

# Autonics

## SCALING METER M4NS SERIES

### M A N U A L



Thank you very much for selecting Autonics products.  
For your safety, please read the following before using.

#### Caution for your safety

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
  - Warning** Serious injury may result if instructions are not followed.
  - Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
  - Caution: Injury or danger may occur under special conditions.

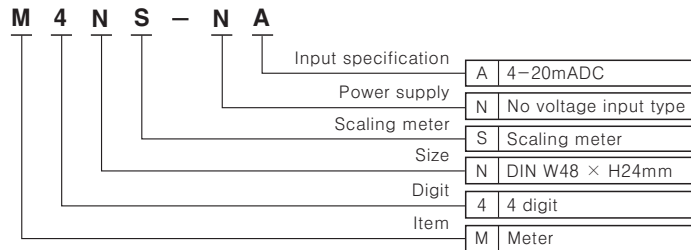
#### Caution

- In case of using this unit with machineries (Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required. It may result in serious damage, fire or human injury.

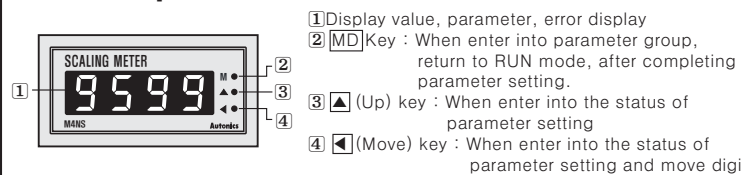
#### Warning

- It must be mounted on panel. It may give an electric shock.
- Do not repair, check up or connect when power on and measuring input applied. It may give an electric shock.
- Do not disassemble and modify this unit, when it requires. If needs, please contact us. It may give an electric shock and cause a fire.
- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock.
- Please observe specification rating. It might shorten the life cycle of the product and cause a fire.
- Be sure that there is not insulated between measuring input terminal and power terminal. It may cause mechanical trouble of measuring target or result in product damage.
- Please wire properly after check polarity of power. It may cause a fire or explosion and result in product damage.
- In cleaning the unit, do not use water or an oil-based detergent. It might cause an electric shock or fire that will result in damage to this product.
- Do not use this unit at place where there are flammable or explosive gas, humidity, direct ray the sun, radiant heat, vibration, impact etc. It may cause explosion.
- Do not inflow dust or wire dregs into inside of this unit. It may cause a fire or mechanical trouble.
- Please connect properly after checking the polarity of measuring terminals. It may cause a fire or explosion.

#### Ordering information



#### Front panel identification



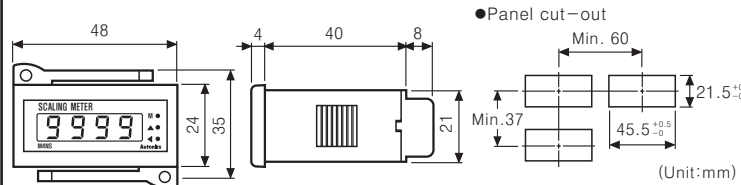
\*The above specification are changeable without notice anytime.

#### Specifications

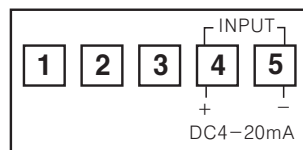
|                         |             |   |
|-------------------------|-------------|---|
| Model                   |             | M4NS-NA   |
| Power supply            |             | No voltage type   |
| Display method          |             | 7Segment LED Display(4digit)  |
| Display accuracy        |             | (Note1) 0.3% full scale of ±1Digit  |
| Display cycle           |             | Selectable 0.5sec/1sec/2sec/3sec/4sec/5sec  |
| Resolution              |             | 12,000 resolution   |
| Max. display            |             | -1999 to 9999   |
| Setting type            |             | Front S/W key   |
| Input                   |             | 4-20mADC  |
| Self-diagnosis function |             | Error display function(HHHH/LLLL)   |
| Insulation resistance   |             | Min. 100MΩ(500VDC) between external terminal and case                                 |
| Dielectric strength     |             | 2000VAC for 1minute between external terminal and case                                |
| Vibration               | Mechanical  | 0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1hour   |
|                         | Malfunction | 0.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10minute |
| Shock                   | Mechanical  | 300m/s <sup>2</sup> (30G) in X, Y, Z directions for 3 times                           |
|                         | Malfunction | 100m/s <sup>2</sup> (10G) in X, Y, Z directions for 3 times                           |
| Ambient temperature     |             | -10 to 50°C(at non-freezing status)   |
| Storage temperature     |             | -25 to 66°C(at non-freezing status)   |
| Ambient humidity        |             | 35 to 85%RH   |
| Weight                  |             | Approx. 46g   |

\*(Note1) Ambient temperature : 0.3% full scale of ±1Digit (-10~+50°C : 0.4% full scale of ±1Digit)

#### Dimensions

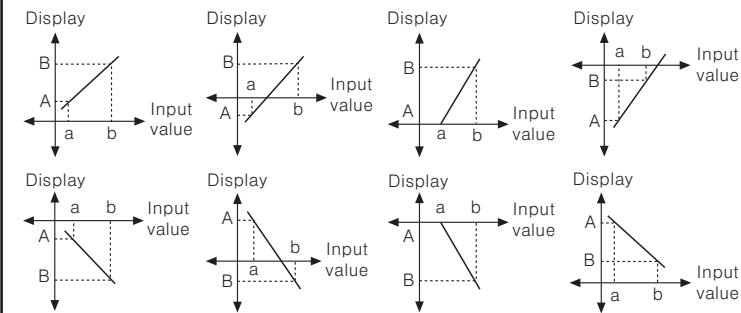


#### Connections

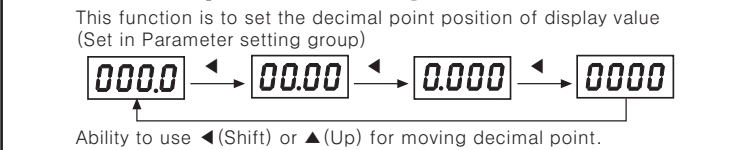


#### Prescale function

This function is to display the value with setting certain Hi/Low limit value against 4-20mADC input. For example If set a=4mADC, b=20mADC and A,B as display value, it will be displayed a=A, b=B.



#### Decimal point setting function[dot]



#### Correction function (Parameter group : InbH/InbL mode)

This function is to adjust the error of display value after calculating scale value for measuring input and also correct the input error of sensor etc.

InbL : -100 to 100 [Adjust deviation of Low value],  
InbH : 0.900 to 1.100 [Correct gradient(%) of High value]

Ex) When display value is 0.0 to 500.0 against 4-20mA input, if the display value is "1.2" for 4mA input, set -12(ignore the decimal point) as InbL value to display "0.0" So enable to remove offset of Low display value.

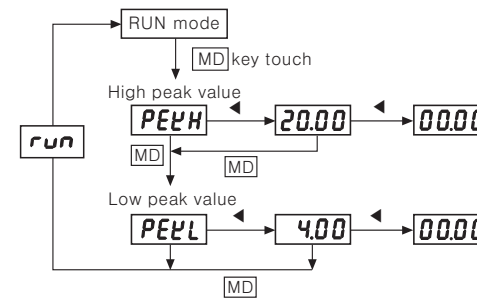
\*When completed above Low value setting then apply 20mA, if the display value is "500.5, the correction value will be 0.999(5005/5000=0.999), set 0.999 as InbH value then enable to correct High value(50005×0.999=50000). Lgnore the decimal point.

#### Monitoring mode for Peak display value

This function is to monitor Max. value and Min. value by current display value then display its Data in PEEL mode and PEEL mode.

Enable to set delay time in PEEL mode to protect the wrong Data by initial over current and settable from 0 to 30sec. and start to monitor after delay time.

- Pressing MD key to enter Monitoring mode in RUN mode.
- Each Peak value will be shown by pressing MD key in Monitoring mode and Peak value will be initialized by pressing MD once more.
- If no key touched for 60sec., it will return to RUN mode.
- When do not use Monitoring function, set 00 5 for PEEL in Parameter setting.



#### Display cycle delay function

It is difficult to display when the measuring input value is fluctuating. In this case it is able to make display value stable by delaying display cycle. Display cycle can be changed in dISt mode of Parameter 2(Selectable 0.5s/1.0s/2.0s/3.0s/4.0s/5.0s). If select 5.0s, it will be the measuring input value on an average for 5sec., then display it every 5sec.

#### Error Display function

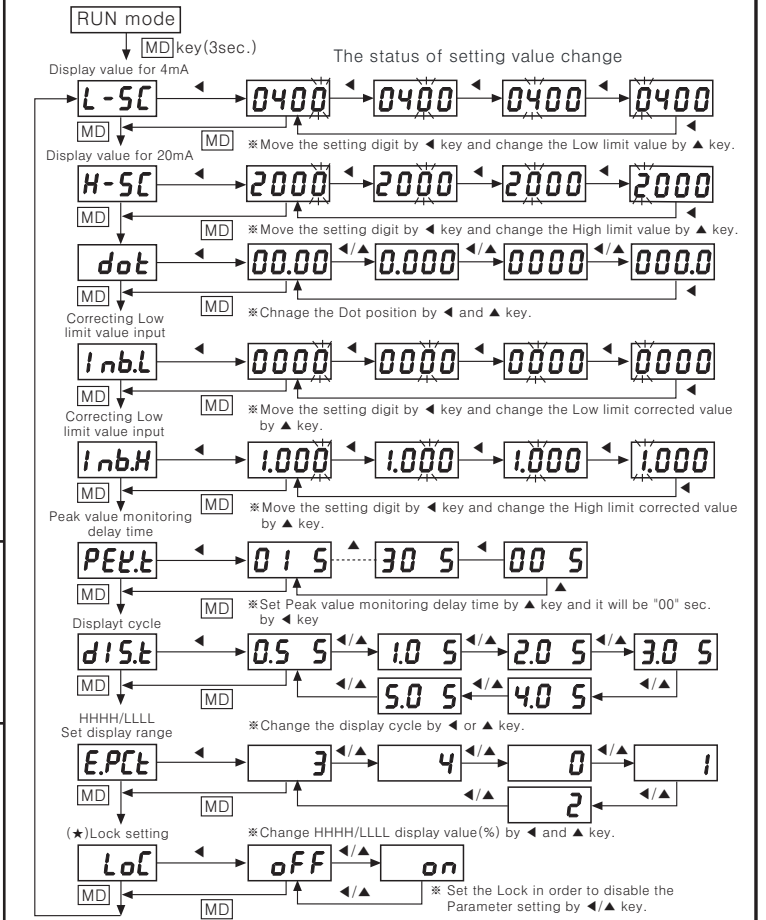
- Error display
  - When LLLL flickers
    - Input current is lower than 3% in 4-20mADC(16mA scale)
    - LLLL will flicker when it is under 3.52mA [16mA×3%=0.48mA] → 4mA-0.48mA=3.52mA
    - When it is beyond Min. display value(-1999)[by display value]
  - When HHHH flickers
    - Input current is higher than 3% in 4-20mADC(16mA scale)
    - HHHH flickers [16mA×3%=0.48mA] → 20mA+0.48mA=20.48mA.
    - When it is higher than 20.48mA.
    - When it is beyond Max. display value(9999)[by display value]
- Turn Error display off
  - LLLL and HHHH are displayed when input is out of measuring range, therefore it will be disappeared automatically when input returns to measuring range.
- Error setting and sort
  - It will display the error message according to the setting value which set % value against analog input range and set it in E.PCL mode by ◀/▲ key.

|         |  |
|---------|--|
| E.PCL 0 | LLLL/HHHH are displayed when it is over 0% out of 4-20mADC range |
| E.PCL 1 | LLLL/HHHH are displayed when it is over 1% out of 4-20mADC range |
| E.PCL 2 | LLLL/HHHH are displayed when it is over 2% out of 4-20mADC range |
| E.PCL 3 | LLLL/HHHH are displayed when it is over 3% out of 4-20mADC range |
| E.PCL 4 | L-SC/H-SC are displayed always when it is out of 4-20mADC range  |

#### Parameter

| Display | Function                                     | Setting range                             |
|---------|--|---|
| L-SC    | Low limit display value for 4mA input        | -1.999 ~ 9.999                            |
| H-SC    | Hi limit display value for 20mA input        | -19.99 ~ 99.99<br>-199.9 ~ 999.9          |
| dot     | Set Dot position                             | -1999 ~ 9999                              |
| Inb.L   | Correct Low-limit value of display value     | -100 ~ 100                                |
| Inb.H   | Correct High-limit value of display value(%) | 0.900 ~ 1.100                             |
| PEEL    | Peak Time                                    | 0 ~ 30sec                                 |
| dISt    | Selectable sampling time (sec)               | Selectable 0.5/1.0/2.0/3.0/4.0/5.0        |
| E.PCL   | HHH/LLLL display value range for input       | Selectable 0 to 3% or (4:Fixed H-SC/L-SC) |
| LoC     | Set lock function                            | Selectable ON, OFF                        |

#### Parameter setting



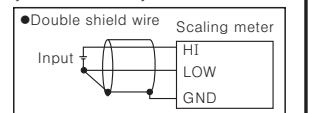
- Pressing MD key to complete the setting and move to next parameter in status of changing setting value.
- Pressing MD key for 3 sec. to move to RUN mode after displaying run.
- If no key touched for 60sec., it will return to RUN mode.
- (\*)Key lock setting
  - off : Disable to change or set parameter
  - on : Disable to change or set parameter but enable to check the setting value in parameter group. Disable to enter into the status of change setting value by pressing ◀/▲.

#### Factory specification

| Parameter                             | Parameter display | Factory specification |
|---------------------------------------|-------------------|-----------------------|
| Low limit display value for 4mA input | L-SC              | 0400                  |
| Hi limit display value for 20mA input | H-SC              | 2000                  |
| Set Dot position                      | dot               | 0000                  |
| Correction of Low limit value input   | Inb.L             | 0000                  |
| Correction of Hi limit value input    | Inb.H             | 1000                  |
| Peak value monitoring delay time      | PEEL              | 01 5                  |
| Display cycle                         | dISt              | 0.5 5                 |
| Set % of HHH/LLLL display range       | E.PCL             | 3                     |
| Lock setting                          | LoC               | off                   |

#### Caution for using

- Please use separated line from high voltage line or power line in order to avoid inductive noise.
  - Please install power switch or circuit breaker in order to cut the power supply.
  - The switch or circuit breaker should be installed near by users for safety.
  - Be sure to avoid using this unit near by machinery makes strong high frequency noise. (Welding machine, high capacity SCR unit etc.)
  - Input line : Shield wire must be used when the measuring input line is getting longer or there are lots of noises.
- \*It may cause malfunction if above instructions are not followed.



#### Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO<sub>2</sub>, Nd:YAG)

**Autonics** Corporation  
http://www.autonics.com

Satisfiable Partner For Factory Automation

HEADQUARTERS :  
41-5, Yongdang-ni, Uingsang-eup, Yangsan-si, Gyeongsang, 626-847, Korea

INTERNATIONAL SALES :  
Bldg. 402 3rd Fl., Bucheon Techno Park, 193, Yakdae-dong, Wornji-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea  
TEL: 82-32-329-0722 / FAX: 82-32-329-0728  
E-mail : sales@autonics.net