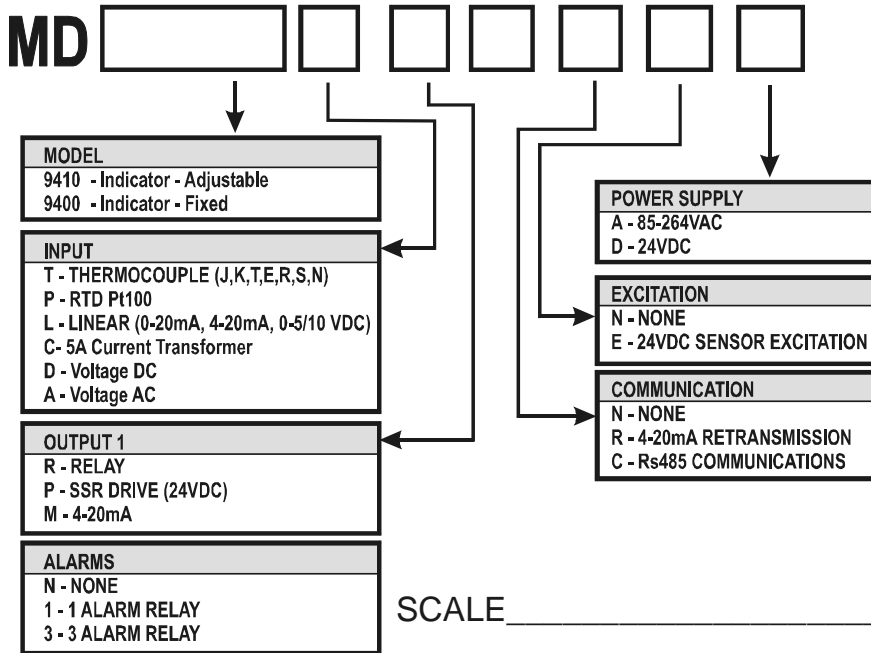
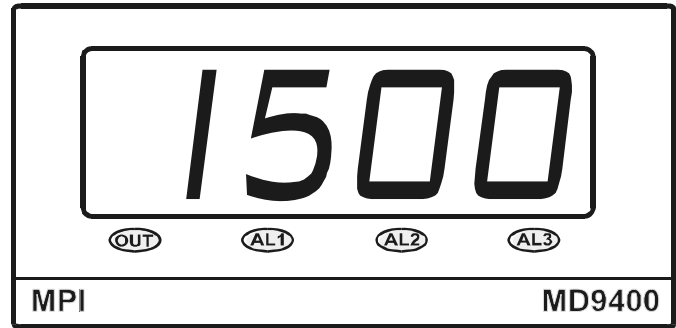
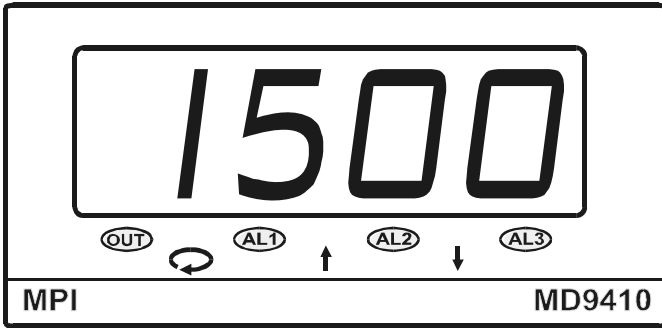




# MICROPROCESSOR INDICATOR

## MD9400 series



**STANDARD**  
**0.8" LARGE DISPLAY**  
**10 SECURITY OPTIONS**  
**UNIVERSAL INPUT**  
**1 ALARM - 18 TYPES**  
**POWER - 85-265VAC**

**OPTIONS**  
**3 ALARMS - 15 TYPES**  
**24VDC EXCITATION**  
**4-20mA RETRANSMISSION**  
**POWER - 24VDC**  
**Rs485 COMMUNICATIONS**

## SPECIFICATIONS

### 1. INPUT

- \*Thermocouple J, K, T, E, B, R, S, N, C
- \*RTD Pt100 ohms RTD (DIN 43760/BS 1904 or JIS)
- \*Linear Voltage (current) -10 to 60 mV configurable with input attenuation
- \*CT input 0-5amp CT
- \*Voltage 0-600V AC/DC
- \*Range User configurable
- \*Accuracy +/-2C for T/C, +/-0.2C for RTD, +/-0.05% for Linear input.
- \*Cold Junction Compensation 0.1% ambient typical.
- \*Input Impedance 10M ohms for T/C, 100K ohms for Linear Voltage, 2.7 Ohms for 0 (4)- 20 mA/
- \*Excitation Current for RTD 0.2mA Max.
- \*Sample Rate 500mS

### 2. CONTROL

- \*Proportional Band 0.0-100.0%
- \*On-Off With adjustable hysteresis
- \*Cycle Time 0-99 seconds.
- \*Control Action Configurable for Direct (cooling) or Reverse (Heating)

### 3. OUTPUT/ALARM

- \*Relay 5A/240VAC resistive.
- \*Pulsed Voltage Isolated 24 VDC 100mA Max.
- \*Current Isolated 0 (4) - 20 mA Max load 500 ohms.
- \*Alarm Relay output, (SPST) 10A/240VAC resistive.

### 4. POWER

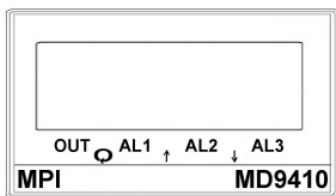
- \*Rating 85 - 265 VAC 50/60Hz 5VA max 24VDC (optional)

### 5. ENVIRONMENTAL

- \*Operating Temp -10 - 50C
- \*Humidity - 90%
- \*Insulation 20M ohms minimum @ 500VDC
- \*EMC Emission EN500081-1:1992, EN55022:1994
- \*EMC Immunity EN 50082-1:1992, IEC 801-3, IEC 801-4:1988
- \*Weight 240g

## MD9410 MICROPROCESSOR INDICATOR

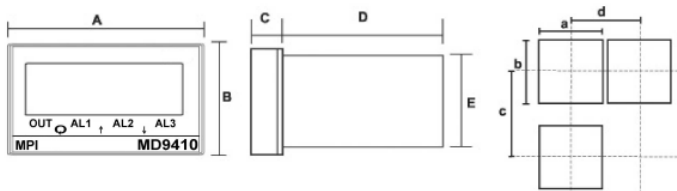
### FRONT PANEL DESCRIPTION:



- OUT – Control output status indicator
- AL1 – Alarm 1 output status indicator
- AL2 – Alarm 2 output status indicator
- AL3 – Alarm 3 output status indicator

- (1) Press once to access the next program level  
Press for 5sec to move from one to next level
- (2) Press to increase value
- (3) Press to decrease value.
- (4) Press and to return to normal

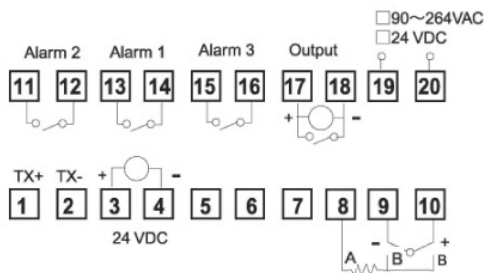
### PANEL CUTOUT:



Model	A	B	C	D	E	a	b	c	d
MD9410	96	48	9	80	45	92+0.5	45+0.5	48	120

(Unit:mm)

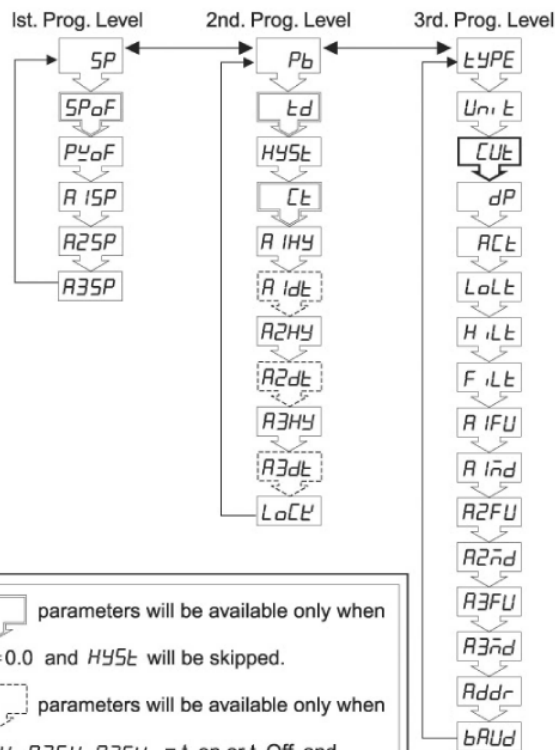
### WIRING DIAGRAM:



### WIRING PRECAUTIONS:

1. Before wiring, verify the controller label for correct model number and option.
2. For thermocouple input, use the appropriate compensation wire. And note the polarity of input signal.
3. To avoid noise induction, keep input signal wire away from instrument power line, load lines and power lines of other electric equipment.

### PROGRAMMING LEVEL PARAMETERS:



1. parameters will be available only when  $P_b \neq 0.0$  and  $HYSL$  will be skipped.
2. parameters will be available only when  $R1FU, R2FU, R3FU = t.$  on or t. Off. and  $R1HY, R2HY, R3HY$  will be skipped.
2. parameters will be available only when  $TYPE = LinE.$  and  $UnL$  will be skipped.

### FIRST PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	Default
SP	Set point value of control	LoL - HiL	100
SPoF	Set point offset. : Offset (manual reset) value for P control only.	-1000-1000 (-100.0-100.0)	0
PVoF	Process value offset. : Use to offset the PV indication from the actual PV	-1000-2000 (-100.0-200.0)	0
R1SP	Alarm 1 setting value	-1999-9999	10
R2SP	Alarm 2 setting value	-1999-9999	10
R3SP	Alarm 3 setting value	-1999-9999	10

### SECOND PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	Default
Pb	Proportional band variable. Set to 0.0 for ON/OFF control mode.	0.0-300.0%	0.0
Ed	Derivative (Rate). When $P_b = 0.0$ , this parameter will not appear.	0-900sec	60
HYSL	Hysteresis for ON/OFF control action on output. When $P_b \neq 0.0$ this parameter will not appear.	0-2000 (0.0-200.0)	2
CL	Proportional cycle time of control output. When $P_b = 0.0$ this parameter will not appear. Set to 15 or 20 for relay output Set to 1 or 2 for SSR output Set to 0 for current output.	0-100sec	15
R1HY	Hysteresis of alarm 1 action. When $R1FU = t.$ on or t.Off, $R1HY$ is not displayed.	0-2000	0
R1dL	Delay time of alarm 1 action when $R1FU = t.$ on or t.Off	99 MM. 59 SS. 99 HH. 59MM.	
R2HY	Hysteresis of alarm 2 action. When $R2FU = t.$ on or t.Off, $R2HY$ is not displayed.	0-2000	0

<i>R2dt</i>	Delay time of alarm 2 action when <i>R2FU</i> =t.on or t.Off	99 MM. 59 SS. 99 HH. 59MM.	
<i>R3HY</i>	Hysteresis of alarm 3 action. When <i>R3FU</i> = t.on or t.Off, <i>R3HY</i> is not displayed.	0-2000	0
<i>R3dt</i>	Delay time of alarm 3 action when <i>R3FU</i> =t.on or t.Off	99 MM. 59 SS. 99 HH. 59MM.	
<i>LoLk</i>	Parameter lock. This security feature locks out selected levels or single parameters prohibiting tampering and inadvertent programming changes.		
	SETTING	DESCRIPTION	
	0000	All parameters are locked.	
	0001	Only SP is adjustable.	
	0010	USE (level) and A1(parameter) are adjustable.	
	0011	USER \ PID(level) and A1 \ A2 (parameter) are adjustable.	
	0100	USER \ PID \ OPTI(level) and A1 \ A2(parameter) are adjustable.	
	1000	Additional A3(parameter). All parameter you can find out, but can't adjustable.	
	1001	Additional A3(parameter), only SP is adjustable.	
	1010	Additional A3(parameter). USER(level) and A1(parameter) are adjustable.	
	1011	USER \ PID (level) and A1 \ A2 \ A3 (parameter) are adjustable.	
1100	All parameters in all level are opened.		

THIRD PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	Default
<i>TYPE</i>	Input type selection.		
	TYPE	RANGE (°C)	RANGE (°F)
	J	-50 ~ 1000	-58 ~ 1832
	K	-50 ~ 1370	-58 ~ 2498
	T	-270 ~ 400	-454 ~ 752
	E	-50 ~ 1000	-58 ~ 1832
	B	0 ~ 1800	32 ~ 3272
	R	-50 ~ 1750	-58 ~ 3182
	S	-50 ~ 1750	-58 ~ 3182
	N	-50 ~ 1300	-58 ~ 2372
	C	-50 ~ 1800	-58 ~ 3272
D-PT	-200 ~ 850	-328 ~ 1652	
J-PT	-200 ~ 600	-328 ~ 1112	
LINE	-1999 ~ 9999		
<i>Unit</i>	Unit of process value. This parameter is not displayed when <i>TYPE</i> =LinE	<i>°C</i> :Degrees C. <i>°F</i> :Degrees F.	°C
<i>CLt</i>	Used to specify the process value when linear input (type=line) signal is out of range. None = This function is not used. Lo = The process value will be limited to LoLt when input signal is lower than the scale range. Hi = The process value will be limited to HiLt when input signal is higher than the scale range. Lo.Hi = The process value will be limit within the range of LoLt to HiLt when input signal is out of scale.	nonE, Lo Hi, Hi.Lo	nonE
	Decimal Point selection. 0000: No decimal point. 000.0: 0.1 resolution 00.00: 0.01 resolution, used for linear input only. 0.000: 0.001 resolution, used for linear input only. After change decimal point, make sure all other setting of parameters are correct.	0000 000.0 00.00 0.000	0000

<i>Rct</i>	Control Output action.	<i>rE</i> :Reverse action for heating. <i>d r</i> :Direct action for cooling	<i>rE</i>
<i>LoLk</i>	Low limit of span or range. Set the low limit lower than the lowest expected SV and PV display.	Full range.	0
<i>HiLk</i>	High limit of span or range. Set the high limit higher than highest expected SV and PV display.	Full range.	500
<i>Filt</i>	Input signal filter.	0.0-9.9	5.0
<i>R1FU</i>	Alarm 1 function. Refer to alarm function section for detail.	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d rFH</i>
<i>R1nd</i>	Alarm 1 mode. Refer to alarm mode section for detail.	nonE, Stdy, Lath, St.La HH.mm, mm.SS	nonE
<i>R2FU</i>	Alarm 2 function. Refer to alarm function section for detail	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d rFH</i>
<i>R2nd</i>	Alarm 2 mode. Refer to alarm mode section for detail.	nonE, Stdy, Lath, St.La HH.mm, mm.SS	nonE
<i>R3FU</i>	Alarm 3 function. Refer to alarm function section for detail	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d rFL</i>
<i>R3nd</i>	Alarm 3 mode. Refer to alarm mode section for detail.	nonE, Stdy, Lath, St.La HH.mm, mm.SS	nonE
<i>Raddr</i>	Address of controller when communication with master device.	0-255	0
<i>brUD</i>	Communication baud rate. 2.4k=2400bps, 4.8k=4800 bps, 9.6k=9600 bps, 19.2k=19200 bps	2.4k, 4.8k, 9.6k, 19.2k	9.6k

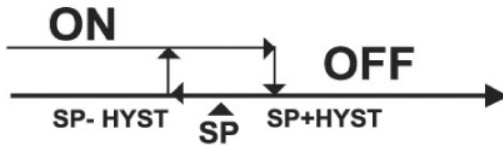
ALARM FUNCTION

A1FU/A2FU/A3FU	ALARM TYPE	ALARM OUTPUT OPERATION
nonE	Alarm function OFF	Output OFF
<i>Hi</i>	PV high alarm	
<i>Lo</i>	PV low alarm	
<i>d rFH</i>	Deviation high alarm	
<i>d rFL</i>	Deviation low alarm	
<i>bdHi</i>	Band high alarm	
<i>bdLo</i>	Band low alarm	
<i>t on</i>	PV high alarm with delay time	
<i>t oFF</i>	PV low alarm with delay time	

ALARM FUNCTION

ALMD	DESCRIPTION
nonE	Normal alarm mode
<i>Stdy</i>	Standby mode when selected, in any alarm function, prevents an alarm on power on. The alarm is enabled only when the process value reach alarm set point. Also known as "Startup inhibit" and is useful for avoiding alarm trips during startup.
<i>LrLk</i>	Latch mode. When selected, the alarm output and indicator will be energized even if the alarm condition has been cleared unless the power is shut off.
<i>St.Lr</i>	Standby and latch mode
<i>HH.nn</i>	99 Hours 59 Minutes
<i>nn.SS</i>	99 Minutes 59 Seconds

The controller can also be set to ON/OFF, P and PD control mode. Set Pb = 0 for ON/OFF control mode. The Hysteresis (dead band) of ON/OFF control can be set as follow:



■ ERROR MESSAGE AND TROUBLESHOOTING

SYMPTOM	PROBABLE	SOLUTION
uuuu	-Input signal below the low limit -Incorrect input sensor selection	-Set a higher value to high limit. -Check connect input sensor selection.
nnnn	-Input signal below the low limit -Incorrect input sensor selection	-Set al lower value to low limit. -Check correct input sensor selection-Sensor break error
oPEn	-Sensor break error -Sensor not connected	-Replace sensor -Check the sensor is connected correctly
Keypad no function	-Keypads are locked -Keypads defective	-Set "LoLH" to a proper value -Replace keypads
No heat or output	-No heater power or fuse open -Output device defective or incorrect output used	-Check output wiring and fuse -Replace output device
All LED's and display not light	-No power to controller -SMPS failure	-Check power lines connection -Replace SMPS
Process Value changed abnormally	-Electromagnetic Interference (EMI) or Radio Frequency Interference (RFI)	-Suppress arcing contacts in system to eliminate high voltage spike sources. Separate sensor and controller wiring from "dirty" power lines. Ground heaters
Entered data lost	-Fail to enter data to EEPROM	-Replace EEPROM

\* **MPI** is constantly striving to improve its high-quality products, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this manual.



**TOLL FREE (800) 817-3486**  
**PH (416) 675-7329**  
**FX (416) 675-7349**  
**www.morheat.com**

**DISTRIBUTOR :**

**DISTRIBUTOR INQUIRIES  
 WELCOME**