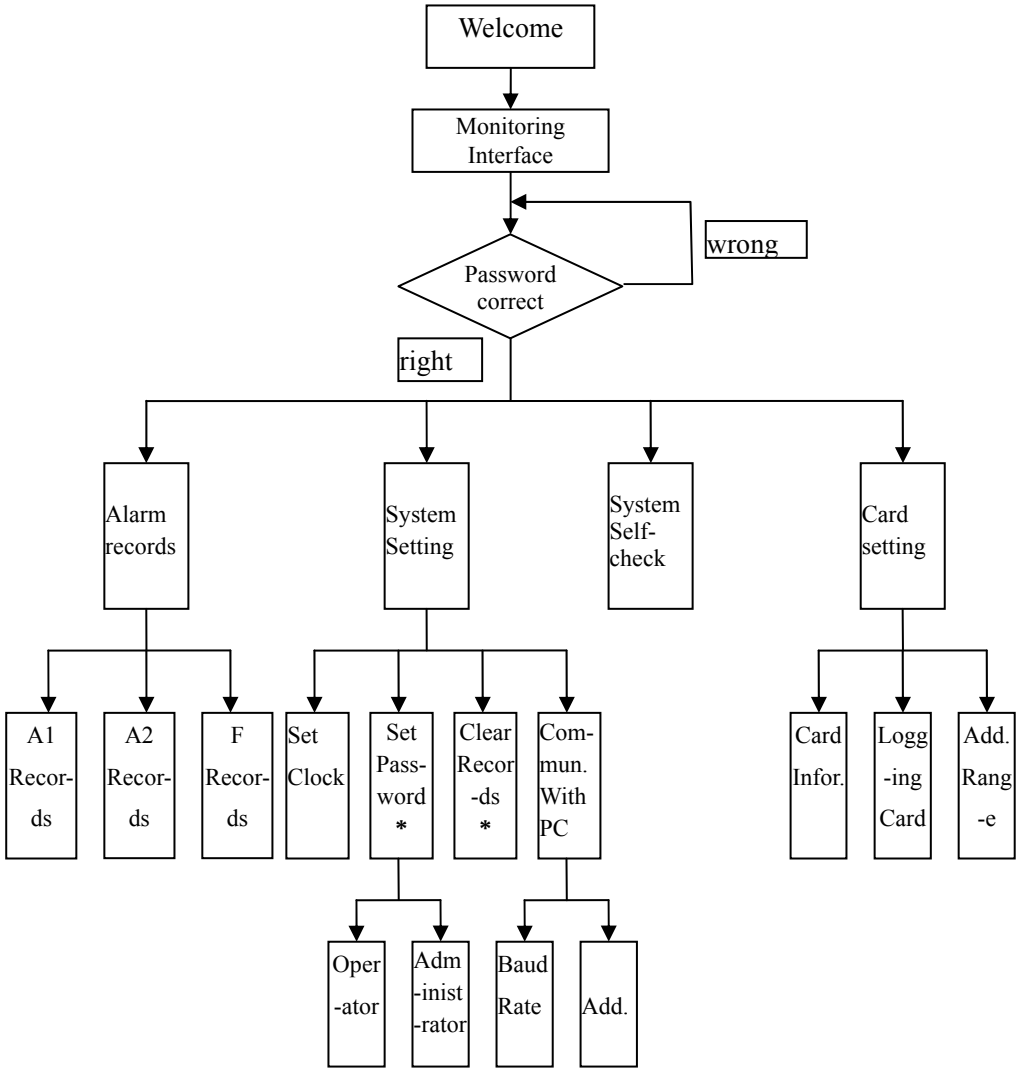
Display the model and serial number of current register card.

5.2.4 Alarm monitoring interface

Alarm monitoring interface displays the operation situation of each current channel. Display information includes current time and date, current alarm position sum, the first alarm position and the detailed information list of current alarm. Alarm monitoring interface can display 2 pieces of alarm information on every page. When the quantity of alarm information is more than 2 pieces, main alarm interface displays all information circularly. Relevant alarm information may be referred to by "⇧" and "⇩" key. Press "exit" to return to circular display.

5.2.5 Password operations

In order to ensure the system operates safely and stably, the system can only be operated accordingly after the corresponding permission is obtained. The operation authority is classified into two grades: Ⅰ, primary authority – operator level; Ⅱ, advanced authority – administrator level; Operator level is only applicable for inquiring about alarm record but not inquiring or changing the parameters of system; administrator level is the highest level that can set and change the parameters of system, and delete alarm records and other operations.



Note: * means only the administrator can access.

Figure 3: Flow Chart Of T200 Register Card

5.2.7 Alarm record

This option includes three submenus: alarm record, warning record and fault record. Capacity of every record is 999 pieces respectively.

5.2.8 System setting

This option includes four submenus: clock setting, password setting, emptying record and upper computer communication.

Clock setting: set current time and date.

Password setting: set two grades operation authority – operator level and administrator level.

Emptying record: clear all alarm records. If it is alarming at present, the record can only be cleared after resetting.

Upper computer communication: includes two submenus: baud rate setting, communication address setting. The setting of baud rate has three options: 4,800bit/s, 9,600 bit/s, 19,200 bit/s; the range of communication address setting is: 200~247. If the set value exceeds the above range, the system will prompt error.

5.2.9 Self-check of the system

After entering self-check menu, crystal and LED state indicator lamps of T200 register card liquid panel turn on for 2S and turn off for 1S alternately. Buzzer rings 2S every 1S; all numeral tubes of T200 control card light up. State indicator lamps light up in turn from top to bottom. It takes 6S to complete the self-checking and system resetting.

5.2.10 Card setting

This option includes three submenus: card information, login card and address range.

Card information: display the address of login card.

Login card: this function is to enter all cards again. Its function is the same as automatic login card while initializing. If the card address connecting with controller has changed, this function may be used. After login, save current address information of all cards. If this operation succeeds, the login card will be displayed. And then enter main alarm interface automatically 5S later.

Address scope: set the address scope of the login card. It is recommended that the address setting shall not exceed the maximum value of the login card so as to avoid login for a long time

5.2.11 Parameter setting

Move cursor by "⇧" and "⇩", select the parameter required to be changed, press "OK" to enter parameter setting state, then the cursor flashes, and adjust values by "⇧" and "⇩", press "OK" to finish parameter change, the cursor moves to the next position automatically, and so forth. After all parameters are set, move cursor to "OK", and press it to save set parameter; move the cursor to "cancel", press "OK" to return to the previous menu, and the setting value will not be saved.

6.0 Fault Diagnosis and Maintenance

6.1 Fault Diagnosis

6.1.1 When the fault occurs, besides the "fault" indicator lamp on the front of board, T200 control card can

provide fault codes on the digital display screen. The fault codes are as follows:

F1 - Open circuit of analog output signal. Check if the connection of back terminal 5 and terminal 6 is in good.

F2 – Not used.

F3 – Not used

F4 – Open circuit or short circuit connection of sensor, or null shift exceeds the specified value

F5 – Not used

F6 – Low power supply. Ensure the voltage of power supply is 24VDC.

F7 - EEPROM storage verification function fails. If micro processor unit is unable to store the calibrated setting information in EEPROM, F7 will appear in the window. When such fault occurs, please contact with WUXI GM or its Representative Office.

F8 - Not used

F9 - Not used

6.1.2 The fault codes that displayed on the LCD of T200 register card are as follows:

81 – Storage hardware error on the host. Re-apply the power, if this error displays again, please consult WUXI GM or its Representative Office.

82 – Clock error on the host. Re-apply the power, if this error displays again, please consult WUXI GM or its Representative Office.

84 – Low power supply of the host.

41 – Storage parameter error on the host. Reset or re-apply the power.

42 - Clock error on the host. Reset or re-apply the power.

48 – RAM error on the host. Reset or re-apply the power.

FF- Control card or power supply fails to communicate with register card.

F2 – Standby power supply error.

F4 – Low voltage of the standby power supply.

F8 – Main power error of the standby power supply.

6.2 Maintenance

6.2.1 Once T200 is installed, it requires little maintenance. Only regular inspection is needed to ensure integrity of the system.

6.2.2 Users shall estimate conditions of detection field so as to determine the calibration period.

6.2.3 Conduct systematic function test at least once each year. This test shall include the equipment and power supply unit which work with the system.

6.2.4 Power line, sensor signal wire and output signal wire shall be connected reliably. All components and parts shall be connected correctly to equipment.

6.2.5 If the “password” setting is disable, the set parameters shall be checked regularly.

7.0 Receipt of Equipment

All equipment shipped by WXGM is packaged in shock absorbing containers, which provide considerable protection against physical damage. The contents should be carefully removed and checked against the packing list. If any damage has occurred or there is any discrepancy in the order, please notify WXGM as soon as possible. All subsequent correspondence with WXGM must specify the equipment part number and the serial number. Each T200 is completely tested at the factory. However, a complete system checkout is required upon initial installation and start-up to ensure system integrity.

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