User Manual

MD610 MD710 high accuracy 4 digits display process indicator

1:General Features:

- Very easy to operate, high accuracy
- White+Green or Red+Yellow, 2 combination on the display
- Available with 5 different sizes
- 0.3% accuracy for MD610 and 0.2% accuracy for MD710
- Dual display,4 digits,7 segments LED display
- Process value re-transmitted as 4-20mA optional
- Built-in 24VDC auxiliary sensor power
- maximum 0.01 resolution for TC/RTD input, 0.001 for analog input
- 250ms sampling rate for MD610, 50ms sampling rate for MD710
- Touch button, feedback beep sound when you tap on the buttons this is a very useful features for user to track the operation not only visually, but aslo auditory.
- 100~240Vac or 24VDC/AC source optional
- Small temperature drift,<+/-0.03%FS/^{0}C(+/- 75ppm/^{0}C) for MD610
- Small temperature drift,<+/-0.01%FS/^{0}C(+/- 50ppm/^{0}C) for MD710
- Ultra low power consumption less than < 5W
- Operates at extremely wide ambient range, -30℃~75℃ degree

>Dust proof, water splash proof,
>corrosion proof
>IP65 protection
>3 years warranty,
longest warranty you can expect from controller made in China.
>Fully sealed housing without any open ventilation holes
>-30℃~75℃ operating range, extremely wide operating range
>True universal input
TC/RTD/Analog/Resistance

2:Ordering Information

MD610 / MD710 — 1 — 2 — 3 — 4 — 5 — 6 — 7

1:Size of the contorller

05	48mm*48mm, panel cutout size(45mm*45mm), depth(78mm)
06	48mm*96mm, panel cutout size(44mm*92mm), depth(92mm)
07	72mm*72mm, panel cutout size(68mm*68mm), depth(92mm)
08	96mm*48mm, panel cutout size(92mm*44mm), depth(92mm)
09	96mm*96mm, panel cutout size(92mm*92mm), depth(92mm)

2:Input

1	Code "1" for factory default input, compatible with TC/RTD input, also works with voltage signal 0-5V and 1-5V, work with 4-20mA too, but need to jump a 250 ohm resistor between the input terminal when input is 4-20mA, jump 250 ohm resistor will convert 4-20mA to 1-5V
2	Code "2" input will be true universal, works with TC/RTD input, also compatible with all analog inputs such as 0-10V, 4-20mA, addition to this, a 24VDC auxiliary power supply will be included for powering the transducer such as pressure transmitter or temperature transmitter

3:Output

0	Factory default is "0" , without re-transmission output
1	0~20mA or 4-20mA process value re-transmitted output if you select "1", then the process value PV will be re-transmitted to 4-20mA or 0-20mA and this can be feed to PLC or paperless recorder as a source

4:Alarm output

0	Without alarm
1	1 alarm with NO+NC relay
2	2 alarms with 2 relay(Normally open)
3	1 alarm output(SSR Drive output)
4	2 alarms with 2 SSR Drive output

5:Auxiliary ouptut

0	Without alarm
1	1 alarm with NO+NC relay
2	2 alarms with 2 relay(Normally open)
3	1 alarm output(SSR Drive output)
4	2 alarms with 2 SSR Drive output

6:Communication

0	Without communication
1	Modbus RS-485 communication

7:Power supply

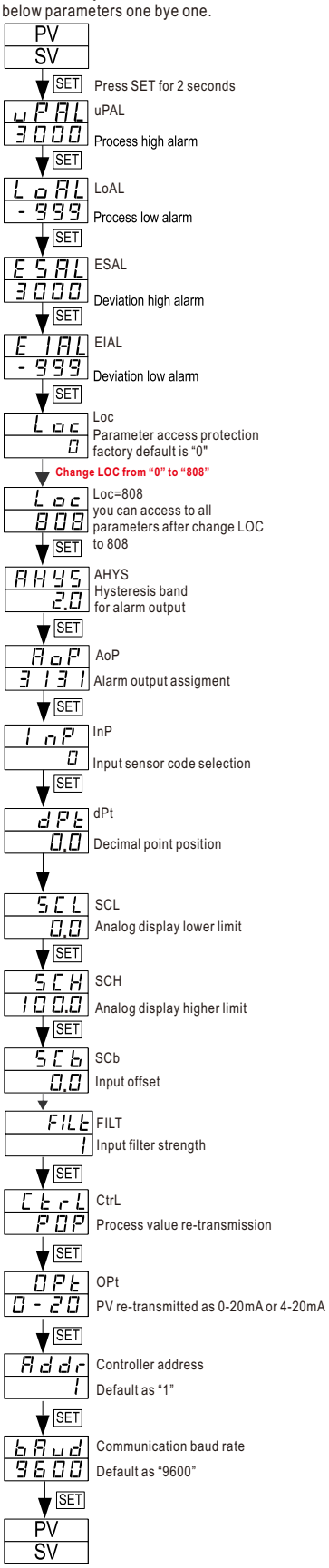
A	100-240Vac 50/60HZ
D	24VDC

MD610-08-1-0-1-1-0-A
1 2 3 4 5 6 7

1: Size 96mm*48mm(horizontal configuration)
2: Factory default input
3: Without PV re-transmission function
4: 1 alarm output on alarm output position(NO+NC relay)
5: 1 alarm output on auxiliary output position(NO+NC relay)
6: Without communication
7: Power supply 100-240Vac

3:Parameter Setting

Press SET key for more than 2 seconds, and then tap on the SET key, you will see below parameters one bye one.



3.1 List of system parameters

Table 1

Code	Description	Setting Range	Initial Setting	Remarks
uPAL	process high alarm	-999~3000	3000	refer to 3.1.1
LoAL	process low alarm	-999~3000	-999	
ESAL	deviation high alarm	-999~3000	3000	
EIAL	deviation low alarm	-999~3000	-999	
AHYS	alarm hysteresis band	0~2000	2	
AoP	alarm output assigment	0~4444	3131	
InP	Input sensor code	0~37	0	refer to 3.1.2
dPt	decimal point	0,0.0,0.00,0.000	0	refer to 3.1.3
SCL	lower limit display for analog input	-999~+3000	0	refer to 3.1.4
SCH	Higher limit display for analog input	-999~+3000	1000	
SCb	Input offset	-1999~+4000	0	refer to 3.1.5
FILt	Input filter strength	0~40	1	
CtrL	PV re-transmission configuration	POP, SOP	POP	refer to 3.1.6
OPt	0-20mA or 4-20mA configuration	0-20, 4-20	0-20	
Addr	Device address	0-80	1	refer to 3.1.7
bAud	Baud rate	0-19.2K	9600	
Loc	Access protection	0-255	0	refer to 3.1.8

3.1.1 Alarm parameters

UPAL

-Absolute temperature value high alarm, if PV > UPAL , then alarm on.
If PV < UPAL-AHYS, alarm off. set UPAL=3000 will deactive the alarm. AHYS is alarm hysteresis

LoAL

-Absolute temperature value low alarm, if PV < LoAL , then alarm on.
If PV > LoAL+AHYS, alarm off. set LoAL=-999 will deactive the alarm.
AHYS is alarm hysteresis

ESAL

-Deviation high alarm, when PV-SV > ESAL, alarm on, when PV-SV < ESAL, alarm off, set ESAL=3000 will deactive the alarm.

EIAL

-Deviation low alarm, when PV-SV < EIAL, alarm on, when PV-SV > EIAL, alarm off, set EIAL=-999 will deactive the alarm

AHYS

-Alarm hysteresis, Also known as dead zone or hysteresis, it is used to avoid frequent alarm generation/relief due to fluctuations in measured input values.

AOP

The alarm function of our controller is very flexible therefore a little bit complicated for beginners to understand, our controller can be made with maximum 4 alarms which sets apart our controller from other controllers on the market. four different type of alarms are UPAL, LoAL, ESAL and EIAL, absolute high alarm, absolute low alarm, deviation high alarm and deviation low alarm. these are alarm types. and when alarm condition satisfied, the respective alarm will be triggered and alarm relay can be triggered too. the controller can be equipped with maximum four relays, AL1, AL2, AU1 and AU2 relays. each alarm can trigger different relays. unlike other controller, they have a fixed combination, for example, if the absolute alarm is triggered, then AL1 relay will go from NO to NC , this is the scenario on other controller, for our controller, the absolute high alarm can trigger any relay it wants, below is the details information on how to program the alarm output. Parameter AoP are used to define the output positions of the four alarms UPAL, LoAL, ESAL and EIAL, for example, if AOP=3301

AOP = 3 (EIAL) 3 (ESAL) 0 (LoAL) 1 (UPAL)

AOP will always be a 4 digits number such as 3301, and the value of each digits can be 0, 1, 2,3,4, 0 means when alarm condition is met, the alarm LED on the panel will lit, but the alarm does not trigger any relay. 1 means the alarm will trigger AL1 relay, 2 means the alarm will trigger AL2 relay, 3 means the alarm will trigger AU1 relay, 4 means the alarm will trigger AU4 relay, in summary.

0---- Alarm do not trigger any relay
1---- Alarm trigger AL1 relay
2 ---- Alarm trigger AL2 relay
3 ---- Alarm trigger AU1 relay
4 ---- Alarm trigger AU2 relay

So for AOP=3301, means the EIAL alarm will trigger AU1 relay when EIAL alarm condition is met, ESAL alarm will trigger AU1 relay too when ESAL alarm is met and LoAL alarm won't trigger any relay even if the alarm condition is met, UPAL alarm will trigger AL1 relay when alarm condition is met

3.1.2 Input sensor code(InP)

InP, Please see table 2 for acceptable sensor type and its range

Table 2. code for InP input and its range.

InP code	Input sensor type	InP code	Input sensor type
0	K	21	PT100
1	S	26	0~80 ohm
2	R	27	0~400 ohm
3	(T)	28	0~20mV
4	E	29	0~100mV
5	J	30	0~60mV
6	(B)	31	0~500mV
7	N	32	100~500mV
8	(WRe3-25)	33	1~5V
9	(WRe5-26)	34	0~5V
10	Reserved code for special input	35	0~10V(-20~+20mV)
15	4-20mA	36	2~10V(-100~+100mV)
16	0-20mA	37	0~20V(-5V~+5V)
20	Cu50		

Remark: (T), (B), (WRe3-25) and (WRe5-26) is for MD710 series

3.1.3. Decimal point setting (dPt)

The parameter dPT defines how many decimal point you will see for PV the display format can be 0, or 0.0 for TC and RTD input, for analog input the options are 0, 0.0, 0.00 and 0.000, maximum 3 decimal points for analog inputs, maximum 1 decimal point for TC/RTD inputs.

3.1.4 Lower limit and higher limit display for analog inputs or lower limit and higher limit value for PV/SV re-transmission (SCL and SCH)

These parameters defines the lower limit and higher limit display for analog inputs. for example, if you have an input signal at 0-10VDC, which you want to display it as 0-200.0, then configure the dPt as 0.0 for 1 decimal point, and configure SCL as 0, and configure SCH=200.0, when the indicator has PV/SV re-transmission feature and the input would be thermocouple or RTD sensors, the SCL defines the lower limit value of the re-transmission. for example, if you want to re-transmit the temperature range 0~400 degree into 4-20mA, then SCL should be set as "0 " and SCH should be set as "400". by doing this, the PV 0-400 will be re-transmitted as 4-20mA.

3.1.5 Input offset (Scb) and input filter strength (FILt)

Input offset Scb is used to add an offset value to compensate the sensor error or simply to shift the reading. for example, if the controller displays 2°C when probe is in ice/water mixture, setting Scb=-2, will shift the temperature reading to 0°C

If measurement input fluctuates due to noise, then a digital filter can be used to smooth the input. "FIL" may be configured in the range of 0 to 40. Stronger filtering increases the stability of the readout display, but causes more delay in the response to change in temperature. FIL = 0 disables the filter.

3.1.6 Re-tranmission output mode (CtrL) and output range(OPt)

This indicator has PV or SV re-transmission as an optional feature, if it comes with this feature, you can configure to either retransmit the PV or SV, by configuring the parameter CtrL as POP, means PV value will be re-transmitted as 4-20mA or 0-20mA, if CtrL set as SOP, then setting value will be re-transmitted as 4-20mA or 0-20mA, Opt defines the output value to be at 4-20mA or 0-20mA.

3.1.7 Communication setting, Address (Addr) and Baud rate (bAud)

This parameter(Addr) is used to define the address of the instrument. Parameter (bAud) used to define the communication speed in Modbus RS-485 communication Baud rate options are 4800, 9600 and 19200.

3.1.8 Access protection (Loc)

To prevent the parameters being changed accidently, you can completely or partially lock the parameters after the initial setup.the configuration privilege is determined by "Loc", please refer to the table 3 for the privilege levels.

Table 3. "Loc" value and the configuration privilege level

Loc value	Privilege	UPAL LoAL ESAL EIAL	System parameters
0	limited	Yes	No
808	unlimited	Yes	Yes

Set Loc=0, user have access to parameter UPAL, LoAL, ESAL and EIAL, configuration can be made on these parameters, Set Loc=808, user have access to all parameters and configuration can be made on all parameters.

4:Wiring diagram